GSPCGUJARAT STATE PETROLEUM CORPORATION LIMITED



FEASIBILITY STUDY FOR GAS GRID IN GUJARAT

FINAL REPORT

TATA CONSULTANCY SERVICECS

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TATA CONSULTANCY SERVICES

Nirmal Bldg., Nariman Point Mumbai 400 021

MAY 1999

TABLE OF CONTENTS

Chapter	Description	Page No.	
	Executive Summary	1	
1	Introduction	4	•
2	The Energy Scenario	5	,)
3	Natural Gas Demand – Short & Medium Term (1997 – 2007)	8	}
4	Natural Gas Demand – Long Term (upto 2017)	19	}
5	Natural Gas Supply	23	3
6	The Regulatory Framework	28	
Annexures			
A1	List of Abbreviations	42	2
A2	Natural Gas Demand Power (Short & Medium Term)	43	3
A3	Natural Gas Demand – Fertiliser (Short & Medium Term)	47	7
A4	Natural Gas Demand – Cement (Short & Medium Term)	48	8
A5	Gas Demand from Neighbouring States	49	9
A6	Assumptions for Estimating Long Term Demand	50	0
A7	Natural Gas Demand – Power (Long Term)	5	3
A8	Natural Gas Demand - Industry (Long Term)	5	4
A 9	Gas Pricing	5	7

The total energy consumption in India, which has registered a higher growth of 6% p.a., from 1973 to 1993 (as compared to the world average of 1.5%) is expected to double by 2010. An increasing awareness over environmental concerns and higher efficiencies has resulted in the emergence of natural gas as a viable alternative to coal.

Currently, India accounts for only 1 % of the world's natural gas consumption (1755 MMTOE). As against global levels of 5%, nearly half of the total natural gas is consumed as feedstock for fertiliser units.

The Government of Gujarat has ambitious plans for accelerating the industrial growth of the state. Investments worth Rs. 1,000 billion have been earmarked for infrastructure projects (excluding Power, LNG terminals and Refineries) over the next 15 years. Majority of these investments (over 50%) are expected to be concentrated in the Central and South Gujarat corridors. The break up of the investments across industries is as under:

•	Chemical and Petrochemical	60%
•	Glass	10%
•	Ceramics & Cement	10%
•	Engineering	10%
•	Textiles	10%

The demand for natural gas in Gujarat, is expected to reach 44 MMSCMD from the current level of 27 MMSCMD - by 2007. Power and Fertiliser units will continue to be the main drivers of demand for natural gas and are expected to account for nearly 75% of this demand.

The power sector itself will contribute to half the total demand. By 2007, installed capacity in the state is expected to more than double, from the current level of 6800 MW to 15500 MW. Of this increase, gas and naphtha based plants will account for nearly 2500 MW.

Though demand for urea is likely to outstrip indigenous supply, further domestic expansions of 1.5 MMTPA may not fructify as it may be economical to set up dedicated, gas-based plants in the Middle East where natural gas is available cheaply.

The cement industry has predominantly used coal as fuel. However, deterioration in the quality of coal, inadequate supply and transportation bottlenecks coupled with the advantages of using natural gas an economical, environmental-friendly and efficient fuel has resulted in natural gas being considered as a suitable substitute for coal. At one point 40 MMTPA of new cement manufacturing capacity was envisaged in the state. Due to the current recession in the domestic market and collapse of the export market, these projections have been scaled down to 10 MMTPA and the corresponding demand for natural gas will not exceed 2 MMSCMD by 2007.

Demand for natural gas from other industries is unlikely to exceed 20% of the demand from the above core drivers going by the consumption figures provided by GAIL and the expansion plans of the glass, ceramic and petrochemical industries.

Over a longer time-frame, (by 2017), issues relating to efficiency and environment will drive the demand for natural gas to 98 MMSCMD, the power sector accounting for nearly 75% of the demand.

In order to be considered for substitution of competing fuels - naphtha, domestic coal, imported coal and lignite - natural gas will have to be priced at US\$ 5.3, 4.9, 4.6 and 2.7 per MMBTU, respectively, at current prices.

On the supply side, currently, Gujarat produces about 9 MMSCMD of natural gas (12 % of India's total natural gas production) from its Gandhar & Tapti basins and Hazira. This figure is expected to increase to about 28 MMSCMD (inclusive of Coal Bed Methane) by 2007 (source: Ministry of Petroleum and Natural Gas, Annual Report 1997-98). The shortfall of around 16 MMSCMD in 2007 will have to be met though the import of LNG.

This potential for natural gas will attract large-scale private investments in the areas of gas transmission, distribution, and storage. Scattered demand centres, across the state, will necessitate the creation of a gas grid in Gujarat. In order to attract investment and create a level playing field for both public and private promoters, it is necessary to have an independent regulatory authority in place.

The following distinct areas exist in the natural gas industry:

- Gas exploration and production
- Gas transmission
- Gas distribution

Gas transmission is a natural monopoly because the minimum efficient scale of operation is very large in relation to the market and only one supplier can function if the cost of service is to be kept at minimum. The majority of pipeline costs are fixed costs and a very small proportion is the variable cost i.e. operation & maintenance costs. Hence any existing pipeline operator can effectively prevent competition from entering by reducing cost of service. A newcomer who has to cover total costs cannot compete with an existing entity.

Ever since the Government of the United Kingdom began selling off state-owned utilities in 1984, it has become a role model for privatisation and unbundling of services. Governments around the world have embraced not only the privatisation ideology but also its methods. The RPI-X formula, which is used to set the prices that UK privatised utilities charge their customers, has driven gains in efficiency so successfully that it is becoming the method of choice in countries from Argentina to Australia.

The regulatory authority should comprise the Chairman and two other members with a tenure of around 3-5 years, and an upper age limit of 65 years. The members should be appointed through a legislative process. Any member of the regulatory authority may be removed from office by order of the Governor of the State after the High Court has reported that the member ought to be removed.

The responsibilities of the State Regulatory Authority would include:

- Establishing procedures, promoting efficiency and economy through optimal utilization of pipelines.
- Laying down procedures for effective settlement of disputes
- Monitoring compliance of safety, regulations and standards.

In the long-term, gas and power regulators can be expected to be merged on account of the increasing convergence of the two markets.



1.1 Background and Terms of Reference

The Government of Gujarat has designated the Gujarat State Petroleum Corporation (GSPC) as the nodal agency for exploration and exploitation of oil and gas in the state. As part of its vision to pursue a multi-dimensional role to meet the state's energy needs, GSPC plans to set up a gas grid to supply natural gas in the state. In this context, TCS was given the following mandate:

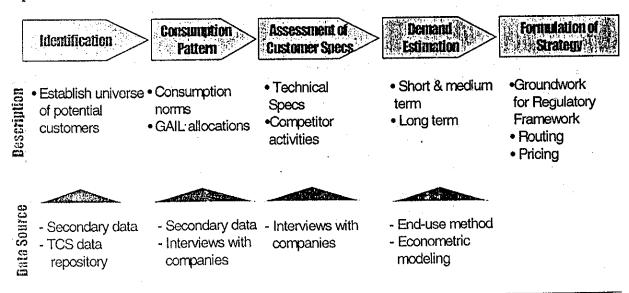
- Preparation of macro-level regulatory framework for gas distribution in Gujarat
- Assessing demand supply for natural gas in Gujarat
- Advising on gas pricing

1.2 Scope of the engagement

The scope of the engagement for assessing demand of natural gas was restricted to units in the power, fertiliser, refinery, petrochemicals, steel, glass and cement industries, and the transportation and household sectors. The geographical scope was restricted to the state of Gujarat. Gas demand was projected over the short term (5-year), medium term (10-year) and long term (20-year) horizon.

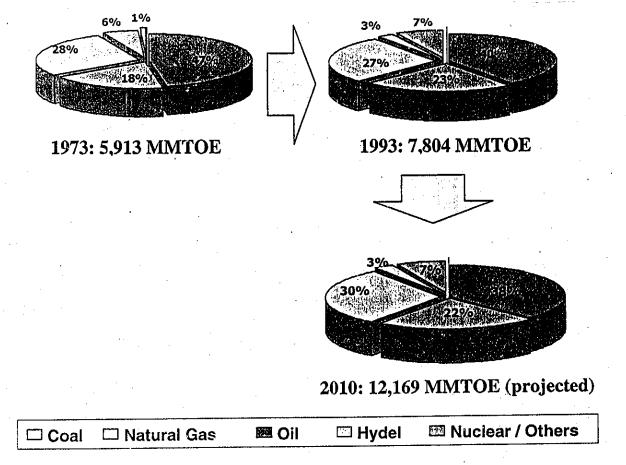
1.3 Approach & Methodology

TCS' approach and methodology, for execution of this assignment, has been pictorially represented below:



2.1 The Global Energy Scenario

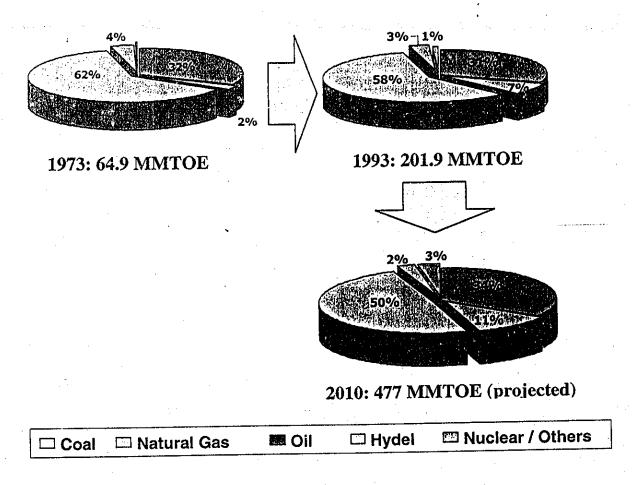
There has been a steady increase in global energy consumption: from 5,913 MMTOE in 1973 to 7,804 MMTOE in 1993. Energy consumption is expected to reach 12,169 MMTOE by 2010. Oil and gas account for around 60% of global energy consumption and this trend is expected to continue.



Source: IEA Estimates

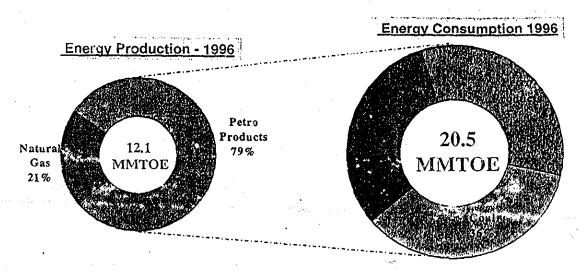
2.2 The Indian Energy Scenario

Indian energy consumption has registered a higher growth of 6% p.a., from 1973 to 1993, as compared to the world average of 1.5%. This high growth rate is on account of industrialisation and the shift from non-commercial to commercial energy sources. The total energy consumption, in India is likely to double by 2010. Natural gas is gradually emerging as a viable alternative to coal.



Source: IEA Estimates

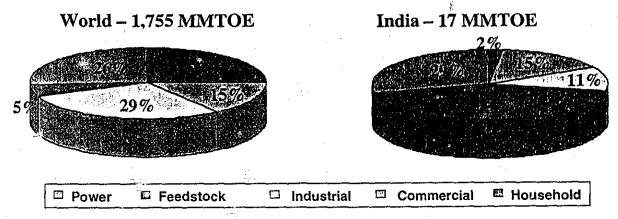
2.3 Energy Scenario in Gujarat



Source: GAIL, CIL, CMIE

Gujarat accounts for 9% of national energy consumption but has only 4% of the population of India. This is an indication of the relatively high level of industrial development of the state. The state has limited coal deposits and oil / gas is the major local sources of energy. The short fall in energy production of about 40 % is met by imports from neighbouring states.

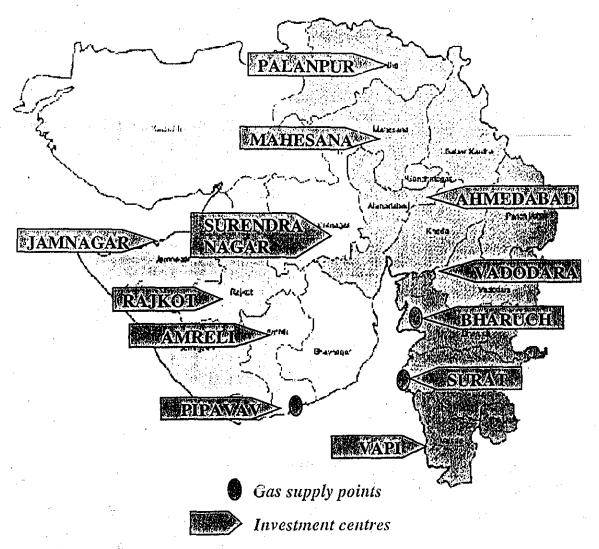
2.4 Natural Gas Consumption – India v/s the World



Source: 'R' Group Report, 1996

India accounts for only 1 % of the world's natural gas consumption. Nearly half of the total natural gas is consumed as feedstock, in India, as compared to 5 % globally. This is not surprising since the only major gas transmission system in India, the HBJ pipeline, was set up to provide feedstock to fertiliser plants.

3.1 The Investment Corridor



Source: Industries Commissionerate, Gandhinagar

Investments worth Rs. 1,000 billion are expected to be made in Gujarat over the next 15 years. This figure does not include investments in Power, Refineries, and LNG terminals. Majority of these investments (over 50%) are expected to be concentrated in Central and South Gujarat. Chemical and petrochemical industries would account for over 60% of total investment while glass, ceramics & cement, engineering and textiles, would account for 10% each.

3.2 Gas Allocation for Gujarat

The gas allocation for consumers in Gujarat is as shown below:

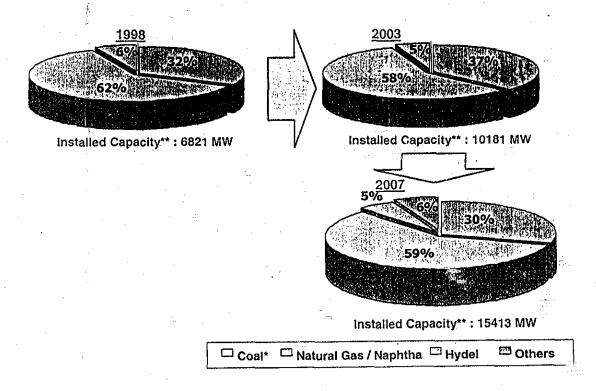
Along HBJ Pipeline		Onshore Gas Consumers in G	ujarat
GSFC - Vadodara	0.45	IFFCO - Kalol	0.84
IPCL - Vadodara	0.90	GSFC - Vadodara	0.35
!OCL - Vadodara	0.40	GEB - Dhuvaran & Utran	0.75
NTPC - Kawas	0.75	GNFC - Bharuch	0.60
		Heavy Water Project	0.13
Gas Allocation at Hazira		Baroda City Gas	0.06
		AEC - Vatva	0.40
KRIBHCO	3.00	Gujarat Gas Co.	0.17
Essar Guajarat	1.40	Reliance Industries Ltd.	80.0
Reliance Industries	0.50	GIPCL - Vadodara	0.70
Gujarat Gas Co. Ltd.	0.30	NTPC - Gandhar	1.50
Heavy Water Project	0.10	Torrent - Gandhar	1.50
· · · · · · · · · · · · · · · · · · ·		Gujarat Guardian Ltd.	0.12
Total	7.80		7.20

Grand Total

15.00

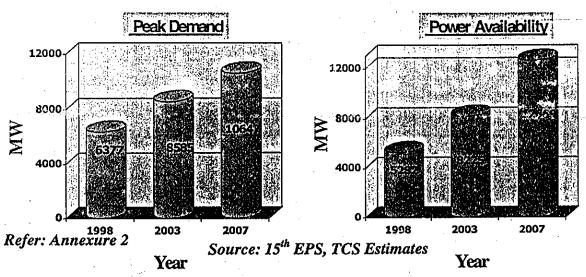
Source: GAIL

3.3 Power Scenario in Gujarat



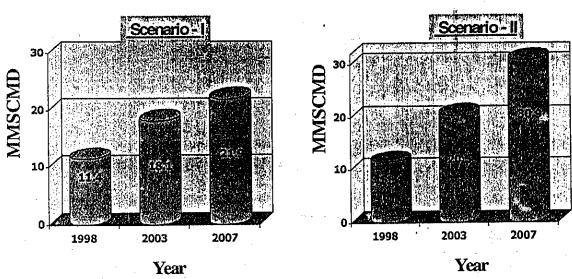
[Note: * indicates coal, lignite and petroleum coke and ** indicates installed capacity of all power plants in the state (including central plants but excluding captive power plants)]

Over the next 10 years, 2000 MW of gas-based capacity is expected to be installed. This excludes naphtha-based projects, which may switch to natural gas, if it is available. Total gas and naphtha based capacity addition is estimated to be of the order of 2,400 MW. In addition, captive power capacity is expected to increase from 1,540 MW to 2,900 MW by 2007.



With an estimated capacity addition of nearly 7,500 MW, Gujarat is likely to move from being a peak power deficit state (-1,100 MW) in 1998 to a power surplus one (+ 2,000 MW) by 2007 assuming that the growth in Net State Domestic Product (NSDP) remains below 7%.

3.3.1 Demand for Natural Gas from Power Sector



Refer: Annexure 2

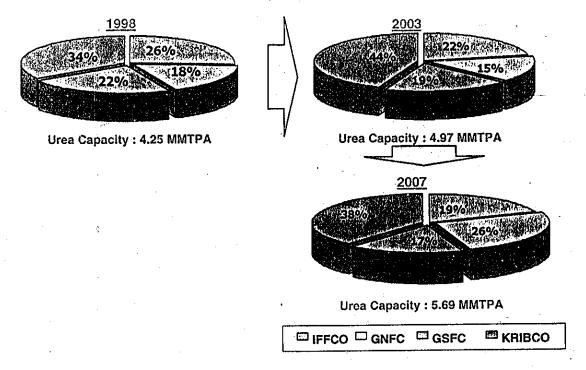
(Note: Plant Availability assumed to be 85%)



Assuming that the proposed capacity additions come through (Scenario I), the demand for natural gas is expected to rise to 22 MMSCMD at the end of the ten-year period (1998-2007).

However, in the event the state government decides on a single 510 MW gas based plant in lieu of the scrapped 10 small power plants, and a single 2,000 MW gas based project in Pipavav instead of three separate plants (2 x 615 MW gas based plants & 1x 1,000 MW imported coal based plant), this demand will increase to nearly 31 MMSCMD (Scenario II).

3.4 Fertiliser Scenario in Gujarat

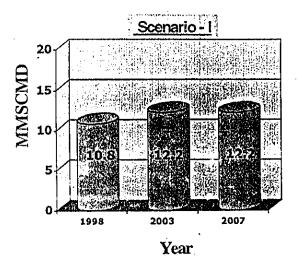


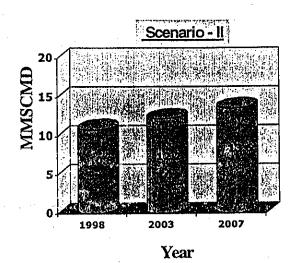
Refer: Annexure 3

Source: Company sources

On account of the expansion plans of existing fertiliser units, urea capacity in the state is expected to increase by nearly 33% - 4.25 MMTPA in 1998 to 5.69 MMTPA by 2007. There is, however, some thought by the Ministry of Fertiliser to locate new capacity in the Middle East where natural gas is cheaper. This may affect the fructification of the expansion plans of the units in Gujarat.

3.4.1 Demand for Natural Gas from Fertiliser Industry



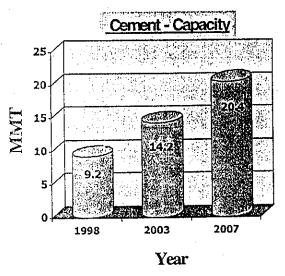


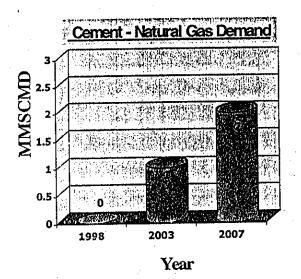
Refer: Annexure 3

Of the proposed capacity augmentations, the likelihood of the expansion plans of GNFC to fructify is quite low (Scenario I). Correspondingly, demand for gas from the fertiliser industry is likely to increase marginally to 12.2 MMSCMD by 2007.

In the event the GNFC plant does come up (Scenario II), this demand will increase to 13.6 MMSCMD by 2007.

3.5 Cement Scenario in Gujarat





Refer: Annexure 4

Source: Cement Manufacturers' Association



Despite being endowed with large limestone deposits, cement capacity in Gujarat is expected to only double from a current level of less than 10 MMT to just over 20 MMT in the next 10 years. The ongoing recession in the country and the collapse of the export market in South East Asia has put the brakes on the addition of new capacity. Currently all plants use coal / lignite. Use of natural gas improves the plant efficiency and new plants can be expected to use natural gas. Assuming that 50 % of the new capacities will be operated on natural gas, the demand for natural gas from this industry will be around 2 MMSCMD by 2007.

3.6 Demand for Natural Gas from Other Industries

Power, fertiliser and cement industries form the core demand drivers for natural gas. A preliminary survey of the glass and ceramic industries reveals that their gas requirements are 0.51 and 0.07 MMSCMD respectively. The survey included companies like Gujarat Guardian Ltd., Gujarat Borosil Ltd., Alembic, Gopal Glass Works, Bell Ceramics, Somani Pilkingtons, Madhusudan Ceramics and Swastik Ceramics. Other pointers to this demand are provided below:

- Current consumption of gas in the petrochemical industry is 0.5 MMSCMD
- Supply of gas by Gujarat Gas Company Limited, for domestic and commercial use, after
 10 years of operation (1989-98) is 0.67 MMSCMD
- GAIL allocations for the glass industry are around 1.6 MMSCMD
- Potential demand for natural gas in the Vapi area, as detailed below, is unlikely to exceed
 0.05 MMSCMD

Thus, the demand from these industries is unlikely to exceed 20% of the demand from the above core demand drivers.

3.6.1 Potential Demand for Natural Gas in Vapi

The industrial belt in Vapi, South Gujarat comprises textiles (dyeing), chemical, petrochemical and pharmaceutical units. Apart from a handful of medium to large manufacturing units, the Vapi belt is dotted with small scale industrial units.

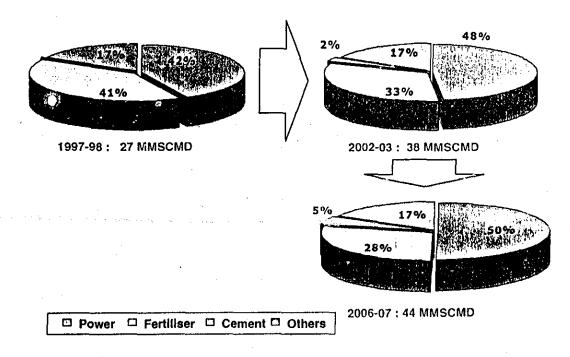
The following extract outlines the details of the large-scale units (listed companies) in Vapi which were considered as potential natural gas consumers.



All the companies, except United Phosphorus, use multi-fuel boilers, which can support a gas fuel (The multi-fuel boiler at United Phosphorus can not be operated with gas). The boilers used in the small scale units are of the single fuel type operating either on FO or LDO. The small capacities, however, may render the switch to a gas based boiler financially unattractive.

Company	Products	Capacity (MT)	Fuel used	Potential Ga (lit/day) (N	is Demand IMCFD)
United Phosphorus Ltd.	Pesticides	14445	Fuel oil	15000	0.60
en e	Pesticide Intermediates	122 40	es de la company		
	Phosphorus compounds	29450			
	Mercury Salts	100		e de la companya de La companya de la co	
Themis Chemicals Ltd.	Bulk Drugs	200	LDO	1000	0.04
٠	Tablets	200 mn. Noose			
	Syrups	0.37 mn ltrs.			
	Injections	0.05 mn. Ltrs			
	Drug Intermediates	220			
Beta Naphthol Ltd.	Dye intermediates	4860	Fuel Oil	2000	0.08
	Dye Stuff	600			
	Beta Mix	150 k. ltrs	•	an hill	
Pidilite Industries	Chemicals	47882	Fuel oil	15000	0.60
4, T	Dyestuffs	2364			
Other Small units	2		Fuel Oil / EDO		0.25
(boiler capacity: 1-2T)		Total F	Potential Demand (Approx.) 1.57 0.04 M	MMCFD MSCMD

3.7 Summary of Natural Gas Demand in Gujarat



In the first scenario (Scenario I), demand for natural gas is expected to increase from the current estimates of 27 MMSCMD to 44 MMSCMD by 2006-07.

As per the alternative scenario (Scenario - II) described in previous sections - the demand for natural gas will shoot up to nearly 56 MMSCMD by 2006-07.

3.8 Cluster-wise distribution of Companies

The table on the following page depicts the distribution pattern of natural gas consumers in Gujarat. Most of the current demand is concentrated in the north-south axis running from Surat to Mensana. Future demand points like Chaara-Pipavav lie along the Saurashtra coast. The proposed LNG terminal at Pipavav could meet the demand in this part of Gujarat.

INDUSTRY	POWER	FERTILISER	OTHERS
HAZIRA - BHARUCH	Essar Power GFB - Uran Gas TPS NTPC - Kawas NTFC - Gandhar GTEC - Gandhar GSPOL - Hazira	GNFC Bharuch KPIBCO - Surat	Adiance Petrochemicals Ltd. IPCL - Gandhar
VADODARA - GANDHINAGAR	AEC - Vatva & Ahmedabad GEB - Dhuaran	GSFC - Vadodara IFFOO - Mehsana	IOC - Koyali IPOL - Vaxbotava
CHAARA - PIPAVAV	GPOL - Pipovov GPOL - Cheara KPIBJOO - Juriagadh	• None	Narmeda Cement - Anireli L&T Cement - Anireli Gujaret Ambuja - Amreli
OTHERS	• GPCL - Coctra • GPCL - Mundra	•None	Pellanca ind Jammagar Essar Refineries, Vadiner Pittie Cements - Bhavnagar Indian Payon - Bhavnagar DLF Quj. Ltd Kutchh Koop - Kutchh Sanghi Cement - Kutchh Grasim Ind - Junagadh Saurashtra Cement - Junagadh

3.9 Customer Responses / Technical Specifications

Some of the customer responses have been captured verbatim, as given below:

'They have given us concrete proposals ... but they do not assure us continuous supply... '

Mr. K. Das Executive Director KRIBHCO

`I want gas.. give me gas and I will use it instead of naphtha for our expansion program '

Mr. Manoj Saxena Senior Supdt. - Maintenance & Planning NTPC - Gandhar Power Plant

`Give me gas at a price lower than naphtha and we will change over...'

Mr. D. S. Sharma General Manager - Operations, NTPC Kawas

`If the price is less than naphtha and you give us an assured supply ... we would use gas instead of naphtha..'

Mr. U. Bhatt Asst. General Manager (Finance) GTEC The following table provides the technical specifications as indicated by current and potential natural gas consumers:

Industry	Power	Fertiliser	Others
Calorific Value	8,500 – 10,300	9,500	Petrochemicals – 8,500
(kcal/SCM)			Refineries – 11,000
Pressure (PSI)	280 – 350	644 – 650	Not available •

GSPC must address the following issues in marketing the gas grid

- Reliability of supply
- Customer technical specifications
- Routing options
- Transportation price

3.10 Demand for Natural Gas from Neighbouring States

		All figu	<u>res in MMSCN</u>
State	1998	2003	2007
Rajasthan			
Power	1.95	9.11	9.11
Fertiliser	1.95	3.40	3.40
Madhya Pradesh			
Power	0.00	4.67	4.67
Fertilizer	2.70	2.70	2.70
Maharashtra	<u>'</u> 		
Power	0.85	0.85	5.33
Fertiliser	4.00	4.00	4.00

(NOTE: Only those units in close proximity to the HBJ pipeline have been considered)

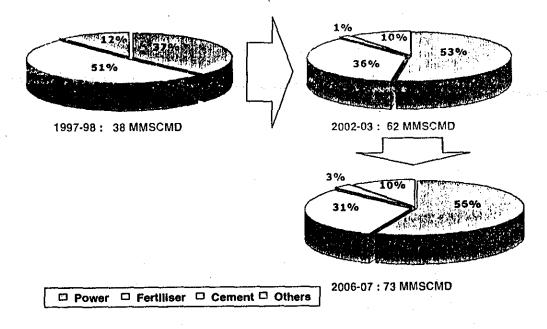
Refer: Annexure 5

Source: TCS Estimates

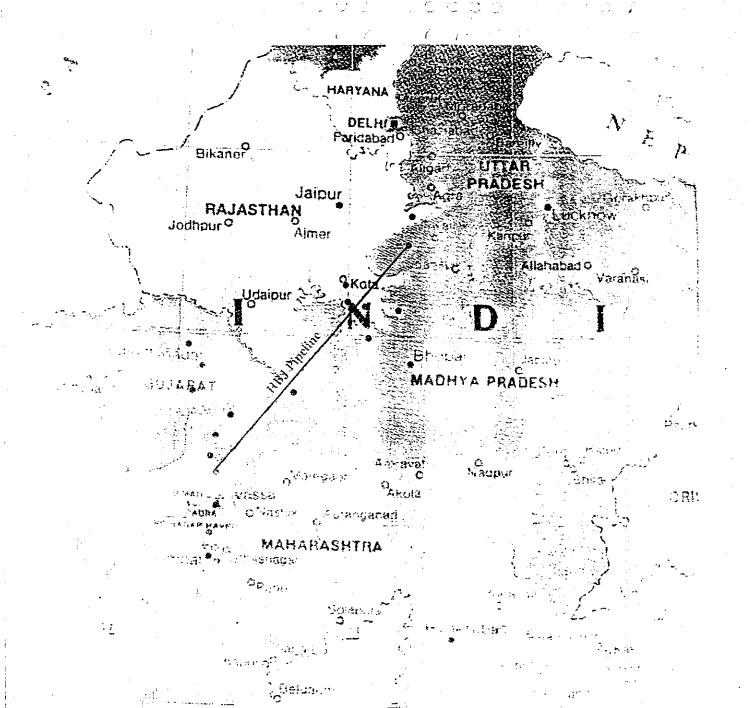
The total demand for natural gas from the adjoining areas of the neighbouring states of Rajasthan, Madhya Pradesh, and Maharashtra, is expected to increase from the current level of 12 MMSCMD to 29 MMSCMD by 2007. The ratio of demand of natural gas from the

power sector to that from fertiliser plants will change from 0.32 to 1.89 indicating a major increase in demand from the power sector as against a stagnant demand from the fertiliser sector.

3.11 Summary of Natural Gas Demand in Gujarat and Neighbouring States



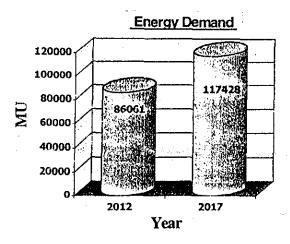
Demand for natural gas, in Gujarat and adjoining areas of neighbouring states, is expected to increase from the current level of 38 MMSCMD to 73 MMSCMD by 2006-07.

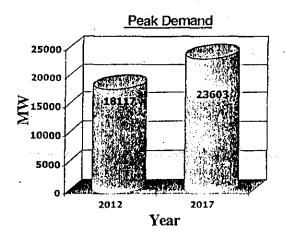


Power (existing & proposed)

Feralizer (existing & proposed

4.1 Power Scenario in Gujarat



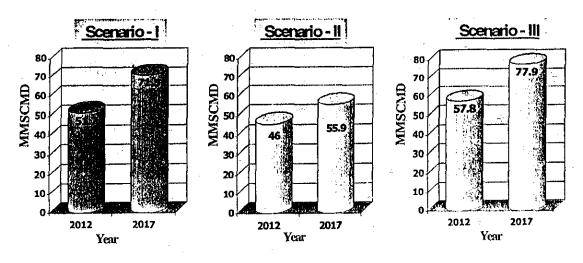


Refer: Annexures 6 & 7

Source: TCS Estimates

The Net State Domestic Product (NSDP) of Gujarat is expected to grow at 6% per annum in the long term; this translates into a power-demand growth rate of 7.1% p.a. Power-demand growth rate is, however, expected to decline from 7.1% p.a. in 2002 to 5% p.a. in 2017 due to development of energy-efficient technologies.

4.1.1 Demand for Natural Gas from Power Sector



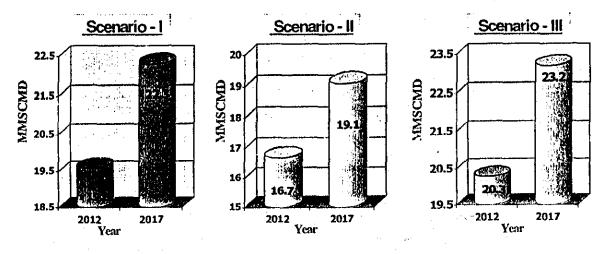
Refer: Annexures 6 & 7

With low availability of domestic fossil fuels in Gujarat, all additional plants (in line with a 6% growth in NSDP p.a.) are expected to be based on natural gas / coal bed methane (Scenario I). Consequently the demand for natural gas is estimated to be 71 MMSCMD by 2017.

Assuming only 50% of the additional plants are based on natural gas (Scenario II), the demand for the same is expected to be nearly 56 MMSCMD by 2017.

If the NSDP growth rate increases to 7% p.a. during IXth and Xth plan periods and stabilises at 6% p.a. thereafter, and if all additional plants are gas-based (Scenario III), the demand for natural gas is expected to reach 78 MMSCMD by 2017.

4.2 Demand for Natural Gas from the Industrial Sector



Refer: Annexures 6 & 8

Increasing substitution of liquid petroleum products in industry by natural gas – driven by environmental and price considerations – will fuel the demand for the latter. Assuming an annualised growth rate of 6% in NSDP (Scenario I), the demand for natural gas from industrial sector is expected to be 22.3 MMSCMD by 2017.

If only 50% of liquid petroleum products are substituted by natural gas (Scenario II), the demand for natural gas will be restricted to 19 MMSCMD. For an NSDP growth rate of 7% per annum during IXth and Xth plan periods and 6% per annum thereafter, and 100 %

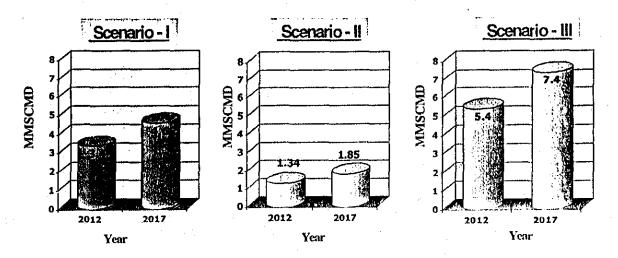
substitution (Scenario III), the demand is expected to be marginally higher at 23.2 MMSCMD.

4.3 Demand for Natural Gas from the Transport Sector

International experience shows that despite many virtues, infrastructural bottlenecks render Compressed Natural Gas (CNG) a poor substitute for liquid petroleum products. In the short-to-medium term CNG is unlikely to be popular mainly on account of:

- Limited availability of CNG across the state
- High cost of inmastructure build-up
- High cost of conversion kit, particularly for diesel vehicles

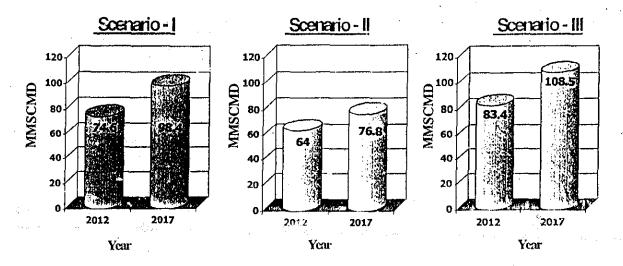
In the long term, CNG could substitute a small percentage of petrol in the passenger car segment. For diesel vehicles, due to high cost of conversion and lower cost of diesel, the usage of CNG is likely to be restricted to the public transport system only.



Refer: Annexure 6

At a 7% and 6% annualised growth in passenger cars and buses, respectively, the population of cars will increase from 3.3 lakhs in 1998 to 12 lakhs in 2017, while the number of buses will increase from nearly 32,000 in 1998 to over 81,000 in 2017. Assuming that 25% (Scenario I), 10% (Scenario II) and 40% (Scenario III) of these vehicles convert to CNG, the demand for natural gas will reach 4.6, 1.85 and 7.4 MMCMD respectively.

4.4 Summary of Demand for Natural Gas



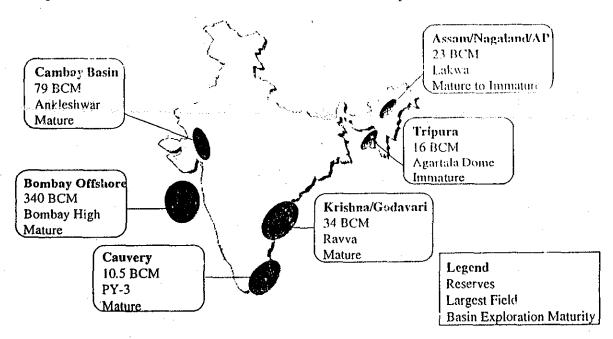
In line with the estimates pertaining to Scenario I (as stated in the previous sections), demand for natural gas is expected to quadruple from the current figure of 27 MMSCMD to 98 MMSCMD in 2017.

The pessimistic estimate (Scenario II) indicates the demand to reach 77 MMSCMD by 2017.

An NSDP growth rate of 7% pr annum during IXth and Xth plan periods and 6% per annum thereafter (Scenario III) will cause demand for natural gas to increase to 109 MMSCMD in 2017.

5.1 Productive Basins in India

The productive basins in India have been shown on the map below:



Source: Ministry of Petroleum & Natural Gas, Annual Report - 1995-96

5.2 Natural Gas Production in India

<u></u>					Ali figures i	g MMSCM
	1985-86	1990-91	1994-95	1995-98	1996-97	1997-99*
Onshore						
Gujarat	919	1696	2462	2878	2932	3115
Assam / Nagaland	2029	2011	1909	1880	1941	2018
Arunachal Pladesh	6	29	37	32	23	23
Tripura	<u>.</u>	70	97	131	154	196
Tamil Nadu	- 1	64	98	117	92	95
Andhra Pradesh	% 	46	640	679	799	1022
Rajasthan			•	12	10	149
Offshore	£4.					
Bombay High	5180	14082	14138	16579	16794	18102
Total	810.1	17003	40.01	20300	22713	21720

provisional

Source: Ministry of Petroleum & Natural Gas, Annual Report - 1997-98

Bombay High is a major source of natural gas production in India and has been consistently contributing around 75% of the total gas produced.

			All figures in MMSCMD
	1997-98	2902-03	2009/07
Domestic Production			
Gandhar - Onshore	0.8	6.3	3.4
Hazira	1.0	3.5	6.0
Tapti - Offshore		10.0 %	N. Sq. 12.0
СВМ		1.0	6.0
Total	9.0	20.8	27.4
Demand	27	38	44
Demand-Supply Gap	(18)	(17.2)	(16.6)

Source: Ministry of Petroleum & Natural Gas, Annual Report - 1997-98

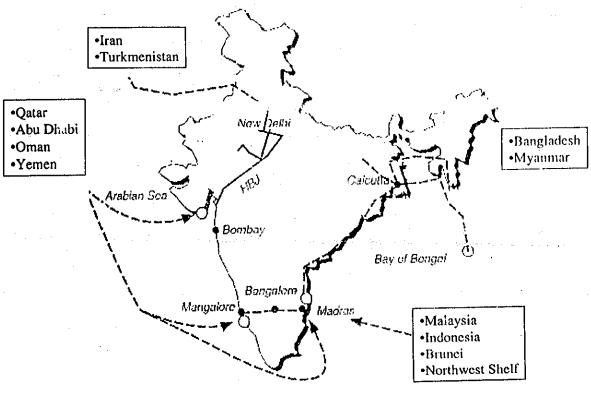
5.3 Domestic Gas - Demand / Supply Scenario in Gujarat

The table indicates a drop in shortfall in supply of natural gas as a percentage of the total demand, but the absolute deficit is expected to be around 17 MMSCMD till 2007. The shortfall will have to be met by way of LNG imports or through cross-border pipelines.

5.4 Import Options for Supply of Natural Gas

The schematic on the following page depicts the various import options for supply of natural gas to India from various gas fields. There large gas reserves surrounding the Indian subcontinent and gas could be brought to India either through cross-border pipelines or by ships as liquefied natural gas (LNG). For reserves lying up to 1500 KM away from India and accessible through a land route, piped gas would be cheaper than LNG. The corresponding figure for submarine pipelines is 1000 KM.

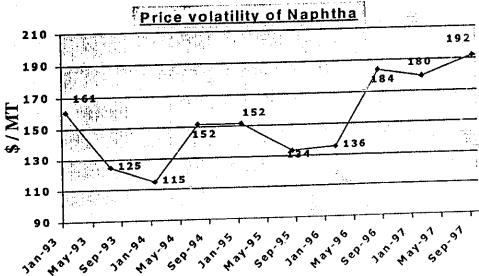




5.5 Pricing of Natural Gas

Natural gas prices are market-determined the world over and the same is expected in India. These prices would be pegged to a basket of petroleum products. Since natural gas will replace some of the existing fuels currently used in power, fertiliser, and other industries, demand for natural gas will essentially be driven by the price of the fuel it replaces.

5.6 Indicative price of natural gas

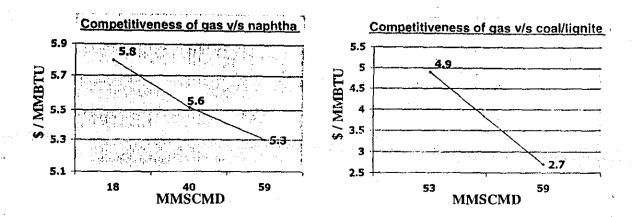


(Landed cost for Naphtha in Mumbai for mid April'99 = \$143 / MT)

Source: Platts Arabian Gulf FOB Prices (via BP)



High volatility in international prices of naphtha renders it unfavourable as fuel for power generation / feedstock for fertiliser as compared to natural gas. It can at best be termed as a short-term / stopgap solution.



(NOTE: Demand figures provided for 2006-07 at current prices)

Refer: Annexure 9

The following prices have been assumed for naphtha, coal, and lignite:

- Naphtha base price = US \$ 143 per MT (landed price in Mumbai for mid April '99).
- Coal base price = Rs 819 per MT (Sale price of 'C' grade Non Long Flame coal from Western Coalfields Ltd).
- Lignite base price = Rs. 510 per MT (Sale price of 'A' grade lignite at Panandharo mines).
- Imported coal price = Rs 2,500 per MT (Consumption point price of South African coal).

The above comparisons indicate that in order to be considered for substitution of competing fuels - naphtha, domestic coal, imported coal and lignite - natural gas will have to be priced at USD 5.3, 4.9, 4.6 and 2.7 per MMBTU, respectively.

5.7 Pipeline tariff

Pipeline tariffs also play an important role in determining the final cost of natural gas to the consumer. The two models normally used to ascertain pipeline tariffs are

- 'RoR' model, which is based on return on investments made
- 'RPI X' model which is based on performance / efficiency level of operation

5.7.1 The 'RoR' Approach (the US practice)

RoR stands for 'Rate of Return' on assets and is fixed by the government / regulator. This approach is also known as the 'cost plus' regulation approach and it limits the maximum return that the operator can earn. At the same time, this method gives the operator an opportunity to earn a certain expected level of profit. The drawback of this model is that it could lead to 'gold plating' of assets.

However, it is a simple and effective way for the operator to calculate the basic price of service, at the time of bidding and is widely used by the privatised public utilities in the US.

5.7.2 The 'RPI-X' Approach (the UK practice)

RPI stands for Retail Price Index and X is a number (efficiency factor) prescribed by the government / regulator. This approach is also known as the price cap regulation approach and it limits the prices to be charged to consumers, irrespective of returns on capital. For example, if RPI is 10% and X has been fixed as 15, prices to consumers would fall by 5% in real terms. For the same RPI, if X were fixed at 5, prices to consumers would rise by 5% in real terms.

In fixing X factor the regulator has to balance the interests of the investors and the consumers.

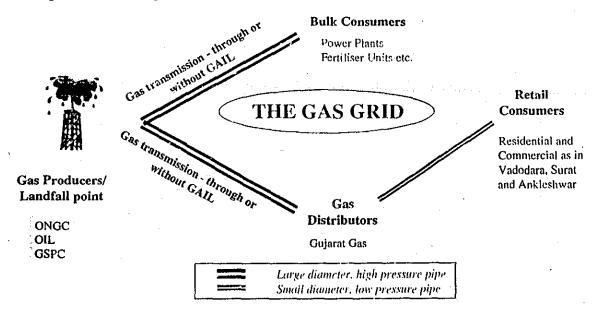
X factors are subject to changes every 3-4 years. This model has the following advantages:

- Protects consumers against monopoly by focusing precisely on the services of monopoly concern
- gives enough incentives to firms to achieve productive efficiency and promote innovation as cost reductions would be retained by the firm
- burden on regulator is low as compared to RoR Method.



6.1 Entities and Activities

The following is a pictorial representation of the different players in the natural gas chain – from producers through intermediaries to end-users.



a. Gas Exploration and Production

In the early stages in most countries the government is often involved in the development of upstream industry such as Exploration & Production (E & P) due to large capital requirements and concomitant high risk. India also followed the same approach whereby only the state owned company ONGC was involved in the E & P activities. Subsequently, there has been a shift in the policy and private investment is now being promoted. Regarding the import of liquefied natural gas (LNG), as of now; anybody can import it as it can be obtained by obtaining an open general license (OGL).

b. Gas transmission network / pipeline:

This is a critical infrastructure for the development of the industry and needs substantial investment. If it is not regulated at this stage, it can lead to wastage of capital due to duplication of pipelines. The government is likely to invite the private sector to participate in this venture and more than one private company could be involved. In order to optimise the



use of resources, gas sellers would be allowed Open Access to the gas grid. The current thinking of the Government of Gujarat on the operation of the gas grid is as follows:

- The Government of Gujarat will decide the route and the capacity of the Gas Grid.
- The Government of Gujarat will endeavor to insure optimum use of resources.
- Regulate the Gas Grid for Open Access / on common carrier principle.
- The Gas Grid has to be regulated by the state, if needed by a legislation to ensure that there is a free market for gas.
- Gujarat State Petrochemicals Corporation Limited (GSPCL) would be the nodal agency for the development of the Gas Grid.
- Promote investment in development of the Gas Grid on a public-private partnership basis through various mechanism like build operate transfer (BOT).
- Fix a Rate of Return for the developer of the pipeline. This return should be linked to the Real Rate of Interest

c. End-users:

- Large users to draw gas directly from the gas grid by laying spur lines.
- Retail consumers to be supplied through distribution utilities.

d. Gas distribution network:

In the retail distribution network, involvement of government is generally low and exclusivity for distribution could be given to the distribution agencies for a specified zone.

- The Government of Gujarat would decide on the boundaries of the geographic zone
- The Government of Gujarat would decide on the exclusivity period
- Attract investment in retail distribution by giving exclusive rights for a zone to a company
- Identify a suitable company through competitive bidding for operating the distribution circle The income of the distribution company would be controlled by using either the "Rate of Return" or "RPI-X" method.

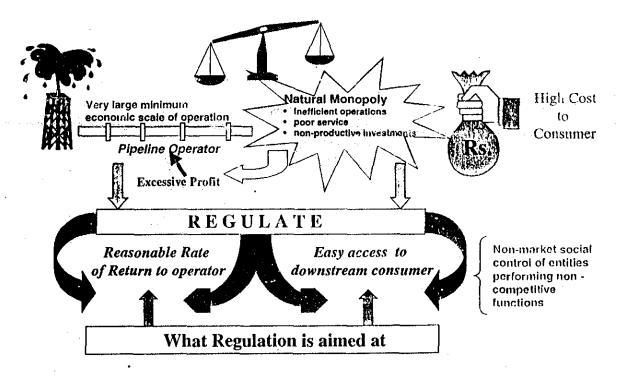
6.2 Need for regulation

As evident from the above analysis, gas transportation is a natural monopoly; inefficient operations of and non-productive investments by operators would result in high costs to consumers. At the same time, huge investments are required even for a minimum economic



scale operation thereby creating the need to ensure reasonable rate of return to the operator. Thus regulation is aimed at addressing these two basic issues.

The following is a pictorial representation of the need for regulation:



6.3 Transmission, Distribution and Storage

The role of the regulator would encompass both gas grid system development activities and operating practices as given below:

Development issues include the following:

- Land identification and acquisition
- Environmental clearance preservation of local flora / fauna, natural beauty
- Development of storage areas
- Scrutiny of applications from prospective service providers
- Authorisation / awarding licences
- Transportation / storage charges
- Specification of operating standards
- Specification of grounds for revoking licences
- Inspection

- Penalties for non-compliance
- Redressal of consumer grievances
- Capacity augmentation
- Renewal of licences

Operating practices include the following:

- Exclusive transportation and storage of gas
- Open access: consumers' right to transport / store gas subject to available capacity
- Access to bonafide users (authorised transporters / end-user of gas) only
- Safety and public health issues
 - gas leakage
 - interference in public water supply
 - laying down maximum rates of injection / withdrawal of gas
 - specifying maximum injection pressure for storage, and compression for transportation of gas
 - provision for inspection bore-holes
 - addition / removal of ingredients to / from gas in storage
- Accidents
 - early public notification
 - arrangements / co-ordination with police, fire, public health, water supply authorities,
 etc.

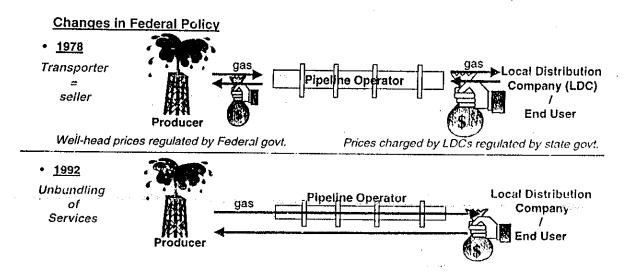
6.4 Pipeline tariffs

The following table provides an analysis of certain issues pertaining to pricing of natural gas:

Issues	Implications for Gas Pricing		
Gas demand more than gas availability	Gas price should be comparable to the fuel it potentially displaces		
Protection of buyers' interests	Ceiling price Price discrimination only at regulator's discretion		
Protection of sellers' interests	Floor price Provision for review of prices by regulator		
Protection of transporter's interests	Reasonable rate of return on investment Transport price according to cost reflective methodology Compensation plan in case of less than reasonable prices being set		



6.5 International regulatory practices – USA



The United States natural gas industry was first regulated in 1938 under the Natural Gas Act (NGA) which created the Federal Power Commission (FPC). The Industry was very simple. Producers sold gas under long-term contracts to pipelines. The pipelines owned all the gas and sold it to end-users. The government controlled the pipeline's purchase and sales price.

The first major change came in 1978 with the Natural Gas Policy Act (NGPA) which created the Federal Energy Regulatory Commission (FERC). The FERC consists of a five-member panel, appointed by the President; each serving staggered five-year terms. The main purpose of the NGPA was to reduce government controls and increase competition. At the time interstate demand had surpassed supply. Diminished gas discoveries attributed to wellhead price controls, led to gas shortages and curtailment. The NGPA attempted to resolve the price-supply issue with a complex law that generated a range of gas prices from \$0.30 to \$10.00 per mcf. In fear of being short of supply and in an effort to stimulate development, pipelines were quick to enter long-term "take-or-pay" contracts (TOP) for this expensive gas. Unfortunately, in 1983 demand decreased, primarily as a result of the US recession, strapping pipelines with expense gas and TOP penalties.

To comply with a court directive to end discriminatory sales of TOP gas by pipelines, the FERC issued order 436 in 1986, which proposed an "open access" transportation plan. However, Orders 436 and 380, which allowed end users to exit high cost shipper contracts with the pipelines, further exacerbated the TOP problem. End users bypassed pipelines and

purchased lower cost "new" gas from producers and shipped as third parties on pipelines under the tenants of Order 436. The "spot market" for gas supply evolved in this environment allowing customers to contract with producers of their choice for short-term supply usually ranging from one day to one year. In 1987 the D.C. Court of Appeals struck Order 436 on the grounds that pipelines were bearing too much of the TOP burden. The FERC then issued Order 500, which allowed for a complicated formula for sharing the burden between producers, pipelines and consumers. In an effort to further increase competition, Orders 436/500 allowed third party transporters to bypass pipelines that possessed inadequate facilities or excessive prices by constructing new pipelines under an expedited or "fast-track" certificate process.

In 1992 FERC brought far-reaching pipeline restructuring with the issue of Order 636. In short, this order facilitated the transportation of gas by pipelines on behalf of other parties. Pipelines were required to "unbundle" rates for the services it provided (i.e. transportation, storage) allowing consumers to choose from a menu only the services they required.

Currently, almost all gas transported by pipelines is by contract for third parties, thus, eliminating the merchant function of pipelines. Furthermore, pipeline shippers have the option of transporting gas under firm or interruptible contracts. With the use of electronic bulletin boards, created by pipeline companies, consumers are given access to available firm and interruptible capacity to better manage their fuel supply requirements.

Order 636 proved very efficient and advantageous to many consumers that possessed the sophistication to manage their fuel supply needs. However, many smaller consumers felt lost in this New World of gas contracting and fuel supply management. Hence, the niche was created for marketing companies to assist consumers with the need.

6.6 Other international regulatory examples

The UK experience and the lessons to be learnt

In the UK the duties and powers under the Gas Act 1995 are shared between the relevant Minister and the Director General of Ofgas. However one decides to allocate functions and powers between the State and the regulator it is crucial that their respective roles are well



defined. In determining such roles one must decide on the level of State involvement in the regulatory process - for instance, whether to limit the State's role to developing government policy in this area and simply leave it to the regulator to implement that policy. Generally speaking, the more one leaves to the discretion of the State the more wary potential industry participants become. There is not normally an issue over who supervises and enforces the regulatory regime, as this will always tend to be the regulator, but rather debate focuses on which body makes the rules and regulations governing the regulated industry. This is particularly evident in the development of licence conditions.

In the UK the Secretary of State for Trade and Industry cannot issue licences - this is the sole domain of the Director General for electricity and gas supply (the UK Regulator). Some control is imposed on the UK Regulator in that he or she must follow set standard conditions for that particular type of licence. ¹ These standard conditions were developed by the UK Regulator along with the Department of Trade and Industry as a series of standard conditions applicable to Public Gas Transporters, suppliers and shippers. The UK Regulator can impose additional conditions but is only able to modify the standard conditions after consultation with, and the agreement of, a specified proportion of licence holders. If this threshold is not reached, the UK regulator then refers the matter to the Monopolies and Mergers Commission for a ruling.

Victoria, Australia

The Office of the Regulator-General Act 1994 appoints a single regulated authority to regulate "Regulated Industries" in Victoria such as gas, electricity and water. The Victoriaa regulator is clearly independent of the State and has been expressly made "not subject to the direction or control of the Minister in respect of any determination, report or enquiry". Specific powers which have been vested in the hands of the regulator include price control. It should be noted that safeguards and guidelines have been included in the legislation which are an effective control by the State legislature on the regulator's discretion in respect of these matters.

There are currently three types of licences under the Gas Act 1986: A Public Gas Transporter (PGT) Licence, a Shipper Licence and Supply Licence)



New South Wales ("NSW"), Australia

The regulatory regime here is governed by the Gas Supply Act 1996 ("the NSW Act"). The bodies responsible for regulation under the Act include the relevant State Minister, the Tribunal and a Review Panel.

Their general duties under the Act include, inter alia:-

- ensuring all reasonable demands for gas are satisfied as far as it is economical to do so;
- · taking proper account of the business interests of transporters and suppliers; and
- considering the development of efficient and safe gas distribution pipelines and gas distribution systems.

While a licence as such is not required for gas supply in NSW, an authorisation from the State Government is required for any person wishing to supply gas to consumers. The authorisation application and award process is transparent with clear guidelines provided for in the NSW Act. The decision rests with the NSW Government as to whether or not an authorisation is given although the government's discretion is fettered as any refusal must be based on specific grounds provided for in the Act. As in the UK the NSW State government imposes conditions on any authorisation given but controls are placed on the type and scope of these conditions. Control is also placed on the NSW government's ability to unilaterally change these conditions once authorisation has been granted. The NSW Government is not, however, permitted to regulate supply prices nor to determine the terms on which a local distribution network operator grants access to its system. Price controls for supply are administered by a Tribunal rather than the State.

A Review Panel, consisting of three members appointed by the State, resolves any disputes arising from decisions made, for example, by the Tribunal over pricing control orders.

Australian Capital Territory ("ACT"), Australia

The regulatory regime is governed by the Gas Supply Act 1998 ("the ACT Act"). As with New South Wales, the legislation provides for authorisations rather than licences but, in practice, there is little difference between the two.



As in the UK, the downstream gas related functions of transmission, distribution and supply are unbundled under the ACT Act with separate authorisations required for each. Applications for these authorisations are made to, and granted by the State Government. The State has a fairly wide discretion over both the conditions which it can attach to any authorisation and any changes to those conditions. This discretion is slightly fettered, however, as the State cannot make authorisation variations which affect the authorised companies ability to meet either their contractual obligations or the supply of gas to their customers.

Unlike in NSW, the ACT Act does provide for the appointment of a regulator. The "Gas Technical Regulator" is limited to a supervisory/enforcement role and its functions include:-

- securing compliance with the ACT Act;
- assisting and advising the State in relation to the matters arising under the ACT Act;
- developing gas technical policy in consultation with other States;
- monitoring and promoting safety and technical standards in relation to gas installations and gas appliances; and
- enforcing authorisation conditions.

South Australia ("SA")

The regulatory regime is governed by the Gas Act 1997 ('the SA 'Act'). As with the ACT legislation the SA Act does provide for the appointment of a technical regulator whose functions are to:-

- administer the licensing regime;
- monitor and regulate safety standards; and
- monitor service standards.

Unlike the other Australian State legislation which we have examined, the technical regulator, rather than the State, is responsible for awarding licences and imposing licence conditions. The guidelines for awarding licences are more comprehensive than in other Australian States as the regulator may consider the applicants' previous commercial dealings, financial and technical resources etc.



The SA Act also provides for the appointment of the relevant State minister as a Pricing Regulator. The Minister's function here is to fix a maximum price for the sale of gas to certain groups of customers.

New Zealand

Downstream gas regulation in New Zealand is currently very light handed with little government involvement. This is in contrast with the early days of the New Zealand gas industry where wellhead prices were originally negotiated by the New Zealand government, on behalf of the then government owned gas company, NGC, with oil and gas production companies. As was the case in the UK and the USA these supply arrangements were in the form of long term take-or-pay contracts.

Competition in gas supply has now been established in New Zealand. Unusually, the impetus for this change has come from individual applications to the courts using competition law to ban restricted trade practices rather than through a pro-active regulator as in the UK, USA and to a lesser extent, Australia. Unlike the other examples we have included there is no gas or general energy regulator in New Zealand to regulate the industry or promote competition.

Gas transmission, by definition a natural monopoly, is controlled by one company, NGC, which, unusually, is not prohibited from competing with other gas suppliers in the supply of gas. The 1990's have seen the New Zealand Government embark on a policy of deregulation through the development of an "open access regime". NGC, the transmission system owner/operators, must provide access to third parties at set tariffs. These tariffs are controlled by the New Zealand Government.

The regulatory framework governing the downstream gas industry derives from two separate areas: competition law in the form of the Commerce Act 1986 and specific gas legislation in the form of the Gas Act 1992. There is no licensing regime as such nor, we understand, are there any authorisations required for the transportation or supply of gas.

The Gas Act 1992 removed local gas supply franchises and did away with price control. The Act provided the relevant ministerial chief executive with the following functions:-

ensuring the safe supply and use of gas;



- determining whether or not the provisions of the Act are being complied with;
- inspecting distribution systems.

More recently the New Zealand Government has enacted the Gas Information Disclosure Regulations. These regulations require gas pipeline companies such as NGC to disclose:-

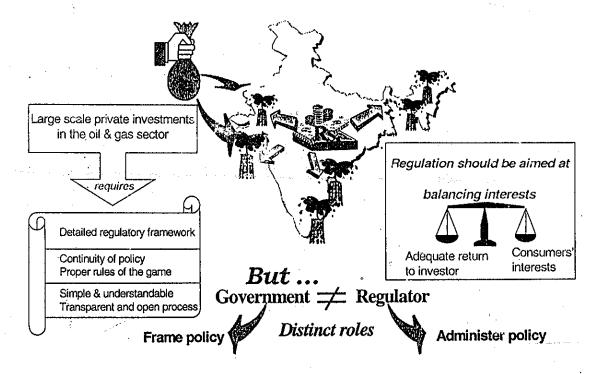
- separate financial statements for transmission, wholesale, distribution and retail businesses;
- contract prices, terms and conditions;
- financial, efficiency and reliability performances measures;
- methodologies used;
- pipeline capacity information; and
- line charges.

Israel

There is currently no real natural gas industry in Israel. Recent draft Israeli legislation attempts to provide a legal framework for the industry's development. To provide a certain amount of flexibility the licensing route is preferred but with a slight difference, as the draft Act provides an exclusive transportation and supply licence for around 20 years to one company (the winner of a tender) which will be a joint venture between the successful tenderer and the Israeli Government. Interestingly no industry regulator is planned although there is a post referred to as the "superintendent of safety". Licence conditions will be prepared before the tender (and hence available to all prospective tenderers) with any subsequent modifications which financially disadvantage the licensees being compensated by the Government.

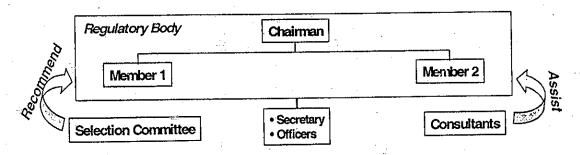
In developing any regulatory regime much debate will focus on how much authority the State should cede to its regulator. While the State will naturally wish to retain all real control over the regulated industry, experience has shown that investors are more willing to enter markets which are stable and which have, to a certain degree, removed themselves from the vagaries of political control. Those countries or states which have not opted for a truly independent regulator akin to the UK/US model have still placed sufficient legislative control on the relevant government's discretion to regulate the industry.

6.7 Reinforcing the need for regulation in India



In sum, there has to be a clear demarcation of the Government and the Regulator's role – the former should frame policies and give the regulator a free hand in administering the same.

6.7.1 Structure



The Government of Gujarat may, if it deems fit, establish the State Regulatory Authority consisting of the Chairman and two other members. Members should be appointed through a legislative process, by the State Government, on recommendation of Selection Committee constituted by the State Government. The tenure of members should be around 3-5 years, with an upper age limit of 65 years. Members should have adequate knowledge of and

experience in dealing with problems relating to engineering, law, economics, commerce, finance, and management. They should have an impeccable personal record with regard to integrity and honesty. Salaries of members would be as prescribed by the State government. Any member of the regulatory authority may be removed from office by order of the Governor of the State after the High Court has reported that the member ought to be removed. There should be limited grounds for removal of members, such as insolvency, conviction, abuse of position, conflict of interest. Appointment of officers and other employees, required to assist the State Authority in discharge of its functions, would be subject to the approval of the state government. The regulatory authority may levy appropriate charges for its services.

6.7.2 Roles

- To maintain standards of performance on Health, Safety and Environment issues
- Arbitrator
- Consumer Protection

6.7.3 Responsibilities

- Safeguarding property, environment and public safety in the construction and operation of systems of transport and distribution
- Monitoring compliance of safety, regulations and standards:
- Regulate the market i.e. liberalised or closed markets
- Safeguarding the interests of the consumers.
- Establishing procedures, promoting efficiency and economy through optimal utilization of pipelines.
- Regulating the rent for the use of pipelines to a fair and reasonable level.
- Lay down procedures for effective settlement of disputes

6.7.4 Legislation:

It is proposed to have a State Legislation to set broad framework comprising of:

- Power and Duties of the Regulator
- Rules and Procedures



6.7.5 Advisory Committee:

• The Regulatory body should be assisted and advised by an Advisory Council comprising eminent persons from various disciplines including representatives of the gas industry and gas consumers.

6.7.6 Appeals Committee:

All appeals on the decision of the Regulatory Body should lie with appeals Committee to
be headed by a retired Chief Justice of the High Court and will be consisting of Secretary,
E&P Department and eminent persons from the gas industry as members. Further appeals
on the decision of Appeals Committee to lie with the concerned High Court.

6.7.7 Functioning of the regulator

In order to discharge its duties effectively, the regulatory authority should function in a systematic manner:

- It may appoint a Secretary and Consultants to assist the authority in the discharge of its duties
- It shall meet at its head office (or any of its offices) at such time as the Chairperson may direct
- It shall observe such rules of procedure, with regard to transaction of business at its meetings, as determined by regulations
- The Chairperson shall preside at the meeting
- Every member shall have one vote
- · Majority of votes would be used to decide on all questions, which come up
- The Secretary shall authenticate all orders and decisions of the regulatory authority.



Annexure 1

LIST OF ABBRËVIATIONS

MMSCMD - Million Metric Standard Cubic Metre per Day

BCM - Billion Cubic Metres

NSDP - Net State Domestic Product

CNG - Compressed Natural Gas

MW - Mega Watt

MU - Million Units

FO - Fuel Oil

Annexure 2

NATURAL GAS DEMAND – POWER (SHORT & MEDIUM TERM)

interling Interl	Coal Type	64 534 660 120 215 2 240 300 5 850 30 135 1260	1998-99 11 54 634 680 120 215 2 240 300 5 650 39 135 1280 4414 1998-99 11 400 110 300 145 665	54 534 660 120 216 2 240 300 5 850 39 136 1260	2000-01 64 634 680 120 215 2 240 300 6 639 136 1250 110 4744 2000-01 400 110 300 146 655	2001-02 64 534 660 120 215 2 2 400 5 850 1260 110 120 160 4804 2001-02 400 100 300 145 655		\$4 \$34 660 120 215 2 240 300 5 650 39 135 1280 110 120 500 180	2004-06 64 534 880 120 215 2 240 300 5 850 39 135 1280 600 100 5 5304	54 534 660 120 215 2 240 300 5 850 39 136 1260 110 120 500	84 834 860 120 215 240 300 6 850 39 1280 110 120 600 180 5 5304 40 400 101 300 101 101 300 110 110 110 110 1	1.
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landkinagar TPS Coal adna HEP Hyde adna HEP Hyde luch Lighte TPS Light anum Hydro Project kika TPS Coal kika TPS Coal kika TPS Coal kika TPS Coal kita TPS Coal tran TPS (New) CCPP Gas adna Hydro Project lucar TPS (New) CCPP Gas adana Hydro Powor Project lucar TPS (Table Text) Stage II lucar Gas Based project adana Hydro Powor Project lucar TPS (Table Text) Stage II lucar Gas Based Project lucar Gas Based Project gas Based PS stage II lucar Gas Based Project lucar Gas lu	Coal Type	660 120 215 2 240 300 5 5 5 5 5 1260 117 1260	4414 1998-99 11 400 110 300 5 650 39 135 1280	660 120 216 2 240 300 5 850 39 136 1260 80 4474 999-2000 400 110 300 00 146 665	650 120 215 2 2 2 2 300 5 5 650 39 135 1290 110 60 160 2000-01	660 120 215 2 240 300 5 850 1260 110 120 160 4804 2001-02 400 110 300 145 655	680 120 215 2 240 300 6 550 39 135 120 110 120 250 180 502-03 400 110 300 400 145 655	860 120 215 2 240 390 5 6 650 120 500 100 120 600 100 100 100 100 100 100 100 100 10	860 120 215 2 240 300 5 850 1280 110 120 600 100 400 110 304 100 100 100 100 100 100 100 100 100 1	660 120 215 224 300 5 650 120 110 120 500 180 5304 2005-06 110 300 145 655	860 120 215 240 300 6 850 39 135 1260 110 120 160 160 160 170 170 170 170 170 170 170 170 170 17	1.3011
adna HEP Light Lighte TPS Light Light Lighter Li	Type 1997	120 215 2 240 300 5 850 30 1260 1145 1414	120 215 2240 300 5 e50 39 135 1280 4414 1990-99 tr	120 216 2 240 300 5 850 39 136 1260 80 4474 999-2000 400 110 300 300 146 665	120 218 2 2 240 300 5 850 39 135 1290 110 47 44 2000-01 400 110 300 146 655	120 215 2 240 300 5 850 39 135 1260 110 120 160 4804 2001-02 400 110 300 145 655	120 215 2 240 300 6 850 39 135 1260 110 220 260 110 2002-03 400 110 300 145 655	120 215 2 240 300 5 650 39 135 1280 600 110 420 600 180 2003-04	120 215 2 240 340 5 850 136 1240 110 120 600 110 300 110 300 145 666	120 215 2 240 300 5 850 39 136 120 500 110 120 500 160 160 170 180 180 180 180 180 180 180 180 180 18	120 215 2 240 300 5 850 39 135 1280 110 500 100 100 400 400 300 400 100 100 100 100 100 100 100 100 1	1.2011
ulch Lighite TPS ulch Lighite TPS coal likka TPS coal likka TPS coal likka TPS coal likka LBC hydro kat LBC hydro kat LBC hydro dear coal litera TPS coal litera CPS coal litera TPS coal litera CPS coal litera TPS coal litera CPS coal litera TPS coal litera TPS coal litera TPS coal litera CPS coal litera TPS coa	12 Coal Type 1997	215 2 240 300 5 6 850 30 135 1260 1144 400 110 300 146	215 220 300 5 650 39 135 1280 4414 1998-98 11 400 110 300 145	216 2200 300 5850 39 136 1260 89 4474 999-2000 400 110 300 146 665	215 2200 300 5 850 39 39 135 1290 110 800 160 4744 2000-01 400 110 300 145 655	215 220 300 5 850 39 135 1260 110 120 160 4804 2001-02 400 110 300 145 655	215 220 300 550 39 135 120 110 220 250 160 2002-03 400 110 300 145 656	216 2240 300 5 650 39 195 1280 110 500 160 203-04 2003-04 400 110 300 145 656	215 240 300 5 850 39 135 1280 110 600 100 5304 400 110 300 400 110 300 406 666	215 220 300 5 650 39 135 1260 110 500 180 2005-06 110 300 145 655	215 220 300 6 650 39 135 1280 110 120 600 180 5304 2006-07 400 10 10 30 605 110 120 600 180	12011
anom hydro Project Hydro Ikka TPS Coal I	Coal Type (997	2 240 300 5 850 30 135 1260 1144 117 400 110 300 145	2 240 300 5 650 39 135 1260 4414 4 100 110 300 145	2 240 300 5 850 39 136 1260 80 4474 499-2000 400 110 300 146 666	2 240 300 5 850 39 135 1250 110 60 160 160 170 170 170 170 170 170 170 170 170 17	2 240 300 5 850 39 135 1260 110 120 160 4804 2001-02 400 110 300 300 145 655	2 240 300 6 5 550 1240 110 120 250 180 100 300 146 656	2 240 300 5 6 650 1250 1250 120 100 160 160 170 300 145 655	2 240 300 6 850 39 135 1250 110 120 600 100 406 110 300 110 300 145 666	2 240 500 5 650 110 120 500 180 153 04 200 506 110 300 145 655	2 240 240 300 6 850 39 135 1280 100 100 100 100 100 100 100 100 100 1	1.2011
Ikka TPS Coal Kasi HEP Coal Kasi TPS Coal Kasi Mew Invarian Gas Based project Hyore CEC JEP, Gikta Exin, Stage II Iran Gas based PS stage ii Coal Kasi Her Coal Kasi Her Coal Kasi Her Coal CEC - Valva Gas Sasir Power - Hazka Gas Sasir Power - Hazka Gas Gas Coal CEC - Ahmedabad TPS Coal Sasir Power WHRU - Hazka Mer MECL - Godhra, Varodiara CCPP Lign Lign Lign Lign Lign MDC - Aktimota TPS Lign Lign Lign Gas PCL - Chara, Amreli Lign Gas PCL - Pipavav Gas JECL - Pipavav JECL - Ghogha TPS Lign Lign	1/2 Coni Type 1997	240 300 5 850 30 135 1260 7-98 400 110 300 146	240 300 \$ 650 30 135 1280 4414 1998-99 11 400 110 300 145	240 300 5 650 39 126 1260 80 4474 999-2000 400 110 300 146 665	240 300 5 850 39 136 1290 110 40 4744 2000-01 400 110 300 146 655	240 300 5 850 39 135 1260 110 120 160 2001-02 400 110 300 145 655	240 300 6 950 97 135 1260 110 120 260 180 202-03 400 110 300 300 146 655	240 300 5 650 39 135 1280 500 110 500 180 2003-04 400 110 300 145 855	240 300 5 850 39 135 1240 600 110 2004-05 400 110 300 145 656	240 300 5 850 39 135 1260 110 120 500 180 500 180 400 110 120 120 120 120 120 120 120 120 1	240 300 5 85 39 135 1280 110 120 600 100 100 100 110 300 110 300 110 300 115 115	53
KAL HEP KAL HEP KAL BC hydro KA	12 God! Type 1997	300 5 850 30 195 1260 114 7-98 400 110 300 146	300 \$ 650 39 135 1280 4414 4100 110 300 145	300 5 850 39 136 1260 80 80 4474 999-2000 110 300 146 665	300 5 5 650 39 136 1290 110 80 160 160 110 300 146 655	300 5 850 39 1155 1260 110 120 160 4804 2 2001-02 400 110 300 145 655	300 6 350 39 135 1240 110 120 250 180 5054 400 110 300 145 655	300 50 39 135 1280 110 120 500 180 2003-04 400 110 300 145 855	300 6 850 39 136 1280 1200 600 100 5304 400 110 300 146 666	300 5 850 39 136 1260 120 500 180 5304 400 110 300 145 856	300 6 850 39 135 1280 110 120 160 160 170 170 170 170 170 170 170 170 170 17	53
Kis LBC hydro Kis TPS Coal Ittan TPS (New) CCPP Gas Kis TRS (New) CCPP Gas Gas Kis TRS (New) CCPP Gas Gas Gas Gas Gas Gas Gas Ga	Coal Type 1997	5 850 38 195 1260 7-98 400 110 300 145	\$ 650 39 135 1280 14414 1998-99 10 400 110 300 145	5 850 39 136 1260 80 1260 80 1474 999-2000 110 300 146 665	5 850 39 136 1290 110 80 160 147 44 2000-01 400 110 300 146 655	5 850 39 135 1260 110 120 160 4804 2001-02 400 110 300 145 655	5054 4 2002-03 146 655	5 650 110 120 160 160 170 170 170 170 170 170 170 170 170 17	5 850 4 110 120 600 110 2004-06 110 300 145 656	5 850 39 135 1260 110 120 500 180 5304 400 110 300 145 856	\$ eso 39 135 1280 110 120 600 180 20 4 10 300 100 300 146 665 155	53
kai TPS Coal tran TPS (New) CCPP Canakbot. TPS Coal tran TPS (New) CCPP Coal tran Cas Based project Coal tran Cas	12 Cool Type 1997	950 30 195 1260 1260 7-98 400 110 300 145	650 39 135 1280 4414 1998-99 11 400 110 300 145	850 39 126 1260 80 4474 999-2000 110 300 146 665	4744 2000-01 400 110 300 146 655	850-39 135 1260 110 120 160 201-02 400 110 300 145 655	550 59 135 1260 110 120 260 160 5054 40 2002-03 400 110 300 145 656	50 39 135 1280 110 120 500 180 120 100 140 100 145 856	850 39 135 1260 110 120 600 100 5304	650 39 136 1260 110 120 500 160 5304 2005-06	850 39 135 1280 110 120 600 100 5304 % 2006-07 27 400 110 300 145 665	
tran TPS (New) CCPP Gas tran TPS (New) CCPP (New) CCP	12 Cool Type 1997	30 195 1260 114 7-98 400 110 300 145	195 1260 1260 1260 1460 110 300 145	39 136 1260 80 80 4474 999-2000 400 110 300 146 655	39 136 1250 110 80 160 4744 2000-01 400 110 300 146 655	39 135 1260 110 120 160 4804 2001-02 400 110 300 145 655	39 135 1240 110 120 260 160 5054 400 110 300 146 656	39 135 1260 110 120 500 180 2003-04 400 110 300 146 856	39 135 1280 110 120 600 100 5304 2004-05 400 110 300 145 656	39 135 1260 110 120 500 180 5304 2005-06 400 110 300 145 856	39 135 1280 110 120 600 180 . 5304 % 2006-07 2 400 110 300 145 665	
Itan TPS (New) CCPP Itan American Amer	Coal Type 1997	195 1260 114 7-98 400 110 300 145	135 1280 4414 1998-99 10 400 110 300 145	136 1260 80 80 4474 999-2000 400 110 300 146 655	135 1290 110 80 160 4744 2000-01 400 110 300 146 855	135 1260 110 120 160 4804 2001-02 400 110 300 145 665	135 1260 110 120 250 180 5054 2002-03 400 110 300 145 656	135 1280 110 120 500 180 15304 2003-04 400 110 300 145 656	136 1280 110 120 600 160 5304 2004-05	135 1260 110 120 500 180 5304 2005-06 400 110 300 145 856	135 1280 110 120 600 180 5304 2006-07 110 300 145 665	
anakbc.i TPS Coal KR.D.B.Ju.//New huvaran Gas Based project dana Hydro, Power Project Hydro, Based PS stage II Liten Gas Based Power Hazke IIPCL Godhra Gas ITPCL Godhra Gas Gas Gas Ahmedabad TPS Gas Ahmedabad TPS Gas Ahmedabad TPS Liten Gas Akrimota TPS Liten Gas Akrimota TPS Liten Gas Gas Based Power WHRU - Hazke IIPCL - Chhara, Amreli Gas PCL - Playevav Gas PCL - Playevav Gas PCL - Playevav Gas	Coal Type 1997	7-98 400 110 300 145	1280 4414 1998-99 11 400 110 300 145	4474 999-2000 400 110 300 146 655	1290 110 80 160 4744 2000-01 400 110 300 146 655	1260 110 120 160 4804 2001-02 400 110 300 145 655	1240 110 120 250 180 5054 2002-03 400 110 300 145 656	1280 110 120 500 180 180 2003-04 2003-04 400 110 300 145 866	1280 110 120 600 100 5304 2004-06 110 300 145 655	1260 110 120 500 180 5304 2005-06 400 110 300 145 656	1280 110 120 600 180 5304 2006-07 110 300 145 655	
KFJINSIO-I/New Norman Anger Based project Index Anger Based Project Hyde SEC_IFF, Jikke Exit, Stage II Imp. Iten Gas based PS slage II Imp. Iten Gas Based II Imp. I	Gool Type 1997	7-98 400 110 300 145	4414 1998-99 1 400 110 300 145	4474 999-2000 400 110 300 146 665	110 60 160 4744 2000-01 400 110 300 145 656	4804 2001-02 400 110 300 145 655	110 120 250 180 5054 2002-03 400 110 300 146 656	110 120 600 180 5304 2003-04 400 110 300 146 666	110 120 600 100 5304 2004-06 110 300 145 666	110 120 500 180 5304 2005-05 400 110 300 145 655	5304 % 2006-07 2006-07 2000-07	
hevaran Gas Based project defana Hydro Power Project Hydro Gas Based Project Hydro Gas Based Project Hydro Gas Based Project Hydro Gas Based Project Hydro Gas Hydro	44 Type 1997	7-98 400 110 300 145	1998-99 10 400 110 300 145	4474 999-2000 400 110 300 146 665	4744 2000-01 400 110 300 146 855	4804 2001-02 400 110 300 145 655	250 180 5054 2002-03 400 110 300 145 656	120 600 180 5304 2003-04 400 110 300 146 656	120 600 100 5304 2004-06 400 110 300 145 666	120 500 180 5304 2005-05 400 110 300 145 855	5304 % 2006-07 & 400 110 300 146 665	
adana Hydro, Power Project DEC JEP, Okke Exta, Stage II Iran Gas based PS stage II Onn - GEB Planta Xistling EC - Sebermati & Ahmedabad EC - Vativa sear Power - Hazira IPCL - Godhar, CCPP Xpension/New EC - Ahmedabad CCGT EC - Ahmedabad TPS Sear Power WHRU - Hazira IPCL - Gencher, Vaciora CCPP IPCL - Mangrol TPS IPCL - Ghother, Andodara CCPP IPCL - Chhars, Annell Gas IPCL - Ghogha TPS ILign IPCL - Ghogha TPS ILign IPCL - Pipavav IPCL - Pipavav Imp. IPCL - Pipavav Imp. ISEC-GEB, Gandhinager TPS Ext 5 Coal	44 Type 1997	7-98 400 110 300 145	1998-99 10 400 110 300 145	4474 999-2000 400 110 300 146 665	4744 2000-01 400 110 300 146 855	4804 2001-02 400 110 300 145 655	250 180 5054 2002-03 400 110 300 145 656	120 600 180 5304 2003-04 400 110 300 146 656	120 600 100 5304 2004-06 400 110 300 145 666	120 500 180 5304 2005-05 400 110 300 145 855	5304 % 2006-07 & 400 110 300 146 665	201
CEC-GEP, Gible CEID, Stage II Imp. Iren Gas based PS alage II Gas On - GEB Plante Fuel Fuel III Imp. EGC - Sabermati & Ahmedabad GEC - Valva Gas EGC - Valva Gas EGC - Valva Gas EGC - Gandhar, GCPP IPCL - Godnia Gas EGC - Ahmedabad CCGT EGC - Ahmedabad CCGT EGC - Ahmedabad TPS EGC - Ahmedabad TPS EGC - Ahmedabad TPS EGC - Ahmedabad TPS EGC - CEC - Gedrie, Vadodara GCPP IPCL - Gedrie, Vadodara GCPP IPCL - Gedrie, Vadodara GCPP IPCL - Ghogha TPS EGC - CENTROL TPS EGC - CENTROL TPS EGG - GEG - GE	44 Type 1997	7-98 400 110 300 145	1998-99 10 400 110 300 145	4474 999-2000 400 110 300 146 665	4744 2000-01 400 110 300 145 855	4804 2001-02 400 110 300 145 655	250 180 5054 2002-03 400 110 300 145 656	5304 2003-04 400 110 300 145 866	5304 2004-06 110 200 110 200 145 666	500 180 5304 2005-05 400 110 300 145 855	5304 3 2005-07 2 400 110 300 145 665	201
Iren Gas based PS stogs W Ges Ub Total on - GEB Plants Kristing EC - Sebermett & Ahmedabad EC - Valva Gas sear Power - Hazke Gas IPCL - Godhra Gas TEC - Gandhar, CCPP Ges Kristing Ges Ges Ges Ges Ges HPCL - Gebbad CGGT EC - Ahmedabad CFP IPCL - Gebbad CGGT EC - Ahmedabad CFP IPCL - Gebra, Vanddara CCPP IPCL - Mangrol TPS Lign MDC - Akrimota TPS Lign MDC - Akrimota TPS Lign MDC - Akrimota TPS Lign CGS Ges PCL - Pipavav Ges PCL - Pipavav Ges PCL - Pipavav Imp. LCL - Chole, Mundra SEC-GEB, Gandhinager TPS Ext 5 Cosi	44 Type 1997	7-98 400 110 300 145	1998-99 10 400 110 300 145	999-2000 400 110 300 146 655	4744 2000-01 400 110 300 145 655	4804 2001-02 400 110 300 146 665	160 5054 2002-03 400 110 300 146 656	160 5304 2003-04 400 110 300 145 866	5304 2004-06 400 110 200 145 666	180 5304 2005-05 400 110 300 145 855	180 5304% 2006-07 2 400 110 300 146 685	201
Ub Total on - CEB Plants kitating EC - Sabermati & Ahmedabad Coal EC - Valva Sasar Power - Hazika IPCL - Godhra EC - Ahmedabad CCGT EC - Ahmedabad CCGT EC - Ahmedabad TPS Goal Baser Power WHRU - Hazika Was IPCL - Geher, Vadodara CCPP IPCL - Mangrol TPS ILign MDC - Akrimota TPS ILign CCL - Chhara, Annell Gas PCL - Chhara, Annell Gas PCL - Pipavav Gas PCL - Pipavav Gas PCL - Pipavav Gas PCL - Pipavav Imp. SEC-GEB, Gandhinager TPS Ext 5 Coal	Type (1997	7-98 400 110 300 145	1998-99 10 400 110 300 145	999-2000 400 110 300 146 655	4744 2000-01 400 110 300 145 655	4804 2001-02 400 110 300 146 665	5054 4 2002-03 400 110 300 146 656	2003-04 2003-04 400 110 300 146 856	5304 2004-06 400 110 300 145 665	2005-05 400 110 300 145 855	2006-07 20 400 110 300 145 665	201
on - GEB Plants cristing CC - Sabermati & Ahmedabad CC - Valva Gas sanr Power - Hazira Gas TEC - Gandhar CCPP GEC - Ahmedabad CCGT GC - Ahmedabad CCGT GC - Ahmedabad CCGT GC - Ahmedabad CCGT GC - Ahmedabad CCGT HCC - Gender, Vadodara CCPP IPCL - Gedher, Vadodara CCPP IPCL - Ghogha TPS Lign MDC - Akrimota TPS Lign MDC - Akrimota TPS Lign CCL - Chhara, Amrell Gas PCL - Chhara, Amrell Gas PCL - Pipavav Gas PCL - Pipavav Gas PCL - Pipavav Gas BCC - GEB, Gandhinager TPS Ext 5 Coal	Type (1997	7-98 400 110 300 145	1998-99 10 400 110 300 145	999-2000 400 110 300 146 655	2000-01 400 110 300 145 655	400 110 300 145 655	400 110 300 145 656	2003-04 400 110 300 145 866	400 110 300 145 668	2005-06 400 110 300 145 656	2006-07 20 400 110 300 145 665	201
on - GEB Plants ***********************************	Type (1997	7-98 400 110 300 145	1998-99 10 400 110 300 145	999-2000 400 110 300 146 655	2000-01 400 110 300 145 655	400 110 300 145 655	400 110 300 145 656	2003-04 400 110 300 145 866	400 110 300 145 668	2005-06 400 110 300 145 656	2006-07 20 400 110 300 145 665	201
EXALTING EC - Sebermati & Ahmedebad EC - Vativa EC - Vativa EC - Vativa Gae Sanr Power - Hazika Gae GiPC - Condina Gae Gae Gae Gae Gae Gae Gae G	• heat	400 110 300 145	400 110 300 145	400 110 300 146 665	400 110 300 146 866	400 110 300 145 655	400 110 300 145 656	400 110 300 145 866	400 110 300 145 666	400 110 300 145 855	400 110 300 145 665	1
EC - Valva Gas san Power - Hazka Gas san Power - Hazka Gas IPCL - Godhar CCPP Gas Xpanslon/New GC - Ahmedebad CCGT Gas Power WHRU - Hazha HIPCL - Gcdhre, Vadodara CCPP HIPCL - Mangrol TPS Lign MDC - Aktimota TPS Lign MDC - Aktimota TPS Lign Power MGC - Power Gas Power MGC - Power Gas Power MGC - Power Gas Power Gas Power MGC - Power Gas Power Gas Power Gas Power Gas PCL - Pipavav Gas HIPCL - Villen, Mundra Imp-LipCL - Section Coal	e heat	110 300 145	110 300 145	110 300 146 665	110 300 145 655	110 300 145 655	110 300 145 656	110 300 145 866	110 200 145 666	110 300 145 655	110 300 145 665	1
San Power - Hazke Gae IPCL - Godhra Gae Gee	• heat	300 145	300 145	300 146 665	300 145 655	300 145 655	300 145 656	300 145 666	300 145 666	300 145 655	300 145 665 166	
IPCL - Godhva Gee Kpension/New BCC - Ahmedebad CCGT BEG - Ahmedebad CPC BEG - Ahmedebad TPS BER POWER WHRU - Hazira IPCL - Gedhre, Vadodara GCPP IPCL - Mangroil TPS Lign MDC - Akrimota TPS Lign MDC - Akrimota TPS Lign CL - Pipavav Gee PCL - Pipavav Imp. PCL - Kutch, Mundra SEC-GEB, Gandhinager TPS Ext 5 Coel	e heat	145	145	146 655	145 655	145 655	145 656	145 666	145 665	145 655	145 865 165	
TEC - Gondhar, CCPP general Control C	e heat			655	865	655	656	666	666	655	665 165	
xpension/New EC - Ahmedebad CCGT EC - Ahmedebad CCGT Coal EC - Ahmedebad TPS Coal EC - Chenedebad TPS Coal EC - Chenedebad TPS Coal EC - Chenedebad CCGT Coal EC - Chenedebad CCGT CCGC CCGC CCGC CCGC CCGC CCGC CCG	e haat		000						-		165	
GC - Ahmedebad CGGT EGC - Ahmedebad TPS saer Power WHRU - Hazira IPCL - Gcdhre, Vadodara CCPP IPCL - Mangrol TPS PCL - Chhara, Amrel PCL - Pipavav PCL - Pipavav Imp. PCL - Spavav Imp. PCL - Spavav Imp. PCL - Gedhra, Vadodara CCPP Imp. PCL - Chara, Amrel Gas PCL - Pipavav Imp. PCL - Chiaga TPS Coel GC- GEB, Gandhinager TPS Ext 5 Coel		•		155	165	155	155			146		
### Cools				150	103	100						
ser Power WHRU - Hazira IPCL - Gedhre, Vadodara GCPP Lign IPCL - Mapgiol TPS Lign MDC - Akrimota TPS Lign PCL - Chhara, Amrell Gas PCL - Pipavav RCL - Pipavav PCL - Pipavav Imp. RCL - Kutch, Mundra SEC-GEB, Gandhinager TPS Ext 5 Coal						125	125	125	125	125	125	
IPCL - Godhre, Vacodera CCPP Napi IPCL - Mangrol TPS Lign MDC - Aktimota TPS Lign PCL - Chhare, Amrel Gas PCL - Ghogha TPS Lign PCL - Pipavav Gas PCL - Pipavav Imp. PCL - Kluch, Mundra SEC-GEB, Gandhinager TPS Ext 5 Coal						125 160	150	160	150	150	160	
	INA		160	180	160	160	160	160	180	160	160	
MDC - Akrimota TPS			160					250	250	260	260	
PCL - Chhara, Amreli Ges PCL - Ghogha TPS Ligni PCL - Pipavav Ges PCL - Pipavav Imp. PCL - Kluich, Mundra Imp. SEC-GEB, Gandhinager TPS Ext 5				260	250	250	260				280	
PCL - Ghogha TPS Ligni PCL - Pipavav Gas PCL - Pipavav Imp. PCL - Kulch, Mundra FPS Ext 5 Coal	•				250	260	250	260	260	260	200	
PCL - Pipavav Gas PCL - Pipavav Imp. PCL - Kulch, Mundra Imp. SEC-GEB, Gandhinagar TPS Ext 5 Coal												
PCL - Pipavav Imp. PCL - Kulch, Mundra Imp. SEC-GEB, Gandhinagar TPS Ext 5 Coal	i o .						376	376	376	376	375	
PCL - Kuich, Mundra Imp. SEC-GEB, Gandhinager TPS Ext 5 Coal								815	616	8 15	615	
SEC-GEB, Gandhinager TPS Ext 5 Coal	Coal -										1000	
SEC-GEB, Gandhinager TPS Ext 5 Coal	Coal										500	
			•			210	210	420	420	420	420	
SECL Wanakbori TPS Ext 5 Coal			210	210	210	210	210	210	210	210	210	
SEC-GEB, Penendhro, Kulch Lign	la .							75	160	225	225	
	Cost										1000	
SPCL - Hazira Gas					160	160	340	340	340	340	340	
	leum Çoke							500	600	500	500	
	leum Coke							500	500	600	600	
DIDOUG turnedt Non	dha.				•			200	200	200_	200_	
ub Total	Maria Zin	115 🖔	1980	.2385	2795	3280	3835	69352	6010	26085	8585	%'9
eatrat Plants	1007					2001-02			2004-08	2005-06	2006-07	
AIAPUT (Nuclear) Nucl		160	160	160	160	160	160	180	160	160	160	
exarpur(Nuclear) Nucl		125	125	126	125	125	125	125	125	126	126	
TPC Korba Cos		360	360	360	360	300	300	360	360	360	360	
TPC Vindhyachal Goal		230	230	230	230	230	230	230	230	230	230	•
TPC Kawes Gas		184	184	184	184	184	184	184	184	184	184	
TPC Gandhar Gas		185	185	185	186	186	185	186	185	185	185	
xpansion/New									-			
	i										232	
							183	183	133	183	163	
TPC Kawas II Gas												
uriya CCGT (UP) Gas												
TPC Gandhar II Gas ata CCGT (Rejesthen) Gas												

SUMMARY OF GUJARAT POWER SCENARIO Peaking Capacity GEB NON-GEB GENTRAL Total Peaking Capacity (MW)	.1997-98 4414 1115	1998-99	1999-2000 4474 2365 1244	4744	0000	6054	****	5304	5304	5304	6304 9855 2439
Peak Available Capacity GEB NON-GEB CENTRAL' Total Peak Available Capacity	948	1683	2027	3321 2378	3363 2788	3538 3260	3713 5045	3713 5109	3713 5172	3713 7297	3713 6377

^{*} Only the power addited to the state from the central plants have been considered & not the enths plant capacity

'Surplus Capacity = {Eectricity Available - Electricity Requirement } / (8.78*0.86) 1 MW = 8.76 mkwh PAF = 0.85



CONTRACTOR OF THE PROPERTY AND ASSESSMENT OF THE PROPERTY OF T	EMAND ASSES	SMENT		_						•		
	edá i she	1867-88	1808-80	1858-99 1859-2000 2000-01	2000	2001-02	2002-03	2003-04	2004-65	2005-06		2006-072011-12
1 Oliuvaran TPS	Ges	š							2	2		3
2 Ulran TPS (New) CCPP	Gas	135	135	135					ž.	ž		5 5
3 Dhuvaran Gea Based project**	Gas	0	0						2	9		9 5
4 Ulran Ges based PS stage it	0	٥	٥	9	9	\$	160	9	3	\$	\$	\$
Sub Total	1	180	189 189	180	459	:	7469 TO 1469 WWW.459 WWW.459 WWW.469 WWW.489 WWW.489	659	85	159	68P	- 48 0
Non - GEB Plants	Fuel Type	1997-99	1098-99	1998-99 1989-2000	2000-01	2001-02	2002-03	P0-1002	2004.05	9006.04	2006.07	2011-12
5 AEC - Vatva	986	150	110	92		19	1 2	=	2	5		9
8 Essar Power - Hazira	Gne	515	515		515	51.55		515	35	515	2	515
7 GIPCL - Godhra	Ges	145	145	145		7.5		145	145	145	145	145
8 GTEC - Gandhar, CCPP	Gas	160	655			655	655	958	956	655	655	1310
9 Acc - Ahmodebad CCGT	Gas	C	٥			155		155	₹3	55	55	155
10 GIPCL - Godhm, Vadodara CCPP	Naphiha	0	160	₹	160	5	3	5	2	3	3	160
11 GPCL - Chhara, Amras	Gas	0	•	0	0	•	۰	0	٥	۰	•	615
12 GPCL - Pipavav	80 0	0	•	0	•	0	0	615	615	918	916	615
13 GSPCL - Hazina	CA3	•	0	•	160	8	96	340	340	340	35	360
14 KRIBCHO - Junagadh	Naphtha	٥	•	•	•	•	0	8	88	8	S ₂	800
Sub Total Titte State State Sub	A Control of the cont	THE TRANSPORTED FOR THE STATE OF THE STATE OF THE SOUTH SOUTH SECTION		1740	15 EM	1900	7,2080	2896	2898	7. 2806.	27722805	[35.436d]
Contral Plants	Fuel Type	1907-98	1006-50	1096-90 1999-1900 1000-01 2001-02	2000-01	2001-02	2002-03	2003-04	2004-06	2006-06	2006-072011-12	2011-12
15 NTPC Kawas	go.	4	ž	2	644	4.0	Ž	44	\$	3	44	4
16 NTPC Gandhar	•	ŝ	2		648	3	648	£	979	3	. 648	88
17 NTPC Kewas II	ğ	0	•	•	•	0	•	0	٥	۰	•	650
18 NTPC Gandher II	Gas	•	•	•	•	0	•		0	•	۰	920
Sub Total Transport grant gran	en de la companya de	1292	1292 7 1202	1292	1292		1202 1 1204 1 1202 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	1292	1262	1202	[7][1202]	2602
Total (RW)		241	1900	122	3861	3861	3831	4648	# #	4646	\$	122
Gas (MW)		2411	2006	3061	1946	2401	3671	4286	4266	4286	4286	6856
Marylath - Mater							:	1	3	1	3	,

	GEB Plants	Fuel Type 1997-98	1907-94	1018-00	1046-99 1999-2000 2000-01	2000-01	2001-02	2002-03	2002-04	2004-05	2005-06	2004-072011-12	2011-12
	1 Observation TPS	8	8	00.0		9	9.00	9.00	8	00'0	9.00	8	00'6
	2 Ultan TPS (New) CCPP	Ges	22.60	ន	22.50	22.50	22.50	22.60	22.50	22.50	22.55	22.52	22.50
	3 Dhuyaran Gas Based project	O	000	8		18.33	18.33	16.33	18.33	18.33	18.33		18.33
	4 Ultan Gas based P8 stage H	3	0.00	000		26.67	26.67	26.67	26.67	26.67	26.67	26.07	26.67
	Sub Total The Building Table and Substitute of the Substitute of t	nnen och printing och med sen och se det med det med med med sen och sen sen med med sen och med sen det med s	Talisto,	og in	31.50	78,60	05.07.77	W. 100	377 76.60	V. 76.50	TEXTOSO.	Ser fre so	To shell
щ	Non - GEB Plants	Fuel Type	1997-98	1904-99	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2011-12
1	5 AEC - Valva	đ	18,33	18.33		18,33	16.33	16.33	18,33	18.33	16.33	18.33	18.33
	6 Geser Power - Hazira	Gas	85.83	85.83	85.63	85.83	65.83	65,83	85.83	85,83	86.83	65.83	65.83
	7 GIPCL - Godina	Gas	24.17	24.17	24.17	7.14	24.17	24.17	24.17	24.17	24.17	24.17	24,17
	8 GTEC - Gandhar, COPP	980	26,67	100.17	100 17	100.17	100.17	100.17	100.17	100.17	100.17	100	216.33
	P AEC - Ahmedebed CCGT	eg G	0.00	8	25.83	25.83	25.83	26.83	26.83	25,63	25.83	25.83	25.83
	10 GIPCL - Godhra, Vadodara COPP	Nephda	000	28.67		20.67	26,67	28.67	26.67	26.67	28.67	\$ \$	26.67
	11 GPCL - Chhara, Amrell	988	0.00	8		000	000	8	000	000	8	80	50.5
	12 GPCL - Ploavev	Gas	0.00	80		000	000	8	102.50	102.50	102,50	20.50	102.50
	13 GSPCL - Hazks	986	0.00	0.0		20.07	20.07	56.67	66.67	68.87	56.67	26.67	56.67
	14 KRIBCHO - Junepadh	Naphtha	0.00	000		000	80	80	33.33	33,33	33.33	88	83.33
	Bub Total September 6. September 5. Septembe	and of the control of the control of the state of the state of the state of the state of the sea of	111600	37,284.17	290.00	316.67	7318.67	7. M. o.f.	([462.86	V. 442.80	W. 482.50	T 482 50	7. ee(3)
O	Central Plants	Fuel Type	1997-96	1998-99	1998-99 1896-2000	8	2001-02	2002-03	2003-04	2004-05	2005-08	2006-07	2011-12
. '	15 NTPC Kawas	80	107.33	107.33			107,33		107.33	107.33	55,701	50,33	
	16 NTPC Gendher	980	106.00	108.00	888	108.00	106.00	2	108:00	108.00	08.00	8	
	17 NTPO Kewas il	Gee	000	000	800	8	000		8	000	8	8	•
	18 NTPC Gandhar II	9	800	000	000	000	000	0,00	0.0	000	8	8	50,33

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At P. 85% Grand total - scenario I (MMCFD) in MMSCMD

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A	the state govt, puts up a single 51 instead of three separate plants (GEB Plants					O COMI DAPA	0),						
	GEO PARIS	Fuel Type	1997-98	1998-99	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	201
	1 Dhuyaran TPS	Gas	64	54	54								
	2 Ulran TPS (New) CCPP	Gas	135			54	64	64	54	64	54	54	
	3 Dhuvaran Gas Based project	Gas	0	13:			135	135	135	135			
	4 Utren Gas based PS stage II	Gas	ŏ	à		110 160	110 160	110 160	110	110			
	Sub Total	terent are			•	100	100	100	160	160	160	160	
	SOD TOTAL NEW YORK TOTAL VILLE	3674353	189	180	180	459	450	450	460	459	TENT 450	459	770
B	Non - GEB Plants	Puel Type	1997-96	1996-99	1999-2000	2000-01	2001-02	2002-03	2003-04	2004-05			
	6 AEC - Vetva	Gee	110	110		110	110	110	110	110	2006-08 110	2006-07	201
	6 Essar Power - Hazira	Gas	515	515		515	515	515	515	615	515	110 515	
	7 GIPCL - Godhra	Gas	145	145	145	145	145	145	145	145	145	515 145	
	8 GTEC - Gundher, CCPP	Gas	160	655	655	655	660	655	655	055	655	655	
	9 AEC - Ahmedabad CCGT	Gas	0	0	155	155	155	155	165	185	155	155	
	10 GIPCL - Godh - Vadodera CCPP		Ď	160	160	160	160	160	160	160	160	160	
	11 GPCL • Pipavev	Cas	0	0	0	0	0	0	2000	2000	2000	2000	
	12 Gas based plant	Gas	. 0	0	0	510	610	510	610	B10	510	510	
	13 GSPCL - Hazina	Gas	0,	0	. ^	180	160	340	340	340	340	340	
	14 KRIBCHO - Junegadh	Naphiha	0	0	9	0	0	Q	200	200	200	200	
	Sub Total	naria.	930	1585	1740	2410	2410	2590	4790	4790	2000	and the same	r mer
C	Central Plants	Fuel Type	1997-98	1098-99	1999-2000	2000-01					-		-
	15 NTPC Kawas	Gas	844	644	844		2001-02	2002-03	2003-04	2004-05	2005-06		20
	16 NTPC Gandhar	Gas	648	648		644	644	644	641	844	844	644	
	17 NTPC Kawas II	Gas	0	0	848 0.	64A	648	648	648	648	648	648	
	16 NTPC Gandher II	Gas	ŏ	ŏ	0.	0	0	. 0	0	0	0	0	
	Sub Total				etenio.		_	•	-	•	•	0	
	Company of the Compan	1 4 - 173 i 265,2	1292 :	::.13. 1292	1202	1202	1292	1202	1 (1202)	1202	1202	M. N. 1202	
	Total (MW)		2411	3066	3221	4161	4161	4341	****				·
	1 ' '			••••	7221	7101	4101	4041	6541	6641	6 541	6541	
	Gas (MW) Naphiha (MW)		2411	2906	3061	3401	3491	3671	4288	4266	4286	4266	
	Gae (MW) Nephiha (MW)		2411	160	3061 160	3491 160	3491 160	3671 160	4288 360	4288 360	4286 360	4286 360	
Ges Demand (Nephihe (MW) Note: 1 MW requires 1/6 MMCFD of 9		0 Evelisbility)	<u>163</u>	160	160	160	160	360				1
Ges Demand (A GEI	Naphilha (MW)	ges (at 85% ; Fuel Type	0 Evelisbility)	<u>163</u>		160			360				
A GEI 1 Dhu	Nephihe (MW) Yole: 1 MW requires 1/6 MMCFD of 1 Plants varan TPS		0 Evelisbility)	<u>163</u>	1000-2000	160 2000-01	160 2001-02	160 2002-03	2003-04	260 2004-08	360 2006-06	2006-07	20
A GEI 1 Dhu 2 Uire	Naphiha (MW) Noie: 1 MW requires 1/6 MMCFD of s Plants TPS TPS (New) CCPP	Fuel Type	evelicbility))) 1998-99	160	160 2000-01 9.00	160 2001-02 9.00	160 2002-03 9.00	360 2003-04 9.00	360 2004-08 9.00	360 2006-06 9.00	2006-07 9.00	
A GEI 1 Dhu 2 Uire 3 Dhu	Nephihe (MY) Note: 1 MW requires 1/6 MMCFD of a Plants varan TPS n TPS (New) CCPP varan Gas Based project	Fuel Type Gas	eveliability 1997-08)) 1998-99	1009-2000	2000-01 9.00 22.50	160 2001-02	2002-03 9.00 22.50	360 2003-04 9.00 22.50	2004-08 9.00 22.50	360 2006-06 9.00 22.50	2006-07 9.00 22.50	
A GEI 1 Dhu 2 Uire 3 Dhu	Naphiha (MW) Noie: 1 MW requires 1/6 MMCFD of s Plants TPS TPS (New) CCPP	Fuel Type Gas Gas	9.00 22.50)) 1998-99 9.00 22.50	160 1999-2000 9.00 22.50	160 2000-01 9.00	2001-02 9.00 22.50	160 2002-03 9.00	360 2003-04 9.00	360 2004-08 9.00	360 2006-06 9.00	2006-07 9.00	
A GEI 1 Dhu 2 Uira 3 Dhu 4 Uira	Nephihe (MY) Note: 1 MW requires 1/6 MMCFD of a Plants varan TPS n TPS (New) CCPP varan Gas Based project	Fuel Type Gas Gas Gas Gas	9.00 22.50 0.00	9.00 22.50 0.00	1000-2000 9.00 22.50 0.00	2000-01 9.00 22.60 18.33	2001-02 9.00 22.50 18.33 26.67	2002-03 9.00 22.50 18.33	2003-04 9.00 22.50 18.33 26.67	2004-05 9.00 22.50 18.33 26.67	2006-06 9.00 22.50 18.33 26.67	2006-07 9.00 22.50 18.33 26.67	
A GEI 1 Dhu 2 Uirn 3 Dhu 4 Uire Sub	Nephihe (MY) Note: 1 MW requires 1/6 MMCFD of g Plants n TPS n TPS (New) CCPP varan Gas Based project n Gas based PS slage II	Fuel Type Gas Gas Gas Ges Ges	9.00 22.50 0.00	160 1008-00 9.00 22.50 0.00 0.00	1000-2000 9.00 22.00 0.00	2000-01 9.00 22.50 18.33 25.67	2001-02 9.00 22.50 18.33 26.67	2002-03 9.00 22.50 18.33 26.67	2003-04 9.00 22.50 18.33 20.67	2004-05 9.00 22.50 18.33 20.07	2005-06 9.00 22.50 18.33 26.67	2008-07 9.00 22.50 18.33 26.67	34:{
A GEI 1 Dhu 2 Uira 3 Dhu 4 Uira Sub	Nephihe (MW) Note: 1 MW requires 1/6 MMCFD of s Plants TPS TPS (New) CCPP varan Ges Based project n Ges based PS slage ii	Fuel Type Gas Gas Gas Gas	9.00 22.50 0.00	160 1998-99 9.00 22.50 0.00 0.00	1000-2000 9.00 22.50 0.00 31.60	2000-01 9.00 22.50 18.33 25.67 76.50	2001-02 9.00 22.50 18.33 26.67 78.50	2002-03 9.00 22.50 18.33 26.67	2003-04 9.00 22.50 18.33 20.67 78.80	2004-08 9.00 22.50 18.33 20.67 70.60	2005-08 9.00 22.50 18.33 26.67	2006-07 9.00 22.50 18.33 26.67	2 <u>4:</u> 1
A GEI 1 Dhu 2 Uira 3 Ohu 4 Uira Sub B Non 5 AEC	Nephiha (MW) Note: 1 MW requires 1/6 MMCFD of a I Plants varan TPS n TPS (New) CCPP varan Gas Based project n Gas based PS stage II Total Varian III	Fuel Type Gas Gas Gas Ges Ges Fuel Type Gas	9.00 22.50 0.00 0.00 1997-98 18.33	9.00 22.50 0.00 0.00 1998-90 18.33	1999-2000 9.00 22.50 0.00 31.60	2000-01 9.00 22.50 18.33 25.67 76.50. 2000-01 18.33	2001-02 9.00 22.50 18.33 26.57 76.50 2001-02 18.33	2002-03 9.00 22.50 18.33 26.67 76.66 2002-03 18.33	2003-04 9,00 22,50 18,33 20,67 2003-04 18,33	2004-08 9.00 22.50 18.33 20.67 2004-05 10.33	2006-06 9.00 22.50 18.33 28.67 72.76.80°: 2006-06 18.33	2006-07 9,00 22,50 18,33 26,67 76,60 2006-07 18,33	27:1 20
A GEI 1 Dhu 2 Uira 3 Dhu 4 Uira Sub B Non 5 ACC 6 Sass	Nephthe (MW) Note: 1 MW requires 1/6 MMCFD of g Plants or TPS (New) CCPP varan Gas Based project or Gas based PR stage if Total COUNTY TO THE COUNTY THE COUNTY THE COUNTY THE COUNTY TO THE COUNTY THE	Fuel Type Gas Gas Gas Gas Gas Fuel Type Gas Gas	9.00 22.50 0.00 0.00 1997-98 18.33 85.83	9.00 2.50 0.00 0.00 1908-90 18.33 85.83	9.00 22.50 0.00 0.00 1999-2000 18.33 85.83	2000-01 9.00 22.50 18.33 25.67 ************************************	2001-02 9.00 22.50 18.33 26.67 77.6.50 2001-02 18.33 85.83	2002-03 9.00 22.50 18.33 26.67 2002-03 18.33 95.83	2003-04 9.00 22.50 18.33 20.67 78.69 2003-04 16.33 85.83	2004-08 9.00 22.50 18.33 26.67 76.60 2004-06 18.33 85.83	2006-06 9.00 22.50 18.33 26.67 72.76.80 (2006-06 18.33 85.83	2005-07 9.00 22.50 18.33 26.67 2005-07 18.33 85.83	27:{ 20
A GEI 1 Dhu 2 Uira 3 Dhu 4 Uira Sub B Non 5 AGC 6 Essu 7 GIP	Nephiha (MW) Note: 1 MW requires 1/6 MMCFD of 9 1 Plants varan TPS n TPS (New) CCPP varan Gas Based project n Gas based PS stage II Total (Cast Cast Cast Cast Cast Cast Cast Cast	Gas Gas Gas Gas Gas Gas Fuel Type Gas Gas Gas	9.00 22.50 0.00 0.00 1997-98 18.33 85.83 24.17	9.00 22.50 0.00 0.00 1908-90 18.33 85.83 24.17	1999-2000 9,00 22,50 0,00 31,60 1999-2000 18,33 85,83 24,17	2000-01 9.00 22.50 18.33 25.87 76.50 2000-01 18.33 85.83 24.17	2001-02 9,00 22,50 18,33 26,67 77,6,50 2001-02 18,33 85,83 24,17	2002-03 9.00 22.50 18.33 26.87 2002-03 18.33 85.83 24.17	2003-04 9.00 22.50 18.33 20.87 2003-04 18.33 85.83 24.17	2004-08 9.00 22.50 18.33 28.67 76.60° 2004-06 18.33 85.83 24.17	2005-08 9.00 22.50 18.33 26.67 (72.76.80% 2005-06 18.33 85.83 24.17	2006-07 9.00 22.50 18.33 26.67 2006-07 18.33 85.89 24.17	24; [20
A GEI 1 Dhu 2 Uira 3 Ohu 4 Uira Sub B Non 5 AEC 6 Ess 7 GIF 8 GTE	Nephthe (MW) Note: 1 MW requires 1/6 MMCFD of a Plants I Plants I TPS (New) CCPP varan Ges Based project In Ges based PS slage II Total COMMISSION II - GES Plants - Vatva Ir Power - Hazire L - Godona C - Gendmar, CCPP	Fuel Type Gas Gas Ges Ges Fuel Type Gas Gas Gas Gas Gas Gas	9.00 22.50 0.00 0.00 1997-98 18.33 85.83 24.17 20.07	9.00 22.50 0.00 0.00 1998-98 18.33 85.83 24.17 100.17	1909-2000 9,00 22,50 0,00 0,00 1909-2000 18,33 85,83 24,17 100,17	2000-01 9.00 22.50 25.67 16.33 25.67 2000-01 10.33 65.83 24.17 109.17	2001-02 9.00 22.50 18.33 26.67 76.60* 2001-02 18.33 65.83 24.17 100.17	2002-03 9.00 22.50 18.33 26.67 2002-03 18.33 65.63 24.17 109.17	2003-04 9,00 22,53 19,53 19,53 20,67 30 76,807 19,33 85,83 24,17 109,17	2004-08 9.00 22.50 18.33 20.67 76.60° 2004-05 19.33 85.83 24.17 100.17	2006-08 9.00 22.50 16.53 28.67 72.74.80 10.33 85.83 24.17 109.17	2006-07 9,00 22,50 18,33 26,67 2006-07 18,33 85,83 24,17 109,17	27:1 20
A GEI 1 Dhu 2 Uira 3 Dhu 4 Uira Sub B Non 5 AEC 6 Essa 7 GIP 8 OTE 9 AEC	Nephthe (MW) Note: 1 MW requires 1/6 MMCFD of g Plants on TPS (New) CCPP varan Gas Based project on Gas based PS stage il Total Country - GES Plants - Vativa sr Power - Hazira CL - Goddna C - Gendhar, CCPP - Almodobad CCGT	Fuel Type Gas Gas Gas Fuel Type Gas Gas Gas Gas Gas Gas Gas Gas	9.00 22.50 0.00 0.00 7:11 31.60 1893-8 16.33 35.83 24.17 26.07	9.00 22.50 0.00 0.00 1998-90 1998-90 18.33 35.83 24.17 100.17	1909-2000 9.00 22.50 0.00 31.60 1909-2000 18.33 85.83 24.17 109.17 25.63	2000-01 9.00 22.50 18.33 25.67 76.50 2000-01 18.33 85.83 24.17 109.17 25.83	2001-02 9.00 22.50 19.33 26.87 2001-02 18.33 85.83 24.17 100.17 25.63	2002-03 9.00 22.50 18.33 26.67 2002-03 18.33 95.63 24.17 109.17 25.63	2003-04 9.00 22.50 18.33 20.67 2003-04 18.33 85.83 24.17 109.17 25.83	2004-05 9.00 22.50 18.33 20.67 2004-05 10.33 85.83 24.17 100.17 25.83	2005-06 9.00 22.50 18.33 26.57 76.60 18.33 85.83 24.17 109.17 25.83	2006-07 9.00 22.50 18.33 26.67 18.33 85.63 24.17 109.17 25.63	27:1 20
A GEI 1 Dhu 2 Uira 3 Dhu 4 Uira Sub B Non 5 AGC 6 Ess 7 GIPI 8 GTE 9 AGC 10 GIPI	Nephiha (MW) Note: 1 MW requires 1/6 MMCFD of a I Plants varan TPS n TPS (New) CCPP varan Gas Based project n Gas based PS siage II Total Varian - GEB Plants - Vatva sr Power - Hazire L Godna CCPP - Ahmedobad CCCT - C Godna, Vadodara CCPP	Fuel Type Gas Gas Gas Ges Fuel Type Gas Gas Gas Gas Gas Naphtha	9.00 22.50 0.00 0.00 1997-98 18.33 85.83 24.17 28.67 0.00	160 1998-99 9.00 22.50 0.00 0.00 1998-99 18.33 85.83 24.17 109.17 0.00 28.87	1609-2000 9,00 22,50 0,00 31,60 1999-2000 18,33 85,83 24,17 109,17 25,63 26,67	2000-01 9.00 22.50 18.33 25.67 76.50 2000-01 18.33 85.83 24.17 109.17 25.83 26.07	2001-02 9.00 22.50 18.33 26.67 2001-02 18.33 85.83 24.17 100.17 25.63 26.87	2002-03 9.00 22.50 18.33 26.67 76.867 2002-03 18.33 65.63 24.17 106.17 25.63 20.67	2003-04 9.00 22.50 19.33 26.67 2003-04 18.33 85.83 24.17 109.17 25.83 20.07	2004-08 9.00 22.50 10.33 26.67 2004-06 10.33 85.83 24.17 100.17 25.83 26.67	2005-06 9.00 22:50 18:33 26:67 72:76:80 2005-05 18:33 85:83 24:17 109:17 25:83 26:67	2006-07 9.00 22.50 18.33 26.67 2006-07 18.33 85.83 24.17 109.17 25.83 26.67	2 <u>7:</u> [
A GEI 1 Dhu 2 Uira 3 Dhu 4 Uira 5 Uira 5 AEC 6 Ess 7 GIPP 8 GTE 9 AEC 10 GIPP 11 GPC	Nephthe (MW) Note: 1 MW requires 1/6 MMCFD of a Plents Plents Plents Plents Plents Plents Possible of project Ges based PS stage il Total Marchael - GES Plants - Valva br Power - Hazire L - Godhra C - Gendhra, CCPP - Ahmedebad CCGT L - Godhra, Vadodara CCPP L - Pipevey V	Fuel Type Gas Gas Gas Gas Fuel Type Gas	9.00 22.50 0.00 0.00 1111 31.60 1997-98 18.33 35.83 24.17 20.07 0.00 0.00	9.00 22.50 0.00 0.00 1998-98 18.33 85.83 24.17 0.00 26.67	9.00 9.00 22.50 0.00 31.60 1999-2000 18.33 24.17 109.17 25.63 26.67	2000-01 9.00 22.50 18.33 25.87 76.50 2000-01 18.33 85.83 24.17 109.17 25.83 28.07 0.00	2001-02 9.00 22.50 18.33 26.67 2001-02 18.33 85.83 24.17 100.17 25.63 26.87 0.00	2002-03 9.00 22.50 19.33 26.67 2002-03 18.33 85.63 24.17 109.17 25.63 20.67 0.00	2003-04 9.00 22.50 18.33 20.67 2003-04 18.33 85.83 24.17 109.17 25.83 20.07 33.33	2004-05 9.00 22.50 18.33 26.87 76.60 2004-05 18.33 24.17 106.17 25.83 26.67 333.33	2006-06 9.00 22.50 18.33 28.67 772.78.60 2005-06 18.33 35.83 24.17 109.17 25.83 20.67 333.33	2006-07 9.00 22.50 18.33 26.67 2006-07 18.33 85.83 24.17 109.17 25.83 26.67 333.33	24.1 20 2
A GEI 1 Dhu 2 Urra 3 Dhu 4 Urra Sub B Non 5 AEC 6 Ess 7 GIP 8 QTE 10 GIP 11 GPC 12 Gas	Nephtha (MW) Note: 1 MW requires 1/6 MMCFD of 9 I Plants varan TPS n TPS (New) CCPP varan Gas Based project n Gas based PS stags III Total Varian I Power - Hazirs L - Godins C - Gandhar, CCPP - Ahmedebad CCQT L - Godins, Vadodara CCPP L - Pipavay based plant	Fuel Type Gas Gas Gas Fuel Type Gas	9.00 22.50 0.00 0.00 771131.60 1997-98 18.33 35.83 24.17 20.87 0.00 0.00	9.00 22.50 0.00 0.00 1998-90 18.33 35.83 24.17 100.17 0.00 28.87 0.00	1609-2000 9,00 22,50 0,00 18,33 85,83 24,17 100,17 25,63 26,67 0,00	2000-01 9.00 22.50 18.33 28.67 76.50 2000-01 18.33 65.83 24.17 109.17 25.83 28.07 0.00 85.00	2001-02 9.00 22.50 18.33 26.87 76.80 2001-02 18.33 85.83 24.17 100.17 25.83 26.87 0.00 85.00	2002-03 9.00 22.50 19.33 26.67 2002-03 18.33 65.43 24.17 100.17 25.63 28.67 0.00 85.00	2003-04 9,00 22,50 18,33 20,67 2003-04 18,33 85,83 24,17 109,17 25,83 20,67 33,33 85,00 20,67	2004-05 9.00 22.50 18.33 26.67 2004-05 18.33 85.83 24.17 109.17 25.67 333.33 85.80	2006-06 9.00 22.50 18.33 28.67 70.80 % 2006-06 18.33 85.83 24.17 109.17 25.83 26.67 333.33 85.80	2006-07 9.00 22.50 18.33 26.67 2006-07 18.33 85.83 24.17 109.17 20.67 33.33 85.00	24;[24;[
A GEI 1 Dhu 2 Urra 3 Dhu 4 Utra Sub B Non 5 AEC 6 Ess 7 GIP 8 GTE 9 AEC 10 GIP 11 GPC 12 Gas 13 GSF	Nephthe (MW) Note: 1 MW requires 1/6 MMCFD of a Plants I Power - Hazire IL - Godhra, CCPP I - Ahmedabad CCGT IL - Godhra, Vadodara CCPP IL - Pipavay based plant I - GCP I - Pipavay based plant I - CCPP I - Pipavay based plant I - CCPP I - Pipavay based plant I - CCPP I - Pipavay based plant I - CC - Hazira	Fuel Type Gas Gas Gas Gas Fuel Type Gas	9.00 22.50 0.00 0.00 101 31.60 1997-98 16.33 85.83 24.17 26.87 0.00 0.00 0.00	160 9.00 22.50 0.00 0.00 1998-90 18.33 85.83 24.17 00.00 28.87 0.00 0.00	1909-2000 9.00 22.50 0.00 0.00 1909-2000 18.33 24.17 100.17 25.83 26.67 0.00 0.00	2000-01 9.00 22.50 16.33 25.67 76.80. 2000-01 10.03 85.83 24.17 109.17 25.63 26.07 0.00 85.00 20.00	2001-02 9.00 18.33 26.67 76.50 2001-02 18.33 25.83 24.17 109.17 25.83 26.67 0.00 85.00 26.07	2002-03 9.00 22.50 18.33 26.87 77.856 2002-03 18.33 95.83 24.17 109.17 725.63 28.67 0.00 85.00	2003-04 9,00 22,50 18,33 20,87 2003-04 18,33 24,17 19,17 25,83 24,17 109,17 25,83 20,87 33,33 85,00 56,67	2004-05 9.00 22.50 18.33 26.67 76.60 10.33 85.83 24.17 100.17 25.83 26.67 333.33 85.00 56.67	2006-06 9.00 22.50 18.33 26.67 72.76.80 2005-06 18.33 24.17 109.17 25.83 26.87 33.33 85.80 55.60 55.67	2006-07 9.00 22.50 18.33 26.87 18.33 24.17 19.33 24.17 25.83 24.17 25.83 26.87 33.33 85.00 50.67	20
A GEI 1 Dhu 2 Uira 3 Dhu 4 Uira Sub B Non 5 AEC 6 Easi 7 GIP 8 OTE 9 AEC 10 GIP 11 GRS 13 GSF 14 KRII	Nephthe (MW) Note: 1 MW requires 1/6 MMCFD of a plants varan TPS n TPS (New) CCPP varan Gas Based project n Gas based PR stage il Total MCCANARA - CEB Plants - Valva ar Power - Hazire CL - Godhra CC - Gendmar, CCPP - Ahmedebad CCGT LL - Godhra, Vadodara CCPP LL - Pipsvav based plant CL - Hazira CL - Hazira	Fuel Type Gas Gas Gas Ges Fuel Type Gas Gas Gas Gas Gas Naphtha Gas Gas Naphtha	9.00 22.50 0.00 0.00 1997-98 1893-98 18.33 85.83 24.17 20.87 0.00 0.00 0.00	160 9.00 22.50 0.00 0.00 1908-90 18.33 85.83 24.17 100.17 0.00 28.87 0.00 0.00	1909-2000 9.00 22.50 0.00 0.00 18.03 85.83 24.17 109.17 25.83 26.87 0.00 0.00 0.00	2000-01 9.00 22.50 18.33 26.67 76.60. 2000-01 101.33 85.83 24.17 109.17 25.83 26.07 0.00 65.00 20.07 0.00	2001-02 9.00 22.50 18.33 26.57 78.50' 2001-02 18.33 85.83 24.17 100.17 25.83 25.87 0.00 65.00 0.00	2002-03 9.00 22.50 18.33 26.87 774.863 2002-03 18.33 85.83 24.17 709.17 25.63 26.67 0.00 85.00 66.67 0.00	2003-04 9,00 22,50 18,33 26,67 2003-04 18,33 24,17 25,83 24,17 25,83 24,17 25,83 24,17 25,83 26,07 33,33 85,00 56,07 33,33	2004-05 9.00 22.50 18.33 26.67 2004-05 18.83 24.17 100.17 25.63 26.67 33.33 65.00 56.67	2006-06 9.00 22.50 18.33 26.67 70.80 10.33 85.83 24.17 109.17 25.83 26.67 33.33 85.00 56.67 33.33	2006-07 9.00 22.50 18.33 26.67 2006-07 30.85.83 24.17 109.17 25.83 26.67 33.33 85.83 26.67 33.33 85.83 26.67 33.33	20
1 Dhu 2 Urra 3 Ohtu 4 Urra 8 Urra 5 AEC 6 Essa 7 GPP 8 GTE 9 AEC 10 GPP 11 GPC 12 Gass 13 GSF	Nephthe (MW) Note: 1 MW requires 1/6 MMCFD of a Plants I Power - Hazire IL - Godhra, CCPP I - Ahmedabad CCGT IL - Godhra, Vadodara CCPP IL - Pipavay based plant I - GCP I - Pipavay based plant I - CCPP I - Pipavay based plant I - CCPP I - Pipavay based plant I - CCPP I - Pipavay based plant I - CC - Hazira	Fuel Type Gas Gas Gas Ges Fuel Type Gas Gas Gas Gas Gas Naphtha Gas Gas Naphtha	9.00 22.50 0.00 0.00 1997-98 1893-98 18.33 85.83 24.17 20.87 0.00 0.00 0.00	160 9.00 22.50 0.00 0.00 1998-90 18.33 85.83 24.17 00.00 28.87 0.00 0.00	1909-2000 9.00 22.50 0.00 0.00 1909-2000 18.33 85.83 24.17 25.83 26.67 0.00 0.00 0.00	2000-01 9.00 22.50 16.33 25.67 76.80. 2000-01 10.03 85.83 24.17 109.17 25.63 26.07 0.00 85.00 20.00	2001-02 9.00 22.50 18.33 26.57 78.50' 2001-02 18.33 85.83 24.17 100.17 25.83 25.87 0.00 65.00 0.00	2002-03 9.00 22.50 18.33 26.87 77.856 2002-03 18.33 95.83 24.17 109.17 725.63 28.67 0.00 85.00	2003-04 9,00 22,50 18,33 26,67 2003-04 18,33 24,17 25,83 24,17 25,83 24,17 25,83 24,17 25,83 26,07 33,33 85,00 56,07 33,33	2004-05 9.00 22.50 18.33 26.67 2004-05 18.83 24.17 100.17 25.63 26.67 33.33 65.00 56.67	2006-06 9.00 22.50 18.33 26.67 70.80 10.33 85.83 24.17 109.17 25.83 26.67 33.33 85.00 56.67 33.33	2006-07 9.00 22.50 18.33 26.67 2006-07 30.85.83 24.17 109.17 25.83 26.67 33.33 85.83 26.67 33.33 85.83 26.67 33.33	20
A GEI 1 Dhu 2 Urra 3 Dhu 4 Urra 5 Ubra 5 Mon 5 AEC 6 Ess 7 GIPE 8 GIPE 9 AEC 10 GIPP 11 GIPC 12 Gas 13 Gas 14 KRII	Nephthe (MW) Note: 1 MW requires 1/6 MMCFD of 5 9 Plants varan TPS n TPS (New) CCPP varan Ges Based project n Ges based PS stage il Total MC (MWCFD of 5 1- Vative sr Power - Hazire L - Godorns (CCPP - Ahmedobad CCGT L - Godorns, Vadodara CCPP L - Pipavav based plant C - Hazire CC - Daring CC - Cardon CC - Vazira CC - Unaring CC - Cardon CC - Vazira CC - Vazira	Fuel Type Gas Gas Gas Ges Ges Ges Gas Gas Gas Gas Gas Gas Gas Gas Rephiba Fuel Type	9.00 22.50 0.00 0.00 1997-98 18.33 85.83 24.17 20.87 0.00 0.00 0.00 0.00	160 9.00 22.50 0.00 0.00 1998-99 18.33 24.17 0.00 28.47 0.00 0.00 0.00	1909-2000 9.00 22.50 0.00 0.00 1909-2000 18.33 85.83 24.17 25.83 26.67 0.00 0.00 0.00	2000-01 9.00 22.50 18.33 28.67 76.50 2000-01 1013 65.83 24.17 109.17 25.83 26.07 0.00 65.00 0.00 401.67	2001-02 9.00 22.50 18.33 26.87 78.50 201-02 18.33 25.83 24.17 109.17 25.83 26.50 0.00 85.00 26.07 0.00	2002-03 9.00 22.50 18.33 26.87 78.863 18.33 95.83 24.17 109.17 25.63 26.67 0.00 85.00 65.67 0.00	2003-04 9,00 22,50 18,33 20,87 2003-04 18,33 24,17 109,17 25,83 20,07 33,33 85,00 58,07 33,33 85,00 58,07 33,33 20,07 32,00 33,33 20,07 33,33 20,07 33,33 20,07 33,33 20,07 30,07	2004-05 9.00 22.50 18.33 26.67 76.60° 2004-05 10.33 85.83 24.17 109.17 25.83 26.67 333.33 85.00 56.67 333.33 2004-05	2006-06 9.00 22.50 18.33 26.67 18.33 2005-06 18.33 24.17 109.17 25.83 26.07 33.33 85.00 56.67 33.33 24.07 20.05-06	2006-07 9.00 22.50 18.33 26.87 78.89 2016-03 95.83 24.17 109.17 25.83 26.67 33.33 85.00 50.67 33.33 20.67 37.888 20.67 33.33 20.67 33.33 20.67 33.33	20
A GEI 1 Dhu 2 Uira 3 Ohu 4 Uira 5 AEC 6 Ess 7 GIP 8 GTE 10 GIP 11 GP 11 GF 12 Gas 13 GSF 14 KRII	Nephtha (MW) Note: 1 MW requires 1/6 MMCFD of a 1 Plants varan TPS n TPS (New) CCPP varan Gas Based project n Gas based PS stage il Total Varia - GEB Plants - Valva r Power - Hazirs L - Godhra C - Gendhar, CCPP - Ahmedobad CCQT L - Godhra, Vadodara CCPP L - Pipavav based plant C - Hazira CL - Hazira	Gas	9.00 22.50 0.00 0.00 1997-98 18.33 85.83 24.17 20.87 0.00 0.00 0.00 0.00	9.00 9.00 22.50 0.00 0.00 1998-92 18.33 85.83 24.17 0.00 0.00 0.00 0.00	1009-2000 9.00 22.50 0.00 18.33 85.83 24.17 100.17 25.63 0.00 0.00 0.00	2000-01 9.00 22.50 18.33 28.67 76.50. 2000-01 10.33 85.83 24.17 109.17 25.83 26.07 0.00 26.07	2001-02 9.00 22.50 18.33 28.87 78.50' 2001-02 18.33 85.89 24.17 109.17 25.87 0.00 26.67 0.00 401.67'	2002-03 9.00 22.50 19.33 26.67 2002-03 18.33 65.63 24.17 109.17 25.63 20.67 0.00 65.00 65.00 65.00	2003-04 9.00 22.50 18.33 26.67 2003-04 16.33 85.83 24.17 109.17 25.83 20.07 33.33 85.00 56.67 33.33	2004-08 9.00 22.50 18.33 26.67 76.60° 2004-06 10.33 85.83 24.17 100.17 25.83 26.67 33.33 85.00 56.67 33.93	2006-06 9.00 22.50 18.33 26.67 70.80 2005-06 10.33 85.83 24.17 109.17 25.83 26.67 333.33 85.00 56.67 33.33	2005-07 9.00 22.50 18.33 26.67 2005-07 109.17 109.17 109.17 25.83 24.17 109.17 25.83 33.33 35.00 50.67 33.33	200
A GEI 1 Dhu 2 Uira 3 Ohu 4 Uira Sub B Non 5 AEC 6 Essi 7 GIP 8 GTE 9 AEC 10 GIP 11 GPC 12 Gas 13 GSF 14 KRII Sub C Can 15 NTP	Nephiha (MW) Note: 1 MW requires 1/6 MMCFD of a plants varan TPS n TPS (New) CCPP varan Gas Based project n Gas based PS stage II Total (New) CCPP - Garden CCPP - Ahmedebad CCGT - L. Godhra, CCPP - L. Pipavav based plant CL - Hazira CL - Hazira CL - Hazira CHO - Jurugadin Total (CL - Hazira CHO - Jurugadin Total (CL - Hazira CC - Garden CCPP - Total (CL - Hazira CC - Ga	Fuel Type Gas Gas Gas Ges Ges Ges Gas Gas Gas Gas Gas Gas Gas Gas Rephiba Fuel Type	9.00 22.50 0.00 0.00 1997-98 18.33 85.83 24.17 20.87 0.00 0.00 0.00 0.00	160 9.00 22.50 0.00 0.00 1998-99 18.33 24.17 0.00 28.47 0.00 0.00 0.00	1909-2000 9.00 22.50 0.00 0.00 1909-2000 18.33 85.83 24.17 25.83 26.67 0.00 0.00 0.00	2000-01 9.00 22.50 18.33 28.67 76.50 2000-01 1013 65.83 24.17 109.17 25.83 26.07 0.00 65.00 0.00 401.67	2001-02 9.00 22.50 18.33 26.87 78.50 201-02 18.33 25.83 24.17 109.17 25.83 26.50 0.00 85.00 26.07 0.00	2002-03 9.00 22.50 18.33 26.87 78.863 18.33 95.83 24.17 109.17 25.63 26.67 0.00 85.00 65.67 0.00	2003-04 9,00 22,50 18,33 20,87 2003-04 18,33 24,17 109,17 25,83 20,07 33,33 85,00 58,07 33,33 85,00 58,07 33,33 20,07 32,00 33,33 20,07 33,33 20,07 33,33 20,07 33,33 20,07 30,07	2004-05 9.00 22.50 18.33 26.67 76.60° 2004-05 10.33 85.83 24.17 109.17 25.83 26.67 333.33 85.00 56.67 333.33 2004-05	2006-06 9.00 22.50 18.33 26.67 18.33 2005-06 18.33 24.17 109.17 25.83 26.07 33.33 85.00 56.67 33.33 24.07 20.05-06	2006-07 9.00 22.50 18.33 26.87 78.89 2016-03 95.83 24.17 109.17 25.83 26.67 33.33 85.00 50.67 33.33 20.67 37.888 20.67 33.33 20.67 33.33 20.67 33.33	20 33
A GEI 1 Dhu 2 Uira 3 Ohu 4 Uira Sub B Non 5 AEC 6 Essi 7 GIP 10 GIP 11 GPC 12 Gas 13 GSF 14 KRII Sub C Can 15 NTP 16 NTP	Nephtha (MW) Note: 1 MW requires 1/6 MMCFD of a 1 Plants varan TPS n TPS (New) CCPP varan Gas Based project n Gas based PS stage il Total Varia - GEB Plants - Valva r Power - Hazirs L - Godhra C - Gendhar, CCPP - Ahmedobad CCQT L - Godhra, Vadodara CCPP L - Pipavav based plant C - Hazira CL - Hazira	Gas	9.00 22.50 0.00 0.00 1997-98 18.33 85.83 24.17 20.87 0.00 0.00 0.00 0.00	9.00 22.50 0.00 0.00 1998-90 18.33 85.83 24.17 100.17 0.00 0.00 0.00 0.00 0.00	1609-2000 9.00 22.50 0.00 0.00 1909-2000 18.33 85.83 24.17 100.17 25.83 26.67 0.00 0.00 0.00 0.00 0.00 1909-2000 1909-2000 1909-2000	2000-01 9.00 22.50 18.33 26.67 76.60 2000-01 10.33 85.83 24.17 109.17 25.03 26.07 0.00 05.00 20.07 0.00 10.07 20.00 10.00	2001-02 9.00 22.50 18.33 26.67 2001-02 18.33 85.83 24.17 100.17 25.83 26.67 0.00 26.67 0.00 26.07 2001-02 107.33	2002-03 9.00 22.50 19.33 26.67 19.663 24.17 100.17 25.63 26.67 0.00 55.00 56.67 0.00 107.33	2003-04 9,00 22,50 18,33 26,67 2003-04 18,33 85,83 24,17 109,17 25,83 26,67 33,33 85,00 50,67 33,33 85,00 50,67 33,33 85,00 50,67 33,33 85,00 50,67 33,33 85,00 50,67 33,33 85,00 50,67 33,33 85,00 50,67 33,33 85,00 50,67 33,33 85,00 50,67 33,33 85,00 50,67 33,33 85,00 50,67 33,33 85,00 50,67 33,33 85,00 50,67 33,33 85,00 50,67 33,33 85,00	2004-08 9.00 22.50 10.33 20.67 76.60° 2004-06 10.33 85.83 24.17 100.17 25.83 26.67 33.33 65.00 56.67 33.33 25.00 56.67 33.33 25.00 56.67 33.33 65.00 56.67 33.33 65.00 56.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 33.33 65.00 66.67 67.00 67.0	2006-06 9.00 22.50 18.33 26.67 1727-18.60 2005-06 18.33 24.17 109.17 25.83 26.67 33.33 85.00 56.67 33.33	2006-07 9.00 22.50 18.33 26.67 78.60 2006-07 19.33 85.83 24.17 109.17 25.83 26.87 33.33 85.00 50.67 39.33	20 20 10 20 10 10 10 10 10 10 10 10 10 10 10 10 10
A GEI 1 Divid 2 Ultra 3 Ohto 4 Ultra Stub B Non 5 AECC 6 Ess 7 GIPP 8 GTE 9 AEC 10 GIPP 11 GPC 12 Gas 13 Gas 14 KRII Sub C Can 15 NTP 16 NTP 17 NTP	Nephiha (MW) Note: 1 MW requires 1/6 MMCFD of a plants varan TPS n TPS (New) CCPP varan Gas Based project n Gas based PS stage II Total (New) CCPP - Garden CCPP - Ahmedebad CCGT - L. Godhra, CCPP - L. Pipavav based plant CL - Hazira CL - Hazira CL - Hazira CHO - Jurugadin Total (CL - Hazira CHO - Jurugadin Total (CL - Hazira CC - Garden CCPP - Total (CL - Hazira CC - Ga	Fuel Type Gas	9.00 22.50 0.00 0.00 0.00 1997-98 18.33 85.83 24.17 26.87 0.00 0.00 0.00 0.00 0.00 1997-98 107-93 107-93	9.00 9.00 22.50 0.00 0.00 1998-98 18.33 85.83 24.17 0.00 0.00 0.00 0.00 0.00 0.00	1999-2000 9.00 22.50 0.00 0.00 1999-2000 18.33 85.83 24.17 25.63 0.00 0.00 0.00 0.00 1999-2000 107.33 108.00	2000-01 9.00 22.50 18.33 25.87 76.50. 2000-01 10.33 65.83 24.17 109.17 25.03 26.07 0.00 65.00 0.00 65.00 0.00 401.67 2000-01 107.33 108.00	2001-02 9.00 22.50 18.33 26.57 76.50' 2001-02 18.33 85.83 24.17 109.17 25.63 26.67 0.00 401.87 2001-02 107.33 108.00	2002-03 9.00 22.50 18.33 26.67 2002-03 18.33 65.63 24.17 109.17 25.63 20.67 0.00 65.00 0.00 65.00 0.00 107.33 108.00	2003-04 9,00 22,50 18,33 26,67 18,33 20,17 76,80 19,17 25,83 24,17 79,17 25,83 24,17 25,83 24,17 25,83 24,17 25,83 26,67 33,33 85,00 60,67 33,33 20,03 41,17 20,03 2	2004-06 9.00 22.50 18.33 26.67 2004-06 19.33 85.83 24.17 109.17 25.63 26.67 33.33 85.00 65.67 33.33 2004-06 107.33	2006-06 9.00 22.50 18.33 26.67 709.17 25.83 24.17 109.17 25.83 26.67 33.33 85.00 66.67 33.33 2006-06 107.33	2005-07 9,00 22,50 18,33 26,67 18,56 20,17 109,17 25,83 24,17 109,17 25,83 26,67 33,33 85,00 50,67 33,33 20,67 107,73 107,73 107,73 107,73	20 20 20 20 20 20 20 20 20 20 20 20 20 2
B Non 5 AEC 6 Ess 7 GIP 8 OF 10 GIP 11 GIP 12 Gas 13 Gas 14 KRII 8 Ub C Can 15 NTP 16 NTP 17 NTP 18 NTP	Nephthe (MW) Note: 1 MW requires 1/6 MMCFD of a Plants I Plants I Plants I Plants I Plants GES Plants Vative I Plants I Ramas I Plants I Ramas I Ramas I Ramas I Ramas I Plants I Ramas I Ramas I Ramas I Ramas I Ramas I Ramas I Plants I Ramas I	Fuel Type Gas	9.00 22.50 0.00 0.00 1997-98 16.33 95.83 24.17 20.87 0.00 0.00 0.00 0.00 0.00 1997-98 107.33 109.00 0.00	9.00 22.50 0.00 0.00 1998-99 18.93 35.83 24.17 0.00 28.47 0.00 0.00 0.00 0.00 1998-99 107.33 108.00 0.00	1909-2000 9.00 22.50 0.00 0.00 31.60 1909-2000 18.33 26.67 0.00 0.00 0.00 0.00 1999-2000 107.33 100.00	2000-01 9.00 22.50 16.33 25.87 76.80 2000-01 10.33 24.17 25.03 26.07 0.00 85.00 20.07 0.00 401.67 2000-01 107.33 108.00 0.00	2001-02 9.00 22.50 18.33 2001-02 18.33 85.83 24.17 100.17 25.63 26.07 0.00 401.67 2001-02 107.33 108.00 0.00	2002-03 9.00 22.50 18.33 28.87 78.86 2002-03 18.33 95.83 24.17 25.63 28.87 0.00 85.00 65.67 0.00 24.17 25.63 28.87 0.00 85.00 66.67 0.00 107.33 108.00 0.00	2003-04 9,00 22,50 18,33 20,87 2003-04 18,33 20,87 20,17 25,83 20,17 25,83 20,17 33,33 85,00 56,67 33,33 85,00 60,67 33,33 85,00 60,00 107,03 109,00 100,00 1	2004-05 9.00 22.50 18.33 26.67 76.60 19.33 85.83 24.17 100.17 25.83 26.67 333.33 85.00 56.67 33.33 26.07 33.33 26.07 33.33 26.07 33.33 26.07 33.33 26.07 33.33 36.00	2006-06 9.00 22.50 16.33 26.67 72.79.60 2005-06 18.33 24.17 109.17 25.83 26.97 33.33 85.00 56.67 33.33 2005-06 107.33 108.00 0.00	2006-07 9,00 22,50 18,33 26,87 2006-07 18,33 85,83 24,17 109,17 25,83 26,87 33,33 85,00 50,67 33,33 85,00 50,67 107,33 108,00 107,33	20 20 20 20 20 20 20 20 20 20 20 20 20 2
4 GEI 1 Dhu 2 Urra 3 Dhu 4 Urra 5 Mo 5 ACC 6 Gas 6 Gas 6 Gas 7 GIP 10 GIP 11 QC 12 Gas 13 QSF 14 KRI 15 NTP 16 NTP 16 NTP 16 NTP 16 NTP	Nephthe (MW) Note: 1 MW requires 1/6 MMCFD of a I Plants varen TPS n TPS (New) CCPP varen Gas Based project n Gas based PS stage II Total Variation Total Control - QES Plants - Vatve sr Power - Hazire L - Godnra CCPP - Ahmedebad CCQT L - Godnra Vadodara CCPP L - Pipevev based plant CL - Hazira GCHO - Junegadn Total Total C Kawas C Gandhar II C Gendhar II	Fuel Type Gas	9.00 22.50 0.00 0.00 1997-98 18.33 85.83 24.17 28.67 0.00 0.00 0.00 0.00 0.00 1997-98 107.33 109.00 0.00	9.00 22.50 0.00 0.00 1998-92 18.33 85.83 24.17 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0	160 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 2000 - 216	2800-01 9.00 22.50 18.33 28.67 76.50. 2000-01 10.33 85.83 24.17 109.17 25.93 28.07 0.00 20.07 107.33 108.00 0.00 0.00 0.00 0.00 0.00 0.00 0.	2001-02 9.00 22.50 18.33 26.87 78.50 2001-02 18.33 85.83 24.17 100.17 25.83 26.87 0.00 401.87 2001-02 107.33 108.00 0.00 0.00	2002-03 9.00 22.50 19.33 26.87 2002-03 18.33 65.63 24.17 109.17 25.63 20.67 0.00 65.67 0.00 107.33 108.00 0.00	2003-04 9.00 22.50 18.33 26.67 331.33 85.80 26.17 25.83 26.67 331.33 15.00 56.67 331.33 100.00 9.00	2004-08 9.00 22.50 18.33 26.67 76.60° 2004-06 10.33 85.83 24.17 100.17 25.83 26.67 333.33 85.00 56.67 33.33 1798.33 2004-06 107.93 108.00 0.00 0.00	2006-06 9.00 22.50 18.33 26.67 70.80 2005-06 10.33 85.83 24.17 109.17 25.83 26.67 333.33 85.00 56.67 33.33 100.00 0.00 0.00	2005-07 9.00 22.50 18.33 26.67 20.67 33.33 35.00 56.67 35.33 798.33 798.33 108.00 0.00 0.00 0.00 0.00 0.00 0.0	20 3
A GEI 1 Dhu 2 Uira 3 Ohu 4 Uira 5 Uira 5 Non 5 AEC 6 Ess 7 GIPE 8 GTE 9 AEC 10 GPC 11 GPC 12 Gas 13 GSF 14 KRIII 8 Ub C Can 15 NTP 16 NTP 17 NTP 18 NTP	Nephthe (MW) Note: 1 MW requires 1/6 MMCFD of a plants Plants Plants Total Mark Plants - GEB Plants - Valva - GEB Plants - Valva - Oddhra C - Gendhra C - Gendhra C - Cendhra C - Cordo L - Odde - Odde	Fuel Type Gas	9.00 22.50 0.00 0.00 1997-98 16.33 95.83 24.17 20.87 0.00 0.00 0.00 0.00 0.00 1997-98 107.33 109.00 0.00	160 9.00 22.50 0.00 0.00 1998-99 18.33 24.17 0.00 28.47 0.00 0.00 0.00 0.00 1998-99 107.33 109.00 0.00	1909-2000 9.00 22.50 0.00 0.00 1909-2000 18.33 24.17 25.83 26.67 0.00 0.00 1999-2000 107.33 108.00 0.00 0.00	2000-01 9.00 22.50 18.33 25.67 76.50 2000-01 10.33 26.07 0.00 401.67 2000-01 107.33 108.00 0.00 0.00	2001-02 9.00 22.50 18.33 26.57 76.50' 76.50' 76.50' 76.50' 201-02 18.33 26.57 0.00 85.00 26.07 0.00 85.00 26.07 0.00 100.13' 201-02 107.33 108.00 0.00	2002-03 9.00 22.50 18.33 26.87 2002-03 18.33 95.83 24.17 109.17 25.83 26.67 0.00 85.00 85.00 85.00 85.00 107.33 108.00 107.33 108.00 0.00 0.00 0.00 0.00	2003-04 9,00 22,50 18,33 20,33 20,33 20,17 25,83 24,17 109,17 25,83 20,07 33,33 85,07 33,33 85,07 33,33 85,07 33,33 85,07 33,33 85,07 30,07	2004-05 9.00 22.50 18.33 26.67 76.60 ² 2004-05 10.33 85.83 24.17 109.17 25.83 26.67 333.33 85.00 56.67 333.33 2004-05 107.33 108.00 109.00 109.00 109.00	2006-06 9.00 22.50 18.33 26.67 172.76.80 2005-06 18.33 24.17 109.17 25.83 24.17 25.83 24.17 25.83 26.07 33.33 85.00 56.07 33.33 106.00 0.00 0.00 0.00	2006-07 9.00 22.50 18.33 26.87 78.89 2006-07 109.17 25.83 24.17 109.17 25.83 26.87 33.33 85.00 50.67 33.33 85.00 50.67 30.00 107.33 108.00 0.00 0.00 0.00	20 2 3 3 1 1 1 1 1 1 1



Annexure 3

NATURAL GAS DEMAND - FERTILISERS

(SHORT & MEDIUM TERM)

FERTILISEA	INDUSTRY IN GUJARAT	

Company	Location	Oletriat	Capacity (MMTPA)	Production	Status of Project	Feed	Current Cons.of NG (mmcfd)	Potential Cone.of NG for NH3 Prodn. (mmcld)	Potential Cons.of NQ for Ures from NH3 (mmcfd)		Total Polential of for Cons. Of NO	Year of Comm
GSFC	Baroda	Baroda	0.364	0.287	Existing	Naph/Gas	23.48	33.28	3.66	15.00	31.96	
GSI*C Exp.	Daroda	Boroda	0.728		Existing	Necl/Gas		38.70	0.29	••	48.08	-
GNFC	Bharuch	Bharuch	0.742	0.726	Existing	FC/Gas	24.71	52,07	9.29		66.67	
IFFCQ	Katol	Mehsana	0.396	0.455	Extering	Gas	26.46	30.09	5.02		35.90	
KRIBHÇO	Hazira	Surret	1.452	1.722	Existing	Gea	105,67	99.63	22.04		121.68	~~~~
IFFCO	Kalol	Mehsana	0.545		Ul	Gea	,.,,,	31.59	6.97		38.56	1992
KRIBHCO	Hazira	Surei	0.726		Approved in	Gas	,	38.81	9.29		48,10	2003
GNFC	Bhe uch	Bharuch	6,742	3 6 6 5 5 5 5 5 5 E	Proposed	Nach		30.81	9.49		48.30	2007
		1996	2003	2007	1	1998	2003	2007	1			
Gas doman	d - Scenario I	382.81	430.91	430.91	l .	10.84	12.20	12.20	1			
					1				1			

Gas demand - Scenario II 382.81 430.91 479.21	19.84
in MMCFD	In MMSCM
Notes	
Specific heat required per tonne of ammonia for existing plants	9.00 million Kca
1kcal equals	4.20 BTU
1 Ton equals	1,000 kg
1 Million equals	1,000,000
1 cubic metre equals	35.31 cubic feet
Heat Requirement for production of Iton of ammonia - old / ext.	37.60 MMBTU

Heat Requirement for production of 1 ton of ammonia - old / ext. Gas required for production of 1 ton of ammonia - old theat Requirement for production of 1 ton of ammonia - new plant. Gas required for production of 1 ton of ammonia - new plant. Heat Requirement for production of 1 ton urea from ammonia Additional gas required for conversion to 1 ton of urea from ammonia Calorific Value of Natural Gas. Calorific Value of Naphtha Calorific Value of Naphtha Calorific Value of Naphtha (Calorific Value of

37,80 MMBTU 35,310 sc! 34,00 MMBTU 31,760.32 mmcsc! 5.00 MMBTU 4,670.83 sc! 9,000 Kcal/scm 10,500 Kcal/Kg 9,600 Kcal/Kg 365 90 MW 36667 mmcld of gas

NATURAL GAS DEMAND – CEMENT (SHORT & MEDIUM TERM)

Company	Location	District	Capacity	Potential Demand for Natural Gas	Potential Demand Year of
			(MMTPA)	(mmcfd)	for Natural Gas Comm. (mmcfd)
	5	1.7	, ,	(Scenario I)	(Scenario II)
Existing Cement Plants				•=	(
Narmada Cement	Magdalla	Surat	0.667	•	
Ambuja Cement	Kodinar	Amrell	1		
Gujarat Ambuja Cement	Kodinar	Amreli	t		
Sujarat Sidhee Cement	Viraval	Junagadh	1.2	!	
farmada Cement	Jafrabad	Amreit	1		
.&T	Plpevey	Pipavav	1.5	1	
evalla Cement	Sovalla	•	0.215		
IMP Cemants	Porbundar	Junagadh	0.198	1	
aurashtra Cements	Ranavav	Junagadh	1.164		
hettinad Cement	Dwarka		0.277	i	
irl Digyljay Coment	S!kka		1		
ub-total State of the state of			9.22	PERMITTING	
Proposed Cement Plants				κ.	
&T	Kovaya	Amrell	1.6		
ujarat Ambuja	 Vadnagar 	Amrell	1	0.00	
anghi Cement	Jadhwa	Kutchch	2.6		
ub-total			5,00		3 2 2 2 2 65
otal (upto 2003)	energy controls and	annen sanch	45.056.50765897 14.22		Deren in der der States der State
Arasim Inds.	Madhapur	Junagadh	8		
aurashtra Cement	Ranavav	Junagadh	1.2		3 15.6912
ub-total			6.20	4	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
otal (upto 2007)	DESTRUCTION OF THE PROPERTY OF	richten der Steiner	#213000000000001.120.42	. Delegation de la company	3
Assumptions					
lant with a capacity of 1 MT consumer	s		mmcfd of Natural Gas		
Capacity Utilisation		100%			•
icenario I - shill from col to gas		50%		i .	
Scenario II - shiil from col lo gas		100%			
MMSCMD #		36.31	MMCFD		•
·	199				
3as Demand (MMSCMD)	0.0	ю 0.93	2.0	7	

GAS DEMAND FROM NEIGHBOURING STATES

	Fuel Type	1998	1999	2000	2001	2002	2003	2004	2006	200
1 Trombay GT(TEC)	Ges	180	180	160	180	180	180	180	160	18
Palghar CC Power Project (BSES)	Gas							600	500	60
3 Bhivpuri Power Project (TEC)	Gas	•						450	450	. 48
TOTAL (MW)		180	160	160	160	180	180	1130	1130	113
Gas demand (MMSCMD)	And the Control of the State of	0.85	0.85	0.85	0.85	0.85	0.65	5.33	5.33	6.
PROJECTS CONSIDERED FOR DEMA						•				
	Fuel Type	1998	1999	2000	2001	2002	2003	2004	2006	200
1 NTPC, Anta	Gas	413	413	413	413	1063	1063	1063	1063	106
2 Chambai Power Ltd.	Naphilia.			100	166	160	168	* 110	106	10
3 APG Dholpur	Naphiha				7.02	702	702	702	702	70
TOTAL (MW)		413	413	413	1281	1931	1931	1931	1931	19:
Gas demand (MMSCMD)	Section of Man	1.95	1.95	1.95	6.05	9.11	9.11	9.1175	9.11	
•										
PROJECTS CONSIDERS OF ORDER	INVESTEE OF VAL	NT TO STREET A	a heath (diff)	Carrier de la	through digital to					
	Fuel Type	1998	1999	2000 .	. 2001	2002	2003	2004	2006	20
									330	
1 Bhandar Power project	Gas				330	330	330	330	330	. 3:
1 Bhander Power project 2 Ralgath Power project	Gas Gas		÷		330	330	330	330	330	3
					330	330				3

ZERTILISER PROJECTS CONSIDERED FOR O Company	Location	Ures Capacity	Ammonia Capacity	Feedstock	Natural Gas Demand (MMSCMD)	
1 RCF 2 RCF	Chembur Thai	0.33 1,782			1.: 2.	2 9 Total and California MMSCM DISCRETS
FERTIMSER PROVECTS CONSIDERED FORD	EMANOVASSESSI Location	ENTANTIA) Urea		Year of	Natural Gas	1
		Capacity (MMTPA)		commision	Demand (MMSCMD)	pa pyram alaksiyat i vinan saannada.
1 Chambal Fertilisers Ltd.	Gadepan	0.74	0.22		1.4	0
2 Shriram Fertiliser & Chemicals Ltd.	Kola	0.33	0.15		0.5	5 or received an engage Court
3 Chambal Fertilisers Ltd.	Gadepan	0.74	0.22	2002	1.4	O Total = 3.4 3.5 MMSCMD
EERTILISER PROJECTS CONSIDERED FOR O Company	EMANO ASSESSI Location	ENTIN ME: Urea Capacity		Feedstock	Natural Gas Demand	1

A6.1 Power

Regression of power consumption with NSDP indicates the following linear relation between the two:

Power =
$$-6680.68 + 2.284 \times (NSDP)$$

 $R^2 = 0.90$

With increasing efficiency in electricity usage, the consumption of electricity is likely to flatten in future. The elasticity of power demand with NSDP is expected to go down gradually from the current level of 1.4 to 0.92 in 2017.

Currently, Transmission & Distribution loss in Gujarat is 22.5%. This is expected to go down by 0.75% per annum in the long term.

Annual load factor is taken to be 65.0%.

Scope for additional hydel capacity is limited as the potential for the state itself is about 450 MW (Source – CEA), which has already been surpassed.

Scope for additional nuclear capacity would be limited by environmental hazards.

Gujarat's current lignite reserves of 780 million MT can support a generation capacity of around 4,600 MW over 30 years. In the long term, a major part of this potential is expected to be realised. Thus, additional 2,000 MW (over and above 1,500 MW of proposed lignite-based projects) of lignite-based capacity has been taken into consideration.

A6.2 Industry

The demand for natural gas consists of two parts - actual and latent. Latent demand arises out of substitution of liquid petroleum products viz., FO, LSHS, naphtha, and LDO. The higher the availability of natural gas, the greater will be the level of substitution.

For FO, LSHS, and naphtha, only the part of consumption having substitution compatibility has been considered.

Naphtha is primarily consumed in fertiliser and petrochemical sectors, where almost total compatibility for substitution exists. Thus, for projecting the demand for naphtha, the current consumption has been converted into natural gas.

A6.3 Passenger cars

Average Mileage Prevailing Price
CNG: 10 km/Kg 12.0 Rs/lt or kg
Petrol: 12 km/Lt 27.0 Rs/lt or kg

- Net benefit per km on substituting petrol with CNG Rs 1.05
- Approximate cost of conversion kit Rs 40,000
- Average distance travelled in a day 100 km
- CNG required per day 10 kg
- Natural gas required per day 12.5 SCM
- Current population of passenger cars (including taxis) in Gujarat 3,34,354
- Average annual growth rate of passenger cars in Gujarat 7.0%
- Expected population of Passenger Cars -

2007	2012	2017
6,14,700	8,62,150	12,09,200

A6.4 Buses

	Average Mileage	Prevailing Price
CNG	4.5 km / kg	12.0 Rs / lt or kg
Diesel	4 km / lt	12.0 Rs / lt or kg

- Net benefit per km on substituting diesel with CNG Rs 0.35
- Approximate cost of conversion kit Rs 1,20,000
- Average distance travelled in a day 150 km
- CNG required per day 33.5 kg

- Natural gas required per day 41.5 SCM
- Current population of buses in Gujarat 31,513
- Average annual growth rate of buses in Gujarat 6.0%
- Expected population of buses –

2007	2012	2017
49,800	63,600	81,150

NATURAL GAS DEMAND – POWER (LONG TERM)

LONG TERM GAS DEMAND . POWER									
Annualized Growth of NSDP NSDP (Re cr)	6,0%	2007-08P	2008-09P 34,093	2010-11P	2011-12P	20113-14P	2014-16P	2018-16P	2016-17P
Equation Energy (MU)= -6580,56 + 2,264 x (MSDP) R-square = 0,9		34,163	34,003	38,306	40,601	45,624	48,341	£1,2€3	64,338
Consumption of Electricity (MUs) -		64,770	71,167	80,811	86,061	97,524	103,778	110,403	117,428
Long Tarm T & D Lasses (Annual Reduction by 0.15%)	22.50%	20.85%	20,70%	20.40%	20.25%	19,95%	19.80%	19.65%	19,60%
Energy Requirement at the Bus Bar		84,371	89,760	101,522	107,913	121,829	129,397	197,403	145,874
Peak Power Demand (MW) (Based on an Annual Load Factor of 65.0%)	•	14,817	16,766	17,830	18,452	21,396	22,725	24,131	25,610
Peak Power Demand (MW) (adjusted for decreasing elasticity)	1 NA 90	14,514	16,354	17,164	16,217	20,173	21,260	22,412	23,403
Energy Surply from Utility (based on short-medium term esimalca)		125,447	124,241	124,241	123,983	123,460	122,824	122,667	122,567
Energy Supply from Captive Units		3,798	3,766	3,788	3,798	3,798	3,798	2,798	3,798
Total Energy Supply		129,265	128,039	128,039	127,781	127,236	126,622	126,366	126,365
Energy surplus/shortage(-)		44,895	36,270	26,517	19,866	6,438	-2,774	-11,038	-19,509
Peak Supply from Utilities(MW) (based on shorl-medium term esimetes)		14,323	14,163	14,183	14,153	14,095	14,021	13,092	13,992
Peak Supply from Captive Units (MW)	·	1,050	1,050	1,050	1,050	1,050	1,050	1,050	1,050
Total Peak Supply (MW)		16,373	15,233	15,233	16,203	16,145	16,071	15,042	16,042
Peak Surplue / Shortage (-) -MW		659	-121	-1,922	-2,811	-5,029	-6,198	-7,370	-4,661
Additional lignite/Coal based capacity (MW)		٥	0	0	600	1,500	2,000	2,000	2,000
Balance capacity to be based on liquid fuel		-859	121	1,922	2,414	3,629	4,198	6,370	6,641
Scenario I: If all the capcities are base	ed on natural gas ,	i							
Additional Gae Demand (MMCMD)		-4.1	0.6	9.2	11.5	18.6	20,0	35.6	\$1,2
Total Gas Demand (MMCMD)		28.0	35.6	49.4	51.7	67.0	60.2	65.8	71.5
Scenario II: If 50% of New capcilles at	re based on natura	d gas ,		٠.	•				
Additional Gas Demand (MMCMD)		-2.0	0.3	4.6	5.7	8.4	10.0	12.6	16.6
Total Gas Demand (MMCMD)	#	30.0	35.3	44.8	46.0	48.6	50,2	53,0	65.9
Sconario III: NSDP growing @ 7 durin	g 9th & 10th pland	sunsequently (96% p.a., all	additional po	wer plant to		i		
Total Gas Demand (MMCMD)		43.2	47.1	55.2	57.0	63.5	66.7	72.3	77.9

NATURAL GAS DEMAND – INDUSTRY (LONG TERM)

LONG TERM GAS DEM AND INDUSTRY: (Sceneria D								
NSDP	2007-08P	2008-09P	2010-119	2011-12P	20113-14P	2014-15P	2015-16P.	2016-17P
Product.: EO	\$2163	34093	38305	40605	45624	48361	51263	54338
HOUGHLEG								
Equation: Ln (FO) =5.440265+0.12165xLn(t)xLn(t)	23 6,63526243	24 6.667923178	26 6.730541715	27 6.760606816	29 6.918491701	30 6.846372858	31 6.87361519	32 6.900241596
Estimated Consumption (800 MT) Non-Convertible Consumption	761.5	786.8	837.6	863,2	014.6	940.6	966.4	992,6
Transport	50.9	50.9	50.9	50.9	50.9	60.0	60.9	50.9
Power Generation	76,1	78.7	83.8	86,3	91.5	94.0	96.6	99.3
Cement/Mining/Engg/Fert	45.9	45.9	45.9	45.9	45,9	45.0	45.0	46.0
Convertible Consumption	539,1	560.2	602,4	624.0	656.0	668.5	710.2	732,0
Equivalent Gas Demand (M.: CMD)	1.6	1.6	1.8	1.8	1.9	2.0	2.1	2.1
E.oduct.: LSHS								
Equation; Ln (LSHS) =4.012619+0.347851xLn(NSDP)		MAL NO	4.7					42.5
Estimated Consumption (000 MT) Non-Convertible Consumption	2046.4	2088.3	2174.8	2219.3	2311.1	2358.5	2406.6	2456.1
Transport	5	5	5	5	5	5	5	5
Power Generation	739,7	739.7	869.9	887,7	924.5	943.4	962,7	982.4
Coment/Mining/Engg/Fert Miscellaneous	71,6	73.1	76.1	77.7	. 80.9	82.5	84.2	66.0
wiscellar MDUS	34.8	35.5	37.0	37.7	39,3	40.1	40.0	41.8
Convertible Consumption	1195.4	1235.1	1186,8	1211.2	1261.5	1287.5	1313.8	1340.0
Equivalent Gas Domand (MMCMD)	3.5	, 3.6	3.5	3,5	3.7	3.8	2.8	3.9
Product - 1,00								
Equation: Ln (LDO) =6.612487-0.123072xLn(NSDP)								
Estimated Consumption (000 MT) Non-Convertible Consumption	207.5	206.0	203.1	201.6	196.8	197.3	195,9	194.5
Yransport Food/Plantation	12.5	12.4	12.2	12.1	11.9	11.8	11.8	11.7
Power Generation	24.9	24.7	24.4	24.2	23.9	23.7	23.5	23.3
Cement/Mining/Engg/Fert Miscellaneoue	20.6	20.6	20.3	20.2	19.9	19.7	19.8	19.5
Convertible Consumption	149.4	148,3	146.2	145.2	143.1	142.1	141,1	140.1
Equivalent Gas Demand (MMCMD)	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4
Total latent demand for natural gas (MMCMD)	5.5	5.7	5.7	5.8	6.1	6.2	6.3	8.5
Naturai Gas								
Demand for Natural Gas (MMCMD)	12.5	12.6	13.4	13.6	14.5	14.9	15.4	15.8
Equation: NQ =6.612497+ 0.000195x(NBDP)								
Total natural gas demand in Industry	18.0	18.5	19.1	19.6	20.6	21.1	21.7	22.3

LUNG-LENGLIAS DEMAND - INDUSTRY: (Seenatio II)	ONG TERM GAS DEMAND . INDUSTRY: /Scenario	"
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Product.: EO	2007-08P	2008-09P	2010-11P	2011-12P	20110-14P	2014-15P	2015-16P	2016-17P
W at a see a constant	23	24	26	27	29	30	31	32
Equation: Ln (FO) =5,440265+0.12165xLn(I)xLn(I)	8.63526243	8.667923178	6.730541715	8.760606816	6.618461701	8.846372858	6.87361519	6.900241596
Estimated Consumption (000 MT) Non-Convertible Consumption	761.5	786.6	837.6	863.2	914.6	940.5	966.4	992.5
Transport	50.9	60.9	50.9	50.9	0.0	50.9	50.9	50.9
Power Generation Cement/Minimp/Engg /Fert	76.1 45.9	78.7	63.8 45.0	86.3	91.5	94.0	96.6	99,3
	46.9	45.9	45.9	45.9	45.9	45.9	45.9	45.0
Convertible Consumption	269.6	290.1	301.3	312.9	333.5	344,3,	356.1	366.0
Equivalent Gas Demand (MMCMD)	0.8	0.8	0.9	0.9	1.0	1.0	1.0	1.1
Product: LSHS								
Equation: I.n (L896) =4.012819+0.347951#Ln(NSDP)		4.4				- 1-2		
a James of the State of the Sta		•						
Estimated Consumption (000 MT) Non-Convertible Consumption	2046,4	2088.3	2174.8	2219.3	2311,1	2358.5	2406.8	2456.1
Yensport	5	5	5	. 5	5	5	5	8
Power Generation Cement/Mining/Engo./Fert	739,7 71,6	739.7 73.1	860.9 76.1	867.7 77.7	924,5 80,9	943.4	982,7	982.4
Miscellaneous	34,6	35.6	37.0	37.7	39.3	82.5 40.1	84.2 40.9	86.0 41.8
Convertible Consumption	507.7	817,5	503.4	606.6	630.6	843.7	457.0	670.5
Equivalent Gas Demand (MMCMD)	1.7	1.8	1.7	1.8	1.8	1.9	1.9	. 2.0
Product - L.DO Equation: Ln (LDO) =6.612487-0.123072xLn(NSDP)								
Estimated Consumption (000 MY) Non-Convertible Consumption	207.5	206.0	203,1	201.6	198.8	197.3	195.9	194.5
Transport	12.5	12.4	12.2	12.1	11.9	11.6	11.8	11.7
Food/Plantation Power Generation								
Cement/Mining/Engg./Fert	24.9 20.8	24.7 20.6	24.4 20.3	24.2 20.2	23.9 19.9	23.7 19.7	23.5 19,6	23.3 19.5
Miscellaneous								
Convertible Consumption	74.7	74.2	75.1	72.6	71.6	71.0	70.5	70.0
Equivalent Gas Demand (MMCMD)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total latent demand for natural gas (MMCMD)	2.8	2.8	2.8	. 2.9	3.0	3.1	3.2	3.2
Natural Gas								
Domand for Natural Gas (MMCMD)	12.5	12.6	13.4	13.8	14.5	14.9	15.4	15.0
Equation: NG m6.612467+ 0.000195x(NGDP)						. 7.0		
•								
Total natural gas demand in industry	15.2	. 15.6	16.2	16.7	17.6	18.0	16.5	19.1



LONG YERM GAS DEMAND INDUSTRY: (Scenario III)

The state of the s								
Product : FQ	2007-08P	2008-09P	2010-11P	2011-12P	20113-14P	2014-15P	2015-16P	2016-17P
Equation: Ln (FO) =5.440265+0.12166xLn(l)xLn(l)	23 6.63523243	24 6.667923178	26 8.730541715	27 6.760606818	29 6.818481701	30 6.846372858	31 6.87361519	32 6,900241596
Estimated Consumption (000 MT) Non-Convertible Consumption	761,5	786.8	637.6	863.2	914,6	940.5	955.4	992.5
Transport	50.9	50.0	50.0	50.9	50.9	50.9	50.9	50.9
Power Generation	76.1	78.7	83.8	86.3	91,5	94.0	96.6	99.3
CamenVMining/Engg_Fed	45.9	45.9	45.9	45.9	45.9	45.9	45,9	45.9
Convertible Consumption	539.1	660.2	602.6	624.0	665.9	608.5	710_2	732.0
Equivalent Gas Demand (MMCMD)	1.6	1.6	i.8	1.8	1.9	2.0	2.1	2.1
Product:LSHS					•			•
Equation: Ln (LSHS) =4.0(2619+0.347961xLn(NBDP)				2.34				
Fortmaled Consumation (000 sers					****			***
Estimated Consumption (000 MT) Non-Convertible Consumption	2114.4	2157.7	2247.0	2203.0	2387.9	2436.8	2486.7	2537.7
Transport	5	5	6	5	5	5	5	5
Power Generation	754.3	754.3	898.8	917.2	955.2	974.7	994.7	1015.1
CemenVMining/Engg/Fert	74.0	75.5	70.6	80,3	83.6	85.3	87.0	88.9
Miscellaneous	35.0	36.7	38,2	39.0	40.6	41.4	42.3	43.1
Convertible Consumption	1245,1	1286.2	1226.4	1251.6	1303.6	1330,4	1367.7	1385.6
Equivalent Gas Demand (MMCMD)	3.6	3.8	3.6	3.7	3.8	3.9	4.0	, 4.0
Product: LDO								
Equation: Ln (LDO) =6.612487-0.123072xLn(NSDP)								
Estimated Consumption (009 MT) Non-Convertible Consumption	205.1	203.7	200.8	199.3	196.5	195.1	193.7	192.3
Transport	12.3	12.2	12.0	12.0	11.8	11.7	11.4	11.6
Food/Plantation			41.					
Power Generation	24.6	24.4	24.1	23.9	23.6	23.4	23.2	23.1
Cement/Mining/Engg /F #1 Miscesseneous	20.5	20.4	20.1	19.0	19.6	19.5	10.4	19.2
Convertible Consumption	147.7	148.6	144,5	143.5	141.5	140.5	139.5	134.5
Equivalent Gas Demand (MMCMD)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Total latent domand for natural gas (MMCMD)	6.7	5.6	5.8	6.9	6.2	6.3	6.6	6.6
Natural Gas			•	· . ·		•		
Demand for Natural Gas (MMCMD)	13.0	13.3	14.0	14.4	15.2	15.6	16.1	16.6
Equation: NG =6.812467+ 0.000195#(NSDP)	•							
Total natural gas demand in industry	18.6	²⁰⁰ 19.1	19.6	20.3	21,4	22.0	22.6	23.2



GAS PRICING

Power : Gas v/s Naphtha
Assumptions : Nephtha expplies from Koyall Relinary
All Rigures in Ru - MT unless specified oth
Basic cost of Naphtha = US\$
Exchange rate Rtr/s

		Service of the last	piral (Equivalent 22	ea System Car
		HAAR CONTEST	Traine 2 77. I	Alecta and State State	harge Liter	Part Control	A PROPERTY	A PHIAT IN	276 m 129
1 Dhuveren TPS	Gas	6149	16% 922.35	20%					THE PARTY OF THE P
2 Dhuvaren TPS	Coat	6140	922,35	1414.27	108	198.24	8789.86		9.00
3 Gaadhinegar 1PS	Coal	6149		1414.27	108	198,24	8789,86		89.00
4 Kutch Lignite TPS	Lignite	8149	922.35	1414.27	106	348.32	B939.94		110.00
. 5 Sikka TPS	Coel	6149	922,35 922,35	1414.27	106	1635,2	10228,62		35.83
6 Ukal TPS	Coef	6149	922,35	1414.27	106	813,12	9404.74		40.00
7 Ulran TPS	Coal	6149		1414.27	106	348.32	8039.94		141.67
3 Utran TPS (New) CCPP	Gas	6149	922.35 922.35	1414.27	108	348.32	8939.94		6.50
0 Wannkbori TPII	Conl	6149	022.35	1414.27	100	346.32	8939.04		. 22.50
10 Dhuvaran Gas Based project	Gas	8140	022,35	1414.27	106	100.24	8769,86		210.00
11 OSEC-GEB, Sikka Exin. Slage II	Coal	8149	922.35	1414.27	108	160.24	8780.66		18.33
12 Utran Gas Imaed PS stage II	Gns	6149		1414.27	106	813.12	9404.74		70.00
13 A&C - Sabermuli & Ahmodebad	Coat	8149	022.35	1414.27	108	348,32	8939.94		22.50
14 AEC - Valva	Ges .	6149	922,35	1414,27	156	198.24	9789.P4		66,67
15. Esser Power - Hazira	Gas	6149	922.35	1414.27	108	198,24	6789.66		18,33
16 GIPCL - Godhra	Gas	6149	922,35	1414.27	108	348.32	6939,94		50.00
17 GTEC - Gandhar, CCPP	Gas		922.35	1414.27	106	198.24	8789.86		24.17
18 AEC - Ahmedebed CCQT		6149	922.35	1414.27	106	348,32	8939.94		109.17
19 GIPCL - Godhra, Vadodara CCPP	Gae	8149	922.35	1414,27	106	198.24	8789.86		25.00
20 GIPCL - Mangrol TPS	Naphtna	8149	922.35	1414.27	108	198.24	8789.88		63.33
21 GIPCL - Mangrol TPS Ext.	Lignite	6149	922.35	1414,27	108	108.24	9789.86		41.87
	Lignite	6149	922.35	1414.27	108	195.24	8789.66		0.00
22 GMDC - Akrimota TPS	Lignite	6149	922.35	1414.27	106	1635.2	10226.82		41.87
23 GPCL - Cnhara, Amrell	Gas	6149	922.35	-1414,27	106	B13.12	9404.74		0.00
24 GPCL - Ghogha TPS	Lignite	5149	922.35	1414.27	106	813.12	9404,74		62.50
25 GPCL - Mundre, Kutch	Nephine	6149	922.35	1414.27	106	1635.2	10226.82		0.00
26 GPCL - Pipavav	Gas	6149	922.35	1414.27	. 108	813.12	9404.74	5.8	102.50
27 GPCL • Pipavav	Cost	6149	922.35	1414.27	108	813,12	9404.74	6.8	166.87
28 GPCL - Valle, Baruch	Lignite	6149	922.35	1414.27	106	348.32	8939.94	5.6	0,00
29 GSECL - Gendilineger TPS Ext S	Coni	6149	922.35	1414.27	106	348.32	6939.94	6.6	35.00
30 GSECL Wanakbori TPS Ext 5	Cosi	6149	9:2.35	1414.27	106	198.24	8789,86	6.5	35.00
31 GSPCL - Hazira	Gas	6149	922.05	1414.27	106	348.32	8939,94	5.6	53,33
32 IOC - Savil	Petroleum	1 6149	922.35	1414.27	108	0	8591.62	5.0	83,33
33 Jamnegar TPS (Reliance Power)	Petroleum	6149	022.35	1414.27	106	813.12	8404.74	5.0	63,33
34 KRIBCHO - Junegedh	Nephtha	8149	922.35	1414.27	106	813,12	9404.74	5.0	33,33
35 NTPC Kawas	Que	6149	922,35	1414.27	106	348.32	8939.94	6.6	107,33
36 NTPC Gandhar	Gap	8149	922.35	1414,27	106	348.32	6939.94	5.6	108.00
المنها المستوريدين والمستوريدين						To	لمك	MMCFD	2075 67

								717	\$1907 J.
		the that w					Market And	MARKET STATE	Por ABION
Con			18%	3.5G	0%				NAME OF TAXABLE PARTY.
Lignit			2.50	0.00	26%				
1 Dhuvaren TPS	Gas	819	147.42	3.50	0.00	746.50	1716.82	4.90	9.00
2 Dhuvaren TPS	Coal	819	147.42	3,60	0.00	746.90	1718,82	4.90	89.00
3 Gandhinagar TPS	Cost	819	147.42	3,50	0.00	746.80	1716.82	4.80	110.00
4 Kulch Lighte TPS	Lionite	610	2.50	0.00	127.50	0.00	640.00	2.70	35.83
5 Sikka TPS	Cost	819	147,42	0,00	0,00	746.00	1713.32	4,90	40.00
8 Ukal TPS	Coal	819	147.42	0.00	0.00	746.90	1713.32	JI.00	141.67
7 Ulran TPS	Cost	819	147.42	0.00	0.00	746.90	1713.32	4.00	6.50
8 Ulren TPS (New) CCPP	Gat	819	147.42	0.00	0,00	746.90	1713.32	4.00	22.50
9 Wanakbori TPS	Coal	819	147.42	0.00	0.00	746.90	1713.32	4.90	210.00
10 Dhuvaran Gas Based project	Ges	819	147.42	0.00	0.00	748.90	1713,32	4,00	18.33
11 GSEC-GEB, Sikka Extn. Stage II	Coal	819	147.42	0.00	0.00	746.90	1713.32	4.90	70.00
12 Utran Gas basso PS stage il	Gas	. 819	147.42	0.00	0.00	746.90	1713,32	4,90	22.50
13 AEC - Sebarmali & Ahmedabad	Coal	819	147.42	0.00	0.00	746.90	1713,32	4.90	86.87
14 AEC - Valva	Ges	619	147.42	0.00	0.00	740.80	1713,32	4,90	18.33
15 Essar Power - Hazira	Gas	819	147.42	0.00	0.00	746.90	1713.32	4.90	50.00
16 GIPCL - Godhra	Gas	619	147.42	0.00	0.00	746.90	1713.32	4.90	24.17
17 GTEC - Gendher, CCPP	Gae	619	147.42	0.00	0.00	746.90	1713,92	4.90	109.17
18 AEC - Ahmedebed CCGT	Gns	819	147.42	0.00	0.00	746.90	1713.32	4.90	25.00
19 GIPCL - Godhra, Vadodara CCPP	Naphthe	819	147.42	0.00	0,00	746.90	1713,32	4.90	53.33
20 GIPCL - Mangrai TPS	Lignite	510	2.50	0.00	127.50	0.00	840.00	2.70	41.67
21 GIPCL - Mengrol TPS Ext.	Lignite	510	2.50	0.00	127.50	0.00	640.00	2.70	0.00
22 GMDC - Akrimote TPS	Lignite	510	2.50	0.00	127.50	0.00	640.00	2.70	, 41.67
23 GPCL - Chhere, Amreli	Gau	819	147.42	0,00	0.00	746.90	1713.32	4.90	0.00
24 GPCL - Ghooks TPS	Lignite	610-	2.50	0.00	127.50	0.00	640.00	2.70	62.50
25 GPCL - Mundra, Kutch	Naphtha	819	147.42	0.00	0.00	746.90	1713,32	4.90	0.00
26 GPCL - Ploavay	Ges	819	147.42	0.00	0.00	746.90	1713.32	4.90	102.50
27 GPCL - Plosvav	Coal	819	147.42	0.00	0.00	746.90	1713.32	4.90	166.67
28 GPCL - Valle, Beruch	Lionite	510	2.50	0.00	127.50	0.00	640.00	2.70	0.00
29 GSECL - Gondhinager TPS Ext 6	Cual	619	147.42	0.00	0.00	740.00	1713.32	4.90	35.00
30 GSECL Wangkbort TPS Ext 6	Coal	819	147.42	0.00	0.00	746.90	1713.52	4.90	35.00
31 GSPCL • Hazira	Gas	819	147.42	0.00	0.00	746.90	1713.32	4.90	50,33
32 IOC - Savit	Petroleum	819	147.42	0.00	0.00	746.90	1713.32	4.90	83.33
33 Jamnagar TPS (Relience Power)	Petroleum	810	147.42	0.00	0.00	746.90	1713.32	4.90	63.33
34 KRIBCHO - Junacedh	Naphtha	619	147.42	0.00	0.00	746.90	1713.52	4.90	33.33
35 NTPC Kawas	Gas	819	147.42	0.00	G.00	746.90	1713.32	₹4.90	107.33
			147.42	0.00	0.00	746.90	1713.32	4.90	108.00

MMCFD MMSCMD

2075,67 58.78



	OMPETITI	VENESS (OF FUEL	s in indi	A FOR I	OWE	SECTO	Ŗ			
Makes particularly and the second	 I									and of the Child	
Cost of Imported gas per MMBTU	•						\$5.30	\$5,60	\$6.30	\$6.50	\$7.10
Type of fuel	Dom Coal	Imp Cost	FO	D. NapMha	I. Nachiba	D Gas	I. Gae	i. Gen	I. Ges	I Ges	I. Gas
Etticlency	33%	33%	38%	45%	45%	45%	45%	45%	45%	45%	45%
Heat Rate (KCal/KWh)	2606	2608	2263	1911	1911	1911	1911	1911	1011	1911	1911
CV (Kcal/Unii) (Kg or M²)	4200	8400	9600	10500	10500		10000	10000	10000	10000	10000
Consum, Unit/Kwh (Kp or M³)	0.620	0.407	0.236	0.182	0.102		0.191	0.101	0.191	0.191	0.191
Fuel coet/unit (pales)		210	450	659	750		905	0.101	1075	1110	1212
Fuel cost/KWh (palse)	167 97	210	106	156	137	50	173	189	206	212	232
Auxi Power Consumption	9%	8%	- 5%	. 3%	3%	2%	2%	2%	2%	2%	2%
Fuel cost/Net KWh (palse)	107		112	161	141	70	176	193	210	216	
ESMINARIZMANA NOTE CASTA AND LANGUE OF THE CONTROL OF	NAZZA ZANI		Seattle State	Section Vell					•		
Lond Factor KWh in 1 year	85%	85%	85% 7446	85% 744d							
	7446	7440		7440							
Life of the plant (years)	30	25	25								
Total KWh in life	223380	186150	186150	188150							
Capita cost/KW (Rs.)	45000	40000	35000	30000							
Dobi (Re./KW)	31500	28030	24500	21000							
Equity (Re /KW)	13500	12000	10500	9000							
Annual cost of dobt (Rs.)	5403.65	4855.86	4249.87	3641.80						and the	
Annual cost of equity (Re.)	2860.00	2560.00	2240.00								
Total Annual cost of capital (Fig.)	6283,65	7415.86	6488.87	5561.89							
Capital cost/KWh (palas)		100	87	76							
THE PROPERTY OF THE PROPERTY O		Company St.									
Depreciation (as % of capital exp.)	3.33%	4.00%	4.00%	4.00%							
O&M Expenses (as % of capital exp.)	2.50%	2.50%	2.50%	2.50%							
O&M and Oep Exp. (as % of capital exp)	6.83%	8.50%	6.50%	6.50%							
O&M Exponses (Rs /annum/KW)	2624	2600	2275								
Total OaM Exp./KWh (palse)	35	35	31	26							
						,	\$5.30			17 15 77	
Cost of imported gas per MMBTU	Dom Coal	imo Cosi	FO	D. Nanhiha	s. Nachtha	D. Gas		. \$5.80. L Gan	L,: 50.30	" \$6,50 " L Gan	67.103 L Gan
PROBLEM AND HER PROPERTY OF THE PROPERTY OF THE	Dom Coal	imp Coal	FO 112	D. Naphiha			I. Ges 176	I. Gen 183	L,1 . 50.30.1	\$6.5Q	I, Gae
Fuel cost (pelse/KWh)	107	91	112	161	141	70	l. Ges 176	L Gas 193	l. Gas 210	I, Gas 216	I, Gae 238
Fuel cost (palsa/KWh) Capital cost (palsa/KWh)	107 111	91 111	112 100	161 67	141 87	70 75	I. Gas 176 76	L Gas	L,1 . 50.30.1	L Gas	I, Gae
Fuel cost (palea/KWh) Coptiel cost (palea/KWh) OSM cost (palea/KWh)	107 111 35	91 111 35	112 100 35	161 67 31	141 87 31	70 75 25	l. Ges 176 75 20	L Gas 193 76 26	I. Gas 210 75 26	t, Gas 216 75	I, Gae 236 75 25
Fuel cost (palsa/KWh) Capital cost (palsa/KWh)	107 111	91 111	112 100	161 67	141 87	70 75	I. Gas 176 76	L Gas 193 76	l. Gas 210 75	1, Gas 216 75 26	I, Gae 236 75 25
Fuel cost (pelsar/(Wh) Capital root (pelsar/(Wh)) OSM cost (pelsar/(Wh)) Total cost (pelsar/(Wh))	107 111 35	91 111 35	112 100 35	161 67 31	141 87 31	70 75 25	l. Ges 176 75 20	L Gas 193 76 26	1. Gas 210 75 26	t, Gas 216 75	I, Gae 236 75 25
Fuel cost (palsar(Wh) Capital cost (palsar(Wh) CSM cost (palsar(Wh) Total cost (palsar(Wh) CSM cost (palsar(Wh) CSM cost (palsar(Wh) CSM cost (palsar(Wh)	107 111 35 254	91 111 35 237	112 100 35	161 67 31 276	141 87 31 268	70 75 25 171	I. Gas 176 76 26 277	I. Gat 193 75 26 294	I. Gas 210 75 26	1. Gan 216 75 26	I, Gae 236 76 25 25
Fuel cost (pelsan(Wh) Cepital cost (pelsan(Wh) Cepital cost (pelsan(Wh) Cost (pelsan(Wh) Total cost (pelsan(Wh) Long to describe the cost (pelsan(Wh) Cost of Imported gas per MMSTU Assumptions: Fuel Cost	107 111 38 254 Dom Coal	91 111 35 237	112 100 35 246	161 67 31	141 87 31 268	70 75 25 171	I. Gae 176 76 26 277 \$8,30	I. Gae 193 76 26 26 294	I. Gas 210 75 26 311	t, Gas 216 75 26 317	1, Gae 236 76 25 26 387 387 87.10
Fuel cost (pelsan(Wh)) Capital cost (pelsan(Wh)) CSM cost (pelsan(Wh)) Total cost (pelsan(Wh)) Cost of Imported gas per MMBTU Assumptions: Fuel Cost Thormal Efficiency (%)	107 111 35 254 Dom Coal 33%	91 111 35 237 Imp Coal 33%	112 100 35 246 FO 38%	161 67 31 276 D. Naphiha 45%	141 87 31 268 I. Naphtha 45%	70 75 25 171 D. Gae 45%	I. Gas 176 75 20 277 \$5,30 I. Gas 45%	L Gae 193 75 26 20 294 \$5,80 1, Gas 45%	I. Gas 210 75 26 311 G \$8,30 I. Gas 45%	\$6,50 L. Gan 216 75 26 317 \$1,50 j. Gas 46%	1, Gae 230 76 25 337, 37,10 1, Gae 45%
Fuel cost (palsar(Wh)) Capital cost (palsar(Wh)) CSM cost (palsar(Wh)) Total cost (palsar(Wh)) Cost of Imported gas per MMSTU Assumptions: Fuel Cost Therms Efficiency (%) CV (KCstr(x)) (for gas in KCstrM*)	107 111 35 284 Dom Coel 33%	91 111 35 237 Imp Coal 33%	112 100 35 246 FO 38%	161 87 31 276 D. Naphiha 45%	141 87 31 268 I. Naphtha 45%	70 75 25 171 D. Gee 45%	L Gas 176 75 20 277 \$5.30 L Gas 45%	L Gae 193 75 26 294 \$5.80 I, Gas 45%	I. Gas 210 75 26 311 C \$8,30 I. Gas 45%	\$6.50 L. Gan 216 75 26 317 \$1.7 \$6.50 L. Gan 45%	1, Gae 230 76 25 25 337, 87,10 1, Gae 45%
Fuel cost (pelsar/KWh) Capital cost (pelsar/KWh) CSM cost (pelsar/KWh) Total cost (pelsar/KWh) Total cost (pelsar/KWh) Cost of Imported gas per MMSTU Assumptions: Fuel Cost Thormal Etitolency (%) CV (KCal/Kg) (for gas in KCal/M) Fuel cost (pelsar/Kg) (for gas in pelsar/M) - at fectory gate	107 111 35 254 Dom Coal 33%	91 111 35 237 Imp Coal 33%	112 100 35 246 FO 38%	161 87 31 276 D. Naphiha 45%	141 87 31 268 I. Naphtha 45%	70 75 25 171 D. Gee 45%	I. Gas 176 75 20 277 \$5.30 I. Gas 45% 100005	L Gae 193 75 26 294 \$5,80 F. Gae 45%	210 75 22 25 351 C \$8,30 I. Gane 45%	E. Gan 216 75 26 317 317 \$1.50 E. Gan 45%	1, Gae 236 76 25 25 347 47.10 1, Gae 45%
Fuel cost (pelsar(Wh)) CAM cost (pelsar(Wh)) CAM cost (pelsar(Wh)) Total cost (pelsar(Wh)) Cost of Imported gas per MMBTU Assumptions: Fuel Cost Thormat Elitidency (%) CV (KCal/Kg) (for gas in KCal/K²) Fuel cost (pelsar(Kg) (for gas in pelsar/M²) - at fectory gate Aux, power consumption	107 111 35 284 Dom Coel 33%	91 111 35 237 Imp Coal 33%	112 100 35 246 FO 38%	161 87 31 276 D. Naphiha 45%	141 87 31 268 I. Naphtha 45%	70 75 25 171 D. Gee 45%	L Gas 176 75 20 277 \$5.30 L Gas 45%	L Gae 193 75 26 294 \$5.80 I, Gas 45%	210 75 22 25 351 C \$8,30 I. Gane 45%	\$6.50 L. Gan 216 75 26 317 \$1.7 \$6.50 L. Gan 45%	1, Gae 230 76 25 25 337, 87,10 1, Gae 45%
Fuel cost (pelsar(cWh) Cepital cost (pelsar(cWh) Cepital cost (pelsar(cWh) Cest (pelsar(cWh) Total cost (pelsar(cWh) Total cost (pelsar(cWh) Lepital cost (pelsar(cWh) Lepital cost (pelsar(cWh) Cost of Imported gas per MMSTU Assumptions: Fuel Cost Thermal Efficiency (%) CV (KCalf(x)) (for gas in KCalf(x) Fuel cost (pelsar(c)) (for gas in pelsar(M) - at fectory gate Aux. power consumption Aux. power consumption Aux. conversion	107 111 35 284 Dom Coel 33%	91 111 35 237 Imp Coal 33%	112 100 35 246 FO 38%	161 87 31 276 D. Naphiha 45%	141 87 31 268 I. Naphtha 45%	70 75 25 171 D. Gee 45%	I. Gas 176 75 20 277 \$5.30 I. Gas 45% 100005	L Gae 193 75 26 294 \$5,80 F. Gae 45%	210 75 22 25 351 C \$8,30 I. Gane 45%	E. Gan 216 75 26 317 317 \$1.50 E. Gan 45%	1, Gae 236 76 25 25 347 47.10 1, Gae 45%
Fuel cost (pelsar(Wh)) CAM cost (pelsar(Wh)) CAM cost (pelsar(Wh)) Total cost (pelsar(Wh)) Cost of Imported gas per MMBTU Assumptions: Fuel Cost Thormat Elitidency (%) CV (KCal/Kg) (for gas in KCal/K²) Fuel cost (pelsar(Kg) (for gas in pelsar/M²) - at fectory gate Aux, power consumption	107 111 35 284 Dom Coel 33%	91 111 35 237 Imp Coal 33%	112 100 35 246 FO 38%	161 87 31 276 D. Naphiha 45%	141 87 31 268 I. Naphtha 45%	70 75 25 171 D. Gee 45%	I. Gas 176 75 20 277 \$5.30 I. Gas 45% 100005	L Gae 193 75 26 294 \$5,80 F. Gae 45%	210 75 22 25 351 C \$8,30 I. Gane 45%	E. Gan 216 75 26 317 317 \$1.50 E. Gan 45%	1, Gae 236 76 25 25 347 47.10 1, Gae 45%
Fuel cost (pelsar(Wh)) CAM cost (pelsar(Wh)) CAM cost (pelsar(Wh)) Total cost (pelsar(Wh)) Cost of Imported gas per MARGTU Assumptions: Fuel Cost Thermal Efficiency (%) CV (KCalKQ) (for gas in KCal/K*) Fuel cost (pelsar(M) (for gas in pelsar/M*) - at fectory gate Aux, power consumption Ru's conversion GTU / KCAL	107 111 35 284 Dom Coel 33%	91 111 35 237 Imp Coal 33%	112 100 35 246 FO 38%	161 87 31 276 D. Naphiha 45%	141 87 31 268 I. Naphtha 45%	70 75 25 171 D. Gee 45%	I. Gas 176 75 20 277 \$5.30 I. Gas 45% 100005	L Gae 193 75 26 294 \$5,80 F. Gae 45%	210 75 22 25 351 C \$8,30 I. Gane 45%	E. Gan 216 75 26 317 317 \$1.50 E. Gan 45%	1, Gae 236 76 25 25 347 47.10 1, Gae 45%
Fuel cost (pelsar/KWh) Catiot oost (pelsar/KWh) CSM cost (pelsar/KWh) Total cost (pelsar/KWh) Total cost (pelsar/KWh) Limited (pelsar/KWh) Limited (pelsar/KWh) Limited (pelsar/KWh) Limited (pelsar/KWh) Limited (pelsar/KWh) Cost of Imported gas per MMSTU Assumptions: Fuel Cost Thermal Efficiency (%) CV (KCal/Kp) (for gas in KCal/M) Fuel cost (pelsar/Kp) (for gas in pelsar/M) - at feotory gate Aux, power consumption Ra/S convention OTU / KCAL	107 111 35 284 Dom Coel 33%	91 111 35 237 Imp Coal 33%	112 100 35 246 FO 38%	161 67 31 276 D. Naphitha 45%	141 87 31 268 I. Naphtha 45%	70 75 25 171 D. Gee 45%	I. Gas 176 75 20 277 \$5.30 I. Gas 45% 100005	L Gae 193 75 26 294 \$5,80 F. Gae 45%	210 75 22 25 351 C \$8,30 I. Gane 45%	E. Gan 216 75 26 317 317 \$1.50 E. Gan 45%	1, Gae 236 76 25 25 347 47.10 1, Gae 45%
Fuel cost (pelsar(Wh)) CAM cost (pelsar(Wh)) CAM cost (pelsar(Wh)) Total cost (pelsar(Wh)) Cost of Imported gas per MARGTU Assumptions: Fuel Cost Thermal Efficiency (%) CV (KCalKQ) (for gas in KCal/K*) Fuel cost (pelsar(M) (for gas in pelsar/M*) - at fectory gate Aux, power consumption Ru's conversion GTU / KCAL	107 111 35 284 Dom Coel 33%	91 111 35 237 Imp Coal 33%	112 100 35 246 FO 38%	161 67 31 276 D. Naphitha 45%	141 87 31 268 I. Naphtha 45%	70 75 25 171 D. Gee 45%	I. Gas 176 75 20 277 \$5.30 I. Gas 45% 100005	L Gae 193 75 26 294 \$5,80 F. Gae 45%	210 75 22 25 351 C \$8,30 I. Gane 45%	E. Gan 216 75 26 317 317 \$1.50 E. Gan 45%	1, Gae 236 76 25 25 347 47.10 1, Gae 45%
Fuel cost (pelsen/CWh) Cepital cost (pelsen/CWh) Cepital cost (pelsen/CWh) Cost oot (pelsen/CWh) Total cost (pelsen/CWh) Total cost (pelsen/CWh) Lepital cost (pelsen/CWh) Cost of Imported gas per MMSTU Assumptions: Fuel Cost Thermal Efficiency (%) CV (KCal/Kg) (for gas in KCal/K²) Fuel cost (pelsen/Kg) (for gas in pelsen/M²) - at feotory gate Aux, power consumption Ray's conversion GTU / KCAL Load Factor	107 111 35 284 Dom Coel 33%	91 111 35 237 Imp Coal 33%	112 100 35 246 FO 38%	161 67 31 276 D. Naphitha 45%	141 87 31 268 I. Naphtha 45%	70 75 25 171 D. Gee 45%	I. Gas 176 75 20 277 \$5.30 I. Gas 45% 100005	L Gae 193 75 26 294 \$5,80 F. Gae 45%	210 75 22 25 351 C \$8,30 I. Gane 45%	E. Gan 216 75 26 317 317 \$1.50 E. Gan 45%	1, Gae 236 76 25 25 347 47.10 1, Gae 45%
Fuel cost (palsa/KWh) Capital cost (palsa/KWh) Capital cost (palsa/KWh) Total cost (palsa/KWh) Total cost (palsa/KWh) Land Fuel Capital Capital Total cost (palsa/KWh) Land Fuel Capital Thermal Efficiency (%) CV (KCal/Kg) (for pas in KCal/M) Fuel cost (palsa/Kg) (for pas in palsa/M²) - at feotory gate Aux, power consumption AuX: conversion OTU / KCAL Load Factor Life of the plant (years) Capita cost/KW (Rs.)	107 111 35 284 Dom Coel 33%	91 111 35 237 Imp Coal 33%	112 100 35 246 FO 38%	161 67 31 276 D. Naphitha 45%	141 87 31 268 I. Naphtha 45%	70 75 25 171 D. Gee 45%	I. Gas 176 75 20 277 \$5.30 I. Gas 45% 100005	L Gae 193 75 26 294 \$5,80 F. Gae 45%	210 75 22 25 351 C \$8,30 I. Gane 45%	E. Gan 216 75 26 317 317 \$1.50 E. Gan 45%	1, Gae 236 76 25 25 347 47.10 1, Gae 45%
Fuel cost (pelsar(Wh)) Capital rost (pelsar(Wh)) CSM cost (pelsar(Wh)) Total cost (pelsar(Wh)) Total cost (pelsar(Wh)) Cost of Imported gas per MMBTU Assumptions: Fuel Cost Thermal Etticlency (%) CV (RCalr(p)) (for gas in RCalr(P) Fuel cost (pelsar(Kg)) (for gas in pelsar(Mg)) - at fectory gate Aux, power consumption Ru's conversion GTU / KCAL Little Action Little of the plant (years) Capita cost/RW (Rs.) Elfoctive tax rate	107 111 35 284 Dom Coel 33%	91 111 35 237 Imp Coal 33%	112 100 35 246 FO 38%	161 67 31 276 D. Naphitha 45%	141 87 31 268 I. Naphtha 45%	70 75 25 171 D. Gee 45%	I. Gas 176 75 20 277 \$5.30 I. Gas 45% 100005	L Gae 193 75 26 294 \$5,80 F. Gae 45%	210 75 22 25 351 C \$8,30 I. Gane 45%	E. Gan 216 75 26 317 317 \$1.50 E. Gan 45%	1, Gae 236 76 25 25 347 47.10 1, Gae 45%
Fuel cost (palsa/KWh) Capital cost (palsa/KWh) Capital cost (palsa/KWh) Total cost (palsa/KWh) Total cost (palsa/KWh) Land Fuel Capital Capital Total cost (palsa/KWh) Land Fuel Capital Thermal Efficiency (%) CV (KCal/Kg) (for pas in KCal/M) Fuel cost (palsa/Kg) (for pas in palsa/M²) - at feotory gate Aux, power consumption AuX: conversion OTU / KCAL Load Factor Life of the plant (years) Capita cost/KW (Rs.)	107 111 35 284 Dom Coel 33%	91 111 35 237 Imp Coal 33%	112 100 35 246 FO 38%	161 67 31 276 D. Naphitha 45%	141 87 31 268 I. Naphtha 45%	70 75 25 171 D. Gee 45%	I. Gas 176 75 20 277 \$5.30 I. Gas 45% 100005	L Gae 193 75 26 294 \$5,80 F. Gae 45%	210 75 22 25 351 C \$8,30 I. Gane 45%	E. Gan 216 75 26 317 317 \$1.50 E. Gan 45%	1, Gae 236 76 25 25 347 47.10 1, Gae 45%
Fuel cost (pelsar(Wh)) Capital rost (pelsar(Wh)) CSM cost (pelsar(Wh)) Total cost (pelsar(Wh)) Total cost (pelsar(Wh)) Cost of Imported gas per MMBTU Assumptions: Fuel Cost Thermal Etticlency (%) CV (RCalr(p)) (for gas in RCalr(P) Fuel cost (pelsar(Kg)) (for gas in pelsar(Mg)) - at fectory gate Aux, power consumption Ru's conversion GTU / KCAL Little Action Little of the plant (years) Capita cost/RW (Rs.) Elfoctive tax rate	107 111 35 284 Dom Coel 33%	91 111 35 237 Imp Coal 33%	112 100 35 246 FO 38%	161 67 31 276 D. Naphitha 45%	141 87 31 268 I. Naphtha 45%	70 75 25 171 D. Gee 45%	I. Gas 176 75 20 277 \$5.30 I. Gas 45% 100005	L Gae 193 75 26 294 \$5,80 F. Gae 45%	210 75 22 25 351 C \$8,30 I. Gane 45%	E. Gan 216 75 26 317 317 \$1.50 E. Gan 45%	1, Gae 236 76 25 25 347 47.10 1, Gae 45%
Fuel cost (pelsar(cWh) Cepital cost (pelsar(cWh) Cepital cost (pelsar(cWh) Cest (pelsar(cWh) Total cost (pelsar(cWh) Total cost (pelsar(cWh) Loss (pelsar(cWh) Cost of Imported gas per MMSTU Assumptions: Fuel Cost Thermal Efficiency (%) CV (KCal/Koj) (for gas in KCal/Kr) Fuel cost (pelsar/Kg) (for gas in Delsar/Kr) - at fectory gate Aux, power consumption Aux conversation GTU / KCAL Load Factor Life of the plant (years) Capita cost/Kv (Rs.) Efficilive tax rate debt propolitor in total capital Rate of increast (pre fax) Ratum on equity (post tax)	107 111 35 284 Dom Coel 33%	91 111 35 237 Imp Coal 33%	112 100 35 246 FO 38%	161 67 31 276 D. Naphitha 45%	141 87 31 268 I. Naphtha 45%	70 75 25 171 D. Gee 45%	I. Gas 176 75 20 277 \$5.30 I. Gas 45% 100005	L Gae 193 75 26 294 \$5,80 F. Gae 45%	210 75 22 25 351 C \$8,30 I. Gane 45%	E. Gan 216 75 26 317 317 \$1.50 E. Gan 45%	1, Gae 236 76 25 25 347 47.10 1, Gae 45%
Fuel cost (pels af(Wh)) Capital cost (pels af(Wh)) CSM cost (pels af(Wh)) Total cost (pels af(Wh)) Total cost (pels af(Wh)) Cost of Imported gas per MMABTU Assumptions: Fuel Cost Thermal Efficiency (%) CV (KCalK(p) (for gas in KCalM ³) Fuel cost (pels af(M) (for gas in pelse/M ³) - at feotory gate Aux, power consumption Ru's conversion BTU / KCAL Load Factor Ule of the plant (years) Capita cost/KW (Rs.) Elfoctive tax rate debt propolitor in total capital Rate of increat (pre lax)	107 111 35 284 Dom Coel 33%	91 111 35 237 Imp Coal 33%	112 100 35 246 FO 38%	161 67 31 276 D. Naphitha 45%	141 87 31 268 I. Naphtha 45%	70 75 25 171 D. Gee 45%	I. Gas 176 75 20 277 \$5.30 I. Gas 45% 100005	L Gae 193 75 26 294 \$5,80 F. Gae 45%	210 75 22 25 351 C \$8,30 I. Gane 45%	E. Gan 216 75 26 317 317 \$1.50 E. Gan 45%	1, Gae 236 76 25 25 347 47.10 1, Gae 45%

