Project 0389: Waste heat recovery project based on technology up-gradation at Apollo Tyres, Vadodara, India

Review No 1

Reason for request	Reply
1. The investment test has not been done properly by the developer and not been appraised properly by validator.	In absence of clear guidance of conducting investment analysis for small scale project activity, we have conducted the investment analysis in an adequate manner, as per the acceptable business practices.
The validator has not recognized that the alternative to the project "power and steam generation with boiler and steam turbine using Indian coal as fuel" is unrealistic due to the shortage of domestic coal which is thus not delivered to private industries but only to power plant and state industries. So the only alternative "Generation with boiler and steam turbine using petcoke and imported coal as a fuel" is realistic.	The investment analysis conducted to demonstrate the fact that there is at-least one alternative to the project activity which is economically attractive but more GHG emissive. Therefore five possible alternatives to the project were studied. Some of them, being unrealistic were dropped from further analysis, that is, fist option 'Electricity from State Electricity Grid and Steam generation from boiler running on NG' considering the reliability / availability of electricity from Grid. Many publications / references including the one listed in the PDD (central electricity authority, www.cea.nic.in) would endorse the fact that Gujarat state grid is a deficit grid. Remaining alternatives were analysed using IRR as indicator and the calculations (excel sheet soft copy) along with assumptions were submitted to the validator along with the PDD. We are also aware that validator has discussed the same and understood convincingly the how the IRR numbers have been arrived at. These are presented in the table of page 13 of the PDD submitted (and reviewed by RIT). As such the alternative available to us was Coal based "Power plant" to which RIT it seems agree that coal would have diverted in any case. We realise possibility of deficit in Indian coal availability, however, our observation is, the data from reliable references such as union budget and economic survey of Government of India suggest that the coal requirement used to arrive at the deficit include coal requirement for captive power consumption as well. (Annex 1 reference: www.indiabudget.nic.in, page 177, infrastructure) Therefore, as project proponent in-spite of general deficit of

	Indian coal we have both the options available *i.e.* Indian coal from supplier and imported coal, petcoke from supplier even before starting of project activity. To endorse this after request for review; project proponent has asked for the quotation for coal from suppliers and they endorse the availability of coal and given the current prevailing prices of the same. (Annex 2, Letter from Janardan metal industries and quotation from Shah coal private limited). Therefore, we would like to emphasise that general coal deficit as published by Government doesn't mean that Indian coal is not available to the industry for power plant. Infact many such reports would project coal use as the cheaper option. To provide realistic example, two coal based captive power plants are proposed in state of Gujarat (Annex 3: www.infraline.com, captive power projects: Planned investment): 1. Gujarat Ambuja cement 50 MW 2. Indian rayon 16.5 MW Based on above mentioned facts it is clear that the option 4 *i.e.* "power and steam generation with boiler and steam turbine using Indian coal as fuel" is a feasible alternative to be consider for power and steam generation.
The PDD does not give the assumption about the imported coal used to derive IRR for the alternative. Moreover, the PDD does not include the enclosures mentioned in page 13 so it is impossible for me to check IRR calculations.	This alternative was evaluated for imported coal and pet coke as in absence of Indian coal these two fuels are available at comparable rates (INR 3000 per tonne for petcoke as well as imported coal). To back-up this price we have quotation from the supplier (Annex 2 C, Quotation from Coal supplier). This assumption of price is used in the IRR calculation and also mentioned in the PDD. All the excel spread sheets for IRR calculation has been submitted to Validator along with PDD and the same has been enclosed for RIT's reference. The project proponent has prepared all the excel sheets for the IRR analysis and submitted to DOE. The DOE has validated all the enclosures. The enclosures were not included in PDD and attached separately. The same enclosures are again attached along with this response ***(Please see enclosure 1 to 7)***.
The natural gas price assumption for the project case is unrealistically high. According to the Indian ministry of oil, the price per m3 was 2.85 Rs in 2004 (see petroleum.nic.in/petstat.pdf, table 30). Even if pipeline costs of 1.1 Rs/m3 are taken into account, the	The natural gas that project proponent will use is not crude natural gas but Regasified LNG. The project proponent signed the contract with GAIL (India) Limited (Annex 4: contact with GAIL) for the R LNG. The cost break-up with reference is shown below: **Calculation of cost of R LNG**

price is still just half of the price quoted in the PDD.

I strongly suspect the project case to become the most attractive if realistic natural gas price is used.

Particular	**Value**	**Unit**	**Remark**
Foreign currency component	135	INR/MM BTU	Based on exchange rate of US dollars
Indian rupees	42	INR/MM BTU	
	177	INR/MM BTU	
1 MM BTU	252000	Kcal	Conversion factor
Calorific value of gas (GCV)	9350	Kcal/SM3	GAIL Invoice (Annex 5)
Quantity of gas in 1 MMBTU	26.95187	SM3	
Cost per SM3	6.567262	INR/SM3	
Transaction charges (Dollar to rupees) @ 10% of foreign component	0.500893	INR/SM3	GAIL Invoice
Transportation charges	0.531688	INR/SM3	GAIL Invoice
Total charges	**7.599843**	INR/SM3	
State gov. charges (Currently vat @ 12.5%)	0.94998	INR/SM3	GAIL Invoice
Cost of RLNG	**8.549824**	INR/SM3	
Cost used in calculation of IRR for CDM	**8.2**	INR/SM3	

Based on above table which is based on the signed contract with GAIL (R LNG supplier) it is clear that the price of RLNG is 8.55 INR/sm3 while in calculation 8.2 INR/SM3 is used.

Moreover it can be seen from other available documents that the cost of power generation from coal is much lower that that is from gas in Gujarat (Annex 6, captive power plants: case study of

	Gujarat, India, http://www.electricityindia.org/papers/captive_powerplants1.pdf). At the same time this is fact that Apollo Tyres has invested additional money for environment friendly project.
The sensitivity analysis is designed in a way (assumption about the price changes) that always make the project case less attractive than the alternative. The EB should require project developers using an investment analysis to state all the assumptions and to publish the excel sheets as annex to the PDD. In case of confidentiality issues, the sheets should at least be made available to the DOE and the RIT members to check the calculations.	The excel sheets for IRR and sensitivity calculations has been submitted to validator. All the variables are assumptions have been submitted to validator as attachment. The price of CER is based on discussions that we had with international representatives, consultants during CDM related seminars.
2. The PDD does not contain any documentation on the sources of the electricity grid emission factor. It is just mentioned in table A.4 of the PDD as 760g CO2/kWh. While the validator states of page A-10 that supporting information was provided and therefore closed NIR 4, the supporting information has not been integrated in the PDD.	The excel sheet for the electricity grid is submitted to the validators (DOE) and it is reflected from the validation report page A-10. The same is attached here for RIT's reference. **Please see enclosure 8**
3. The validation findings overview (p.3) states that the investment barrier is used for additionality, then mentions a technology barrier but only gives an argument on the barriers according to prevailing practice. A letter from the producer of specific type of equipment that this equipment (produced by the same producer) has not been used in the host country is not sufficient evidence for the prevailing practice barrier, as similar equipment manufactured by other producer could be widespread in the host	The technology used is new and the project proponent was not aware of implication due to new technology. The same equipment supplier (M/s Solar Turbine INC) has standard module (without dry low NOx) for gas turbines for which cost is low and the operation and maintenance is well established. We had to spend more for this advance dry Dry Low NOx Turbine based on returns from CDM revenue stream. The **annex 7** is attached for the turbines installed in nearby industries. It is evident from the sheet that no industry in nearby area has Dry Low NOx turbine (either from M/s Solar or from any other manufacturer). Other than that M/s Solar is reputed international turbine manufacturer with world wide supply of its equipments and considerable market information. The letter issued by M/s Solar is from there regional office in Singapore. Therefore, endorsement from M/s Solar, data gathered from nearby industries reflects that this was not a

country.	common practice when Apollo Tyres have installed the turbine.
Moreover, this letter does not fulfil the requirements specified by DOE to close NIR 4 stated on page A-9 of the validation report: "Under common practice analysis, please provide other same kind of project's name and distinctions between them and project activity."	In the validation stage the validators have discussed the issues of common practice. The turbine installation to the nearby industries is discussed with the validators. The supporting gathered and presented to validators is presented as annex 7.
4. The spreadsheet in annex 4 (Calculations) attached to the CDM-SSC-PDD (version 02) has columns missing which was not noted by the DOE.	This was an error during conversion of word file to PDF files. Te same is corrected in the version 06 of PDD.

Review No 2

Reason for request	**Reply**
The investment test has not been done properly by the developer and not been appraised properly by validator who did not recognized that the alternative 4 (use of Indian coal as fuel) to the project is unrealistic due to the shortage of domestic coal. The PDD does not give the assumption about the price of imported coal used to derive IRR for the alternative 5 (use of petcoke and imported coal as fuel). Moreover, the PDD does not include the enclosures mentioned on page 13 so it is impossible to check IRR calculations. The natural gas price assumption for the project case is unrealistically high, which may mean that the project case would be more attractive if a realistic natural gas price was used. The sensitivity analysis is designed in a way (assumption about the price changes) that always make the project case less attractive than the alternative.	Same as comment 01 of review 01.
The PDD does not contain any documentation on the sources of the electricity grid emission factor. It is just mentioned in table A.4 of the PDD as 760g CO2/kWh. While the validator states of page A-10 that supporting information was provided and therefore closed NIR 4, the supporting information has not been integrated in the PDD.	Same as comment 02 of review 01.
The spreadsheet in annex 4 (Calculations) attached to the	Same as comment 04 of review 01.

CDM-SSC-PDD (version 02) has columns missing which was not noted by the DOE.	

Review No 3

Reason for request	**Reply**
The investment test has not been done properly by the developer and not been appraised properly by validator who did not recognized that the alternative 4 (use of Indian coal as fuel) to the project is unrealistic due to the shortage of domestic coal. The PDD does not give the assumption about the price of imported coal used to derive IRR for the alternative 5 (use of petcoke and imported coal as fuel). Moreover, the PDD does not include the enclosures mentioned on page 13 so it is impossible to check IRR calculations. The natural gas price assumption for the project case is unrealistically high, which may mean that the project case would be more attractive if a realistic natural gas price was used. The sensitivity analysis is designed in a way (assumption about the price changes) that always make the project case less attractive than the alternative.	Same as comment 01 of review 01.
The PDD does not contain any documentation on the sources of the electricity grid emission factor. It is just mentioned in table A.4 of the PDD as 760g CO2/kWh. While the validator states of page A-10 that supporting information was provided and therefore closed NIR 4, the supporting information has not been integrated in the PDD.	Same as comment 02 of review 01.

ANNEX 1

Box 9.1 : Partnership in Excellence

To improve generation in the short term, Ministry of Power has launched the programme: **"Partnership in Excellence"**. Priority is being given to restoration of units to an operating level by enhancing performance through short- and medium-term measures. Central Electricity Authority (CEA) has identified 26 thermal power stations operating at a PLF of less than 60 per cent. The concept of Partnership in Excellence, to be forged between these 26 stations and the better performing utilities, is to utilize the expertise of the latter to improve the performance of these 26 stations.

Modus operandi

- Team of engineers from the better performing partners to visit the identified power stations to diagnose the problems behind the low performance.
- The team to formulate a report for improving O&M practices and other measures for starting operation of the unit on a short term regular basis, with zero-based budgeting.
- On the recommendations of the team, needed funds, as subsidized loans or grants, to be provided by Power Finance Corporation (PFC).
- A team of 8 to 10 engineers to be posted at low performing thermal power stations, which will strive to implement the improved O&M practices and formulate the need based Rennovation and Modernisation (R&M) scheme.
- R&M programme so identified to be implemented under the supervision of partner in excellence.

The programme has received a positive response, and these low performing power stations are expected to attain 60 per cent PLF or more during the period December, 2005 to March, 2006.

variation across States. The PLF for the eastern and north-eastern states was relatively lower.

9.6 The rate of return of SEBs improved to –26 per cent in 2005-06 (RE) from –32 per cent in 2004-05 (Table 9.4). The resources forgone through such poor return continue to be very large. In 2005-06, while the direct transfers from State Governments to SEBs was Rs.11,562 crore, an uncovered subsidy of Rs.15,987 crore remained, indicating the large potential that reforms have in improving not only the electricity sector itself but also the fiscal position of the States.

9.7 Out of the total power generated in the country, around 66 per cent comes from the coal-fired power stations. Domestic coal production is not keeping pace with the growing demand for coal in the power sector (Table 9.5). The demand-supply imbalance has been a matter of concern for the last two years. Non-availability of the desired level of coal has resulted in generation loss of 1512 Million Units during 2004-05, and hampered the growth of thermal generation.

9.8 The power generation capacity based on gas/liquid fuel in October 2005 was 12,530.62 MW (10,513.62 MW gas & 2,017 MW liquid

Table 9.5 : All India coal requirement, availability and likely shortfall

(In million tonnes)

Particulars	2005-06	2006-07
Coal requirement	338*	365**
Availability	316.66	334
Shortfall from indigenous sources	21.34	31

* Including 28 million tonnes for captive power plants.

** Including 33 million tonnes for captive power plants

Table 9.6 : Trends in requirement, allocation, supply and shortfall of gas

(In MMSCMD)

Year	Requirement at 90% PLF	Allocation	Supplied	Demand-Supply gap	Estimated Generation Loss *(BU)
2000-01	44.54	36.67	24.40	20.14	33.0
2001-02	46.31	36.76	24.33	21.98	36.1
2002-03	48.26	39.47	25.12	23.14	38.0
2003-04	49.25	39.47	25.62	23.63	38.9
2004-05	49.73	40.95	30.70	19.03	31.2

* Considering the demand-supply gap of gas at 90 per cent PLF, station heat rate of 2000 Kcal/KWhr and no generation made using liquid fuel

Note: 1. MMSCMD—Million metric standards cubic metre per day. 2. BU—Billion Units

ANNEX 2
(A)

SUBJECT TO VADODARA JURISDICTION

JANARDAN METAL INDUSTRIES

Engineers, Manufacturers, Steel Fabricators & PipeLine Contractors
And Approved Boiler Repairers

Behind Atladara Rly. Stn. Padra Road,
ATLADARA, VADODARA - 390 012.
Telephone: Factory & Office: 2680032
Telefax: 2681335 Residence: 2340936
Email: jmi@icenet.net, jmi@icenet.co.i

Date: 16. 06. 2006

To,
Apollo Tyres Limited
Village: Limda,
Tal. Waghodia,
Dist. Baroda

Dear Mr.Vikram Kalele,

This has reference to our telephonic discussion regarding availability of Indian coal.

We had indicated to you earlier vide our fax dated 18-02-2003 regarding availability and rate o Indian Coal and once again we confirm that there is no problem regarding availability of thi coal.

To give you more confidence, this time we have arranged quotation of all grades of Indian Coa from M/S Shah Coal Pvt. Ltd. directly on your name (A copy of which is attached with thi letter).

Please confirm your firm requirement at the earliest for further action.

Regards

For Janardan Metals Industries

Partner

ANNEX 2 (B)

SHAH COAL PVT. LTD.

COAL & COKE MERCHANTS & COMMISSION AGENT

A-8, 3rd Floor, Moiz Apartments, 12th TPS Road, Shuja Baug, Santacruz (E), Mumbai-400 055.
Ph. (O) : 2610 1955 / 2612 4811 / 3092 2353 • Fax : 2618 2957 • E-mail : shahcoalpvtltd@vsnl.net

Dt – 16/6/2006

To,
Mr. Vikram Kalele,
Group Manager – Project,
Apollo Tyres Ltd.
Limda Plant,
Baroda

Sub: Supply of Steam coal to your plant at Baroda

Dear Sir,
With reference to your enquiry for procurement of Steam coal to your plant at Baroda, we hereby give our offer for supply of coal by road –

Type of Coal	Grade	Rate / Ton
Steam Coal	"A"	Rs.4,000/-
---"---	"B"	Rs.3,800/-
---"---	"C"	Rs.3,600/-
---"---	"D"	Rs.3,200/-

The above rate/ton is only the cost of coal. Transportation charges and 4% V.A.T. shall be charged on above mentioned cost of coal.

We hope that you find our offer fair and reasonable and shall place your valid order at the earliest.

Thanking you,
Yours truly,
For Shah Coal Pvt. Ltd.

V R Shah.

Director.

ANNEX 2C

TO : M/S. Apollo Tyres Limited	
ATTN : Mr. Vikram Kalele	
FROM : Rasit Parikh	
FAX NO : (02668) 263432	
NO. of PAGES : –	INCLUDING THIS PAGE
REF. :	DATE : 18/2/2003

JANARDAN METAL INDUSTRIES
B/H.Alladara Rly. Station
P.O.Alladara, BARODA-390 012.
Phone : 0265-340632
FAX : 0265-342335

FAX TRANSMISSION

Dear Sirs,

As per telephonic talk with you and as per your requirement the Budgetory price for diff. types of coal are as under.

Type of coal	Rate per Ton	Gross calorific Value	Sulpher %
Indian coal	2700/-	4800	–
Pet coal	3000/-	7000	6%
Imported coal	3000/-	6000	–

We hope that above will meet with your requirement.

With Regards,

IF THIS MESSAGE IS RECEIVED INCOMPLETE, PLEASE TELEPHONE (0265) 340032

TOTAL P.01

Back to Index

Captive Power Projects: Planned Investment

Company	Fuel	District	State	Capacity (MW)	Cost (Rs crore)
ACC	Coal	Gulbarga	Kar	50	250
ACC	Coal	Jabalpur	MP	50	242
Alembic Chemical	Thermal	Vadodara	Guj	7	25
Aruna Sugars	Thermal	South Arcot	TN	32	50
Ashok Leyland	Fuel Oil	Kendujhar	Ori	250	1,000
Bellary Steels & Alloys	Thermal	Bellary	Kar	12	40
Bharat Earth Movers	Hydel	Mysore	Kar	12	30
Carbon & Chemicals	Thermal	Kochi	Ker	7	30
Cochin Refineries	Thermal	Cochin	Ker	17.8	55
DGP Hinoday	Thermal	Pune	Mah	30	100
DLF Power	Coal	Giridih	Bih	20	80
DLF Power	Coal	Bhojudih	WB	10	40
Duncans Industries	Thermal	Kanpur	UP	70	245
Finolex Cables	Thermal	Ratnagiri	Mah	25	120
Grasim Industries	Thermal	Nagda	MP	40	125
Grasim Industries	Thermal	Bharuch	Guj	15	60
Gujarat Ambuja	Coal		Guj	50	200
Haldia Petrochemicals	Naphtha	Haldia	WB	100	360
Hindalco Industries	Coal	Renusagar	UP	225	775
Hindustan Newsprint	Thermal	Mandya	Kar	10	35
Hindustan Organic	Thermal	Raigarh	Mah	10	35
Hindustan Petroleum	Thermal	Vishakhapatnam	AP	40	200
Hindustan Petroleum	Gas/Naphtha	Mumbai	Mah	20	125
IBIL Energy Systems	Gas/Naphtha	Kachch	Guj	60	216

India Cement	Naphtha		TN	100	350
Indian Aluminium	Naphtha	Belgaum	Kar	100	350
Indian Oil	Coal	Panipat	Har	75	225
Indian Rayon	Coal	Junagadh	Guj	16.5	74
IPCL	Thermal	Gandhar	Guj	70	225
Ispat Industries	Naphtha	Raigarh	Mah	250	1,076
Jindal Strips	Thermal	Raigarh	MP	40	120
Jindal Tractabel	Coal	Bellary	Kar	260	1,195
Kanoria Chemicals	Thermal	Renukoot	UP	25	100
Kerala Minerals	Thermal	Pallakad	Ker	6	21
Kasoram Industries	Coal	Gulbarga	AP/Kar	30	99
KSIDC	Thermal	Kozhikode	Ker	40	100
Lloyds Metals	Gas	Chandrapur	Mah	36	105.0
Lloyds Steel	Gas	Wardha	Mah	80	394.0
Madras Aluminium	Naphtha	Salem	TN	180	630.0
Mardia Chemicals	Naphtha	Surendranagar	Guj	150	525.0
Maruti Udyog	Gas	Gurgaon	Har	50	200.0
Modern Threads India	Gas/Naphtha	Barauch	Guj	200	600.0
Modern Threads India	Gas/Naphtha	Bhilwara	Guj	200	600.0
Modi Alkalies	Thermal	Alwar	Raj	37	75.0
Mukerian Papers	Thermal	Hoshiarpur	Pun	6	12.0
NRC	Thermal	Thane	Mah	28	85.0
Nargarjuna Fertilisers	Thermal	Mangalore	Kar	120	
National Aluminium	Thermal	Angul	Ori	240	915.0
Nava Bharat Ferro	Coal	Khammam	AP	30	113.4
Nicolas Piramal India	Gas	Bharuch	Guj	5	20.0
Nippon Denro Ispat	Naphtha	Raigarh	Mah	250	800.0
Paramani Power	Thermal	Anantapur	AP	33	100.0

Raipur Alloys & Steel	Thermal	Rajpur	MP	8	27.0
Rajinder Steels	Thermal	Raipur	MP	50	206.0
Rashtriya Ispat Nigam	Thermal	Vishakhapatnam	AP	67.5	220.0
Raymond	Coal	Bilaspur	MP	25	100.0
Reliance Industries	Gas	Patalganga	Mah	30	90.0
S P B Energy	Lignite	Periyar	TN	37	175.0
Sanghi Industries	Naphtha	Kachchh	Guj	60	80.0
Servall Engineering	Thermal	Coimbatore	TN	5.5	14.0
Star Paper Mills	Coal	Saharanpur	UP	15	56.0
Sujana Steels	Thermal	Ananthapur	AP	48	150.0
Thiru Arroran Sugars	Thermal	Thanjavur	TN	8	28.0
Titaghur Paper Mills	Thermal	North 24 [illegible]	WB	15	60.0
United Phosphorus	Naphtha	Bharuch	Guj	55	130.0
Usha Ispat	Naphtha	Sindhudurg	Mah	120	180.0
Zuari Agro	Diesel	Cuddapah	AP	24	84.0

Back to Index **Go to Top**

ANNEX 4

50 Rs.

GAIL (INDIA) LIMITED

GAS SALES AGREEMENT (GSA)

BETWEEN

GAIL (INDIA) LTD.

AS SELLER

AND

M/s APOLLO TYRES LIMITED

AS BUYER

FOR SALE

OF

NATURAL GAS [Regasified LNG]

Date: 23/07/2004

गेल (इंडिया) लिमिटे
(भारत सरकार का उपक्रम)
अहमदाबाद आंचलिक कार्याल
GAIL (India) Limit
(A Government of India Undertak
Ahmedabad Zonal Office

Ref: GAIL/AZO/GSA/ATL/2004-05

Date:23/07/2004

To
M/s Apollo Tyres Limited
Limda Village, Waghodia Taluka,
Dist. Vadodara

Sub: Side Letter for Article 9.2 of the Gas Sale Agreement (GSA) between GAIL(India) Ltd, and M/s Apollo Tyres Limited.

This refers to the GSA signed on 23/07/2004 between GAIL (India) Ltd and M/s Apollo Tyres Limited for supply of R-LNG to their plant at Limda Village, Waghodia Taluka, Dist :Vadodara.

In consideration of mutual agreements contained in Gas Sale Agreement dated 23/07/2004 and in this Side Letter, Seller and Buyer agree to revise Article 9.2 of GSA as follows:

9.2 The elements of Price payable by the Buyer to the Seller on account of delivery of Gas under this Agreement shall be as follows

9.2.1 Elements of Price:

S.No	Elements of Price	Rs./MMBTU
1	Foreign Currency Component(USD)	135
2	Indian Rupees Component*	42
3	Total	177

*Escalating @ 5% on annual rest basis for five years.

Foreign Currency component is calculated considering the Exchange rate of 1 US $ = Rs. 46.00. However, the actual exchange rate will be as per clause 9.2.6 below.

809, साकार - II, टाउन हॉल के सामने, एलिसब्रिज के पास, अहमदाबाद - 380 006. दूरभाष : 6586692-94, 6584459 फैक्स : (079) 6585681
809, Sakar - II, Opp. Town Hall, Near Ellisbridge, Ahmedabad - 380 006. Phone : 6586692-94, 6584459 Fax : (079) 6585681

Further the Buyer shall pay Fixed transmission charges of Rs. 645000/- (Six Lakhs Forty Five Thousand Only) per month (Considering the life period of pipeline as 25 years). However, additional investment, if any, made by Seller to supply gas under this agreement, shall be charged extra, which shall be mutually discussed.

9.2.2 The above total price includes basic custom duty, Purchase Tax (for Buyer located outside Gujarat) and is exclusive of all taxes, duties and statutory levies, by whatever name called and levied by either central, state Governments or local bodies. Sales tax, entry tax, any other taxes and duties and statutory levies shall be payable extra as applicable from time to time.

The Buyer shall be liable for any of above taxes/duties/statutory levies with respect to the sale, transfer, transport or importation of the Gas. Any taxes/duties/statutory levies for which the Buyer is liable under this article but which may have been paid by the Seller shall be reimbursed by the Buyer together with applicable interest, if any, (if delay is attributable to the Buyer) within 3 days from the date of written request by the Seller. For avoidance of doubt, the Buyer shall indemnify the Seller against any taxes/duties/statutory levies which the Seller as a result of any law, rule or policy, is or becomes obliged to pay directly or indirectly on sale, transfer, transport, importation, treatment or handling of natural gas sold under this Agreement.

9.2.3 The present amount payable against basic custom duty applicable @ 5% is Rs. 6.50 / MMBTU (equivalent to US $ 0.1412/ MMBTU) included in the FE Component indicated under 9.2.1 above. Custom duty shall be charged as applicable from time to time.

9.2.4 The Purchase Tax rate, in case of Buyer located outside Gujarat (Not applicable to Buyers located within Gujarat), considered is @ 4% on LNG cost including Regasification Charges . Purchase Tax shall be charged as applicable from time to time.

9.2.5 The above prices are valid up to 1st January, 2009.

9.2.6 Invoice for Foreign Currency Component shown at Sr. No1 in Para 9.2.1 shall be raised in equivalent Indian Rupees converted at the prevailing TT selling rate as per State Bank of India (SBI) Card rate applicable on a business day of SBI New Delhi immediately preceding the date of Invoice.

Other sub-clauses of Article 9.2 will remain same as per GSA dated 23/07/2004.

This side letter dated 23/07/2004 forms part of the GSA dated 23/07/2004.

(T K Majumdar)
Zonal General Manager
For GAIL (India) Limited

ACCEPTED & AGREED AS ABOVE

(M/s Apollo Tyres Limited)

Name: K Prabhakar

Designation: Chief (Projects)

ANNEX 5

ORIGINAL/DUPLICATE/TRIPLICATE/QUADRUPLICATE(MULTIPLE)

TAX INVOICE

GAIL(India)Ltd.

R.P/L Network Hqr,Manisha Circ, Old Padra Road, Vadodara

INVOICE

Customer Code	10587	VAT Invoice No.	GJ00010319
To:	APOLLO TYRES LTD, LIMDA VILLAGE, TAL-VADODARA Gujarat, INDIA TIN:24073701230 DTD 01.07.2002	Date	15.05.2006
		Kind Attention	
		Location	TAL-VADODARA
		MeteringStation	
Telephone		D.C.Q	0.000
Fax		Product	Natural Gas(R-LNG)
		ATOPQ	0.000
		Seller Shortfall	0.000
Billing Doc.No: 2110003053		Cal Value for the Fortnight	9377.567

Supply from 01.05.2006 to 15.05.2006

Category	Qty 1000 SCM	Qty MMBTU	Rs/MMBTU	Amount (In Rs.)
	1,083.114	40,305.455	179.74	7,244,099.43
Price	Rs. Per MMBTU		Sub Total	7,244,099.43
INR	46.43			
Transmission Charges	14.33	Local Dist Charges		0.00
FE Component - USD	2.935	Lumpsum TPT Charge		645,000.00
Exchange Rate	45.42000	Trans. Amount	577,577.17	
		Entry Tax	0.00	0.00
SUB TOTAL	179.74	Service Tax	12.00%	146,709.26
Addl Chrgs		SCG Serv. Tax	2.00	2,934.19
TOTAL INR		VAT @	12.50 %	1,004,842.86
		Turnover Tax		
		Surcharge	0.00	0.00
		Sub - Total (A)		9,043,586.00
			Total Amount Payable in Rupees	9,043,586.00
(Amount in Words)	RUPEES NINETY LAC FORTY-THREE THOUSAND FIVE HUNDRED EIGHTY-SIX ONLY			

In case the Invoice is not paid within 3 days(4 days for e-banking) of receipt of invoice, the supply of gas shall be disconnected without any further notice and without prejudice to other rights under the contract.

For & on Behalf of GAIL

TIN 24190101732
CST 24690101732
Serv. Tax Regn. No: LCR/VADODARA-I/GAIL/1/2004
"Transport of Goods through Pipeline Service"

Authorised signatory

ORIGINAL/DUPLICATE/TRIPLICATE/QUADRUPLICATE(MULTIPLE)

GAIL (India) Ltd.

TAX INVOICE

R.P/L Network Hqr,Manisha Circo, Old Padra Road, Vadodara

INVOICE

Customer Code	10587	VAT Invoice No.	GJ00010414
To:	APOLLO TYRES LTD, LIMDA VILLAGE, TAL-VADODARA Gujarat, INDIA TIN:240737012230 DTD 01-07-2002	Date	31.05.2006
		Kind Attention	
		Location	TAL-VADODARA
		MeteringStation	
		D.C.Q	0.000
Telephone		Product	Natural Gas(R-LNG)
Fax		ATOPQ	0.000
		Seller Shortfall	0.000
		Cal Value for the Fortnight	9395.035

Billing Doc.No: 2110003093

Supply from 16.05.2006 to 31.05.2006

Category	Qty	Qty	Rs/MMBTU	Amount (in Rs.)
	1000 SCM	MMBTU		
	1,108.562	41,329.281	183.76	7,594,255.39
Price	Rs. Per MMBTU		Sub Total	7,594,255.39
INR	46.43			
Transmission Charges	14.33	Local Dist Charges		0.00
FE Component - USD	2.935	Lumpsum TPT Charge		0.00
Exchange Rate	46.79000	Trans. Amount	592,248.60	-
		Entry Tax	0.00	0.00
GUB TOTAL	183.76	Service Tax	12.00%	71,069.83
Addl Chrgs		ECS Serv. Tax	2.00	1,421.40
TOTAL INR		VAT @	12.50 %	958,343.33
		Turnover Tax		
		Surcharge	0.00	0.00
		Sub - Total (A)		8,625,090.00
		Total Amount Payable in Rupees		8,625,090.00
(Amount in Words)	RUPEES EIGHTY-SIX LAC TWENTY-FIVE THOUSAND NINETY ONLY			

In case the Invoice is not paid within 3 days(4 days for e-banking) of receipt of invoice, the supply of gas shall be disconnected without any further notice and without prejudice to other rights under the contract.

For & on Behalf of GAIL

TIN 24190101732
CST 24690101732
Serv. Tax Regn. No: LCR/VADODARA-I/GAIL/1/2004
"Transport of Goods through Pipeline Service"

Authorised signatory

3523
3/6/12

778

ANNEX 6

Captive Power Plants: Case Study of Gujarat, India

P.R. Shukla, Debashish Biswas, Tirthankar Nag,
Amee Yajnik, Thomas Heller and David G. Victor

Working Paper #22

March 2004

Table 5: Installation cost and cost of generation[14]

Fuel Type	Installation cost (million rupees per MW)	Generation cost (rupees per unit)
Lignite	50 - 52.5	1.59 - 1.90
Coal	42.5 – 45	1.78 - 1.92
FO	10 - 12	3.5 - 3.75
LDO	7.5 - 10	4.25 - 4.6
HFO	10 - 15	4.5
Naptha	35 - 41	3 - 3.25
Natural Gas	42.5 - 50	2.3 - 3.3

Source: Gujarat based CPPs

In contrast, the utilities in Gujarat chose conventional fuels like coal and gas for electricity generation. This is because the utilities try to produce electricity in lower costs. The average cost of production for the coal based plants was rupees 1.6 and for the gas based utilities was around rupees 1.95 in 1999 (IIMA-Stanford Joint Project, Working Paper WP 2/2003/ESR-IDE).

4.4 VINTAGE

As stated earlier, the CPPs in Gujarat was commissioned as early as 1935. Until the end of 1980s, coal and lignite were the preferred fuels used by the CPPs. Many of these plants came over because the utilities were not able to supply electricity and there were severe shortages. During this period, various sugar mills used bagasse as fuel to generate both electricity and steam. Very few industries used gas or naptha as fuel. These industries were mainly petrochemicals (Example Indian Petrochemical Company Limited) or gas companies (Example Gas Authority of India Limited) which had a secured supply of these fuels.

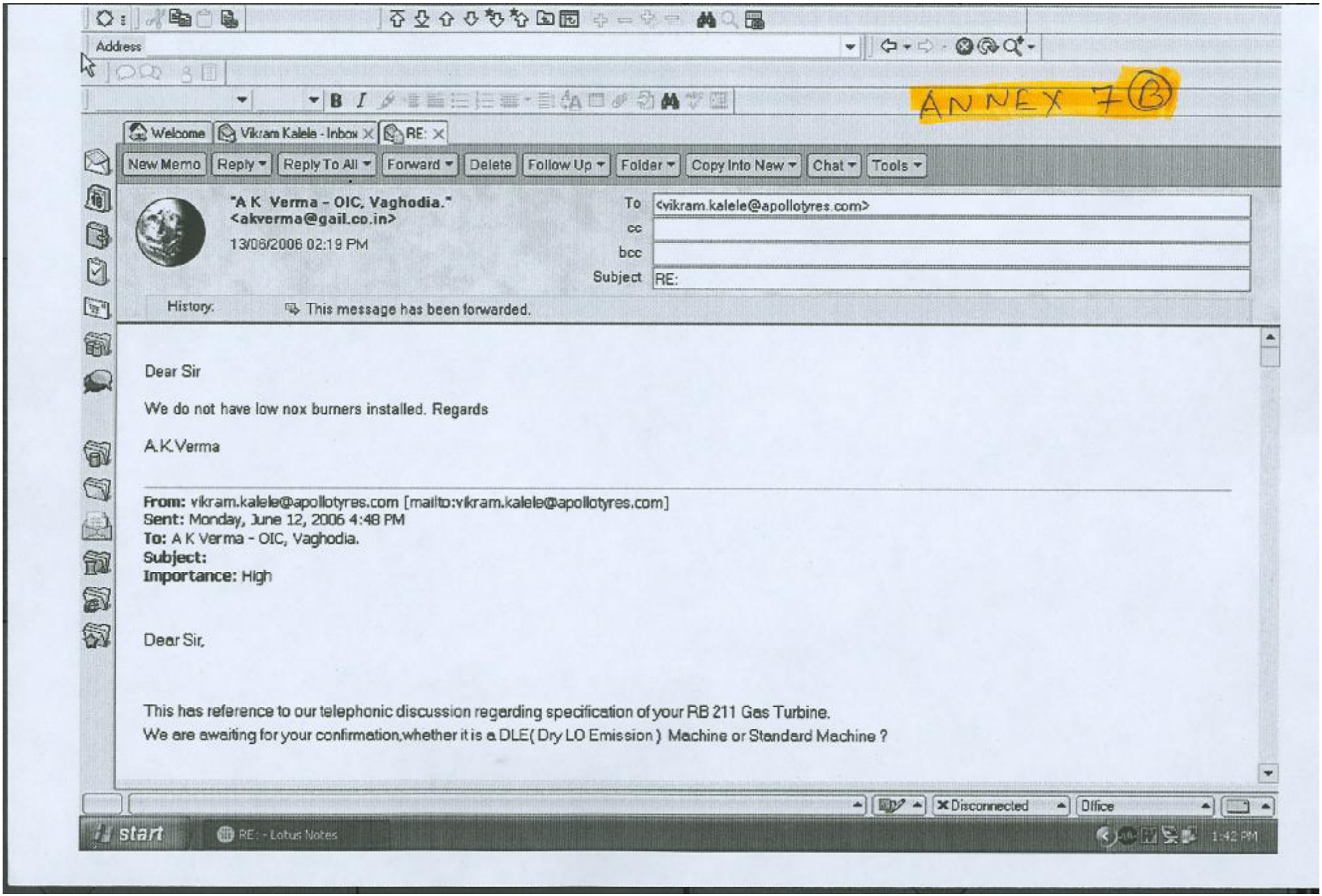
In the 1990s, naptha, oil (FO, LDO, and HSD etc) and gas became the preferred fuel of the CPPs. Coal, Lignite and Bagasse, which was the dominating fuels of 1980s, saw very marginal capacity addition during this period. Small sized back up type CPPs chose oil as the preferred fuel. Naptha and Gas as fuel were chosen by the larger and middle-sized CPPs. There are essentially three main reasons for this. Firstly, medium sized plants with some degree of economies of scale were available as technological choice (manufacturers like GE, Siemens came in) during this period. Second, gas fields were struck near Hazira, Gujarat. Thus, gas as a fuel became an option for the power plants situated in Gujarat. Also, the higher industrial tariffs made these medium sized Naptha or gas based plants a viable option.

[14] The figures are of the year 1999

ANNEX 7
(A)

Gas Turbine Installation Details For Near By Industries.

Sr. No.	Company Name	Unit Installation Detail	Contact Person	Mode of Communication
1	GAIL, Waghodia Plant	Make – Rolse Royes Capacity – 29 MW Model – RB2 11 Type – Standard Combustion (Without DLE) No. Of Unit - 2	Mr. A K Verma, Plant Operation In charge	By E-Mail / Telecom (Attached below)
2	M/S Alembic Ltd., Baroda Plant	Make – Alstom Capacity –4.9 MW ISO Model – TYPHOON -M Type – Standard Combustion (Without DLE) No. Of Unit - 3	Mr. A V Bhatt, Power Plant In charge	By E-Mail / Telecom
3	M/S Sarabhai Ltd., Baroda Plant	Make – Solar Capacity – 4.4 MW ISO Model – Centur 50 Type – Standard Combustion (Without DLE) No. Of Unit - 1	Mr. Uday Dholkia, Power Plant Installer Agency	By E-Mail / Telecom
4	M/S Bell Ceramic Ltd. Dora, Baroda Plant	Make – Solar Capacity – 1.17 MW ISO Model – Saturn 20 Type – Standard Combustion (Without DLE) No. Of Unit - 1	Mr. Manoj Sheth Power Plant Supplier Agency	Old Supplier Data Available


ANNEX 7(B)
Welcome
Vikram Kalele - Inbox
RE:
New Memo
Reply
Reply To All
Forward
Delete
Follow Up
Folder
Copy Into New
Chat
Tools
"A K Verma - OIC, Vaghodia."
<akverma@gail.co.in>
13/06/2006 02:19 PM
To <vikram.kalele@apollotyres.com>
cc
bcc
Subject RE:
History:
This message has been forwarded.
Dear Sir
We do not have low nox burners installed. Regards
A.K.Verma
From: vikram.kalele@apollotyres.com [mailto:vikram.kalele@apollotyres.com]
Sent: Monday, June 12, 2006 4:48 PM
To: A K Verma - OIC, Vaghodia.
Subject:
Importance: High
Dear Sir,
This has reference to our telephonic discussion regarding specification of your RB 211 Gas Turbine.
We are awaiting for your confirmation,whether it is a DLE(Dry LO Emission) Machine or Standard Machine ?
Disconnected
Office
start
RE: - Lotus Notes
1:42 PM