

Report (Part-I)



The Expert Committee on Road Map for Coal Sector Reforms



Ministry of Coal
Government of India, New Delhi
December 2005

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28th December 2005

Dear Prime Minister,

I deem it a privilege to submit to you the Report of the Expert Committee on Coal Sector Reforms. This is Part I of the Report covering issues of immediate relevance.

I would like to first thank the GOI for giving me this opportunity to revisit the coal sector to examine the developments during the three decades that have passed since the submission of the Report on the Fuel Policy by Prof. Sukhomoy Chakravarti in 1975. As one associated in a small way with that Report, I eagerly looked for the strategic shifts and vibrant growth in the coal sector during these years which was expected to ensure energy security for India. I am sad to report that the essential weaknesses of the sector have remained almost unchanged during these three decades.

Prof Chakravarti wrote, "our analysis contained in the Report establishes beyond any reasonable doubt that coal should be considered the primary source of energy to the country. The coal resources of India, in spite of the quality being poor and their unevenness in geographical dispersal represent the most valuable and reliable source of energy to the economy. In order that this potential advantage is fully exploited several actions are urgently called for. While the primary Knowledge about our coal resources is adequate, detailed information on the nature of the deposits is inadequate and is proving to be a hindrance to expanding coal production quickly." Today the efforts to accelerate the pace of growth in coal production are constrained by the lack of adequate reliable data on the coal reserves.. The Committee finds that the efforts made by Coal India Limited(CIL)/ Singareni Colliery Company Limited (SCCL) to speed up the pace of exploration are significant, they fall far short of the level of exploration needed to provide a confident estimate of our overall coal resources and adequate information base to take up an accelerated production plan. The Committee has suggested an increase in the allocation made to GSI for regional mapping and to set up an Exploration Revolving Fund of, at least Rs 500 crores ,to be operated by Central Mine Planning & Design Institute (CMPDI) by themselves and by engaging suitable agencies to take up the requisite level of drilling to convert at least ten billion tonnes of coal reserves from the regional maps to the proved category, along with clear mine plans which set out the nature of the flora, fauna and human habitation in the identified coal blocks. We request that special consideration be given to this suggestion.

The Committee was surprised to find that the current critical shortage of coal has occurred in spite of the coal production target being fulfilled. This is partly the result of adopting a conservative estimate of coal demand for power generation and for small users of coal while fixing the target for coal production in the Tenth plan period and leaving an unfilled gap of 30 million tones of coal at the end of the plan. The Committee is of the view that this is a short-term phenomena and should be overcome by importing as much of coal as possible in the next three years and by augmenting domestic production through Captive coalmines to be set up mainly by power generating companies and selected large coal consumers. The Committee is firmly of the view that this short-term coal shortage should not deflect the country from its resolve to make coal the primary source of commercial energy in India.

The Committee has very carefully examined the conflicting views about Coal resources of India voiced by well meaning experts. On the basis of the data and information furnished and discussions held with the experts, the Committee is convinced that even the reserves of coal which are in the proved category and for which mostly Geological Reports (GRs) which set out the depth at which the coal is available and the technical feasibility of exploitation, could comfortably serve the needs of power generation for several decades. Coal-resources are not in short supply. The major hurdles to the multi- pronged effort needed to increase production are the procedural roadblocks in activating the requisite number of coalmines, which can yield production in the quickest possible time. The Committee has made some practical recommendations for increasing the production from CIL and SCCL up to end of Eleventh Plan and for enlisting the cooperation of other State and Central public sector companies and power industry to supplement their efforts. This needs the active intervention at the highest levels of governance, as the strongly entrenched interests in the coal industry would strive to keep coal, forever in a situation of shortage.

The Committee has examined the current legal position and has suggested that a more liberal interpretation of the Coal Mines (Nationalisation) Act is possible by which most of the large coal using companies , especially in the power sector, can be incentivised to take up mining of most of their coal requirements by the year, 2011-12. In fact the Committee foresees that with the new policies and procedures adopted during the current year for leasing more coal-blocks could lead to significant additions to coal for power sector much before the end of Eleventh Plan. The Committee has also suggested measures which could strengthen and fine-tune these efforts .We commend these for your priority attention.

The procedures for obtaining the numerous approvals and permissions from diverse departments at the State and Central level for launching a coal mine are proving to be the major factors which inhibit the companies using coal but not familiar with coal mining to shy away from captive mining. The apathy and indifference of the State Governments in providing the necessary approvals for land and water use and the delays in land acquisition could, to some extent, be set right by making the state level agencies partners in coal mining companies.

The Committee has analyzed a few cases of long delays in giving the environmental clearance by the concerned State and Central Agencies. The delays were due to routine administrative lethargy in organizing the site inspections, getting the relevant revenue or forest department records for the lands to be allotted and in holding the Public Enquiry to be organized by the State Governments. The Committee is also concerned that the State or Central Government agencies dealing with Forest and

Environment are not inclined to accept proposals from the mining companies for advance undertaking of compensatory afforestation in the large areas, already identified as depleted reserve forests or as wasteland in the different states. Such a proposal appears to be in the best interests of development and environment. The Committee, while fully appreciative and supportive of the efforts to ensure that our developmental efforts not endangering the environment, would like to urge the environmental agencies to appreciate the need for expedition in the decisions on the environmental issues . The Committee would like a group of eminent environmental scientists to re-examine the current approach of a case by case clearance of the coal mine proposals and to consider a national five-year plan for afforestation which is built around the required compensatory afforestation likely to be required during the period. The Committee proposes to examine the environmental issues in coal mining in greater detail in Part II of the Report, but some suggestions have been made for immediate consideration with a view to ensure the achievement of coal production to the target levels at least up to the end of the Eleventh Plan.

The Committee has made some important recommendations towards rational pricing of coal and for stimulating trading in coal including imports. The committee finds that there is need not only for stepping up import of coal in the short-term but also to maintain the facilities created now to be used on a long term basis to maintain a sustained level of imports of about thirty million tonnes of coal at appropriate locations. India as the third largest producer and consumer of coal should emulate the other larger users, namely, China and US, and become an important importer and exporter and a leading player in the world coal market.

The Committee has raised some important issues on the pricing of national assets like coal and other natural resources and in the sharing of 'economic rent' represented by the difference between the costs of production within the country and the international prices of the same commodity. The Committee hopes that the Government would be able to give clear indication of the Government Policy. This is of special interest to Coal sector in which we are inviting the interests of private of sector to participate in coal mining.

The Committee would like to submit that you should initiate a national debate on integrated energy pricing and sustainable Energy Security. To-day even countries, which are endowed with abundant hydrocarbon reserves, tend to use oil and gas primarily as raw material for high value chemicals instead of burning them as mere fuels. The use of any specific fuel for a given end-use will have to be decided in future with reference to the price at which we can get alternative fuels to be used in its production. The choice of fuel for power generation will have to be decided on the basis of the life-time cost of generating a standard unit of power using different fuels; the relative ranking of the projects should remain largely unaltered for any probable variation in prices. Given the high volatility in the price of oil and gas and the import parity pricing procedures adopted in respect of these it would be highly risky to rely on hydrocarbon based power generation for sustainable energy security. In fact, the use of coal, based on clean-coal technologies, is gaining ground in the World's top three energy consuming countries , namely USA ,China and Japan.

Prime-Minister Sir, India is today, by all accounts, poised for unprecedented rate of economic growth and could become a global hub, not only for IT services but also for out-sourcing of supplies and services for manufacturing industries. This, however, is dependent on the availability of adequate power at internationally competitive rates. The Committee is of the view that this could be achieved by an enlightened policy towards power generation based on coal produced by multiple players including State level public sector mining and power companies and private sector power

companies .The recommendations of the Committee are designed to make this possible within the existing legal constraints. The Committee feels that diverse vested interests are likely to oppose measures to accelerate coal production in the country at competitive prices and these could be countered only by guidance at your level.

On behalf of the members of the Committee, I would like to thank all the concerned departments and in particular the Planning Commission for the cooperation and help, which they have provided to the committee. I would like to place on record my personal gratitude to Shri P.C. Parakh, Secretary, Ministry of Coal who in spite of his busy schedule was always available for consultation and provided valuable new ideas and approaches to the problems of the Coal industry and arranged for all assistance to the Committee

With regards,

T.L. SANKAR

Conclusions and Recommendations

Committee felt that it would be desirable to submit Report in two parts with PART-I dealing with the short to medium term issues and PART-II dealing with the rest. For the purposes of this Report the Committee has decided to divide its recommendations for the short and medium term and long term into the two parts of the Report. The medium term covering upto 2011-12 i.e., the end of Eleventh Plan would be covered in Part One of the Report and anything beyond the end of Eleventh Plan would fall in the long term and would be covered in Part Two of the Report. (1.5)

Part-I Report would mainly address the issues of increasing the availability of coal in the short to medium term and bridge the gap between demand and supply. For this, the projected requirement has been re-assessed in detail and also the production plans and strategies on the ground given by the major producers have been assessed. It was felt that the role of captive coal producers would be quite important and captive mining could take root and contribute significantly in the short to medium term. The committee has also found that the procedures of getting the various approvals and permissions for the grant of a block or the commencement of mining operations in a block allotted to public or private sector are time-consuming and lead to avoidable delays in coal production. The committee has included a brief analysis of the environment related issues and has made some recommendations which would help to expedite the grant of environmental clearances without any deviation from the spirit of the law and policies for environmental protection. (1.7)

Coal shall remain India's primary source of commercial energy supply is equally relevant even today. A time-bound plan to cover the entire country by regional mapping in 15 years should be prepared by GSI, CMPDI and MoC. Funding for this should commence from the 2006-07 budget. The MoC must launch a program of detailed exploration and drilling, in the 11th Plan, aimed at increasing proved category reserves. CMPDI's current capacity of drilling 3 lakh meters per annum must be raised to at least 15 lakh meters per annum by involving all eminent agencies within the country and outside. The committee recommends the creation of a Revolving fund of Rs. 500 crores for this purpose. The fund would recover the outlays once the mining leases are granted on the reserves so proven. Such an enhancement in the capacity for detailed exploration could potentially add about 10 billion tons of coal to the proven category annually. (2.38)

With the need to expedite project approvals, it is also necessary to improve project formulation to match international standards. Greater delegation of authority must accompany greater accountability and

responsibility. CIL could be granted the status of Navratna company in which case the company need not come to Government for approval of projects irrespective of the capital expenditure involved or else the subsidiaries of CIL could be granted the status of mini Ratna companies in which case only those proposals of such a subsidiary would need government approval wherein the capital expenditure exceeds Rs.500 crore. The boards of such companies should be restructured with the induction of independent non-government directors. (3.21)

The environmental clearance for these projects is a cause of major concern. The environmental issues in respect of projects which are important to reach the Tenth and Eleventh Plan targets should be taken up on priority consideration by the MoEF and if necessary a Special Task Force with adequate powers may be set up for examining these on a priority basis. The Environmental clearances should be sought and also given for production levels which are at least 25 % above the initial required mine capacity so that wherever possible and necessary, the production from certain mines could be enhanced. The MoEF could address rapid development of domestic energy resources by identifying critical areas that have Biodiversity and other special features in advance and notifying them as such. Other areas where the environmental impact could be mitigated by creating compensatory afforestation could be treated differently. In respect of the later the environmental clearance should be given within four months of filing of the application. (3.22)

The State Government must be requested to give clearance within six months failing which it should be deemed to have been approved. The rationale for fixing a standard rate for loss of revenue from forestlands, which are acquired for coal mining besides insisting on compensatory afforestation, needs an objective review. (3.23)

Next four years will be years of pronounced coal shortages in India. Shortages are likely to become acute in the first two years of the 11th Plan as the delayed 10Th Plan power projects get commissioned alongside the 11th Plan projects already under construction. These shortages are likely to rise rapidly by the end of the 11th Plan unless Coal India's unprecedented capacity expansion plans materialize during the 11th Plan. CIL's Emergency Production Plan that which is being processed, if delivered in addition to the large capacity expansion foreseen by CIL under the 11th Plan, offers the only hope of reigning in a widening demand-supply gap. While all efforts should be made to meet the immediate shortages it is equally important to examine and implement the recommendations made by the Committee which would lead to self sufficiency in coal in the long run. (3.25)

Thermal coal import to the tune of about 30-40 million tons of high grade coal by 2011-12 is the principal short term measure recommended by the Committee to alleviate looming shortages. However, even this would require that the port capacity and the evacuation facilities be taken up for enhancement immediately. Considering the fact that India is the third largest producer and user of coal in the world, India should be an

important player in the world coal market. The foregoing assumes that the infrastructure requirements for handling rising coking coal imports continue to expand, as required, in line with past trends. (3.26)

To enhance domestic coal production capacity rapidly requires that the MoC sets up a permanent Special Task Force to monitor progress of clearances and project implementation of all projects required to be completed by the end of the 11th Plan to fully realize Coal India's production plans including the Emergency Production Plan. This task force must also monitor clearances and progress of approved Captive projects. The Task Force must include representatives of MoEF, Railways, MoST and MoP as well as the concerned State Governments. (3.27)

The success of this short-term supply management would depend on the organization of suitable institutional arrangements for importing thermal coal and selling it in a transparent manner. Long term planned imports are possible at considerably lower prices compared to ad hoc imports that currently dominate thermal coal imports. Organizations that have long experience of importing coal must be co-opted in implementing the short-term supply management program. (3.28)

Increasing proportion of all domestic coal (supported by imported coal where necessary) that is not earmarked for the Power Sector be brought into the E-auction market over the next 2 to 3 years. Willingness to meet the actual demand at a market driven price would go a long way in establishing transparent coal markets in India. There is need to replace the current system of loose linkages feeding the power sector with formal long-term Fuel Supply and Transport Agreements that include the Railways. Again, this exercise should be completed within the next 2 to 3 years. (3.29)

The current provisions for increasing the level of competition in coal mining through captive mining were adequate and reasonable. However, procedures and processes need to be improved to expedite the allotment of the captive coal blocks in a transparent and effective manner. These procedures/processes should address the legitimate concerns of various stake holders involved and incorporate necessary flexibility to achieve the end objective of raising the number of players engaged in coal mining with a view to increasing supply and competitive efficiency in the coal mining sector. Further, the established procedures/processes should be able to select serious allottees committed to developing and mining blocks allocated within a prescribed timeframe. Finally, the procedures/processes must include a set of punitive penalties for failure to do so. (4.9)

And such of these proven blocks that the two Government companies cannot bring into production even by 2026-27 must somehow be brought under the captive dispensation provided it leads to an earlier realization of the production potential offered by these proven coal reserves. (4.22)

The problems of delay in the pre mining stage of captive mine proposals should be carefully examined in consultation with the concerned Central and State authorities and measures designed to enable a sincere allottee to commence mine construction within three years of the date of allocation in the case of blocks allotted from Proved category. (4.24)

The Central Government (MoC) should take a proactive role in monitoring the approvals and clearances to be provided by the State authorities. The States can be requested to take advance action to earmark coal-bearing areas for allocation to the allottees who obtain Central Government approvals. The State Government must be requested to give clearance within six months failing which it should be deemed to have been approved. In respect of land acquisition the State Government may be requested to keep a standing officer designated as the land acquisition officer to whom these cases could be referred to without waiting for the setting up of a special land acquisition court. (4.25 i)

The Government should set up an empowered High Power Committee of Secretaries who may consider the applications for Environmental clearance with the assistance of specially appointed/designated staff and give clearance within 4-6 months. The same group can also review the rationale for fixing a standard rate for loss of revenue from forestlands, which are acquired for coal mining, besides insisting on compensatory afforestation. (4.25 ii)

All possible legal measures should be evolved to cancel the licenses issued earlier if the allottee has not taken adequate steps to bring the allotted mines to production or in setting up the end-use units. (4.25 iii)

There is urgency to give special attention to incentivising and expediting captive coal production in the period up to the end of the Eleventh Plan.

(i) Any coal block in the Proved reserve areas held by any company that cannot be put into production before 2026-27 should be de-blocked and taken over by the Government of India. However, the current allottees including State and Central PSUs could form Joint Ventures to produce coal within the period specified from the blocks that they hold currently, Any Joint Venture so established as well as all current holders of coal blocks (except CIL & SCCL) must provide bank guarantees to back their production commitments as specified in (iii) below. In the case of CIL/SCCL, MOC could conduct biannual reviews of progress and periodically de-block coal blocks that are unlikely to go into production by 2026-27.

(4.26 i)

(ii) Proven coal reserves un-blocked as a result of the exercise under (i) above must be grouped into the following categories

- a) All blocks with proven reserves that can support a production of 2.5 million tons per annum or more for 30 years should be earmarked for power production exclusively.
 - b) Within the blocks earmarked for power generation attempt should be made to identify a few blocks that could support an annual coal production of 10 million tons or more for 30 years
 - c) Blocks that can support a production of 0.5 mt to 2.5 mt of coal annually for 30 years to be made available to any of the eligible end users.
 - d) Small and isolated blocks reserved for lessees producing for Coal India under sub-leases or for captive and group captive needs. (4.26 ii)
- (iii) A transparent mechanism for allotting the coal blocks so identified should be put in place. The following alternatives as the criteria for selection of the preferred applicant among several for the same block. (4.26 iii)
- a) A minimum net worth of Rs.200 crore for being eligible for blocks in categories (ii) (a) above. The minimum net worth requirement to rise by Rs. 100 crores for every whole multiple of the minimum mine capacity of 2.5 million tons proposed under these categories. A minimum net worth of Rs.50 crore for blocks in category (ii) (c) above rising in steps of Rs 25 crore for each whole multiple of the minimum production potential of 0.5 million tons. And finally, a minimum net worth of Rs 5-20 crores, depending on the size of the deposit, for blocs in category (ii) (d) above. (4.26 iii)
 - b) An undertaking to produce a minimum of 2.5 million tons of coal by an agreed date before the end of the 11th Plan for blocks in category (ii) (a) above, 5.0 million tons of coal for block in category (ii) (b) above, and 0.5 to 1.0 million tons of coal for blocks in category (ii) (c) above (depending upon the size of the deposit). The minimum production target for the lessees for blocks in category (ii) (d) above to be specified individually. (4.26 iii)
 - c) Undertaking to set up the full capacity of the power plant by the end of 12th Plan for blocks under category (ii) (b) above. All other end use capacities to be realized in full by the end of the 11th Plan. (4.26 iii)
 - d) An unconditional bank guarantee at the rate of Rs.40 per ton of coal to be mined per annum. The bank guarantee to be only Rs10 per ton of coal to be mined for blocks in category (ii) (d) above. (4.26 iii)
 - e) One half of the bank guarantee to be encashed on a pro rata basis if production falls below the guaranteed production by the end of the 11th Plan. The remaining 50% of the bank guarantee to be encashed (on a pro rata basis) if the end use project not realized as proposed in the application. Bank guarantees to be released on a pro rata basis if the targets are met. In the event that the mine is never established,

the full guarantee must be encashed and the assigned block must revert back to Government of India. (4.26 iii)

- f) As a contingent measure, in case the end- use industry does not materialize for any reason the allottee should then convert his status to that of a lessee who produces on behalf of CIL/SCCL. In case the allottee is unable to produce coal, as per the plan, the bank guarantee would be encashed as laid out in (e) above. Further, the Bank Guarantee for not putting up the end use project would be encashed in full. (4.26 iii)
- g) In case of multiple applicants for the same block, the Screening Committee should base its decision on a point system based on net worth and technical expertise/experience. In case of a tie, the speed of bringing a mine into production should be considered. As a last resort the level of guarantee offered above the minimum required could be used for selection among competing applicants. (4.26 iii)
- h) Small and isolated deposits under category (ii) (d) above should now be opened up for exploitation by anyone who comes up with a proposal to supply the coal locally as a lessee of Coal India. Terms of such leases to be negotiated individually but the minimum criteria detailed above must be followed. These blocks can also be given for captive/group-captive use of small end users such as the brick and ceramic industry. If more than one application is filed, for the same block, preference could be given for those who are representatives of user associations like small-scale industry association, pottery manufacturing association or even brick kiln owners' association. (4.26 iii)
- i) Coal from blocks under (ii) (d) above need not be subject to any price controls and the administrative arrangements for allotting such coal blocks should be streamlined with powers delegated to a smaller sub-group of the Screening Committee. (4.26 iii)
- j) Group captive mines must be permitted for all categories of blocks identified in (ii) above. (4.26 iii)
- k) CMPDI must be made an autonomous body with powers to independently hire sub-contractors or bid out exploration work so as to enhance its drilling capacity from 3 lakh meters per annum to 10 lakh meters per annum by the end of the 11th Plan. A list of recognized domestic and foreign contractors can be developed to enhance the number of players in the field of detailed exploration in India. (4.26 iii)
- l) Incidental production from captive blocks during mine development or periodic surpluses during mine operation must be sold to CIL/SCCL

at a negotiated price with a band of plus or minus 10% of the CIL price for the same quality of coal. Alternatively, Coal India could auction such coal from captive mines through its e-auction platform for a handling fee of 1% of the value realized. (4.26 iii)

The level of attention given and encouragement extended to captive coal mining will decide whether domestic coal will remain the primary source of energy supply in India. Developing domestic coal resources and successfully extracting this primary energy resource is critical to India's energy security and sustained growth. Hence, captive coal mining is of utmost importance. (4.27)

Coal prices would need to be regulated in light of the above market realities. Further, the regulation of coal price has to differentiate the pricing of coal for power generation since it consumes 80% of the domestic production and the quality of coal it consumes is not easily salable to the steel and cement sectors. Further, the power sector has to be serviced with long-term contracts and special investments in transport. There is need for long-term supply and price contracts between the power and coal industry that involve the critical third party namely the Railways. (5.9)

The recommendation of the Fuel policy Committee made in 1975 and accepted by the GOI is valid even today. FPC 1975 states "From the national point of view, the fuel prices should ensure that the pattern of use of fuels is in keeping with the optimal pattern of production determined with reference to the long-term availability of fuels and their costs." (5.15 i)

Import parity price could increase dependence on imported coal, as many Indian consumers may prefer imported coal. This may aggravate India's energy security concerns. (5.15 ii)

It is reasonable to have special price and supply arrangement for the power sector which will keep Indian industrial production globally competitive and provide electricity at affordable cost to the poor. For convenience the power sector may be called a Class 'A' consumer. All other consumers of coal may be called Class 'B' consumers. To begin with class 'A' consumers would include power utilities and captive power plants. (5.16)

The coal requirements of Class 'A' consumers should be supplied at prices determined strictly on a cost-to-produce basis subject to certain efficiency norms and allowing a rate of return in keeping with the other energy supply industries like electricity. Until the setting up of a Regulatory mechanism or other arrangements for coal price determination, the MOC on the basis of periodic price studies can fix this price. A tripartite agreement involving coal supplier, coal consumer and the transporter called the Fuel Supply & Transport Agreements. Every year on the basis of the production plans of public sector and private coal mines Government

would decide the quantity of coal out of the total production which should be earmarked for supply to Class 'A' consumers. The remaining coal production in the country should be sold to Class 'B' consumers on the following basis : the larger coal consumers including associations of consumers with minimal demand of 1 lakh tones per year can be given 60% of their need under FSTA at a price indexed to e-auction price. The remaining quantity required by these consumers and all other smaller consumers could get their needs through tragers/import or e-auction. For this method to succeed at least 10% of the total domestic production must be sold in the open market through e-auction in the first year. The amount of coal made available for e-auctions can rise to a minimum of 20% of the domestic production by the third year. Simultaneously, the power utility sector should be asked to set up coastal generating stations along the Western Coast of India and South Tamilnadu based on imported coal. This will lower the dependence of domestic power utilities on domestic coal, thereby making it possible, over time to raise the quantity of coal being sold in the open market through e-auctions to 25% and even 30%. If during the transition the requirements of the Class 'A' consumers as a group or as individual consumer within the group get an allocation which is below the projected demand for the year, the industry should, individually or collectively, arrange to import the extra requirements. (5.17)

The above gradual approach spread over three years to reach 20% of domestic production and possibly 5-7 years to reach 30% of local production being sold through e-auctions recognizes that it is necessary that the distribution and pricing of coal should be gradually moved from the current practices to the desired final stage set out above. The procedures of auction and the quantities to be auctioned during the year with the monthly break up of the quantities and the possible locations from which the coal is likely to be offered should be published in advance of the year and revised once in three months. (5.18)

The recommendations towards liberalizing captive coal mine allocations, totally deregulating production from small mines, and imports by major users like NTPC are encouraged, the coal shortage could be completely remedied in 4-5 years. Further, in keeping with India's size of deposits and the level of production/consumption India's coal sector should integrate more closely with the world coal market for a competitive coal industry to develop. To keep the import option functioning efficiently as an essential supply option along with the regulation of price in the Indian coal industry which will ensure least cost supply of coal for power generation while allowing a competitive and transparent coal market to supply the needs of other consumers. These recommendations are conceived as a package and they should all be implemented simultaneously starting with the year 2006-07. (5.19)

Three measures are urgently required concerned with Railways :

- a) The Railways, Coal and Power Ministry have to work together to draw up a well-conceived model of Fuel Supply and Transport Agreement

- (FSTA). GOI should ensure that all the concerned Ministries and agencies accept the FSTA and perform as per its provisions.
- b) The Railway tariff for coal should be subject to a detailed review by an independent agency, preferably headed by a High/Supreme Court Judge.
 - c) The Railways should in consultation with Planning Commission and the ministries of coal and power determine the main corridors through which coal would move in very large quantities to power plants and examine the cost and feasibility of setting up dedicated trunk-routes for coal transport. The exercise can also consider the possibilities of using multimode of coal transport involving rail-cum-coastal shipping and the use of double decker freight trains. This exercise should be taken up immediately to enable a decision on this investment in the early years of the XI plan. (5.20)

The concern for Climate-change implications on account of increased coal use in India at the current stage is somewhat premature. Having said this, India must take up various measures of reducing the pollution impact of coal use by developing and adopting all appropriate emerging clean-coal technologies including carbon sequestration whenever found economically viable. (5.21)

Introduction

1.1 Considering the growing importance of coal production to support the fast growing power generation industry and the need to bring about result oriented changes in coal mining sector, Government of India have appointed a seven member Expert Committee to prepare a **comprehensive road map for the modernization of the Coal Sector**. The Committee was assigned the task of considering the recommendations of the Committees which have earlier examined the issues relating to the Coal industry, the reports prepared by professional bodies and technical institutions on reforms required in the Coal mining sectors, and making their own enquiry into the relevant issues and to make recommendations towards a result oriented reform roadmap. Important among the earlier reports examined by the Committee are:

- 1) Report of the Committee on Integrated Coal Policy (Chari Committee) – Planning Commission – May 1996.
- 2) Review of Regulatory Frame Work in Coal Industry of India – Final Report by Tata Energy Research Institute (TERI) / International Mining Consultants (IMC) – March 2000,
- 3) Formulation of Corporate Plan of Coal India Limited – Prepared by KPMG – October 2002.
- 4) Presentation of Energy Security made by the Department of Coal to Committee on Infrastructure of Planning Commission – 14th September 2004.

1.2 The Expert Committee comprises:

1. Shri T L Sankar, Adviser – Energy Group, Administrative Staff College of India, Chairman
2. Dr J J Irani, Director, Tata Sons Limited
3. Shri P K Sengupta, former Chairman CIL (Coal India Ltd.)

4. Shri S K Mahajan, Former Joint Adviser (Project Appraisal & Monitoring Div.), Planning Commission
5. Shri P V Sridharan, Senior Visiting Fellow, TERI
6. Shri Surya P Sethi, Advisor (Energy), Planning Commission of India
7. Shri Pradeep Kumar, Additional Secretary, MOC- Member Secretary of the Committee.

Shri Shashi Kumar, Chairman, Coal India Limited was a permanent Invitee and attended all the meetings of the Committee.

The order of the Government constituting the Committee with the Terms of Reference is in Annexure – I. The terms of reference as spelt out in the order are:

- i) Measures for meeting the demand–supply gap in Coal in the short, medium and long-term.
- ii) How to improve productivity of man and machinery in the Indian coal sector, particularly in Coal India Limited.
- iii) Introduction of cutting edge technology in the coal sector
- iv) How to convert CMPDIL into a Center of Excellence for planning and research in the coal sector and restructuring of CIL to make it a World class company.
- v) Other matters that the Committee may consider important for the general improvement in the functioning of the coal sector
- vi) Examining the merits of opening up trading in coal,
- vii) Examining the current policy of providing captive mining and considering the recommendations which might reduce the demand – supply gap.

1.3 The Expert Committee has so far had 10 formal meetings. The previous reports and relevant documents were considered. The Committee also took note of other reports which became available after the constitution of the Committee, such as the "Vision Coal 2025" Report of CIL/CMPDI. The Committee decided to meet various stakeholders directly and, as and when the need arose to invite experts during their deliberations. An advertisement was also inserted in the newspapers to invite suggestions from interested members of the public at large. In response, a number of suggestions and recommendations have been received as a consequence which were also considered by the Committee. The Committee has met and had presentations and deliberations with the major producers of coal such as Coal India Limited, Singareni Collieries Company Limited and Neyveli Lignite Corporation, the major consumers of coal in the power (NTPC), steel and cement industry and minor

consumers of coal of the Indian Coal Merchants' Association, All India Brick and Tiles Manufacturer's Association, Hathras Zila Brick Kiln, Khurja Pottery Manufacturer's Association etc. The Committee had useful exchange of ideas with the representatives of the workers and trade unions. The Committee heard the presentations of equipment suppliers, washery operators and resource/exploration organization like CMPDIL, MECL, IBM and GSI. The Committee had useful exchange of views with the Representatives of the Officers Associations of Coal industries. The Committee had purposeful discussions with the senior officials of the ministries of Coal, Power and Environment on several occasions during the discussions and preparation of this Report.

- 1.4 The Committee, after its meetings decided to delay the consideration of the immediate issue of bridging the demand-supply gap as the Planning Commission was at the same time making the Mid-Term Assessment (MTA) of the Tenth Five Year Plan and the Committee decided to benefit from the findings of the MTA regarding the Coal sector performance and the role assigned to it in the remaining period of Tenth Plan. After the receipt of the MTA the Committee commenced its work in right earnest.
- 1.5 A careful consideration of the scope of the Report as set out in the TOR revealed that some of the terms were of immediate relevance while the others had long-term implications. The Committee felt that it would be desirable to submit its Report in two parts with PART-I dealing with the short to medium term issues and PART-II dealing with the rest. For the purposes of this Report, the Committee has decided to divide its recommendations for the short and medium term and long term into the two parts of the Report. The medium term covering upto 2011-12 i.e., the end of Eleventh Plan would be covered in Part One of the Report and anything beyond the end of Eleventh Plan would fall in the long term and would be covered in Part Two of the Report.
- 1.6 Part – I report attempts to cover three major terms of reference as set out below:
 - i) Reassess critically the demand-supply gap and make recommendations for meeting the demand-supply gap in the short term (upto 2006-07) and also the medium term (upto 2011-12) as indicated in the ToR.
 - ii) Captive mining: Examining the Current policy of providing captive mining and considering the recommendations, which might reduce the demand – supply gap.

- iii) Examining the merits of opening up trading in coal including the examination of the current e-auction procedures.

1.7 Part-I Report would mainly address the issues of increasing the availability of coal in the short to medium-term and bridge the gap between demand and supply. For this, the projected requirement has been re-assessed in detail and also the production plans and strategies on the ground given by the major producers have been assessed. It was felt that the role of captive coal producers would be quite important and captive mining could take root and contribute significantly in the short to medium term. Therefore, a separate chapter has been included on Captive Mining in the Part-I Report. The Committee has also found that the procedures of getting the various approvals and permissions for the grant of a block or the commencement of mining operations in a block allotted to public or private sector are time-consuming and lead to avoidable delays in coal production. The Committee has included a brief analysis of the environment related issues and has made some recommendations which would help to expedite the grant of environmental clearances without any deviation from the spirit of the law and policies for environmental protection. Even with the implementation of all the recommendations regarding increasing coal production and encouraging Captive coal mining, the available coal supply would be short of demand and the gap has to be filled by import of coal in 2006-07. The Part-I Report therefore has examined the issues relevant to encourage coal imports. The analysis of these issues has led the Committee to the conclusion that all further reform and restructuring as well as bridging the short to medium term gap between demand and supply would strongly depend on rationalizing the principles and procedures of determining the price of coal to different users of coal. The Part-I Report therefore covers these issues in detail. The resultant gap between the demand and supply has been consequently reassessed based on the ground realities and presented in this Part – I Report.

1.8 Coal occurs in nature in three basic forms, namely: (a) Anthracite with highest carbon content and very little moisture, (b) Sub-bituminous to bituminous black hard coal with wide range of calorific values depending upon fixed carbon, ash and moisture content of coal and (c) largely low calorific value fuel known as lignite or brown or soft coal. Anthracite is neither produced nor consumed in the country in significant amounts. The country produces mainly hard sub-bituminous steam and metallurgical coals largely through two public sector companies, Coal India Limited (CIL) and Singareni Collieries Company Ltd (SCCL). Some hard coal is also produced by

TISCO, IISCO, DVC and some private producers. The hard coal is used in diverse industries such as power, steel, cement and other industries such as paper, textiles, the brick kiln and ceramic industries etc. Lignite is produced by Neyveli Lignite Corporation (NLC), a public sector undertaking and, in small quantities, by some private producers mainly for power generation in Tamil Nadu, Gujarat and Rajasthan. Small quantities of lignite are also used in industry and households in the form of Leco (Low temperature carbonized fuel). Total lignite output is less than 7% of hard coal production in the country and taking into account the calorific value of lignite, its contribution to domestic fuel supply in the form of coal in the country is under 5% of total coal based primary energy.

- 1.9 Part-I of the Report concentrates on the hard coal. Lignite is currently a captive industry feeding power generation by the same company and its demand is, thus, limited to the need of the power plant it feeds. Given its low calorific value, lignite is likely to remain a captive energy resource for pit head power plants. Part I of the Report focuses on hard coal because: (a) it accounts for over 95% of the coal-based primary energy supply; (b) it faces a serious demand-supply imbalance; and (c) the hard coal market is characterized by major entry barriers, a monopolistic pricing regime, negligible amounts of trading, a constrained and monopolistic domestic transport infrastructure and a highly limited import infrastructure. The Committee would deal with the Lignite industry in Part-II of the Report.
- 1.10 It is hoped the recommendations contained in the Interim Report would assist the policy makers to set in motion, result oriented quick yielding measures towards improving the availability of coal and thereby reducing the demand supply gap as early as possible in the short to medium term.

Coal Industry in India – Status and Structure

History of Coal Industry in India

- 2.1 Coal is the primary source of supply of commercial energy in India. Of the four major fuel sources – oil, natural gas, coal, and uranium – Coal has the largest domestic reserve base and the largest share of India's energy production and consumption. Some 55% of the current commercial energy use is met by coal. Coal is directly used for providing heat energy in railways, industries and households and as a reducing agent in some industries. It is also used to produce another form of energy, namely electricity. Over the years the use of coal has been reducing significantly and has become almost negligible in railways and marginal in households relative to the use of coal for power generation.
- 2.2 Mining of coal in small pockets in India began early in the year 1774. However, with the advent of steam locomotives in the year 1853, the production of coal slowly increased to an annual level of slightly more than 6 million tonnes at the beginning of the twentieth century and stagnated at that level. There was a sudden rise in coal production at the end of the First World War and the production reached a level of about 22.4 million tonnes in 1919. India was producing 33 million tonnes at the beginning of the First Five Year Plan (1951). Initially, the railways, was the main consumer; subsequently, as the steel industry grew, thrust was given to exploitation of the coking coal reserves in the Jharia coalfields. Coal resources are of two distinctly different categories, coking and non-coking (also referred to as thermal/steam coal). Our resources of Coking Coal used in steel and other metallurgical industries are meager and of relatively poor quality. In comparison, high ash, low sulphur and low calorific value non-coking coal resources, which are best suited for thermal power generation, exist in fairly abundant quantities. Helped by the high growth rate of thermal power generation, the power sector has now emerged as the major consumer of coal with coal for metallurgical sector coming

next, followed by other industries. Coal consumption in the railways and domestic sector has become insignificant.

- 2.3 In keeping with the Government policies in force in the 1970s, the Central Government took a decision to nationalize the private coalmines. The nationalization was done in two phases; the first with the coking coalmines in 1971-72 and then with the non-coking coalmines in 1973. In October 1971, the Coking Coal Mines (Emergency Provisions) Act, 1971 provided for taking over, in the public interest, the management of coking coal mines and coke oven plants pending nationalization. This was followed by the Coking Coal Mines (Nationalization) Act, 1972 under which the coking coal mines and the coke oven plants other than those with the Tata Iron & Steel Company Limited and Indian Iron & Steel Company Limited, were nationalized on 1.5.1972 and brought under the Bharat Coking Coal Limited (BCCL), a new Central Government Undertaking. Another enactment, namely the Coal Mines (Taking Over of Management) Act, 1973, extended the right of the Government of India to take over the management of the coking and non-coking coalmines in seven States including the coking coalmines taken over in 1971. This was followed by the nationalization of all these mines on 1.5.1973 with the enactment of the Coal Mines (Nationalization) Act, 1973.
- 2.4 In 1947, India was producing a little over 30 million tonnes of coal only. Successive Five-Year Plans of India gave importance to increasing our coal production and implemented several legal and institutional changes in coal industry. By the end of the 1960s, Coal production from a large number of big and small coal mines, largely from the then privately-owned mines, had reached around 60 million tonnes. However during the later years of the sixties, prior to nationalization, the coal industry faced a slowing of demand due to low price of petroleum products. With a view to analyzing the causes and to suggest a comprehensive energy policy for the country the Fuel Policy Committee (FPC) was set up in 1970. The FPC made a comprehensive analysis of the energy sector and concluded beyond any reasonable doubt that coal should be considered the primary source of energy for the country and recommended the use of coal in preference to oil products on grounds of economics and energy security. Following this, the succeeding Five-Year plans reiterated the pre-eminence of coal in the energy supply arrangements, set out the arrangements for matching demand and supply and maximizing production of indigenous coal, both coking and non-coking. Attention was also given to effective environmental management policies and plans and the improvement in the

productivity of mines. The production plans, annual plan targets for non-coking coal and the resource allocation from government to the two coal companies got linked to the performance of the power sector, the planned power generation targets in successive plans and the level of performance of power plants, as measured by the Plant Load Factor (PLF). The Committee finds that the lack of a long term vision for coal development and linking the fortunes of coal industry almost exclusively to the power sector performance in India, in spite of the categorical recommendations for a distinct coal policy in the Fuel Policy Committee 1975 and the Report of the Working Group on Energy 1979, has affected the healthy and optimal growth of the coal sector. As this is primarily responsible for the present critical shortage of coal, the Committee would like to emphasize again the need to explicitly set out a Coal Policy as part of the Integrated Energy Policy for India.

Present Status - Organisation

- 2.5 Following the enactment of the Nationalization Acts, the coal industry was reorganized into two major public sector companies, namely Coal India Limited (CIL) which owns and manages all the old Government-owned mines of National Coal Development Corporation (NCDC) and the nationalized private mines and Singreni Colliery Company Limited (SCCL) which was in existence under the ownership and management of Andhra Pradesh State Government at the time of the nationalization. Coal India Limited CIL is a holding company and has the following seven production subsidiaries and an eighth subsidiary (CMPDI) that provides technical support to the seven production subsidiaries:
- i) Bharat Coking Coal Limited (BCCL)
 - ii) Eastern Coalfields Limited (ECL)
 - iii) Central Coalfields Limited (CCL)
 - iv) Northern Coalfields Limited (NCL)
 - v) Western Coalfields Limited (WCL)
 - vi) South -Eastern Coalfields Limited (SECL)
 - vii) Mahanadi Coalfields Limited (MCL)
 - viii) Central Mine Planning & Design Institute Limited (CMPDI)
- 2.6 Under the provisions of the Coal Mines (Nationalization) Act 1973 only public sector companies can mine coal. Further, in 1976 and subsequently in 1993 additional provisions were enacted to allow coal mining for captive end-use for steel, power, cement and to permit the exploitation of isolated small patches of agencies approved by State Governments. The coalmines operated by the Tata Steels and Indian Iron &

Steel Company were allowed to remain as non-government coal producers even under the Nationalization Act (IISCO was subsequently nationalised in 1975-76 whereby TISCO was left as the only non-governmental coal producer). The share of production from the non Public Sector Coal mines has remained small. The production build-up under different ownership is given in Table 2.1 below:

Table - 2.1
Production of Coal (Ownership wise) 1970-2004

(In Million Tonnes)

	1970-71	1980-81	1990-91	1995-96	2000-2001	2004-05
CIL	17.85*	100.86	189.68	237.27	268.14	323.58
SCCL		10.10	17.71	26.77	30.27	35.30
TISCO/IISCO/ DVC/ Private/Captive Mines	55.10	3.05	6.47	9.38	15.29	23.74
Total	72.95	114.01	213.86	273.42	313.70	382.62

* NCDC and SCCL only

Present Status – Coal Production

- 2.7 The economic liberalization policies and programs, which commenced in 1991 in India, had no impact on the Coal Industry. Coal Industry continued substantially unchanged in spite of the captive mining being permitted for specified industries. It is however, noteworthy that the industry, in spite of its limitations, was able to deliver the total quantities of coal as per the year-wise action plan targets fixed in the VIIIth, IXth and Xth Plan periods, though there were shortcomings in terms of timely delivery and quality of coal. Since the Eighth Plan, coal production has met the targets set even though the power sector capacity addition fell well short of targets. (see Table 2.2 for details)

Table - 2.2

Coal Production and Power Generation Capacity-Targets and Achievements

Terminal Year Of Plan Periods	Annual Plan Production Targets, Million Tonnes	Action Coal Million	Coal production achieved Million Tonnes	Coal based thermal Capacity addition target in MW	Actual Thermal Capacity addition achieved in MW
VIII-1996-97	288.65		289.32	21840	9688
IX-2001-02	322.73		327.65	14691	7109
X-2006-07	424.27		430.00*	18308	14,845*

* likely

- 2.8 Coal has been recognized as the most important fuel source for thermal power generation in India. About 75% of the total coal consumed in the country and some 80% of the domestic production is used for power generation. In addition, other industries like steel, cement, fertilizers, chemicals, paper and thousands of medium and small-scale industries are also dependent on coal for their process and energy requirements. In the transport sector, though direct consumption of coal by the Railways has become almost negligible on account of phasing out of steam locomotives, the energy requirement for electric traction is still dependent on coal converted into electric power.
- 2.9 Coal production from underground mines has either stagnated or declined despite significant investments aimed at improving the technology and the working conditions in these mines. Despite this it has been possible to raise the production of coal from a level of about 70 million tonnes at the time of nationalization of coalmines in early 1970's to 383 million tonnes (provisional) in 2004-05. This has been possible primarily because of a strategy of developing large open cast mines. The increase in production has been achieved almost entirely by the two public sector companies operating in the coal sector. The increase in production has come almost entirely from non-coking coal and the production of coking coal has declined despite heavy investments in coking coal mines and coking coal washeries. These coking coal washeries have remained under utilized and while attempts have been made to convert some of these washeries for washing non-coking coal, the yields have remained low and operations have remained sub-optimal resulting in high cost of washed coal. The quality of washed coking coal supplied to steel plants by the BCCL and CCL coking coal washeries has been inconsistent and has deteriorated over time with poorer grade of raw coal being produced from lower seams of Jharia and West Bokaro coalfields which are the two primary sources of coking coal in India. The quality of thermal coal produced has also gone down significantly partly due to inherently inferior grades of coal being available from the coalfields of MCL, SECL and NCL which have contributed the most towards increased production and partly due to the fact that the entire additional production has come from large scale open cast mining undertaken since nationalization. Another reason for the fall in quality of Indian coal has been the absence of any incentive to apply grade control techniques in the mines because of very wide calorific value bands adopted in India in the grading of coal.

2.10 The stagnation/decline in the production of coal from underground mines despite heavy investments can be ascribed to several reasons, the chief among them being unsuccessful introduction of highly productive longwall technology in several Indian underground coalmines in the 1980s. The failure of longwall technology was partly due to inadequate exploration and geotechnical investigations of coal horizons, roof and floor rocks and partly due to the foreign equipment supplier not matching the equipment with ground conditions. An operational reason for the failure of longwall technology had to do with the high cost of equipment for which India remained entirely import dependent and the consequent loss of control on timely supply of spares and repair services. The inability to successfully apply longwall technology has made it difficult to economically extract coal reserves below 300 to 400 meters. Using other technologies to extract these deeper reserves sharply reduces reserve recovery ratio. Mechanization of underground coal mines adopting Board and Pillar technology using **Load Haul Dumpers (LHDs) and Side Discharge Loaders (SDLs)** has also been less than successful with below par productivities of machines being achieved on average. Use of more productive and efficient continuous miners has been tried in a few Indian coalmines only in the last few years with encouraging results. Continued neglect of underground mining would lead to severe imbalance as the coal production would sharply get reduced once the 'open castable' reserves get exhausted. Moreover, open cast mines are being designed to extract thicker seams in the shallow in-crop areas. As a result, coal reserves available in relatively thinner and deeper seams might be lost especially if external OB dumps are sited on such "deep seated" coal bearing areas. Though the domestic coal producers have been able to meet the production targets of thermal coal in quantitative terms to a reasonable extent, quality of Indian coal has been dropping and there has been reluctance on the part of the coal producers to prepare the coal as per the specifications required by the consumers – which is a standard practice in the rest of the world. Consumers, however, had made arrangement with the private sector to take up beneficiation of thermal coal in the last few years. The current washery throughput capacity is nearly 73 million tonnes of thermal coal. The share of public sector in washed coal is only about 20% sourced primarily from coking coal washeries, which have been converted for use in washing of non-coking coal.

Trends in Sector-wise Coal Consumption

2.11 The thermal power generation programme covering utilities and captive plants primarily drives the growth in coal demand. Table 2.3 below details the pattern of

coal consumption for different end uses over the years. The demand for the metallurgical sector has been increasingly met through imports of high grade coking coal while some 80% of domestic production has been used to meet thermal power generation needs.

Table - 2.3
Sector-wise Trend in Coal Consumption

(Million Tonnes)								
Sl. No.	Consuming Sector	1970-71	1980-81	1990-91	1995-96	2000-01	2004-05	2006-07**
1	Steel & Coke Ovens	13.5	22.4	30.5	35.1	28.8	29.06	42.70
2	Power (Utilities)	13.2	36.7	116.7 (2.07)	184.5	237.0 (2.49)	280.75 (1.48)	322.00
3	Power (Captive)	*	*	14.0	15.7 (2.03)	16.0 (1.26)	23.88 (1.71)	28.26
4	Fertilizer	*	2.3	3.9	4.28	3.2	2.51	3.52
5	Cement	3.5	4.8	9.7	11.13	14.7	14.84	25.40
6	Railways	15.6	11.9	5.2	0.27	-	-	-
7	Domestic (soft coke)	4.1	1.3	1.3	0.33	0.004	-	0.20
8	Other industries	21.8	30.3	30.7	28.78	40.35	28.31	49.60
TOTAL:		71.7	109.7	210.1	279.73 (4.36)	340.54 (3.75)	379.35 (3.19)	473.18

Note: Number in brackets indicates use of middlings.

- * Included in other industries ** Mid-Term Review of X Plan

2.12 India has very limited resources of coking coal. Much of this coking coal is of poor quality with high ash content and is difficult to wash. The washed coal (with ash content in the range of 18% to 20%) obtained from high ash raw Indian coking coal needs to be blended with low ash imported washed coal (with ash content below 10% to 12%) for achieving reasonable performance of blast furnaces of the steel plants. Despite the huge domestic iron ore reserves, the Indian steel industry's growth was constrained in the past due to coking coal shortages. Steel producers have thus supplemented domestic production of coking coal with direct imports. Tata Steel and Indian Iron & Steel Company (IISCO) have captive mines and washeries to partially meet their coking coal demand from domestic coal. The steel industry (SAIL, RINL, Neelachal Ispat etc.) do not have captive mines and rely on BCCL, CCL and WCL for their indigenous coking coal supplies. The production of raw coking coal and imported washed coking coal are given in the Table 2.4 below:

Table - 2.4
Coking Coal Production and Imports

Terminal Year Of Plan Periods	Production of raw coking coal Million Tonnes	Imports of washed coking coal Million Tonnes
V-1978-79	29.67	0.14
VI-1984-85	36.06	0.54
VII-1989-90	43.82	4.83
VIII-1996-97	40.54	13.1
IX-2001-02	28.66	20.9
X-2006-07	20.53	24.19

Note: Source Energy 2003 (CMIE) Report

- 2.13 Prime coking coal occurs only in the upper coal seams of Jharia coalfield and the total resource is extremely limited. This forced the Integrated Steel Plants (ISPs)) to use larger quantities of medium coking coal from West Bokaro and other coalfields in the coal blend used in their coke oven batteries. However, increased use of medium coking coal in the blend resulted in lowering the strength of the hard coke produced in conventional coke oven plants and this was detrimental to optimal blast furnace operations. TISCO adopted stamp charging technology in the new coke oven batteries replacing the old conventional batteries in its Jamshedpur plant to successfully augment the strength of hard coke using a blend of domestic high and medium coking coal supplemented by use of imported coking coal in limited quantities. SAIL on the other hand adopted the Partial Briquetting of Coal Charge (PBCC) technology and Tall Coke Ovens Battery technology in the Bhilai Steel Plant and increased the use of imported coking coal in the coal blend to overcome the same problem. RINL has also adopted tall coke ovens technology and maximum use of imported coking coal in the blend. The shift to the stamp charging technology by SAIL and RINL by conversion of conventional/tall coke ovens batteries appears to be uneconomic. As such the scope for increased use of the more abundantly available indigenous medium coking coal, is rather limited (till new steel plants are set up with the advanced coke oven batteries).
- 2.14 Steel producers are also increasingly adopting Coal Dust Injection and Oxygen Enrichment technologies in their blast furnaces to further reduce coking coal

requirements of the steel plants. Superior quality of non-coking coal is used for coal dust injection.

- 2.15 Another offshoot of the limited domestic availability of coking coal has been the development of scrap/sponge iron based mini steel industry using Electric Arc Furnace technology for steel making. The Corex technology, which provides yet another option for steel making has been deployed by Jindal in one of its units. Both these technologies avoid use of coking coal altogether and use gas or thermal coal instead. While directly and indirectly contributing to the increased use of thermal coal in the steel industry, these technologies have succeeded in reducing the demand for coking coal by the steel sector.
- 2.16 Prior to the liberalization of economy in the 1990s, Integrated Steel Plants were required to produce pig iron for use in foundries and the additional hot metal required for making pig iron needed additional quantities of coking coal. Now mini blast furnaces have been set up in the country to produce pig iron required by foundries supplemented by imports of pig iron which has also been liberalized. Most of these mini blast furnaces are using imported metallurgical coke to support their pig iron production. Even integrated steel plants like RINL have begun to import metallurgical coke to meet part of their coke requirements. Nearly 4 mt of metallurgical coke equivalent to 5.5 mt of washed coking coal and more than 11 mt of raw coking coal of indigenous quality is planned to be imported in 2005-06. However, this has not been included in the estimates of coking coal demand by the steel industry.
- 2.17 As a result of the measures taken by iron and steel industry and the import of metallurgical coke, the stated coking coal requirements have been reduced to less than 9% of domestic coal production.
- 2.18 The third largest bulk consumer of coal is the cement industry. However, the specific consumption of thermal coal for production of cement has reduced significantly because of the switch to the dry process, efficiency improvements in cement kilns and the increased use of fly ash produced in power plants and granulated slag produced in blast furnaces of steel plants in the production of cement. Thus, despite the fact that cement production in the country has increased from 18.6 million tons to 123.4 million tons in the last 25 years, its coal requirement has only grown from around 5.0 million tons to 18.5 million tons and currently accounts for less than 5% of the domestic coal production..

Overview of the Future Demand for Coal

- 2.19 The key determinants of the long term demand for coal are the total demand for electricity, the share of electricity generation based on coal (both utilities and captive), the competitiveness, and hence the domestic production, of steel and cement to meet domestic and export demand. Further, the relative prices of different fuels, which could be used for thermal power generation, namely Indian coal, imported coal and natural gas would also determine the long-term demand for domestic coal. Other industries using coal have only a marginal impact on the long term demand for coal as they are relatively small players and can resort to alternative fuels such as residual oil or low sulphur heavy stock. Another element that impacts the total coal demand is the demand from the unorganized small scale sector comprising primarily of the brick and ceramic industry. The demand by this small and unorganized sector is relatively large though infirm as these small and unorganized users switch between coal, fuel wood and biomass depending on their relative prices and the availability of coal in the gray market.
- 2.20 Based on current indications, it can be said that coal shall remain India's most competitive fuel choice for power generation over the next 25-50 years. Further, unless rail freights for hauling coal drop significantly, the poor quality Indian coal would find it difficult to compete with imported high quality coal consumed at coastal locations along India's Western coast and Southern coast of Tamil Nadu. The competitiveness of Indian coal could improve further if the commercial viability of in situ coal gasification is established bringing down cost of extracting and transporting energy from Indian coal. Finally, the demand for Indian coal could rise if coal to oil conversion becomes economically viable for Indian coals. This needs to be given serious consideration since Indian coals are qualitatively similar to South African coals for which techno economic feasibility of coal to oil conversion has already been successfully demonstrated.
- 2.21 The Integrated Energy Policy Committee set up by the Planning Commission has recently made an assessment of the requirements of coal under a variety of scenarios using a multi-sectoral, multi-period optimizing linear programming model. The Committee considers these estimates to be a good basis for projecting the long-term coal requirements till 2031-32 under three alternative scenarios, namely, (a)

coal dominant with maximum coal based power generation, (b) reference level forecast emphasizing maximum development of Hydro, nuclear and gas based power generation and (c) low coal scenario maximizing efficiency and renewables on top of reference level forecast. The projected fuel mix based on these three scenarios is presented in Table 2.5 below. The fuel mix is estimated in MTOE (million tonnes of oil equivalent). In physical units the coal demand in 2031-32 under the three scenarios would work out to 2.02 billion tonnes in reference level forecast, 2.7 billion tonnes in the coal dominant scenario and only 1.4 billion under low coal scenario assuming a calorific value of 4000 kcal/kg for Indian coal. It is to be noted that these coal requirements include lignite consumption which would constitute about 2% to 3%% of the coal demand in energy terms.

2.22 It would be useful at this stage to take note of the two extreme scenarios of future demand for coal as projected in the integrated energy policy exercises. These two scenarios translate into a coal demand of 1.4 to 2.7 billion tons by 2031-32 with a calorific value of 4000 kcal/kg or 0.9 to 1.8 billion tons with a calorific value of 6000 kcal/kg. It is the considered opinion of the Integrated Energy Policy Committee that the most likely demand level is likely to be around two billion tones as set out under the reference Scenario in Table 2.5A.

Table - 2.5

India's Fuel Mix by 2031-32 Under Three Scenarios Projected By The Integrated Energy Policy Committee 2005

A. Reference Level Forecast emphasizing maximum development of Hydro, Nuclear and Gas based Power Generation								
Particulars	Unit	1	2	3	4	5	6	7
		2003-2004	2006-2007	2011-2012	2016-2017	2021-2022	2026-2027	2031-2032
Crude Oil	MTOE	119	137	164	211	272	364	464
Natural Gas		29	34	49	77	108	156	224
Coal		167	176	232	293	403	573	807
(MMT)		`(407)	`(439)	`(579)	`(734)	`(1008)	`(1434)	`(2018)
Hydro		7	19	24	31	38	44	49
Nuclear		5	4	14	29	44	66	89
Commercial Renewables		Neg	1	3	2	2	1	1
Total		327	370	485	643	867	1,204	1,633

MTOE =million tones of oil equivalent

B. Coal dominant scenario emphasizing maximum use of coal based power generation								
Particulars	Unit	1	2	3	4	5	6	7
		2003-2004	2006-2007	2011-2012	2016-2017	2021-2022	2026-2027	2031-2032
Crude Oil	MTOE	119	137	164	211	271	365	467
Natural Gas		29	34	41	51	65	86	114
Coal		167	179	261	369	533	765	1,082
(MMT)		`(407)	`(448)	`(652)	`(922)	`(1331)	`(1912)	`(2704)
Hydro		7	16	16	16	10	7	5
Nuclear		5	4	4	4	3	3	3
Commercial Renewables		Neg	1	3	2	2	2	1
Total		327	371	489	653	884	1,228	1,672

C. Low Coal Scenario emphasizing maximum development of renewables over reference level forecast								
Particulars	Unit	1	2	3	4	5	6	7
		2003-2004	2006-2007	2011-2012	2016-2017	2021-2022	2026-2027	2031-2032
Crude Oil	MTOE	119	134	153	188	237	304	406
Natural Gas		29	33	46	68	92	124	168
Coal		167	161	201	239	303	398	573
(MMT)		`(407)	`(393)	`(489)	`(582)	`(740)	`(970)	`(1398)
Hydro		7	19	24	31	38	44	50
Nuclear		5	4	14	29	44	66	89
Commercial Renewables		Neg	9	18	33	49	67	85
Total		327	361	456	587	764	1,002	1,370

Note: Figures in brackets represent coal demand in physical terms in million tonnes corresponding to coal demand estimated in MTOE

2.23 The above scenarios essentially illustrate that the annualized coal demand could grow from a low of about 4.7% to a high of 7.27% over the next 25 years to achieve a sustained GDP growth of 8% per annum. This compares with an annualized growth in consumption of 5.6 % over the previous 25 years for an average GDP growth of only 5.51 % per annum. The actual demand level will depend upon the availability of alternate fuels and their relative prices with gas being the most likely alternative for power generation. The actual demand would also be a function of the level of

success India achieves in hydro, nuclear and renewable power development. And finally, the final level of demand would depend upon the efficiency levels that India attains in energy extraction, energy conversion, energy transportation, energy distribution and energy end use.

- 2.24 In respect of the demand for power there is currently a view that in spite of its much higher cost, unpredictability of future supply and costs and the concerns relating to energy security, natural gas should be used more for power generation. This view essentially rests on the assumption that the coal production in India cannot be raised to meet demand effectively and that imported gas would be a better alternative to imported coal because of its lower environmental impact. This Committee does not share this view and would strongly urge that the domestic coal production should increase to meet all legitimate demands. Gas should compete with domestic and/or imported coal on economic considerations that incorporate externalities.

Over View of the Future - Availability of Coal

- 2.25 While the demand for coal and the production requirements in India are not high as compared to World Standards as in USA or China, there are conflicting views even among experts about the level of availability of coal. There is a view that our coal reserves are huge and we are likely to have more coal if we make exploration efforts. There are others who feel that the estimates are very broad generalization from inadequate exploration data and that the extractable reserve in the final analysis will be very modest. In spite of the very strong recommendation, in the first report on the Energy Policy for India namely the Report of the Fuel Policy Committee (1975), to take urgent efforts to launch a systematic exploration of the coal reserves so as to establish the extent of coal available on a reliable basis, the situation today in terms of our knowledge of coal has not improved. Therefore, the Committee felt that all the details of efforts made so far and the rationale of coal reserve estimates and classification should be explained comprehensively so that judgment could be made by the policy maker in an unbiased manner. This Section deals with the issue of our level of knowledge about the availability of coal reserves.
- 2.26 Under the current system of reporting coal resources of India, the reserves of Coal are classified into three categories based on the level of investigations conducted on the resources. Besides, there are estimates of prognosticated coal resources occurring in coal bearing areas which are yet to be systematically explored through

exploratory drilling and do not form part of the reserve base at present but would be included in the coal inventory only after systematic exploration is undertaken in these areas. Such resources are assessed through tools such as conventional geological mapping, air photo interpretation, satellite imagery etc.

- a) The Geological Survey of India (GSI) and Mineral Exploration Corporation (MEC) undertake prospecting in areas that could potentially have coal resources. Such prospecting is funded by the GOI. The rough estimate of the quantity of available coal made during such a survey, which is called Regional or Reconnaissance Geological survey, is categorized as Prognosticated Resources. As per the latest assessment 22,400 sq km area out of total surveyed area of 49,000 sq km have coal bearing sedimentary formations belonging to Gondwana Group and Tertiary formations. Out of this total potential coal bearing area of 22400 sq km, only about 10200 sq km or 45% has been systematically explored through regional/promotional drilling. In the remaining 12200 sq km area that is still to be systematically explored, prognosticated resources of 143 billion tonnes have been estimated by GSI and CMPDI. Additionally, there are 67 billion tonnes of coal resources occurring in the Tertiary Cambay basin of Gujarat encountered during exploration for oil and resources in other coalfields lying deeper than 1200 meters. These prognosticated resources do not form part of the inventory of Indian coal reserves.
- b) Of these potential coal-bearing areas identified by GSI, certain areas are selected by Coal Ministry/coal industry where coal deposits are likely to be more promising, and which occur at reasonable depths to allow economic extraction and the locations are close to the prospective demand centers. Wide spaced drilling is undertaken in these selected areas by GSI under its Regional Exploration programme funded by the Ministry of Mines or by CMPDI/GSI/MEC under Promotional Exploration Programme funded by Ministry of Coal through its own budget. Coal resources assessed under these exploration programmes are categorized as **Indicated Reserve** if the boreholes are drilled at a spacing of 1 km to 2 km and **Inferred Reserve** if the drill spacing is even wider but the selected areas are contiguous to the areas where Indicated reserves have been assessed. In the 10200 sq km area explored so far through Regional/Promotional Programmes a total of 248 billion tonnes of In-Place **Geological Coal Reserves** had been estimated upto 1200 meters depth as of 1/1/2005. The bulk of these reserves have been estimated to lie within 600 meters depth (230 billion tonnes).

In place coal reserves upto 600 meters depth are considered mineable with the technologies currently being deployed by coal producers. Further, some 152 billion tonnes (61.5% of total coal reserves) are estimated to exist within 300 metres depth and only these reserves are currently considered to be available for open cast mining. However, these numbers include the reserves already depleted due to mining and the reserves that cannot be mined due to surface or other geotechnical constraints as well as reserves that cannot be recovered due to the mining methods employed.

- c) For each plan period there is an attempt to forecast the demand for the next ten years. Based on these forecasts and the judgment of the coal companies, certain areas are identified for detailed drilling to define, more precisely, the lay and disposition of various coal seams and an assessment of the quality of coal available from various coal seams/horizons occurring in such areas. The reserves assessed on the basis of such detailed exploratory drilling (at drill spacing of less than 400 metres) are placed in the category of **Proved Reserves**. About 50% of the total 10200 sq km area explored through Regional/Promotional drilling or about 22.5% of the potential coal bearing area has been explored through detailed drilling. As a result of detailed drilling some 93 billion tonnes of in place reserves have been placed under the “Proved” category upto a depth of 1200 metres or 37.5% of total estimated coal reserves of 248 billion tonnes of all categories. These proven reserves include 91.5 billion tonnes up to a depth of 600 metres and 71 billion tonnes up to a depth of 300 metres. Some 70% of India’s proven reserves have been earmarked as CIL blocks. The detailed exploration is funded by the coal companies from internal resources. The GOI funds the detailed exploration in the non-CIL blocks. Currently detailed exploration is solely entrusted to CMPDI, a subsidiary of CIL. CMPDI’s capacity to carry out drilling is limited to 3 lakh metres per annum and at this rate of detailed exploration CMPDI can, at best, add about 2 billion tonnes of reserves annually to the proven category. Towards the end of the Ninth Plan CMPDI also started to undertake promotional drilling along with GSI and MEC and consequently the detailed drilling capacity has been reduced.

- 2.27 On the basis of Regional and Detailed Exploration carried out so far, the total inventory of coal reserves as on January 2005 as assessed by GSI is given in Table 2.6 below:

Table - 2.6
Depth wise Geological Coal Reserves as on 1.1.2005

Depth (m)	Proved (in Bt)	Indicated (In Bt)	Inferred (In Bt)	Total	
				(In Bt)	(In %)
0-300	71	66.5	15	152.5	61.5
300-600	6.5	39.5	17	63	25
0-600 (Jharia)	14	0.5	-	14.5	6
600-1200	1.5	10.5	6	18	7
Total	93	117	38	248	100
%	37.5	47	15.5	100	

2.28 Such categorization of geological reserves is based on Indian Standards Procedure (ISP) adopted in 1957 as per which coal reserves occurring in seams with a minimum thickness of 0.5 m are to be included in coal inventory. The ISP (1957) was modified in 1989 to henceforth exclude reserves in coal seams with thickness less than 0.9 m from coal inventory but the reserves estimated upto 1989 have apparently not been reassessed. However, minimum thickness of 1 m is assumed in the GRs prepared by CMPDI. Thus coal seams of less than 1 m thickness are not considered as workable and are excluded from the geological reserves of the block as given in the GR, thereby introducing certain distortion between the reserves included in the coal inventory and that estimated in the GRs. It is to be noted that seams with thickness of 0.5 m or more are considered as mineable in countries like USA, Canada and European Union as technologies appropriate for thin seam mining have been developed and are deployed for working such reserves.

2.29 ISP (1957) norm of 400 m drill spacing gives an average borehole density of 6-7 bh/km. It does not take into account the factor of geological complexity and heterogeneities characterizing the coal seams in the block. Moreover, all the boreholes drilled in the block may not intersect all the seams and certain boreholes may be drilled only for the delineation of in-crop area of coal seams and some boreholes may not be drilled to full depth to intersect all the seams due to technical reasons. As such overall borehole density may not be a proper index for defining proved reserves. It would be much better to ascertain seam-wise borehole density within and beyond the in-crop area for assessing adequacy of exploratory drilling for defining proved reserves. A truly scientific method would be to use statistical analysis for assessing the standard error of estimate of

thickness, area and specific gravity at 95% confidence level. A reserve is defined as proved if the standard error is less than 10%.

2.30 Based on its detailed drilling CMPDI prepares Geological Reports (GRs) for a blocked area after the results of Regional/Promotional drilling have been analysed which in turn forms the basis for planning and design of mines, preparation of mine plans and deciding the feasible mine capacity that can be sustained from the reserves in the block. The geological reserves (of all categories) occurring in a block are estimated within vertical boundaries of the block area upto a depth to which the block has been explored through detailed drilling (in case of Proved reserves) and through Regional/Promotional drilling (in case of Indicated and Inferred reserves; ideally this drilling should extend to the basement of the coal basin and not to an arbitrary depth in order to assess the total coal resources available in the basin)

2.31 It is a well-known fact that all the geological reserves are not mineable and all the mineable reserves are not extractable. The mineability and extractability of a deposit depends on the quality of coal, market price that it can fetch, extraction technology deployed, infrastructure available/required at the site and safety and environmental considerations. Factors determining the mineable and extractable reserves in a block from the available in place geological reserves are as follows:

- Certain mining losses are inevitable during mining (coal left in the roof or floor of coal seam in underground mines and in mining benches in open cast mines). There is also a possibility of some contamination of coal extracted from the seam with the waste rocks (stone) in its roof and/or floor which increases the quantity of coal mined but its quality gets diluted due to what is termed as “dilution factor”. Geological disturbances such as faults, dykes and sills etc. may also make certain reserves unavailable for mining. The net reserves available for mining in the block after taking into account mining losses and dilution factor are known as **Mineable Reserves**.
- Out of total area of the block certain area within the block boundary in which mining can actually be taken up is known as the Mine take area and is worked out after leaving certain barriers, if necessary, along block boundaries and along rivers and nallahs, railway line, transmission line or national/state highways passing through the block (unless these can be diverted or rerouted) or around villages/colonies (if these cannot be shifted). These surface constraints make certain coal reserves in the area outside the mine

take unavailable for mining. Such coal reserves effectively get sterilized unless strategies are adopted to reduce such loss of reserves through diversion of rivers/nallahs, realignment of rail track/highways and relocation of villages/colonies etc.

- Coal seams, more often than not, are quite heterogeneous in nature with the occurrence of “dirt bands” of varying thickness within them. Dirt bands less than 0.3 m thickness are difficult to segregate during mining and are often included in seam thickness in evaluating its grade. Dirt bands more than 0.3 m thickness are possible to be segregated and mined separately and very often not included in seam thickness for evaluating its grade. Geological reserves of a block would therefore vary if the grade of coal were assessed on “In Band” and “Ex Band” basis.
- In preparing mine plans it is sometimes decided to exclude certain portions of coal seams for actual extraction since the inclusion of such portions would significantly reduce the grade of the coal seam. Such reduced thickness of a coal seam is known as “Workable” thickness, thereby considerably reducing the mineable reserves. This is particularly true in underground mines where selective mining is practiced to enhance grade of coal and is often resorted to in SCCL mines.
- Mining losses may be significantly higher in such underground mines in which one or more contiguous seams (two adjacent coal seams separated by parting of less than 9 m thickness are termed contiguous seams) occur and in which the parting thickness is less than 3 m over substantial area since coal reserves in one of the seams in the contiguous seam pair may not normally be extractable unless special techniques are deployed.
- Coal is combustible and catches fire when exposed to air for lengths of time beyond the incubation period of the coal seam which can be very low in case of highly gaseous seams. Several mine fires have erupted in Jharia and Raniganj coalfields resulting in substantial loss of reserves, even if the fires are extinguished.
- In several mines in BCCL and ECL command area worked in the past through manual B&P method, large quantities of reserves in upper seams are standing on pillars as these seams have not been depillared. Reserves of lower coal seams cannot be depillared unless the reserves of upper seams have been liquidated thereby reducing recovery of reserves considerably.
- The coal seams of Jharia and Raniganj coalfields have been subjected to igneous intrusions such as dykes and sills as a result of which the coal

adjacent to such intrusive bodies gets devolatilised to what is known as Jhama in local parlance. Substantial quantities of good quality coking coal reserves have been rendered unfit for metallurgical use. Its marketing for non-metallurgical uses needs to be developed in order to exploit such reserves wherever feasible.

- In certain coalfields large industrial plants have been located on coal bearing area and several townships, colonies of coal companies and other human habitation have also been set up in such lands thereby making the large quantities of coal reserves unavailable for mining unless such structures could be relocated.
- Substantial quantities of reserves are located under Reserve/Protected forest areas, National Biological parks etc. Such reserves would also not be available for mining.

2.32 Varying percentage of mineable reserves estimated in a block (after taking into account the reserves lost or sterilized due to surface and geotechnical constraints) are actually extracted or recovered during mining depending upon the mining method and technology deployed in the mine. **Extractable reserves** are the reserves actually recovered in a mine during its life and the percentage of mineable reserves actually recovered defines the **Extraction or Recovery Ratio**. This ratio (of coal actually recovered to total mineable reserves) could be as high as 90-95% in open cast mines but it would be significantly less in underground mines. The highest recovery of reserves is obtained in underground mines employing long wall technology (60-70%) and much less in mines adopting B&P method of mining; recovery of 40-50% in mechanized B&P mines at depths less than 300 metres provided the mine completes the depillaring stage of coal extraction and the recovery would be increasingly reduced sharply at depths more than 300 metres because of necessity of leaving larger sized ribs and pillars to support the gobs; the recovery may be less than 15-20% if coal is extracted in the development stage of mining only leaving large amount of reserves standing on pillars as has actually happened in the underground mines operating for more than 150 years prior to nationalisation and in some mines even after nationalisation; the recovery may not exceed 20% in case manual B&P mining method is employed. It is thus clear that extractable reserves can be properly defined for each mine separately only after the choice of mining technology to be adopted is finalised based on preliminary techno-economic analysis of various alternatives at current cost of mining operations for each mining method and the corresponding likely sales realisation from the coal to be produced.

- 2.33 The nature of coal seams can also influence recovery ratio. Coal seams occur in thicknesses varying from less than 1 m to more than 50 m. In open cast mines recovery of coal reserves in seams of any thickness greater than 0.5-1.0 m is not a problem but in underground mines seams with thickness less than 1.5 m and more than 3.5 m require special technologies to be adopted for their extraction separately for thin seams (less than 1.5 m) and thick seams (more than 3.5 m). Such technologies have been developed internationally but their application in Indian mines has been rather limited. Recovery of coal reserves in such seams is, thus, considerably lower than what would have been had appropriate technologies been adopted.
- 2.34 In the mine plans prepared by CMPDI, mineable reserves are computed by making a deduction of 10% from “gross” geological reserves in order to account for geological disturbances thereby arriving at “Net” geological reserves and a further reduction of 10% is made from net geological reserves to compute mineable reserves instead of estimating mining losses and dilution factors. Clear picture of mineable reserves unavailable for mining due to surface and other geotechnical constraints is often not available.
- 2.35 CMPDI has given a tentative estimate of extractable reserves in the country as a whole in the Coal Vision document 2025 as on 1.1.2005 on the basis of the following criterion:
- Detailed exploration connotes confidence level of 90% in the reserves established
 - Regional exploration establishes the reserves in Indicated and Inferred categories. Confidence level of 70% is paced for indicated reserves and 40% for inferred reserves as worked out by the Association of German Metallurgists and Mining Engineers. (There is no indication whether the norms adopted by that body for defining Indicated and Inferred category reserves are the same as given in ISP 1957 and/or its modified version)
 - Average RP (Reserves to Production) ratio of 4.7:1 is assumed in making a broad assessment of production possibilities from Proved, Indicated and Inferred reserves. This establishes CMPDI’s extractable reserves although this ratio would vary widely for individual projects
- 2.36 Table 2.7 below gives the National inventory of Extractable Reserves as estimated by CMPDI upto 1200 m depth.

Table - 2.7
Tentative Extractable Reserves of the National Coal Inventory

Area	Geological Reserves				Extractable Reserves
	Proved	Indicated	Inferred	Total	
CIL Blocks	67.71	19.42	4.56	91.69	30.03
Rest	25.25	97.66	33.24	156.15	22.21
Total	92.96	117.08	37.80	247.84	52.24

2.37 The discussion above in paragraphs 2.25 through 2.36 clearly highlights the fact that the data on India's inventory of coal reserves as also the estimates of extractable reserves could benefit immensely by an independent assessment. As a matter of institutional design, any structure wherein all detailed exploration for coal is done exclusively by a single entity is bound to be sub-optimal. This would be so in any field and though CMPDI is a highly competent coalmine-engineering group one cannot act always on the opinion of that single agency. The situation is further complicated by the fact that CMPDI is a subsidiary of CIL, the dominant player in the sector. There is a strong feeling among the new aspirants for coal mining, CMPDI, under the given structure, is likely to be guided by what is technically feasible and economically advantageous for Coal India. One cannot hope for anything better under the prevailing structure but clearly the entire debate on India's coal reserves, optimal strategy for extracting these reserves and the appropriate mining technology need to be debated more openly. There should be multiple technical agencies to assist India in strategizing coal exploration and exploitation efforts. **Most importantly, if one accepts CMPDI's estimates of extractable reserves and domestic production is assumed to increase by 5% per annum, India's coal reserves may serve us only for 30-40 years which will of course get extended as CMPDI every year adds around 2.8 to 3.0 billion te of proved reserves. While, our knowledge as mapped by CMPDI does not support the view that we have "huge resources", it does provide confidence that at least in the next thirty years coal requirement of all sectors including power could be met from our resources. This opens the window of opportunity to speed up our efforts to accelerate the pace of regional surveys and drilling to complete the comprehensive coal resource assessment exercise and to re-examine the foundations of our energy security policies and programmes.**

2.38 The committee, on the basis of the above analysis, concluded that the earlier premise that coal shall remain India's primary source of commercial energy supply is equally relevant even today. In order to derive the level of confidence needed for this

and make this a reality, the Committee recommends that a time-bound plan to cover the entire country by regional mapping in 15 years should be prepared by GSI, CMPDI and MoC. Funding for this should commence from the 2006-07 budget. The MoC must launch a program of detailed exploration and drilling, in the 11th Plan, aimed at increasing proved category reserves. CMPDI's current capacity of drilling 3 lakh meters per annum must be raised to at least 15 lakh meters per annum by involving all eminent agencies within the country and outside. The committee recommends the creation of a Revolving fund of Rs. 500 crores for this purpose. The fund would recover the outlays once the mining leases are granted on the reserves so proven. Such an enhancement in the capacity for detailed exploration could potentially add about 10 billion tons of coal to the proven category annually.

- 2.39 PART II of the Report would attempt to examine the issue of the optimal mix of underground and open cast mines, choice of technologies for extraction and end-use and the required transportation infrastructure to support the projected coal demand.

Short and Medium Term Management of Coal Demand and Supply

3.1 The Committee, appreciating the importance of overcoming the current and emerging shortage of coal and consequently power, gave urgent consideration to critically examine the following:

- Likely demand for coal in the short to medium term.
- Extent to which the domestic production as planned now can meet the demand.
- Immediate measures which could increase the domestic produce of coal to reduce the demand-supply gap and
- The principles and procedures for increasing the level of import and the infrastructure and institutional arrangements required for achieving the accelerated production.

The findings of the Committee are discussed in this Chapter

3.2 For the purpose of this Report, short to medium term is defined as the next six years ending in 2011-12.

Tenth Five Year Plan coal targets

3.3 Historically, the Plan documents derive the total coal requirement by projecting the production targets for the coal using industries. The coal production target set on this basis is distributed among operating mines, expansion projects and new mines of the various coal companies. The Ministry of Coal (MoC) follows this production plan for approval of expansion and new green field mining projects. Very little slack or redundancy is normally included in the planning and project approval exercises.

3.4 The Tenth Plan document indicated the target for Coal demand as set out in the Table 3.1 below:

Table - 3.1
DEMAND ESTIMATE OF COAL IN THE TENTH PLAN DOCUMENT

S. No	User Industry	Units	Anticipated Production	Derived Coal Demand (Million Tonnes)			
				Non coking Domestic	Coking Domestic	Imports	Total
1	Power Generator	Billion KWH	452	313.84	-	-3.30	317.14
2	Captive Power Generator	Billion KWH	40.4	28.26	-	-	-
3	Steel (hot metal)	Million tonnes	25.6		20.03	17.18	37.21
4	Cement	Million tonnes	153.5	24.56	-	-	24.56
5	Brick and Small Industry	-	-	37.85	-	-	37.85
6	Others (incl.colliery consumption)	-	-	15.48	-	-	15.48
7	TOTAL			419.49	20.03	20.48	460.50

3.5 As against the total demand of 460.50 mt (million tonnes) the Tenth Plan document set a production target of only 405 mt and the target for planned imports at 20.48 mt. (coking coal 17.18 mt and non-coking coal 3.30 mt), which left an unfulfilled gap of 35.02 mt in the terminal year 2006-07. The reasons for leaving this gap are not set out in the document. More importantly, the plan target itself was a conservative one as it assumed an average PLF of 73% for coal based power plants. The average PLF actually reached almost 75% with some plants delivering PLFs to the extent of 80-85%. This created problems under the current regime of linking quantities of coal for each plant based on certain historically assumed PLFs despite individual performances varying well beyond these assumed PLF. The out-performers, while relying on increased supplies through short-term linkages, also drew down on their inventories and operated with coal stocks of under a week. Another fact that led to the scarcity conditions in recent years was the increased use of washed coal for power generation. Washing of coal effectively increases the ROM coal requirement for the same level of power generation. The additional ROM coal requirement resulting from the use of washed coal was not factored into the coal demand estimates for power generation. The process of washing creates rejects that have some heat value. However, these rejects cannot be sold or traded under the prevailing coal-marketing regime and hence their heat value cannot be used, even for low end uses such as brick kilns. This reduces the effective ROM coal supply.

- 3.6 The coal industry consisting of only two monopoly public sector companies merely concentrated on the “production as per plan” and left the issue of coping with the increased demand from the power industry, on a case by case basis, to the Short Term Coal Linkage Committee. Neither the coal industry, nor the power sector took notice of the large supply-demand gap highlighted in the tenth plan document or the facts highlighted in paragraph 3.5 above and failed to take any steps aimed at increasing domestic production from specific mines and/or planning for increase in coal imports to mitigate the looming crisis. The coal industry continued to meet its production targets as proposed under the Tenth Plan and the power industry kept living in the belief that, being a high priority sector, its demand would get serviced through short term allocations made by the Short Term Linkage Committee through diversion of coal meant for other ‘low priority’ consumers. These facts are recorded here merely to highlight the ‘process of coal planning’, which needs very drastic changes to meet the much higher targets and responsibilities likely to be entrusted to the coal industry in the coming decades.
- 3.7 The Committee also noted that Ministry of Power (MOP) has estimated thermal coal demand based on their own estimates of thermal capacity likely to be operational in 2006-07 and 2011-12. Typically the MoP estimates are higher than those of the Planning Commission. However, actual generation capacity realized has historically remained well below projections made by MoP. In any event, the MoP estimates do not address the concerns highlighted above. The MoP estimates yield a coal demand that is about 1.5% higher than the Planning Commission estimate of coal demand for 2006-07. The Committee noted that the exact treatment of “handling” losses (a euphemism for coal theft) remains unclear and is likely included in the specific consumption reported by some plants. It was noted that the discussion for the demand for coal gets murky due to the different agencies projecting the requirements in different ways, and often not explaining their reasons for the variations.
- 3.8 The Planning Commission, in consultation with the MoC, enhanced the Coal demand target to 473.18 mt during the mid term appraisal exercise. The increased requirement resulted from an upward revision of coal demand in steel industry by 5.49 mt, an additional requirement of 5.0 m.t. for augmenting coal stock in power stations and marginal increases in the case of coal for cement production and brick industry. The revised demand supply scenario for 2006-07, even under the MTA exercise, recognized an unsatisfied gap of 11.5 million tons even after increasing

domestic production from 405 million tons to 431 million tons and raising imports from 20.5 million tons to 30.7 million tons of coal. The supply-demand balance worked out for the 10th Plan under the MTA exercise is attached as Annexure 3.1

- 3.9 The Committee set up a small sub-group of experts to undertake a more critical examination of the coal requirements and possible supply scenario in consultation with the companies. The exercise took plant wise specific coal consumption of all existing utility based power plants, built in the planned improvement in the PLF of certain power plants which have been functioning well below the national average and further assumed that existing plants would, on average, raise their PLFs by a maximum of a further 4 percentage points at the rate of 1% per annum over the period 2005-06 to 2008-09. The ROM coal demand for the power sector was adjusted for the likely use of washed coal and the deterioration in domestic coal quality. The quality deterioration was assumed at the rate of 0.5 % per annum for the period 2005-06 to 2008-09. While coal quality has been falling over the years, this specific correction was made to capture the increasing share of MCL and SECL coal in the coal supplied to the power sector over the short to medium term under consideration. The Committee is hopeful that improvements in mining practices coupled to advances in the heat rate and overall thermal plant efficiency would offset any effective decline in coal quality after 4 years and hence the specific coal consumption per unit of power generated would remain at the estimated 2008-09 level. Finally, the demand for thermal coal for power generation was adjusted to reflect the higher calorific value of imported coal likely to increasingly replace domestic coal in power generation. The exercise also took a more refined estimate of requirement of coking coal in the steel industry based on an in-depth discussion with the Steel Ministry. The thermal coal requirement for cement, the brick kiln and other industries was estimated on the basis of recent trends in demand growth. While plant-wise details were used in the power sector till 2008-09, for the period 2009-10 to 2011-12 the actual electricity generation forecast by the Integrated Energy Policy Committee were used to project the coal demand based on the specific consumption norms of 2008-09.
- 3.10 The estimate of operational stocks to be maintained at the power stations was also re-assessed in the above exercise. The norm suggested by the expert sub-group was 15 days stock for load center power stations and 7 days stock for pithead stations. Based on this norm and taking note of the existing plant-wise coal stocks,

the additional coal requirement for building stocks is estimated at 1.5 mt in 2006-07 and 2.5 mt in 2008-09.

- 3.11 The expert sub-group worked out the coal requirement for utility based power generation under two extreme scenarios, namely, (a) the entire thermal raw coal demand being met through indigenous supplies and (b) if the projected shortfall in domestic availability of thermal raw coal were to be met by using imported coal with a higher calorific value. The Sub-group estimate made especially for this Committee conclude that the coal requirement for power generation would be 330 mt in 2006-07 and 503 mt. in 2011-12 if the entire coal requirements were to be met from indigenous coal and 322 mt in 2006-07 and 472 mt in 2011-12 if the shortfall in domestic availability of thermal coal is to be met from import of superior quality coal. The results for coal demand for power generation are set out for the period 2005-06 to 2011-12 in Table 3.2 below:

Table – 3.2
Short to Medium Term Demand for Coal for Power Generation

Year	Installed Capacity MW	PLF Average (%)	Power Generation (BU)	Specific consumption Kg/kwh	Coal Demand for power generation Mt	Adjustment for washed coal used (Mt)	Total adjusted coal requirement (Mt)	Adjustment for quality of imported coal (Mt)	Total adjusted coal requirement for import coal quality (Mt)
03-04	60048	72.45	381.12	0.692	263.90	5.20	269.10	0.00	269.10
04-05	62748	72.67	399.45	0.693	276.99	8.20	285.19	0.00	285.19
05-06	64328	74.97	422.45	0.697	294.37	13.00	307.37	5.26	302.11
06-07	72728	71.08	452.84	0.701	317.30	13.00	330.30	8.50	321.80
07-08	74908	76.67	503.12	0.705	354.75	15.00	369.75	17.26	352.49
08-09	78098	77.14	527.74	0.708	373.74	16.00	380.74	18.39	371.35
09-10	88000	76.21	587.51	0.707	415.97	18.00	433.37	24.00	409.37
10-11	96500	74.78	632.16	0.707	446.94	20.00	466.94	28.58	438.36
11-12	104000	74.66	680.21	0.707	480.91	22.00	502.91	31.28	471.63

Note: The dip in average PLF in the year 2006-07 is due to commissioning of large number of power plants in that year with aggregate capacity addition of 8400 MW.

- 3.12 In the case of the steel industry, the demand for washed domestic coking coal and imported coking coal were taken as projected by the Steel Ministry up to 2011-12. The domestic raw coking coal requirement was then estimated based on the projected use of demand for washed coking coal. In the case of the cement industry the production plan up to 2006-07 was used and the growth trend was projected up to 2011-12. However, the specific consumption was lowered from 0.16 tons to 0.143 tons per ton of cement based on the actual experience resulting from the current level of slag and fly ash usage. The coal demand for the brick kiln and other industries was projected on the basis of past growth trends.

Assessment of Coal Supply Feasibility in the Short to Medium Term

- 3.13 The mine-wise supply possibilities were provided CIL/SCCL over the planning horizon under consideration. These supply plans did not include the emergency production plan recently submitted by CIL to the Government for its consideration. The short to medium term coal demand-supply balance as estimated by the Sub-group is set out in table 3.3 below:

Table 3.3

Short to Medium Term Coal Supply Plan (Sub-group Estimate)

(In Million Tons)

	2006-07	2007-08	2008-09	2011-12
Total Demand	471-480	511-529	541-559	679-710
Domestic Product	430.0	451.4	476.9	580.3
CIL	371.5	390.5	413.4	506.0
SCCL	37.5	38.2	39.0	39.0
DVC/TISCO Others (including captive producers)	21.0	22.7	24.5	33.5
Planned Imports	30.7	59.9-77.2	63.8-	98.7-
- Coking coal	24.2	25.4	82.2	130.0
- Thermal coal	6.5	34.5-51.8	27.0	36.1
			36.8-55.2	62.6-93.9
Uncovered Gap	10.5-19.0	Nil	Nil	Nil

Note: Lower figures in the range of demand and imports relate to import of superior quality of thermal coal whereas higher figures relate to demand/supply gap if this gap were to be filled in by indigenous quality thermal coal.

- 3.14 The demand-supply analysis carried out by the expert sub-group showed a significant gap for thermal raw coal. In terms of domestic coal, the gap in the supply-demand balance for thermal coal is expected to rise to a level of about 100 mt by 2011-12, from a level of about 15 mt anticipated in 2005-06. In terms of imported coal the gap in the thermal coal supply-demand balance is estimated to be about 63 million tons. Thus India would need to import some 60 million tons of additional thermal coal over the import level of 2004-05. The Report of the Sub-group is annexed at Annexure 3.2
- 3.15 **It is pointed out that the above estimates do not take into account the emergency production plan put forward by Coal India Limited in consultation with the MoC. This emergency production plan, if timely administrative**

approvals and environmental clearances are received, is expected to make available an additional 68 million tons of domestic coal during the 11th Plan period over and above the 145 million ton capacity expansion already planned by CIL for the 11th Plan. Although concerns remain on the possibility of raising Coal India's output by some 60% (inclusive of the emergency plan) in a single Plan period, it is noted that to the extent CIL succeeds in implementing the emergency production plan, the import requirement of thermal coal estimated above shall be reduced. Even the planned increase in production by 145 mt represents an unprecedented 40% growth in output in a single plan period. The estimated thermal coal import requirement would rise to the extent that the planned increase in output does not materialize.

- 3.16 Coal based thermal power plants consume some 80% of the domestic coal production. However, the coal demand from these thermal units is not constant throughout the year as the power generation requirements, apart from being seasonal in nature, are also critically dependent upon the monsoon. During the years of drought hydro-power generation goes down and the thermal power generation needs to be increased. This is usually done by skipping maintenance and through operation at peak capacity. However, this would be possible only if more fuel is made available to the thermal power plants. The reverse is equally true during monsoon or when the monsoon is unusually good. Hydel plants can deliver power, at zero cost, more energy than planned and this would lead to a reduction of coal demand for thermal power plants. Considering these features of coal demand for power generation the Committee felt that planning mining capacity based on just the megawatts installed or proposed was likely to lead to wide swings in the demand-supply gap. The Committee considers it prudent for Coal companies to build-in a slack of 5-10% in the production capacities of coal mines, especially open cast mines, so as to absorb a 5-10% higher demand from the said mine. No doubt the resultant price of coal would be marginally higher than the coal produced exactly to the level of "assessed demand". This extra price would, in the opinion of the Committee, be the least cost option towards ensuring the security of electric supply on a 24x7 basis throughout the year. Further, as import dependence rises, such slack can take care of temporary supply disruptions and enhance India's energy security. Finally, this level of slack would also take care of the different demand perceptions of different agencies.

- 3.17 The coal industry has been operating under regulated conditions and has not been encouraged to take note of market realities and make quick adjustments in its production and marketing plans. The adjustments to unanticipated increases in demand in the power sector always led to a squeeze in the allocation of coal to the small-scale industry and the brick kiln industry, which comprise thousands of functioning units. The shortage gets exaggerated and leads to market manipulations by undesirable elements. In fact, a proper appreciation of the market would have led to keeping the targets always ahead of the demand as the surpluses could easily be absorbed by thousands of consumers in the unorganized sector who consume a large quantity of energy in different forms and use fuel wood or biomass waste whenever coal is not available or whenever the relative prices of these alternatives so dictate. Rationally, coal is the preferred fuel as it is still the most efficient fuel for these industries. However, the exact demand for this sector remains difficult to estimate. The Committee feels that if surplus coal was available, the brick kiln industry would have caused less strain on India's forest reserves. Thus carrying the recommended slack would not be entirely unproductive. During periods of high coal demand by these unorganized sectors, the above slack could easily be absorbed at remunerative prices.

Expediting Clearances for Coal Projects

- 3.18 Major projects whose approval is pending and whose production is assumed to be available by 2011-12 are listed in Annexure 3.3
- 3.19 The Committee is deeply concerned at the very long delays at different stages of granting permissions and approvals for setting up coal mines. The Committee would like to study this issue in greater detail and come out with suggestions of long term significance in Part – II of the Report. Currently, the concern of the Committee is the approval of projects whose production is taken into account in projecting the coal production target of CIL and SCCL till the end of the Eleventh Plan. There are about 21 new mines, which have been included in the production estimates up to the end of the Eleventh Plan. Of these, 5 mines could contribute 12.05 mt by 2006-07 and the others are to commence production in the early years of the Eleventh Plan. There are 16 Eleventh Plan projects, which are projected to contribute substantially by 2011-12. Of these, over 80 % of the projects involve initial capital expenditure below Rs.1000 crores. The coal companies have submitted the proposal for the Committee's consideration that an empowered Committee under Secretary Coal may be set up with Representatives from Finance and the Planning Commission to approve projects

below Rs 1000 crores, leaving the projects of higher capital cost to the normal procedures. The Committee was asked to suggest a time limit of six months by which these clearances to these projects should be given. The Committee was informed that the government has recently taken steps to expedite approval of plan projects in the coal and power sectors by eliminating the pre-PIB stage of scrutiny in the appraisal process and the need for In-Principle approval of the Planning Commission for coal and power projects has been dispensed with. The proposals requiring PIB/EFC consideration are now required to be submitted directly with the appraisal agencies that are required to complete the appraisal process within one month after which the note for CCEA could be submitted within two months.

- 3.20 The Committee was also informed that there have been problems in coal sector project formulation in respect of adequacy of exploration and reliability of estimates of extractable reserves.
- 3.21 On the basis of the above facts brought before the Committee, the Committee concluded that while there is need to expedite project approvals, it is also necessary to improve project formulation to match international standards. Greater delegation of authority must accompany greater accountability and responsibility. CIL could be granted the status of Navratna company in which case the company need not come to Government for approval of projects irrespective of the capital expenditure involved or else the subsidiaries of CIL could be granted the status of mini Ratna companies in which case only those proposals of such a subsidiary would need government approval wherein the capital expenditure exceeds Rs.500 crore. The boards of such companies should be restructured with the induction of independent non-government directors. The subject of restructuring CIL to make it a world class company shall be dealt in detail in Part-II of the report.
- 3.22 The environmental clearance for these projects is a cause of major concern. While the Committee appreciates the need for proper environmental impact analysis and the principles adopted by MoEF to evaluate these aspects, the Committee is shocked at the delays reported with environmental clearances taking over 3 years in some cases. The Committee is unable to understand the substantive causes for long delays in giving a verdict in favor of or against the project proposal. The analysis of a few cases where the environmental clearance has taken several years indicates that very routine delays in arranging meetings and site inspections, delay a project, which ultimately gets the clearance without much modification. **The Committee would suggest that the environmental issues in respect of projects which are**

important to reach the Tenth and Eleventh Plan targets should be taken up on priority consideration by the MoEF and if necessary a Special Task Force with adequate powers may be set up for examining these on a priority basis. The environmental clearances should be sought and also given for production levels which are at least 25 % above the initial required mine capacity so that wherever possible and necessary, the production from certain mines could be enhanced. The Committee fails to see the logic of insisting on a strict adherence to a specific quantity for environmental approval for mines which are in areas which are not environmental hot-spots. The MoEF could address rapid development of domestic energy resources by identifying critical areas that have biodiversity and other special features in advance and notifying them as such. Other areas where the environmental impact could be mitigated by creating compensatory afforestation could be treated differently. In respect of the later, the environmental clearance should be given within four months of filing of the application.

- 3.23 The process for the acquisition of surface rights depends on the category of land to be acquired. Based on the ownership, land can be broadly divided into tenancy (private) land, State owned forestland and State owned revenue land. State owned revenue land is acquired by administrative procedures. Procedures under the Forest (Conservation) Act 1980 apply in the case of forestland. In all this, the State Government must be requested to give clearance within six months failing which it should be deemed to have been approved. **The rationale for fixing a standard rate for loss of revenue from forestlands, which are acquired for coal mining besides insisting on compensatory afforestation, needs an objective review.** The Committee could not examine this issue in detail in consultation with the Ministry of Environment & Forests.
- 3.24 The Committee would make on in-depth examination of the issues detailed in this Chapter in Part-II of its report. In the interim, to ensure that the efforts for increasing coal production on an emergency basis are not stifled by delays in obtaining necessary approvals and environmental clearance, the Committee recommends that the suggestions outlined under these paragraphs may be given priority consideration.

Summing Up

- 3.25 It is amply clear that the next four years will be years of pronounced coal shortages in India. These shortages are likely to become acute in the first two years of the 11th Plan as the delayed 10th Plan power projects get commissioned alongside the 11th Plan projects already under construction. These shortages are likely to rise rapidly by the end of the 11th Plan unless Coal India's unprecedented capacity expansion plans materialize during the 11th Plan. CIL's Emergency Production Plan that was approved recently, if delivered in addition to the large capacity expansion foreseen by CIL under the 11th Plan, offers the only hope of reigning in a widening demand-supply gap. While all efforts should be made to meet the immediate shortages it is equally important to examine and implement the recommendations made by the Committee which would lead to self sufficiency in coal in the long run.
- 3.26 Thermal coal import to the tune of about 30 to 40 mt by 2011-12 of high grade coal is the principal short term measure recommended by the Committee to alleviate looming shortages. However, even this would require that the port capacity and the evacuation facilities be taken up for enhancement immediately. Currently there is capacity to import and handle some 15 to 20 million tons of thermal coal and this provides the breathing space required to raise capacities to meet the rising shortages forecasted. The Committee considers that this approach will provide a lasting solution to the various ills that beset the coal industry, which has operated in a syndrome of perennial shortage. Considering the fact that India is the third largest producer and user of coal in the world, India should be an important player in the world coal market. This will provide the necessary competitive pressure in developing an internationally competitive coal sector in India. Apart from being economically justified, such a strategy is in line with the efforts to aggressively build coal based coastal thermal power plants in the 11th Plan. The foregoing assumes that the infrastructure requirements for handling rising coking coal imports continue to expand, as required, in line with past trends.
- 3.27 The need to enhance domestic coal production capacity rapidly requires that the MoC sets up a permanent Special Task Force to monitor progress of clearances and project implementation of all projects required to be completed by the end of the 11th Plan to fully realize Coal India's production plans including the Emergency Production Plan. This task force must also monitor clearances and progress of

approved Captive projects. The Task Force must include representatives of MoEF, Railways, MoST and MoP as well as the concerned State Governments.

- 3.28 The success of this short-term supply management would depend on the organization of suitable institutional arrangements for importing thermal coal and selling it in a transparent manner. Long term planned imports are possible at considerably lower prices compared to ad hoc imports that currently dominate thermal coal imports. Organizations that have long experience of importing coal must be co-opted in implementing the short-term supply management program.
- 3.29 The additional coal availability, if it materializes, would minimize the manipulation of the market by undesirable elements. The Committee noted that the lack of information regarding the possible levels of allocation to the unorganized sector creates arbitrage opportunities for such market manipulators. Therefore, The Committee recommends that increasing proportion of all domestic coal (supported by imported coal where necessary) that is not earmarked for the Power Sector be brought into the E-auction market over the next 2 to 3 years. Willingness to meet the actual demand at a market driven price would go a long way in establishing transparent coal markets in India. In this regard the Committee stresses the need to replace the current system of loose linkages feeding the power sector with formal long-term Fuel Supply and Transport Agreements that include the Railways Again, this exercise should be completed within the next 2 to 3 years.
- 3.30 Detailed Recommendations towards stimulating captive coal mining in the coal sector are discussed in Chapter IV of this report.

Captive Coal Mining: The Strategy to Reduce Demand-Supply gap in the short to medium term

- 4.1 The analysis of coal demand and supply in the short to medium term made in Chapter 3 confirmed the growing gap between the emerging demand for coal and the levels of future production projected from the current players in coal mining. These plans (without considering the emergency production plan contemplated by CIL) would leave a gap of nearly 100 million tons of thermal coal of indigenous quality (equivalent to about 63 million tons of import quality) by the year 2011-12. This gap might increase further beyond 2011-12 unless India succeeds in restructuring the coal sector by 2011-12 in a manner that ensures that domestic supply increases to meet growth in domestic demand beyond 2011-12. Such a high quantum of imports, even if the necessary infrastructure for imports were created, would seriously impact the power industry both in terms of price stability and the future location of power plants. Natural gas or LNG imports provide an alternative to coal imports but reliance on gas is likely to make power costlier and subject to even more violent price volatility.
- 4.2 Thermal power generation depends largely on the use of either coal or natural gas. The choice of fuel to be imported at the margin to fill the gap would depend on the relative price of imported coal and imported gas. Natural gas prices are currently at historic highs and the import of natural gas requires long-term agreements and large investments either in a pipeline or in liquefaction, shipping and re-gasification facilities. Import of coal can be organized under short and medium term contracts for one-year to 5-year periods. Unless the relative prices tilt the balance of advantage in favor of gas imported coal emerges as a preferred option. Broadly speaking, if the delivered price of gas, at a given point is US \$ 4.00 per million BTU, the equivalent price of indigenous thermal coal transported and delivered to that point should not be more than Rs.2000 per ton and the imported thermal coal price delivered to the same

point should be below US \$ 66 per ton (assuming imported coal has 1.5 times the heat value of indigenous coal). In the current environment, it is difficult to find long term supply of gas, even at a coastal location, at \$4.0 per million BTU. Delivering domestic coal to coastal locations on the Western coast and the southern part of Tamil Nadu costs Rs. 2000 or more per ton. However, imported coal can be delivered under medium to long-term contracts well within the upper bound of \$ 66 a ton at coastal locations on the Western coast of India and the southern coast of Tamil Nadu. Clearly then, unless relative prices change to make gas more competitive, imported coal emerges as the most competitive option along the Western coast and the southern most coast of India.

- 4.3 The Committee considers that all efforts should be made to increase the level of thermal coal imports from the current level of about 5 million tons to about 30 million tons by 2011-12. Such a level of import is considered essential by the Committee for India to establish its position in the World Coal Industry commensurate with its known in-place reserves and its likely dependence on coal as a primary source of commercial energy. Such a level of import would set the right competitive framework for indigenous thermal coal production under economic technological choices.
- 4.4 Coal production, modernization and efficiency improvement would depend on the level of competition in the industry. Mobilization of the requisite investment in coal mining also reinforces the need to induct more players from both the public and private sectors. The introduction of new players in the coal sector would be beneficial to the sector as a whole and is considered essential even if CIL succeeds in realizing its emergency coal production plan. Considering the urgency and need to induct more players in coal production efforts, the Committee examined the legal, administrative and institutional issues in introducing competition in coal production by encouraging the entry of more players within the current legal framework.

Legal Environment for Private Sector Coal Mining in India

- 4.5. The Government of India (GoI) has considered the merits of opening of the coal sector to private entrepreneurs and has introduced a Bill in the Parliament, seeking the necessary amendment to the Coal Nationalization Act. The Bill is pending with the Parliament and could take some time for passage. An examination of the Bill by the Committee revealed that, pending the decision of the Parliament on the Bill already introduced, there is significant scope in the existing legal and policy environment for introducing more players in coal mining and the effective use of

current provisions could add substantial quantities of coal supply in the coming years. Though the law permitting captive coal mining has been in force for a number of years, realization of captive coal mines has been stalled by issues such as: (i) getting coal blocks allotted to parties who are not serious about taking up coal mining for end-use. (ii) need for allowing group captive mines; and (iii) disposal of coal produced during mine development and disposal of periodic small surpluses in excess of the captive needs. Some prospective allottees/applicants for captive mining permission have also pointed out that the problems of obtaining rail linkages to certain coalmines and the release of only mine blocks of low prospects for captive mining are also contributory reasons for the very disappointing performance of the captive coal mining policy.

4.6 **Under the present Coal Mines (Nationalization) Act 1973** and Clarifications issued from time to time, the following Institutions and agencies are entitled to do coal mining and trade without the restriction of captive consumption. These are:

- (A) Central government or a company owned by the central or state government engaged in coal production. Currently CIL and SCCL come under this category
- (B) A Government Company owned by the State or Central Government which now takes up mining of coal.

However, these companies can take up coal mining and trade only subject to the conditions—

- (i) That the Memorandum and Articles of Association of such companies permit coal mining.
- (ii) That they act only as per the Acts and Rules relating to mineral production, coal production, contract labor and environmental protection provisions.

4.7 **Under Section (3) (a)(iii) of Coal Mines (Nationalization) Act** Coal mining can be done but only for captive consumption by the companies listed below. These companies cannot market the coal produced by them. Companies allowed to carry on coal mining are those that are engaged in:

- (a) Generation of power
- (b) Production of iron and steel
- (c) Production of Cement and
- (d) Such other end users, which are specifically notified by GOI under this Section.

The above companies can be called companies eligible to undertake captive mining.

4.8 **Joint Ventures for Captive Coal Mining:**

With a view to help some of the companies eligible for captive coal mining who were allotted captive coal blocks but had no experience in coal mining, the Government has allowed the following dispensations:

- i) A company engaged in any of the approved end-uses can mine coal from a captive block through a joint venture coal company provided both the end-user company and the associated coal company are formed and registered under Section 3 of the Companies Act, 1956 and the JV is formed with the sole objective of mining coal and supplying the coal from the captive coal block to the end-user company provided:
 - a) In the JV company the end-user company should have at least 26% equity ownership at all times and
 - b) The end-user company should take and consume the coal mined by the JV Company.
- ii) A slightly modified version of the corporate arrangement could be to have a holding company with two subsidiaries i.e. (i) a company engaged in any of the approved end-uses and (ii) an associated coal company formed with the sole objective of mining coal and supplying the coal on exclusive basis from the captive coal block to the end-user company, provided the holding company has at least 26% equity ownership in both the end-user company and the associated coal company.

4.9 The Committee felt that the most urgent measure to augment coal supplies and increase the number of players in coal mining would be to ensure the full and fair use of the provisions for captive coal-mining under the current legal framework, especially by those public and private power generating companies with the necessary financial and management capabilities to quickly realize the full potential of captive blocks. The Committee further concluded that the current provisions for increasing the level of competition in coal mining through captive mining were adequate and reasonable. However, procedures and processes need to be improved to expedite the allotment of the captive coal blocks in a transparent and effective manner. These

procedures/processes should address the legitimate concerns of various stake holders involved and incorporate necessary flexibility to achieve the end objective of raising the number of players engaged in coal mining with a view to increasing supply and competitive efficiency in the coal mining sector. Further, the established procedures/processes should be able to select serious allottees committed to developing and mining blocks allocated within a prescribed timeframe. Finally, the procedures/processes must include a set of punitive penalties for failure to do so. This will help address some of the lacunae in the manner in which the policy is currently being implemented. The Committee evaluated the current procedure for allotting captive blocks, the current status of these blocks and has made very specific recommendations on a possible captive policy later in this chapter.

Procedure for Allocation of Captive Blocks

4.10 The procedure for allocation of coal blocks for captive mining has undergone **several changes over time. The Committee noted that the changes introduced in the last two years have resulted in greatly enhancing the speed of allocating captive blocks and prevention of speculation in coal mine permits. The current procedure is as follows:**

- a) MOC, in consultation with CIL and SCCL, identifies coal blocks, which could be allotted for captive mining to the eligible coal using companies. The list of blocks available for captive use ensures that the blocks identified by CIL and SCCL as being necessary for implementing their own projects planned for the next 20-25 years, are reserved for the exclusive use of CIL and SCCL.
- b) From this list of blocks available for captive mining, a few blocks are advertised at a time for inviting applications from eligible companies for setting up captive mines.
- c) These applications are scrutinized by an inter-ministerial group called the Screening Committee which consists of the following:

i) Secretary, Ministry of Coal	Chairman
ii) Joint Secretary (Coal), Ministry of Coal	Member-Convener
iii) Adviser (Projects), Ministry of Coal	Member
iv) Joint Secretary (LA), Ministry of Coal	Member

v) Representative of Ministry of Railways, New Delhi	Member
vi) Representative of Ministry of Power, New Delhi	Member
vii) Representative of Concerned State Govt.	Member
viii) Director (Technical), CIL, Kolkata	Member
ix) Chairman-cum-Managing Director CMPDIL, Ranchi	Member
x) CMD of concerned subsidiary company of CIL/NLC	Member
xi) Representatives of Ministry of Steel	Member
xii) Representatives of Department of Industrial Policy & Promotion (Ministry of Industry)	Member
xiii) Representative of the Ministry of Environment & Forests	Member

4.11 Earlier there was no clearly spelt out criteria on which these mines were allocated. Most of them were given to applicants who had produced only a letter of recommendation from the concerned State Government indicating that the party is planning to set up a permitted end use project of specified capacity. There was no stipulation of the period by which the mine should be brought into production or the end use project completed. Nor were any penalties laid down for non-fulfillment of the conditions of the mining lease. The shortcomings in the procedure have led to many of the earlier applicants not sincerely pursuing power projects. The Committee was informed that the MoC has made several efforts to correct these shortcomings in the last two years.

4.12 As a result of these initiatives, the following provisions have now been built into the basis for allocating captive blocks for mining:

- a) Captive blocks can be applied for additional requirement end-users without affecting the linkages, which are in force currently with CIL/SCCL.
- b) Allowing captive mining in joint ventures with CIL/SCCL as the lead partner.
- c) Allowing the coal produced during the mine development phase to be sold to CIL subsidiaries and/or SCCL at a transfer price to be determined by the Government through administrative procedures.
- d) Specifying the period for implementation of the mine plan duly backed by an acceptable Bank Guarantee.
- e) Specifying provisions for cancellation of the allocation for non-adherence to milestones laid down for achieving various steps leading to coal production.
- f) Providing for the monitoring of the progress by the Ministry of Coal and by the Coal Controller.

Current Status of Captive Mining

- 4.13 The distribution of category-wise coal reserves in various blocks declared as being available for different players engaged in mining in India is detailed in Table 4.1 below:

Table - 4.1

Distribution of Coal Resources Among Coal Mining Categories

(In Billion Tonnes)

Blocks	Proved	Indicated	Inferred	Total	% Share
CIL	67.71	19.42	4.56	91.96	37
Captive	9.55	15.86	2.70	28.11	11
Non CIL	3.46	5.17	5.98	14.61	6
Others (TISCO etc)	2.77	0.35	0	3.12	1
Un-blocked	0.78	7.010	21.61	92.49	37
Godavari Valley	8.26	6.08	2.58	16.92	7
NE Region	0.43	0.10	0.37	0.90	
TOTAL	92.96	117.08	37.80	247.84	100

- 4.14 An analysis of the data in table 4.1 reveals that off the 248 billion tonnes of **known** reserves of coal in the country, as on 1.1.2005, only 93 billion tonnes (37.5%) are in the proven category. Some 68 billion tons or 73% of the currently proved coal reserves are reserved exclusively for Coal India. Another 8.3 billion tons or about 9% of the currently proved coal reserves are reserved exclusively for SCCL. The blocks earmarked for captive mines have only about 10% of the currently proved coal reserves and about 11% of the currently estimated total coal reserves. Further, the so-called Non-CIL blocks have about 4% of the currently proved coal reserves and some 6% of the total currently estimated coal reserves. Between the last two categories, about 14% of the country's currently proved coal reserves and some 17% of its currently estimated total coal reserves are available for captive mines. Finally, there is the unblocked category that accounts for less than 1% of the currently proved coal reserves but almost 37% of the currently known total coal reserves that could potentially be proved and made available to new players on a captive basis.
- 4.15 Captive mining was allowed in 1993 while Central and State Public Sector Units (PSUs) and State Government Undertakings were allowed coal mining at par with the Central Coal Companies in Dec 2000. Under these dispensations, 89 coal blocks (with 13.5 billion tons total geological coal reserves of which 8 billion were in the proven category) have been allocated or decided for allocation to various companies in the public sector (30 blocks) and private sector (60 blocks, with one block being

common to both the public and private sector). Six of the blocks allocated/decided for allocation to the PSUs are under Government Company route and the rest under Captive mining route. Theoretically, the 89 blocks allocated/decided for allocation could yield a total production of about 100 mt of coal annually. However, a rigorous analysis of the progress thus far reveals that this level of output is unlikely by 2011-12. First, it is pointed out that actual letters of allocation have been issued in case of only 68 blocks so far. Second, and more importantly, as seen from Table 4.2 below; most of these letters have been issued recently and development of mines cannot be realistically expected from such allottees. Thus while the policy has been in force since 1993, serious efforts to use this avenue for increasing the number of players in coal mining have been instituted only recently.

Table 4.2
Year Wise Details of Captive Blocks Allotted

1993-95	1996-98	1999	2000	2001	2002	2003	2004	2005
3	10	2	2	1	1	22	5	22 (21) *

*** Letters confirming allocation to these 21 allottees still to be issued**

- 4.16 Off the 68 allotments confirmed to date, 41 blocks have been allocated to the private sector and the remaining 27 to PSUs. Five of the blocks allocated to PSUs are under Government dispensation while the remaining 22 are under the captive dispensation. Joint Venture or Leader Associate arrangements wherein the Joint Venture partner or the Leader Associate mines on behalf of the other joint allottees, called the associate companies, have been permitted on 8 of these blocks. Under this provision, the Joint Venture Partner or the Leader Associate is required to supply coal to the associate companies, directly or through the local Coal India subsidiary, at a price to be determined by the Government. In other blocks the letters of offer and allocation are under process.
- 4.17 Out of 68 allotments confirmed thus far, only 19 (4 to PSUs and 15 to private sector with total reserves of only 2.5 billion tons) were allocated more than 3 years ago. In these 19, production has started in 8 blocks (2 PSU and 6 private) and 5 blocks (1 PSU and 4 private) are progressing well, especially in the last year when rigorous and periodic monitoring was initiated. Under the best case scenario, an open cast mine can be put into production in 3 years (4 years for underground mines) provided it takes only six months to obtain: (i) mining leases; (ii) all necessary clearances including environmental clearance; and (iii) complete validation of the data in the Geological Reports. It is however, a well-known fact that such processes take

anywhere between 2 to 5 years to complete. It may also be noted that achieving rated mine capacities could take another 2 to 4 years from the commencement of production.

- 4.18 So far 3 blocks have been de-allocated for unsatisfactory progress and one lease has been voided for contravening the Law. An additional six blocks (1 PSU and 5 private) are not progressing well and have been kept under watch for possible de-allocation.
- 4.19 An additional twenty blocks (with total reserves of 2.1 billion tons) blocks are currently under offer for possible allocation to interested companies. More than 700 applications have been received for these blocks and are currently being processed. The Screening Committee would decide the allocation of these blocks shortly.
- 4.20 The remaining 39 blocks in the Captive list of 148 blocks have not been prospected in detail and would be available only after detailed exploration is completed. Of these, 18 blocks (with total coal reserves of 5.3 billion tons) have been offered under the Government Companies route. The remaining 21 blocks in the Captive list have estimated geological reserves of over 8 billion tons. Another 10 blocks (with total reserves of 3.82 billion tons) belonging to the large Non-CIL Non-Captive category are proposed to be offered for exploration and subsequent mining. So far 21 applications have been received for these blocks.
- 4.21 Given the recent concerns with potential coal shortages, it has been proposed to allot six blocks to NTPC: 4 large blocks under captive dispensation, 1 under government dispensation and 1 under the joint venture dispensation with CIL. The reserves in these blocks are about 4 billion tones. Another 12 large blocks having reserves of about 3 billion tones have been identified by CMPDIL/CIL for possible allocation to large Power producers and for development of Joint Ventures with NTPC as part of integrated Power and Mining Projects.
- 4.22 **The Committee noted that despite the obvious urgency shown in the last two years to make effective use of the captive and other dispensations under the current law to increase the number of players in coal mining, actual achievement leaves much to be desired. Poorly conceived principles and procedures have contributed to the present situation and have given a bad name to Captive coal mining resulting in Court cases when some corrective action is initiated! Further, based on its review of the current status of the**

blocks allocated for captive use, the Committee concluded that captive projects cannot be expected to deliver large quantities of coal by 2011-12. The Committee also concluded that releasing coal blocks with inferred and indicated categories of reserves for captive mining is not likely to achieve the objective of increasing the number of players in coal mining in the short to medium term. This reinforces the need to increase CMPDI's capacity to undertake detailed exploration and quickly raise the proportion of proved reserves for release to potential captive producers under the different dispensations possible under the current laws. Most importantly, the Committee concluded that its recommendations on the implementation of the captive regime must take into account the fact that CIL and SCCL are having some 82% of the currently proven coal reserves partly due to the fact that these companies have been undertaking detailed drilling in the blocks which were under their control. And such of these proven blocks that the two Government companies cannot bring into production even by 2026-27 must somehow be brought under the captive dispensation provided it leads to an earlier realization of the production potential offered by these proven coal reserves. This will not only help monetize the country's mineral resources more optimally but also lead to increase energy security essential to delivering India's growth targets.

Reasons for the Delay in Captive Mine Production

- 4.23 Coal using companies who want to take up captive mining of coal have to go through several time consuming steps. These are:
- i) Central government recognition of a 'qualified person' to prepare the mining plan under the MCR 1960 to be issued by the MoC.
 - ii) Preparation of a Mining Plan by the 'qualified person' based on geological data furnished by CMPDI.
 - iii) Approval of mining plan by the Empowered Standing Committee in MOC.
 - iv) Environment and forest clearance from the Ministry of Environment and Forests GOI.
 - v) Clearance from Director General Mine Safety (DGMS).
 - vi) Arranging transportation contract with Ministry of Railways.
 - vii) Mining lease from the state government.
 - viii) Land acquisition and related resettlement issues.

4.24 It is, however, possible that several of these steps can be skipped when the same consumer company takes up a second or subsequent captive project. The Committee could not take up a detailed study of the delays in the different stages. The Committee is informed that major delays occur, in most cases, in obtaining Environmental clearance and the necessary approvals for land and mining leases from the concerned State Governments as also the subsequent the Land Acquisition process. The Committee recommends that the problems of delay in the pre mining stage of captive mine proposals should be carefully examined in consultation with the concerned Central and State authorities and measures designed to enable a sincere allottee to commence mine construction within three years of the date of allocation in the case of blocks allotted from Proved category. CIL is known to typically take 3-6 years to bring a mine to production against the 30 months stipulated, as per rules, when CIL does not have to go through the hassles of getting mining leases from State Governments

Expediting the Production from the allotted Blocks:

4.25 Pending such a detailed enquiry the Committee would suggest the following for immediate consideration and implementation to eliminate the delays in the more important steps

- i) *Lack of adequate interest in the mining project by the State Governments & the time taken for obtaining mining leases, surface rights and the subsequent land acquisition.* Although many states have adopted Single Window Clearance procedures, they remain ineffective. The Central Government (MoC) should take a proactive role in monitoring the approvals and clearances to be provided by the State authorities. The States can be requested to take advance action to earmark coal-bearing areas for allocation to the allottees who obtain Central Government approvals. The process for the acquisition of surface rights depends on the category of land to be acquired. Based on the ownership, land can be broadly divided into tenancy (private) land, State owned forestland and State owned revenue land. State owned revenue land is acquired by administrative procedures. Procedures under the Forest (Conservation) Act 1980 apply in the case of forestland. The State Government must be requested to give clearance within six months failing which it should be deemed to have been approved. In respect of land acquisition the State Government may be requested to keep a standing officer designated as the land acquisition officer to whom these cases

could be referred to without waiting for the setting up of a special land acquisition court.

- ii) The enormous delays in obtaining environmental clearance from State and Central Government.* This is a very complicated issue and affects most energy projects. In addition to what is already stated in Chapter 3, it is recommended that to tide over the looming crisis of coal shortages in the short to medium term, the Government should set up an empowered High Power Committee of Secretaries who may consider the applications for Environmental clearance with the assistance of specially appointed/designated staff and give clearance within 4-6 months. The same group can also review the rationale for fixing a standard rate for loss of revenue from forestlands, which are acquired for coal mining, besides insisting on compensatory afforestation.

- iii) Speculation and bargaining in the market by the allottees to obtain a high value for the mining lease.* This is hopefully a problem which relates to the allottees that got the allocation in the initial phase before the recent changes in the allocation procedures. However, this is a serious matter and should be resolved as early as possible. All possible legal measures should be evolved to cancel the licenses issued earlier if the allottee has not taken adequate steps to bring the allotted mines to production or in setting up the end-use units.

Recommendations of the Committee on Captive Coal Mining.

4.26 The Committee would like to reiterate the urgency to give special attention to incentivising and expediting captive coal production in the period up to the end of the Eleventh Plan. The Committee's recommendations towards this end are discussed below:

- i) Any coal block in the Proved reserve areas held by any company (including CIL and SCCL) that cannot be put into production before 2026-27 should be de-blocked and taken over by the Government of India. However, the current allottees including State and Central PSUs could form Joint Ventures to produce coal within the period specified from the blocks that they hold currently, Any Joint Venture so established as well as all current holders of coal blocks (except CIL & SCCL) must provide bank guarantees to back their production commitments as specified in (iii) below. In the case of CIL/SCCL, MOC could

conduct biannual reviews of progress and periodically de-block coal blocks that are unlikely to go into production by 2026-27. However, if some of the blocks could be commissioned earlier to reduce imports, CIL could form JVs to exploit them.

- ii) Proven coal reserves un-blocked as a result of the exercise under (i) above must be grouped into the following categories:
 - a) All blocks with proven reserves that can support a production of 2.5 million tons per annum or more for 30 years should be earmarked for power production exclusively.
 - b) Within the blocks earmarked for power generation attempt should be made to identify a few blocks that could support an annual coal production of 10 million tons or more for 30 years
 - c) Blocks that can support a production of 0.5 mt to 2.5 mt of coal annually for 30 years to be made available to any of the eligible end users.
 - d) Small and isolated blocks reserved for lessees producing for Coal India under sub-leases or for captive and group captive needs

- iii) A transparent mechanism for allotting the coal blocks so identified should be put in place. The Committee considered the proposals under consideration in MOC for auctioning of the blocks for coal mining in view of the large number of applicants for certain blocks and the diverse pressures, which are brought upon the Screening Committee. The Committee feels that proposing an amendment to the Coal Nationalization Act merely to enable auctioning will be counter-productive. It could also potentially increase the cost of coal leading to adverse impact on end use sectors. As the intention is to introduce a transparent and objective procedure which will avoid the unsavory practices in obtaining the preferred coal blocks, the Committee would suggest the following alternatives as the criteria for selection of the preferred applicant among several for the same block.
 - a) A minimum net worth of Rs.200 crore for being eligible for blocks in categories (ii) (a) & (ii) (b) above. The minimum net worth requirement to rise by Rs. 100 crores for every whole multiple of the minimum mine capacity of 2.5 mt proposed under these categories. A minimum net worth of Rs.50 crore for blocks in category (ii) (c) above rising in steps of Rs 25 crore for each whole multiple of the minimum production potential of 0.5 mt. And finally, a

minimum net worth of Rs 5-20 crores, depending on the size of the deposit, for blocks in category (ii) (d) above.

- b) An undertaking to produce a minimum of 2.5 million tons of coal by an agreed date before the end of the 11th Plan for blocks in category (ii) (a) above, 5.0 mt of coal for block in category (ii) (b) above, and 0.5 to 1.0 mt of coal for blocks in category (ii) (c) above (depending upon the size of the deposit). The minimum production target for the lessees for blocks in category (ii) (d) above to be specified individually.
- c) Undertaking to set up the **full** capacity of the power plant by the end of 12th Plan for blocks under category (ii) (b) above. All other end-use capacities to be realized in full by the end of the 11th Plan.
- d) An unconditional bank guarantee at the rate of Rs.40 per ton of coal to be mined per annum. The bank guarantee to be only Rs10 per ton of coal to be mined for blocks in category (ii) (d) above.
- e) One half of the bank guarantee to be encashed on a pro rata basis if production falls below the guaranteed production by the end of the 11th Plan. The remaining 50% of the bank guarantee to be encashed (on a pro rata basis) if the end use project not realized as proposed in the application. Bank guarantees to be released on a pro rata basis if the targets are met. In the event that the mine is never established, the full guarantee must be encashed and the assigned block must revert back to Government of India.
- f) As a contingent measure, in case the end- use industry does not materialize for any reason the allottee should then convert his status to that of a lessee who produces on behalf of CIL/SCCL. In case the allottee is unable to produce coal, as per the plan, the bank guarantee would be encashed as laid out in (e) above. Further, the Bank Guarantee for not putting up the end-use project would be encashed in full.
- g) In case of multiple applicants for the same block, the Screening Committee should base its decision on a point system based on net worth and technical expertise/experience. In case of a tie, the speed of bringing a mine into production should be considered. As a last resort the level of guarantee offered above the minimum required could be used for selection among competing applicants.

- h) CMPDI has limited resources for doing detailed exploration. In order to increase the proven category of reserves CMPDI should be asked to speed up detailed exploration by engaging institutions/companies which could take up exploration of the blocks under the Indicated and Inferred categories. Awards should be made on the basis of competitive bidding and CMPDI should be given the necessary funding for this purpose. This may lead to higher costs of exploration as compared to CMPDI. But when such blocks are given for captive mining, all the data and information collected could be transferred to the allottee on collection of all the costs incurred in the exploration, as is the case currently. Funds provided through the Revolving Fund of Rs. 500 crores could be used for this purpose.
- i) Small and isolated deposits under category (ii) (d) above should now be opened up for exploitation by anyone who comes up with a proposal to supply the coal locally as a lessee of Coal India. Terms of such leases to be negotiated individually but the minimum criteria detailed above must be followed. These blocks can also be given for captive/group-captive use of small end-users such as the brick and ceramic industry. If more than one application is filed, for the same block, preference could be given for those who are representatives of user associations like small-scale industry association, pottery manufacturing association or even brick kiln owners' association.
- j) Coal from blocks under (ii) (d) above need not be subject to any price controls and the administrative arrangements for allotting such coal blocks should be streamlined with powers delegated to a smaller sub-group of the Screening Committee
- k) Group captive mines must be permitted for all categories of blocks identified in (ii) above
- l) CMPDI must be made an autonomous body with powers to independently hire sub-contractors or bid out exploration work so as to enhance its drilling capacity from 3 lakh meters per annum to 10 lakh meters per annum by the end of the 11th Plan. A list of recognized domestic and foreign contractors can be developed to enhance the number of players in the field of detailed exploration in India.

- m) Incidental production from captive blocks during mine development or periodic surpluses during mine operation must be sold to CIL/SCCL at a negotiated price with a band of plus or minus 10% of the CIL price for the same quality of coal. Alternatively, Coal India could auction such coal from captive mines through its e-auction platform for a handling fee of 1% of the value realized.

Summing Up

- 4.27 In the opinion of the Committee, the level of attention given and encouragement extended to captive coal mining will decide whether domestic coal will remain the primary source of energy supply in India. In the next four years due to several historical reasons the nation is going to face huge fuel shortage if adequate efforts are not made to increase production by the existing producers and encourage captive coal mining,. Developing domestic coal resources and successfully extracting this primary energy resource is critical to India's energy security and sustained growth. Hence, captive coal mining is of utmost importance.

Coal Pricing and Trade

Industry and Market Structure

- 5.1 Coal Prices was partially deregulated in 1997 (grades A to D) and completely deregulated in January 2000 (grades E to G). This, in theory, conferred the right to fix the price of coal on the two public sector companies CIL and SCCL, which operate as exclusive producer-cum-traders of coal in India. However, the price fixed by the companies is, in reality, “guided” by the Ministry of Coal (MOC) Government of India (GOI). Though the principles of fixing prices have not been set out explicitly, it is, in essence, determined on the basis of costs incurred in its production from different mines in a coal company plus a reasonable profit margin. This has proved to be unsatisfactory as the “demand” for coal from non-power users at the price fixed, is far in excess of the available supply at this price. The margin to be charged over the costs of production as reasonable rate of return on investment has not been defined and coal companies have recently increased the coal price on the ground that there is evidence of demand at higher price! This situation has aggravated the various ills of the coal industry, including the deterioration of governance in coalmines and the interference of middlemen, musclemen and mafia in the coal industry. This also affects the long-term growth prospects of coal production and the potential to introduce competition in coal industry. The Committee feels that the determination of the principles and procedure for pricing of coal in India with reference to the special characteristics of the fuel producing industries and fuel consuming industries is of great importance to enable the industry to continue as the primary source of commercial energy in India.
- 5.2 Like in all commodities, the price of domestic coal should determine the level of supply and demand. However, response of overall demand and supply to price variations is slow due to the structure of the coal industry as well as the nature of the user industries. Coal industry is dominated by two fully Government owned

companies operating in two different geographical regions. These two companies have never had to compete in the market place and as such have had no interest in creating a vibrant and competitive coal market. These two companies see their role as one of fulfilling the production targets fixed by the Government and take up plans and projects to just meet the targets, with very little surplus to serve any unanticipated or sudden increase in demand. New players in coal mining face huge entry barriers and thus the supply response tends to be slow and demand-supply gaps persist. Finally, only miniscule quantities of coal are available for trading freely.

5.3 To understand the demand response to domestic coal price variations, one has to first recognize that some 80% of the domestic production is actually used for power generation (utilities plus captive). The power sector uses coal that is commonly referred to as Thermal Coal. Typically, the poorest quality of domestic thermal coal (grades E to G) is supplied to the power industry. The demand of the steel sector is just under 9% of domestic production while that of the cement sector is just under 5% of the domestic production. The blast furnace based steel industry and mini blast furnaces for the pig iron industry need good quality coking coal. Since India is deficient in good quality coking coals, the steel producers requiring such coal have, over the years, depended primarily upon imported coking coal with imports rising in step with metal production. The sponge iron industry, the corex steel industry and the cement industry are the typical consumers of higher grades of domestic thermal coal (grades A to D). Finally, there is an estimated demand of the brick kiln industry and other industries that is currently put at 12 to 13 percent of the domestic production. This last category of consumer is not particularly concerned with quality; supply at a viable price is the main issue. While the demand for the power, steel and cement sectors is fairly well established based on the output of these sectors, the demand for the brick kiln industry and other industries has never been fully tested as the country has not experienced coal surpluses in recent history. It is likely that the demand estimates for this last category of consumers are suppressed demand numbers as a result of constrained supply and trade of coal. The demand-supply gap is being met by imports primarily of coking coal for the steel sector.

5.4 Power generation, the biggest consumer of domestic coal, is a regulated industry and fuel cost is a pass through at a liberal heat rate. This makes the demand for power practically insensitive to the price of coal. Oil as fuel for power generation out priced itself in 1973 and large-scale availability of gas for power generation remains uncertain. In any event, as explained below, gas cannot compete with either

domestic or imported coal unless made available at or below \$4/MMBTU. Indian coking coal has to compete with imported coking coal on quality and cost and domestic availability is, in any event, less than 30% of the demand. The cement, sponge iron and corex steel consumers also face shortages of domestic supplies but find imported coal expensive and logistically difficult to use because of small individual demands and constrained port and rail capacity to move coal freely as also restrictions on trading of coal. Although technically the consumers of high-grade domestic thermal coal can switch to alternate fuels, existing plants are mostly designed for coal. In any event, alternate fuels are neither easily available nor cost competitive with coal. Hence, here too, there is relative price inelasticity. These users attempt to source most, if not all, their requirements from domestic supply and supplement domestic supply with imports, which are costly as they entail spot purchases, shipping in smaller vessels and inland transportation in India and the attendant multiple handling. The brick kiln and other industrial consumers are the only consumers that remain truly price sensitive and, on the margin, remain willing to pay up to Rs. 5000 to 5500 per ton of coal (compared to a pit head price ranging from Rs. 400 to Rs. 1000/ton). Consumers in this category are the marginal consumers who depend on the grey market and are not averse to using biomass or other alternatives if coal availability and prices make their operations non-remunerative. Thus this marginal segment, left without linkages and made to fend for itself, is the only segment wherein demand is price sensitive because this is the segment wherein market forces are in full play.

- 5.5 It is important here to understand the dynamics of coal pricing for the power sector in India and the pricing of alternative primary energy sources for power generation that consumes about 80% of domestic production. The power sector primarily consumes 'E', 'F' and 'G' grade thermal coals, which also constitute the bulk of India's coal production. Although the stated calorific values, under the current grading system, for these grades vary over a wide range, actual calorific value of domestic coals received at the power stations is only about 3500 kilocalories/kilogram on an average. The ash content, on average, of the lower grades of Indian coal is around 40% while the sulfur content is below 1%. Imported coals have high calorific values (around 6200-6500 kilocalories/kilogram) low ash content (about 10-12%) but are high on sulfur (2 –3%). The weighted average free-on-rail price of domestic thermal coals sold to the power plants is just under \$5/million kilocalories inclusive of royalty and tax. Freight and handling then adds \$ 7 to \$ 11 for distances between 1000 to 2000 kilometers making the delivered price of domestic coal \$12-\$16 per million kilo

calories for distances of 1000 to 2000 kilometers from the mines. Imported coal, even when it was selling at its all time high prices, in comparison, could be delivered at a cif price of about \$13 per million kilocalories inclusive of a 5% custom duty at a coastal location. Thus imported coal is cost competitive at coastal locations on the West coast and Southern shores of Tamil Nadu especially if it requires no transportation or very minimal transportation on land, in India, to reach the consumption point.

- 5.6 To illustrate the fact that coal (even imported coal) will remain the preferred fuel for power generation, it is pointed out that the domestic gas priced under the Administered Price Mechanism (APM) translates to a land-fall price of just over \$8 per million kilocalories without royalty and taxes. And this APM gas transported to a point along the HBJ pipeline would translate to a sale price of about \$12-13 per million kilocalories inclusive of royalty, taxes and transportation. However, APM gas at the landfall point is currently priced at less than 30% of prevailing LNG prices. Further, availability of APM gas is falling and the share of market priced gas is increasing. Imported LNG offers an alternative to coal for the purposes of power generation. However, even if re-gasified LNG were used at the landfall point (involving zero inland transportation), it would not cost less than \$31-32 per million kilocalories at current market prices inclusive of custom duties and taxes. Although, LNG yields some 25% higher fuel efficiency in power generation compared to coal plants, the fuel cost based on imported LNG would still be about 1.9 to 2.0 times the fuel cost of imported-coal based coastal power plants at current prices of imported LNG and coal. Even if one adjusts the fuel cost of gas based power plants to reflect the lower capital cost of gas based power stations, the fuel cost of imported LNG based generation will be 1.6 to 1.7 times that for imported coal based generation at coastal locations. For gas to be competitive with imported coal as a fuel source, at coastal locations, re-gasified LNG would need to become available at below \$4 per million BTUs inclusive of all taxes compared to the current level of about \$7 per million BTUs. It is stressed that these comparisons are being made at the all time high prices of imported coal unlike the oil prices which have been higher in real terms for extended periods (as much as 12 years) of time in the past. Coal prices in the international market have recently dropped sharply from their highs.
- 5.7 The rapid growth of the coal industry is dependent on the level of use of coal for power generation. The power industry uses coal in preference to other fuels because of the lower price and greater predictability of its future price as compared to natural

gas. Freight plays a key role in changing the economics of domestic coal usage in India and the location of power plants. The large quantities of coal used in specific power plant locations require huge infrastructure facilities to be created in such locations. The first comprehensive energy policy document in India, namely The Report of the Fuel Policy Committee in 1975 highlighted the need for integrated planning for production and transportation of coal and synchronized investments in the coal and railway sectors (see Box 5.1 below).

Box No. 5.1

Coal & Rail Transport Interdependence

Prof.Sukhomoy Chakravarti, Chairman, forwarding the Report of the Fuel Policy Committee wrote: “the Arrangements for transportation of coal have proved to be very much short of our needs and unless an integrated plan for production of coal and its transport are drawn up and synchronized investments are made in coal and transport sectors, there is likely to be severe strains on the energy sector... transportation by rail by increasing quantities of coal will be unavoidable – It is therefore necessary to examine the techniques and procedures of coal transport and device ways which will enable the transportation of adequate quantities in the most economic manner”.

August 22nd, 1974

- 5.8 The above clearly demonstrates that establishing a market mechanism for pricing coal in India is not a simple task of having multiple producers and consumers with minimal entry barriers. Relative fuel prices of competing fuels, their relative convenience of use, flexibility of equipment in place and/or environmental impact may fail to yield the theoretically optimal fuel choice in view of the market characteristics outlined above. Competition and the price determining the demand supply balance for coal and its alternatives is intricately tied up with transport costs, availability of rail and port infrastructure for coal and shipping, port and pipeline infrastructure for gas the key alternative fuel that competes with coal in Europe and USA. The regulatory environment created in the power industry much ahead of regulation of primary fuel industries has further complicated the scenario with domestic gas seeking import parity pricing like the rest of the petroleum sector products even when power prices are regulated
- 5.9 The Committee is of the view that coal prices would need to be regulated in light of the above market realities. Further, the regulation of coal price has to differentiate the pricing of coal for power generation since it consumes 80% of the domestic production and the quality of coal it consumes is not easily salable to the steel and cement sectors. Further, the power sector has to be serviced with long-term

contracts and special investments in transport. There is need for long-term supply and price contracts between the power and coal industry that involve the critical third party namely the Railways.

- 5.10 Another peculiarity of the Indian system of coal pricing that has to be kept in mind is that coal is priced in India based on grades of coal. Each grade of coal is identified by a very broad band of 'Useful Heat Value' (UHV), a concept unique to India. Apart from the fact that the UHV concept is a legacy of the past without any scientific basis, it promotes a slab rate with increasing bandwidth with progressively lower grades of coal as opposed to a fully variable rate linked to the precise calorific value of the coal under consideration. This encourages coal companies to supply coal at the bottom of the grade bands and pass of the coal as belonging to the next higher band. The Table 5.1 below details the UHV bands used for grading and pricing Indian coal.

Table-5.1

Grading And Pricing Of Indian Coal

Coal Grade	UHV Band (Kcal/Kg)	Bandwidth (Kcal/Kg)	Average Pithead Price (Rs/T)	
			As in 2000	Range in average price in different subsidiaries of CIL as on 1.6.2004*
A	>6200	-	1072	1050-1340
B	5601-6200	599	964	940-1250
C	4941-5600	659	792	780-1160
D	4201-4940	739	664	650-730
E	3361-4200	839	527	510-900
F	2401-3360	959	420	400-710
G	1301-2400	1099	300	290-540

* **Lowest range of prices prevail I n MCL and Highest range of prices in WCL**

The rest of the world as also the design and scientific community the world over (including India) uses the Gross Calorific Value (GCV) to specify coal quality. And the price of coal in the rest of the world is fully variable with coal quality.

- 5.11 Finally, pricing of coal in India must also recognize that coal trade and movement are controlled under the Essential Commodities Act and The Colliery Control Order which is a legacy of market situation prevailing during and after World War II and no longer reflects the market realities of today. The Committee was informed that there is no legal bar to trading coal under any act governing the Coal sector. Such restrictions are purely contractual and determined by the contracted end-use of coal. However,

the truth is that each coal consumer in the core sector is required to obtain a coal linkage based on the railway link/capacity available and is practically tied down to a coal mine or basket of mines. This market reality has limited the amount of coal available for trading.

- 5.12 Keeping the above ground realities in view, the Committee examined alternate options available for price reform in the coal sector.

Options for Price Reforms in Coal Sector:

- 5.13 It is stressed once again that alternate pricing options must recognize that there are serious entry barriers to coal mining and only marginal quantities of coal are currently available for trading. Further, coal is not currently priced in accordance with GCV and other relevant quality determinants such as moisture and the price is not completely variable with quality as measured by these parameters. Finally, as stated above, most Indian thermal coal is not tradable across borders without significant preparation and beneficiation. Given these ground realities, the following pricing options follow from the fuel pricing principals enunciated by the Integrated Energy Policy Committee 2005.
- 5.14 **Option – 1:** Coal prices to be totally deregulated. Industry may be allowed to sell coal at any price on the basis of mutual agreements between buyers and sellers. Such an approach in the prevailing market structure described above could be highly disruptive. Success of such a pricing mechanism depends critically on the availability of multiple producers and/or sources of supply with no entry barriers and a level playing field for everyone. Even though bulk of coal produced in India can only be sold to the domestic power generation industry, the constrained supply situation, existence of just two suppliers with one clearly dominant, strong entry barriers, the non-level playing field for private mining, and above all the port and transport constraints would raise prices of coal and may actually lower production even more in order to milk the market. Prices may exceed import parity prices till such time that the physical bottlenecks to large-scale imports are removed. Domestic coal would still have a huge price advantage over imported coal at pithead and inland locations far from the coast. In a limited sense, the availability for the cement industry, the brick kiln industry and other industries may improve but they would all have to pay import parity prices at the factory gate as that would be their only other option. The power sector and the rest of the economy would suffer and the steel sector would mop up the higher-grade domestic coals and continue to rely on imports for the balance.

Clearly this option is unworkable till the industry structure changes significantly, the coal bill becomes a reality and the required infrastructure is put in place.

5.15 Option – II: As in the case of oil industry, Coal price could be fixed on import parity basis. It is pointed out that there is no universally accepted international price of coal. However, some countries like Japan and China adopt a price index for their long-term coal supply contracts. In theory Indian coal industry could be allowed to fix the prices daily on the basis of what is known as Japan or China Coal price Index and in due time develop its own index. The normal understanding is that contracts for coal sales as per a selected Index results in obtaining coal at less cost over a period of time than through Spot purchases. In effect, however, the Index reflects the prevailing price at which the transactions of a short term or medium term basis can be made. The information of the quantities of coal traded on a long-term basis on negotiated prices is often not available. The main reason for support to this option, from different influential quarters, appears to be that such an approach towards Import Parity Pricing has been adopted in the other major fuel industry, namely, oil and gas. There has been no evaluation study available to this Committee regarding the benefits, which have accrued to the country due to the adoption of such a pricing principle for the oil and gas sectors. This Committee does not consider the adoption of Import Parity pricing as appropriate for Indian coal Industry for the following reasons:

- i) This Committee is of the view that the following recommendation of the Fuel policy Committee made in 1975 and accepted by the GOI is valid even today. The FPC 1975 states “From the national point of view, the fuel prices should ensure that the pattern of use of fuels is in keeping with the optimal pattern of production determined with reference to the long-term availability of fuels and their costs.”
- ii) Import parity price could increase dependence on imported coal, as many Indian consumers may prefer imported coal. This may aggravate India’s energy security concerns.
- iii) Countries, which adopted import parity pricing principles, are increasingly recognizing the need to review their choice. The President of South Africa raised this issue in his last State of the Nation Address. In UK and South Africa the Competition commissions have raised several issues on how the adoption of this pricing policy is violative of the Competition Laws. (See Box 5.2 below)

- iv) The bulk of the Indian coal as mined is non-tradable across borders as it has an average ash content of 40%, high moisture and a consequent low calorific value averaging 3500 kcal/kg. To make it acceptable for even neighboring countries it has to be washed and beneficiated. The economic rationale for import parity pricing for such a commodity is highly questionable.

Box NO.5.2

IMPORT PARITY PRICING--EXPERIENCE IN OTHER COUNTRIES

The President of South Africa, in his State-of-the Nation speech has voiced deep concern on the prevailing import parity pricing (IPP) which has resulted in Oil produced with South-African coal at about US\$ 20/barrel being sold in South Africa at international price of US\$ 60/barrel .He has also pointed out that Steel produced in South Africa using all local raw materials and priced on import parity pricing has made it cheaper in neighboring countries than in South Africa. South Africa's Competition Commission has concluded that IPP might contravene several sections of the Competition Act. The IPP principal is currently under review in South Africa.

In UK where Import parity pricing of coal has led to local mines facing closure, a separate commission has been set up to provide cash subsidy to UK coalmines, which supply coal to power and other specified industries. In Nigeria there have been civil riots against the adoption of import parity pricing of petroleum products. In India, it is noteworthy that till a few years back Indian coal was costlier than imported coal and a customs duty of 30% had to be levied

- 5.16 Option –III** Regulating only the price of the power sector. The final option is to take note of the quality of domestic coal and recognize its fit with the economically critical thermal power sector whose large coal needs are not only best met by domestic coal but also need long term transport and other infrastructure arrangements. The coal price system designed should also take note of the price regulation prevailing in the power sector. With the increase in the share of coal based power production in the total power generation, over time, the average cost of bulk power would depend on the price at which coal is sold to power industry. In national interest it is imperative that power costs are kept at the lowest level so that Indian industrial production can be globally competitive and the poor among the domestic consumers could all be

supplied electricity at affordable prices. The Committee considers it reasonable to have special price and supply arrangement for the power sector. For convenience the power sector may be called a Class 'A' consumer. All other consumers of coal may be called Class 'B' consumers. To begin with class 'A' consumers would include power utilities and captive power plants.

- 5.17 The Committee recommends that coal requirements of Class 'A' consumers should be supplied at prices determined strictly on a cost-to-produce basis subject to certain efficiency norms and allowing a rate of return in keeping with the other energy supply industries like electricity. Until the setting up of a Regulatory mechanism or other arrangements for coal price determination, the MOC, on the basis of periodic price studies, can fix this price. A tripartite agreement involving coal supplier, coal consumer and the transporter called the Fuel Supply & Transport Agreements (FSTA) should cover the supply arrangements for such consumers. Needless to say the Railways should agree to be a party to the FSTAs. It is necessary that the Coal industry and Railways recognize their mutual dependence for their growth and prosperity. Every year, on the basis of the production plans of public sector and private coal mines, the Government would decide the quantity of coal out of the total production which should be earmarked for supply to Class 'A' consumers. The remaining coal production in the country should increasingly be sold to Class 'B' consumers, on the following basis: the larger among these consumers including associations of consumers with a minimum annual demand of one lakh tonnes can be given 60% of their needs under FSTA but at a price indexed to the e-auction price. The remaining quantity required by these companies and all other smaller consumers could get their needs of coal through traders or imports or e-auction. For this method to succeed at least 10% of the total domestic production must be sold in the open market through e-auction in the first year. The amount of coal made available for e-auctions can rise to a minimum of 20% of the domestic production by the third year. Simultaneously, the power utility sector should be asked to set up coastal generating stations along the Western Coast of India and South Tamilnadu based on imported coal. This will lower the dependence of domestic power utilities on domestic coal, thereby making it possible, over time to raise the quantity of coal being sold in the open market through e-auctions to 25% and even 30%. If during the transition the requirements of the Class 'A' consumers as a group or as individual consumer within the group get an allocation which is below the projected demand for the year, the industry should, individually or collectively, arrange to import the extra requirements.

5.18 Although the Committee recognizes that the quantity of coal on auction through out the year should roughly match the demand for the consumption covered under e-auctions, it could be disruptive for industries used to getting their requirements under the current linkages. The above gradual approach spread over three years to reach 20% of domestic production and possibly 5-7 years to reach 30% of local production being sold through e-auctions recognizes that it is necessary that the distribution and pricing of coal should be gradually moved from the current practices to the desired final stage set out above. The Committee would also like to suggest that the procedures of auction and the quantities to be auctioned during the year with the monthly break up of the quantities and the possible locations from which the coal is likely to be offered should be published in advance of the year and revised once in three months. A similar protected price for essential industries is operating in China today (see Box 5.3 below).

Box 5.3

China's Coal Industry

China's coal industry presents a picture of mind-boggling growth achieved under fast changing conditions. China's coal industry stagnated during 1995 – 2001. However within three years since 2001 production has increased to nearly 2000 m.t.

Coal Production in China

(in million tonnes)

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Production	1361	1397	1356	1250	1280	1300	1380	1480	1667	1956

The ownership of coalmines was transferred from the Central Government to Provincial governments at the turn of the century. Small mines have now grouped themselves and have increased production without adequate safety arrangements. Asset Supervision and Administration Commission (SOASAC) regulates the industry, which today comprises over 2000 de-centralized producers.

The price of coal for power sector is discussed annually at a "Coal Order Meeting" under the auspices of the National Development and Reform Commission (NDRC), which is attended by all electricity generators, railways and coal producers. The meeting has to arrive at the quantity and prices of coal to be delivered to power industry from specific mines. At the Annual Coal Order Meeting 2004 in Fuzhou no agreement could be reached even though NDRC set a high price increase. It is reported that at the Annual Coal Order Meeting 2005 the price was increased further and a settlement was reached. Prevailing price of delivered coal for power is around \$ 30 per tonne. Rest of the coal is sold at market determined price which is today around \$ 50 per tonne.

Source: (Gathered by Mr. T L Sankar during a recent visit to China from Beijing News, China Daily and Electricity News and discussions).

The Pricing Proposals are a Package

5.19 The Committee is of the view that if the recommendations towards liberalizing captive coal mine allocations, totally deregulating production from small mines, and imports by major users like NTPC are encouraged, the coal shortage could be completely remedied in 4-5 years. However, the large and growing needs of the unorganized industry especially the brick kilns and other small industries such as ceramics should be taken care of to ensure that the coal for organized industry does not get diverted and the forest resources of India do not come under severe strain. The different grades of coal preferred by different consumers and variations in the paying capacity of consumers provide an ideal setting for a “market” to develop in the coal sector. Further, in keeping with India’s size of deposits and the level of production/consumption India’s coal sector should integrate more closely with the world coal market for a competitive coal industry to develop. There is need, therefore, to keep the import option functioning efficiently as an essential supply option along with the regulation of price in the Indian coal industry which will ensure least cost supply of coal for power generation while allowing a competitive and transparent coal market to supply the needs of other consumers. The Committee would like to submit that these recommendations are conceived as a package and they should all be implemented simultaneously starting with the year 2006-07.

Risks anticipated in implementation

5.20 The first major risk of the proposed arrangement failing is the likely negative response of the railways. Railways, which in the distant past, carried coal at a concessional tariff still nurtures the attitude of a donor towards a receiver and not that of a service-provider to a valuable customer. Three measures are urgently required in this context:

- a) The Railways, Coal and Power Ministry have to work together to draw up a well-conceived model of Fuel Supply and Transport Agreement (FSTA). GOI should ensure that all the concerned Ministries and agencies accept the FSTA and perform as per its provisions.
- b) The Railway tariff for coal should be subject to a detailed review by an independent agency, preferably headed by a High/Supreme Court Judge.
- c) The Railways should, in consultation with Planning Commission and the Ministries of Coal and Power, determine the main corridors through which coal

would move in very large quantities to power plants and examine the cost and feasibility of setting up dedicated trunk-routes for coal transport. The exercise can also consider the possibilities of using multimode of coal transport involving rail-cum-coastal shipping and the use of double decker freight trains. This exercise should be taken up immediately to enable a decision on this investment in the early years of the XI Plan.

- 5.21 The second major risk arises from the concerns likely to be voiced by well meaning environmental experts who would point out the carbon accumulation on account of increasing use of coal and the consequential climate-change implications. While India should make all efforts to keep the adverse global pollution effects under control, it should be understood widely that India cannot play this role independently. The quantity explanation will be very convincing. India is the third largest producer-consumer of coal using about 400 million tonnes of coal today with a population of 1.1 billion. If we use coal as the fuel for all incremental thermal power generation our coal consumption may increase to about 1600 million tonnes of comparable coal in 2029-30 (25 years later) for a population of just over 1.4 billion. As against this China, which is the largest producer – consumer of coal uses 2000 million tonnes of coal with a population of about 1.3 billion today and is planning to increase its coal dependence further. The second largest user of coal is USA which uses about 1100 million tonnes of coal today with a population of 390 millions. USA is planning to increase coal production to 1300 million tonnes in the next decade. In per capita terms USA today and in future would be burning more coal than India. The Committee is of the view that the concern for climate-change implications on account of increased coal use in India at the current stage is somewhat premature. Having said this, India must take up various measures of reducing the pollution impact of coal use by developing and adopting all appropriate emerging clean-coal technologies including carbon sequestration whenever found economically viable.

No. A-13011/1/2004-Admn.
Government of India
Ministry of Coal

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New Delhi, the 20th December, 2004

ORDER

1. The Government has decided to constitute an Expert Committee comprising the following:
 1. Shri T.L. Sankar, IAS (Retd)-Chairman of the Committee.
 2. Dr. J.J. Irani, Director, TATA.
 3. Shri P.K. Sen gupta – former CMD, Coal India Ltd.
 4. Shri P.V. Sridharan, Sr. Visiting Fellow, TERI.
 5. Shri S.K. Mahajan, former Joint Adviser (Coal & Mines), Planning Commission.
 6. Shri S.P. Sethi, Adviser (Energy), Planning Commission.
 7. Shri Pradeep Kumar, Additional Secretary-Member Secretary of the Committee.

2. The items of reference of the Committee are as follows:
 - i. Measures for meeting the demand-supply gap in Coal in the short, medium and long-term.
 - ii. How to improve productivity of man and machinery in Indian Coal Sector, particularly in Coal India.
 - iii. Introduction of cutting edge technology in Coal Sector.
 - iv. How to convert CMPDIL into a center of Excellence for Planning and Research in Coal Sector.
 - v. Restructuring of CIL to make it a World Class Company.
 - vi. Other matters that the committee may consider important for the general improvement in the functioning of the coal sector.
 - vii. Examining the merits of opening up trading in coal.
 - viii. Examining the current policy of providing captive coal mining, and considering recommendations which might reduce the demand – supply gap.

3. The Expert Committee should also examine major recommendations suggested by M/s KPMG Consulting Private Limited.

4. CIL will provide secretarial assistance to the committee.

5. The Committee will submit its report within a period of three months.

6. The non-official members of the Committee will be paid TA/DA at the rate applicable to officers of the highest grade in the Central Government for attending the meeting of the committee.

7. This issues with the concurrence of IF Division (DY: No. 863/IF/04 dated 20.12.2004.

(Parkash Chand)
Deputy Secretary

To

1. Shri T.L. Sankar, IAS (Retd)-Chairman of the Committee.
2. Dr. J.J. Irani, Director, TATA.
3. Shri P.K. Sen gupta – former CMD, Coal India Ltd.
4. Shri P.V. Sridharan, Sr. Visiting Fellow, TERI.
5. Shri S.K. Mahajan, former Joint Adviser (Coal & Mines), Planning Commission.
6. Shri S.P. Sethi, Adviser (Energy), Planning Commission.
7. Shri Pradeep Kumar, Additional Secretary, Ministry of Coal.
8. Shri Shashi Kumar, CMD, CIL, Kolkata.

List of Institutions / Individuals met by the Committee:

1. Coal India Limited.
2. Singareni Collieries Company Limited
3. Neyveli Lignite Corporation.
4. Ministry of Power.
5. Ministry of Steel.
6. Ministry of Coal.
7. Indian Coal Merchant's Association.
8. All India Brick and Tiles Manufacturer's Association
9. Hathras Zila Brick kiln
10. Khurja Pottery Manufacturer's Association
11. BEML – Bharat Earth Movers Limited
12. HEC – Heavy Engineering Corporation
13. P&H India Limited
14. Bucyrus (India) Private Limited
15. Bharat Heavy Electrical Limited
16. NTPC – National Thermal Power Plant
17. Tata Iron and Steel Company Limited
18. Jindal Steels Power Limited
19. BCCL – Bharat Coking Coal Limited
20. CMPDIL – Central Mine Planning and Design Institute Limited
21. Aryan Coal Beneficiations (P) Ltd
22. Maruti Clean Coal and Power Limited
23. Bhatia International
24. MECL – Mineral Exploration Corporation Limited
25. IBM – India Bureau of Management
26. GSI – Geological Survey of India
27. Officers Association of India
28. Hind Khadan Mazdoor Federation
29. Mineworkers' Federation (INTUC)
30. Indian Mine Workers Federation Coordination Committee

Individuals:

1. Shri V.K.Singh, President, Mining, Geological & Metallurgical Institute of India.
2. Dr.R N Sharma
3. Shri S K Chawdhary, Ex. President, Indian Coal Forum
4. Shri R B Mathur, ex. CMD, CMPDIL/SECL/BCCL, Vasant Kunj, New Delhi
5. Shri S K Verma, Ex.CMD, ECL/CCL/CMPDIL, Ranchi
6. Shri K K Hajra, Sup. M, Kalidaspur, ECL
7. Shri Y P Keshary
8. Shri Suresh Jha, Ex.DF, CCL, Ranchi
9. Shri B Akala, Ex.CMD, CCL/CMPDIL
10. Shri R K Sachdev, President, Coal Preparation Society of India, New Delhi
11. Shri Manoj Kumar T, Delhi
12. Shri S N Mysorewala, Ahmedabad
13. Shri C S Gangadharan, Chennai
14. Shri Ramanuj Prasad Verma, Ranchi
15. Shri Jawahar Lal Mehta, ex. Director (P&P), NCL, Ranchi

16. Shri T V Sukumaran Nair, Management Consultant, Trivandrum
17. Shri S K Santra, M K Pradhan/R K Chodhury/V Kumar etc
18. Shri K K Thakur
19. Shri K A Sinha, Ex. Director (Tech), CIL
20. Shri T N Singh, Ex. Director, CMRI, Dhanbad
21. Shri D Ramdeo Rao, PM (AHQ), Chandrapur Area
22. Shri K H Limsay, Rahate Colony, Vardha Road, Nagpur
23. Shri B S Rana, WCL, Chandrapur, Maharashtra
24. Shri E N Murthy, Sec. General, Cement Manufacturer's Association, New Delhi
25. Shri Mohinder Prakash, Dy.CE (Excv), WCL, Chandrapur
26. Shri A K Ghosh, Former Director, Indian School of Mines, Dhanbad
27. Shri Subir Kumar Baksi, BE, FIE, Durgapur
28. Shri N C Saxena, Dhanbad
29. Shri C V J Verma, Council of Power Utilities, New Delhi
30. Shri T V Shiva K Rao, Instrumentation systems & Automation Society,
Hyderabad Section
31. Shri Soumen Choudhury, Hoogly, West Bengal
32. Shri Bhola Prasad, Ex-Foreman, CCI, Giridih
33. Shri B N Mishra, Burdwan
34. Shri A K Dubey, Emeritus Scientist, CSIR, Central Road Research Institute,
New Delhi
35. Shri S P Hazra, Kolkata
36. Shri S C Hada, Director, Sumeru (India) Pvt.Limited, kolkata
37. Shri K M Bakshi, Kolkata
38. Shri U P Singh, Kolkata
39. Shri O P Khera, ex-Regional director, Dhanbad
40. Shri Subhash Chand Sitani, Orissa
41. Shri B G Pradhan, Pune
42. Shri Deepak Kumar, Asstt.Mines Manager, DVC

Annexure-III

Coal Demand and Availability by Terminal Year of Tenth Plan

(as per Planning Commission)

Sector			(million tonnes)	
	2001-02	2002-03	2006-07	
	Actual	Actual	Plan Document	MTA
I. Demand				
A Core Sector	292.53	299.88	378.91	390.10
	(83.2%)		(82.3%)	(82.4%)
1. Power Utilities	248.80	252.78	317.14	322.00**
	(70.7%)		(68.9%)	(68.1%)
2. Steel including coke ovens (coking coal)	28.48	30.74	37.21	42.70
	(8.2%)		(8.1%)	(9.0%)
3. Cement	15.25	16.36	24.56	25.40
	(4.3%)		(5.3%)	(5.3%)
B. Non Core Sector	59.18	66.10	81.59	83.08
	(16.8%)		(17.7%)	(17.6%)
1. Brick kiln and others	32.75	36.86	37.85	40.00
	(9.3%)		(8.2%)	(8.5%)
2. Captive Power	17.02	19.04	28.26	28.26
	(4.8%)		(6.1%)	(6.0%)
3. Other industries	9.41	10.20	15.48	14.82
	(2.7%)		(3.4%)	(3.1%)
-Steel SDR	4.40	6.17	7.00	7.00
-Fertilizer	3.20	2.54	4.18	3.52
-Export	0.02	0.01	0.10	0.10
-Colliery Consumption	1.79	1.48	2.50	2.50
-Soft Coke/LTC	*	*	0.20	0.20
-Cokeries	*	*	1.50	1.50
Total:	351.71	365.98	460.50	473.18
	(354.29)	(363.30)		
* Included in BRK/Others				
** Including additional stocks of 5 mt.				
II. Availability	349.35	363.25	425.48	461.69
A. Domestic Production	328.80	341.23	405.00	431.00
	(327.79)	(341.27)		
CIL	279.65	290.69	350.00	373.00
SCCL	30.81	33.16	36.13	37.50
DVC/TISCO !	7.73	7.46	18.87	21.00
Captive Producers !	4.46	5.51		
Others (Meghalaya) !	5.15	4.41		
B. Actual/Planned Imports	20.55	22.02	20.48	30.69
-Coking coal	11.11	12.52	17.18	24.19
-Non-coking coal	9.44	9.50	3.30	6.50
C. Uncovered gap	2.36	2.73	35.02	11.49
	(-6.95)	(1.33)		
D. Import of Met Coke	Nil	Nil	Nil	Nil
Power Generation (utilities-BU)	343.16	354.76	452.00	446.00
Cement Production (mt)	115.00	121.00	153.50	158.56
Hot Metal (mt)	21.86	24.31	25.59	31.83
Figures in brackets is the assessment made by V.K. Singh of NCL				

Annexure-IV

Phasing of production of X plan projects

(Costing Rs. 100 crores & above)

Sub	Sl. No	Name of the Project / Mine	Type of Mine (UG/OC)	Latest Capacity (Mte)	Proposed Capital (Rs. Crs)	Sanction Date
ECL	1	Rajmahal Expn.	OC	6.50	648.50	
				(incr)		
	2	Chuperbhita	OC	4.00	498.80	
	3	Hura-C	OC	3.00	397.30	
	4	Jhanjra LW (R-VI)	UG	1.70	280.80	
		TOTAL		15.20	1825.40	
CCL	5	Ashok Expn.	OC	5.00	458.18	
				(incr)		
	6	Karo Expn.	OC	3.50	193.28	
	7	Konar	OC	3.50	183.43	
	8	North Urimari	OC	3.00	373.72	
	9	Magadh	OC	12.00	923.56	
	10	Amrapali	OC	12.00	1178.31	
		TOTAL		39.00	3310.48	
NCL	11	Block-B	OC	3.50	693.33	
	12	Bina Extension	OC	6.00	823.02	
	13	Krishnasila	OC	4.00	834.44	
	14	Khadia Expn.	OC	6.00	1543.99	
				(Incr)		
	15	Amlohri Expn.	OC	6.00	1361.95	
				(Incr)		
		TOTAL		25.50	5256.73	
SECL	16	Dipka Expn	OC	10.00	856.59	05-07-2005
				(Incr)		
	17	Gevra Expn	OC	13.00	1339.69	05-07-2005
				(Incr)		
	18	Kusmunda Expn	OC	4.00	337.09	
				(Incr)		
		TOTAL		27.00	2533.37	