

National Steel Policy 2012

(Draft)

1.0 Preamble

1.1 Steel will probably remain the world's one of the most important engineering materials for a long time to come. With strong backward and forward linkages, steel industry is an engine of economic growth and a symbol of economic prosperity. Moreover, steel is vital to the nation's economic security as it is extensively used in strategic areas such as defence, power, atomic energy, and in creation of social and economic infrastructure of the country.

1.2 Most of the developed nations during their course of economic development had relied heavily on their domestic steel industry to meet the requirement of faster industrial development and for building physical infrastructure. Even though steel is a freely traded commodity, large scale dependence of a growing economy like India on imported steel may make the economy vulnerable to uncertainty in global supply, export policies of different countries and volatility in international prices. For India, the case for domestic production of steel is even stronger due to indigenous availability of resources and a need to minimize strain on current account balance. In fact, the revealed comparative advantages of labour and raw material have the potential of making India a leading exporter of steel in the world.

1.3 The National Steel Policy 2005 (NSP 2005) was formulated at a time when the Indian steel industry had just moved into a higher growth path with showing promises of a significant resurgence and it enunciated important milestones/physical targets and an overarching broad policy framework to achieve the stated end on an assumed 6.9% growth in steel consumption, 7.3% growth in steel production and a 23% share of exports in total production by the year 2019-20.

1.4 Since then, however, the Indian economy experienced a paradigm shift with the actual performance of the economy as well as that of Indian steel industry surpassing the projected levels of performance. Steel consumption grew by 10% per annum from 2005-06 to 2011-12 and production at an annual rate of 7.8% during the same period thereby surpassing the NSP 2005 projections by a significant margin.

1.5 At the same time, due to relatively faster growth in steel consumption compared to production, the strategic goal of achieving a 23% share of exports in production remained unrealized and India became a net importer of steel from 2007-08 onwards. A major concern in the last few years has been the slow pace of capacity build-up, especially through investments in greenfield sites due to supply-side bottlenecks in areas such as acquisition of land, grant of environmental and forest clearances, availability of raw material linkages and other infrastructure related supports needed by

the sector. Further, the qualitative performance of the steel industry measured in terms of techno-economic parameters of efficiency and productivity has been much below the expectation. It is also being felt that growth of the industry has come at a substantial cost to the environment and local communities.

1.6 The development of domestic steel industry has to be guided by long-term national goals and perspectives. National Steel Policy has, therefore, to be dynamic taking into consideration the changing needs of the industry in view of significant changes in the domestic and global economic environment. The unfolding developments, both on the demand and supply sides, warranted a re-look at the different elements of the NSP and possibly some re-ordering of priorities and modifications in the targets and related policies. In particular, it was felt that a strong policy push is required to expedite creation of green-field steel capacity as growth in steel supply has not been keeping pace with rise in domestic demand for steel. It was also felt that policy making should address the issues related to sustainable growth especially related to long term availability raw materials, protection of environment, inclusive growth, quality of steel products and Research & Development (R&D) with greater focus.

1.7 With this objective and within the above perspective, the Government of India, decided to formulate National Steel Policy, 2012 (NSP 2012) .

2.0 Vision Statement

2.1 **The National Steel Policy 2012** aims at transforming Indian steel industry into a global leader in terms of production, consumption, quality and techno-economic efficiency while achieving economic, environmental and social sustainability. The vision of NSP 2012 is to ensure availability of quality steel to accelerate growth of the domestic economy and provide amenities of life to the people of India at par with the developed world.

3.0 Objectives & Strategic Goals

3.1 In the coming years, the steel industry in India will be required to grow at a fast pace with maximum efficiency in resource consumption. However, steel being a de-regulated sector, Government has only a limited role to play, mainly as a facilitator, to ensure faster and efficient growth of this industry.

3.2 The objectives and strategic goals, however, have been defined to provide a broad direction and guidance to future programmes, policy actions and various decisions of the Government and investors. Government will, however, take upon the responsibility to ensure sustainable development of the steel industry, provide sufficient infrastructure and facilitate easy availability of vital inputs such as natural resources and finance to support faster growth of Industry. The steps towards achieving the defined

objectives and strategic goals will be taken through co-ordinated efforts of the government, industry and other stake-holders.

3.3 To chart a roadmap for the growth of steel industry and reorder priorities, it is necessary to understand the existing strengths, weaknesses, opportunities and threats. A SWOT analysis of the Indian steel industry is placed at **Annexure I**.

3.4 Major Objectives of the National steel Policy 2012 are as follows:

a) To attract investments in Indian steel sector from both domestic and foreign sources and facilitate speedy implementation of investment intentions on board so far so as to reach crude steel capacity level of 300 million tonnes by 2025-26 to meet the domestic demand fully.

b) To ensure easy availability of vital inputs and necessary infrastructure to achieve a projected production level of 275 million tonnes by 2025-26.

c) To provide greater focus on Research and Development (R&D) for developing indigenous technologies especially for finding solutions for optimum utilization of indigenous resources and mitigating the concerns of environment and climate change.

d) To develop indigenous capabilities of design, engineering and manufacturing of critical capital equipments required for steel production.

e) To encourage production and consumption of value-added steel by providing necessary focus on availability and product development especially for (a) meeting the special requirements of rural India, b) meeting the special requirement of auto, power, construction and shipping sectors c) producing lighter but stronger steels which help in achieving higher energy efficiency in end applications and also help in mitigating the concerns on environment, climate change and human health.

f) To foster competition at the market place, discourage cartelization and encourage production of quality steel for maximization of consumer welfare and for protecting the interests of common man and while simultaneously protecting the producers against unfair practices of domestic and overseas competitors.

g) To ensure sustainable development of the industry with minimum possible displacement of local people and loss of their livelihoods and with minimum damage to the environment by adopting best practices in the production processes and ensuring adoption of people and environment friendly practices by the investors.

h) To become globally competitive by achieving efficiency levels at par with the global bests especially in areas such as energy consumption, material efficiency, quality of steel, water consumption, productivity of major iron/ steel making

equipment, pollution levels and CO2 emissions. NSP 2012 envisages achieving the following strategic goals by 2025-26, as shown in **Annexure-II**.

4.0 Projections of Demand and Capacity

4.1 Steel demand has been forecast based on a projected growth path of the GDP as growth in steel demand is closely linked to the growth in GDP and the intensity of steel use in the economy.

4.2 Taking into account the recent developments around the world and the Indian economy and observing the general pattern of growth in other middle income and emerging economies, steel demand has been projected under two likely scenarios of 7% and 8% GDP growth rates per annum. (**Table- 4.1**) Also, another scenario of 6.0% GDP growth rate, however unlikely this may be, has also been drawn up to assess the critical minimum requirement of the economy in the worst case scenario. (**Annexure-III**)

4.3 The basic assumptions of the steel demand forecast adopted here are as follows.

a) GDP growth is sustained around 7 – 8 percent per annum with perceptible improvements in basic structural strength of the economy so that the projected growth rates can be sustained over a long term. Projections made here, however, assume that no drastic structural change of the economy will take place involving major parameters such as savings and investment.

b) The projections of demand has been made on the assumption of zero trade balance in steel e.g., imports and exports of steel balance out.

4.4 Estimated demand for steel and the crude steel capacity required to meet the demand from domestic production are furnished in **Table: 1**.

Table-1: Estimated Steel Demand and required Crude Steel Capacity, 2011-12 to 2025-26

(Million Tonnes)

| Growth Scenario | Projected Demand for Finished Steel | | | |
|---|-------------------------------------|---------|----------|----------------------------|
| | 2011-12 (actual) | 2025-26 | CAGR (%) | Implicit GDP Elasticity |
| GDP Growth at 7% pa (Base Case)* | 70.92 | 202 | 7.8% | 1.11 |
| GDP Growth at 8%* | 70.92 | 233 | 8.9% | 1.11 |
| Crude Steel Capacity Required to Sustain Projected Demand in the Base Case | 88.40 | 244 | | |

Note: * The assumed growth rates are average for the years between 2011-12 and 2025-26, notwithstanding possibilities of yearly fluctuations/swings within the period.

4.5 Projected demand for processed inputs i.e., Pig Iron and DRI/HBI in the Base Case Scenario is placed at **Table : 2**.

Table-2: Estimated Demand for Processed Inputs, 2011-12 to 2025-26

(Million tonnes)

| | 2011-12 | 2025-26 |
|----------|---------|---------|
| Pig Iron | 5.4 | 16 |
| DRI/HBI | 20.3 | 34 |

4.6 The principal strategic goal of the NSP 2012 as far as demand and supply of steel is to create conditions such that the projected demand is met primarily by domestic production. In other words, the goal is to create adequate capacity to produce the required quantities.

5.0 Project Implementation

5.1 Creation of green field steel capacities has been unduly delayed, in the recent past. Among many factors, it is also due to a) involvement of large number of agencies involved in project clearances b) lack of time-bound system of grant of clearances and c) long pending legislation on critical factors of production such as land, mineral resources and environmental/forest clearances and d) strong social resistance to land acquisition and conversion of agricultural land to industrial land even at adequate offer of monetary compensation and securitization of employment of the displaced directly or indirectly. To overcome these constraints, the government will consider taking the following measures.

- a) Introduction of a transparent and easy system for submission and tracking of status of applications for grant of resources/clearances from multiple governmental agencies through an online single e-window in consonance with national e-governance plan.
- b) Enhance, the powers of the existing Inter-Ministerial Group (IMG) for more effective co-ordination to cut delays in project implementation resolution of conflicts.
- c) The New land Acquisition Act, R&R Policy of the government and new provisions of the proposed MMDR Act have already taken up the relevant issues and one expects the policy and procedural issues to have been sorted out in the near future. However, there is a need to eliminate potential conflicts arising out of the various policy documents so that transparency is brought about in every aspect of the policy framework. The government will take appropriate steps in this direction.
- d) There is a need for proper identification of project sites/areas to balance requirements of business, society and service providers. Many steel projects have not taken off due to conflicting interests of various stake-holders. Therefore, there is a need to create an institutional mechanism consisting of producers, project evaluators, local administration and service providers e.g. railways, NHAI, port authorities, MOEF etc. for informed decisions on site selection for faster implementation of projects. Apart from the inter-Ministrial Group (IMG) that already exists, the government will set up a new government body for the purpose involving government agencies and experts in respective fields.
- e) The government will appoint an appropriate agency to prepare documents highlighting the benefits of industrialization and organize regular interactions with them to create a conducive environment for investment in steel capacity.

6.0 Raw Materials

6.1 India's competitive edge in steel production derives, to a large extent, from the indigenous availability of iron ore and coal to a limited extent – the two most critical inputs of steel production. However, recent developments in India's mining sector have given rise to uncertainties in regards to their adequate supply potential, especially of iron ore, and have brought the issue of long term raw material security for India's burgeoning steel industry to the centre stage. Sustaining the competitive advantage for the Indian steel industry rests crucially on devising appropriate strategies to ensure uninterrupted supply of the steel-making raw materials to the Indian steel industry over the next few decades.

6.2 Raw material requirement for the Indian iron and steel industry has been projected and placed at **Table: 3**.

Table 3: Projected Requirement of Major Raw Materials for the Indian Steel Industry by 2025-26

(Million Tonnes)

| Raw Material Requirement | | |
|-------------------------------------|----------------|----------------|
| | | Million Tonnes |
| At 7% GDP | 2016-17 | 2025-26 |
| Iron Ore | 203 | 392 |
| Coking Coal | 89 | 173 |
| Non-coking coal | 27.8 | 66.2 |
| PCI | 4.5 | 9.0 |
| Met Coke(including captive) | 67.4 | 89.2 |
| | | |
| At 8% GDP | 2016-17 | 2025-26 |
| Iron Ore | 215.4 | 452 |
| Coking Coal | 94.2 | 200 |
| Non-coking coal | 30.4 | 78 |
| PCI | 4.8 | 10.4 |
| Met Coke(Including Captive) | 72.5 | 153.9 |

Iron Ore

6.3 Despite the country having a total resources of over 28 billion tonnes of iron ore and the fact that the number can rise with greater efforts towards exploration, the currently assessed reserves of iron ore seem inadequate if the steel industry capacity expansion and production potential are to be fully realized. Strict enforcement of environmental and forest- related laws and difficulties in acquisition of land imply that iron ore supply may not be able to keep pace with projected domestic demand if production targets are to be realized. Exploitation of magnetite resources will be a challenging task as most of these resources lie in environmentally sensitive Western Ghats and adjoining areas. The current judicial position and the declaration of the Western Ghats as a world heritage site will restrain full exploitation of the resources there. The iron ore resources will be exhausted even faster if exports are maintained at high levels similar those witnessed in the past few years.

The government will adopt the following actions to ensure adequate supply of iron ore to the steel industry.

6.4 There is a view that the current assessment of iron ore reserves/resources are underestimated as the same have so far being based on exploration depth of only 60 meters and the Fe-cut off at 50% only. Future efforts, therefore, will have to focused on exploration beyond the depth of 60 meters and bringing down making use of the iron ore with Fe content as low as that.

6.5 To enhance the exploration and mining of iron ore, a detailed study will be undertaken involving domestic and foreign expert agencies to explore the potential of mining iron ore in the ecologically fragile areas in the country. One of the technologies that may need attention for support is underground mining which has been engaged successfully in several parts of the world.

6.6 Support intensive R&D efforts for developing techno-economically viable technologies of beneficiation and agglomeration suitable for the mineral extracted from different iron ore regions of the country.

6.7 Take appropriate fiscal measures, whenever deemed necessary, to encourage beneficiation and agglomeration with special emphasis on manufacture of pellets to substitute consumption of precious lump ores by steel producers and thereby add to efforts of conservation and environmental degradation caused by accumulation of iron ore fines. The government may devise differential schemes to encourage investment in beneficiation depending on the ownership of the iron ore, such as those coming from captive mines and those bought out from the market.

Priorities for Allocation of captive Iron Ore Mines to Steel Producers

6.8 Lack of raw material security has been one of the major causes for tardy progress of steel capacity expansion projects (both green-field and brown-field) in the recent past. The government will consider to further strengthen the provisions of allocation of captive iron mines to steel producers in a transparent manner through a process of open bidding for all the well prospected mines after having earmarked potential large areas for the purpose. . The government may further consider putting some of the iron ore mines in a general category open for bidding by all.

Export of Iron Ore

6.9 If export of iron ore is not restricted, the country may have to import iron ore in large quantities in the future at the forecast rate of growth of the steel industry. This may jeopardize the long term competitiveness of Indian steel industry. Given the

possibility of early exhaustion of iron ore, the government will consider the following measures.

a) An Inter-Ministerial Committee will be constituted to draw up a road map for phased reduction of iron ore exports to a moderate level. While holding a general policy to discourage iron ore exports, the government will actively engage itself in granting iron ore mining concessions in an absolutely transparent manner to draw adequate investment into the area and to ensure finally that there is sufficient mining capacity to feed the growing demand for iron ore within the country.

b) The government will incentivize beneficiation of low grade iron ore fines to ensure long term supplies of iron ore to the domestic industry and trigger adequate technology change within the industry for iron making.

c) The government will engage an appropriate government agency to draw up a long term **Resource Security and Development Plan for the Indian Steel Industry** and monitor the same on a dynamics basis.

Other Issues in Iron Ore

6.10 To make available adequate iron ore resources to the proposed steel plants and thereby accelerate creation of domestic capacity to meet envisaged future demand of around 250 million tonnes (i.e., an additional demand of around 140 million tonnes requiring creation of approximately 170 million tonnes of crude steel capacity over the next 12 – 13 years), appropriate policy measures will be taken to expedite:

a) The government will remove the barriers to movement of iron ore from one state to another and develop a comprehensive federal policy in respect of allocation of iron ore mines to steel producers on captive basis.

b) The government will open up all the mining leases held by the steel producers on captive basis, which are yet to be in operation and those where no investments have so far been made, for bidding among other steel producers. While doing so, it will be ensured that the same lies in excess of the projected requirement of the respective producers for the next thirty years.

Coal

Domestic Coking Coal

6.11 Imports of coal by the Indian integrated steel plants using the hot metal route has increased rapidly due to inadequate availability of low-ash metallurgical coal from domestic sources. The volatility and upward pressure seen in the price movement of

internationally traded coal have put the Indian steel industry under considerable stress in the recent years.

6.12 The government proposes the following measures to enhance the reserve/resource position of coking coal in India:

- a) As indigenous proven resources of prime coking coals are very limited, exploration efforts have to be focused on the prime coking coal resources available beyond 300m depth to bring them to 'Proved' category status. Remaining resources of coking coals in other coal fields also need to be explored in detail to make them available for exploitation.
- b) Existing coking coal mines under CIL in operation are to be de-merged to form a separate PSU.
- c) Idle coking coal assets lying with CIL, to be offered for commercial exploitation to other Public Sector Units (PSUs) under suitable terms of operation and business
- d) Virgin coking coal assets, lying undeveloped with CIL can also be put on auction for steel companies for unrestricted use for captive consumption or merchant sales.

6.13 In addition, the government shall move towards phased de-regulation of the coal sector to tap its full potential. It will also provide incentives for underground coal mining through tax-breaks, lower royalty and financial support to new technologies in underground mining.

6.14 In order to increase availability of coal to steel producers in the short to the medium run, the government shall,

- a) Encourage greater investment in washing and beneficiation of low grade coking coal so as to make them suitable for use in the steel sector and thereby stop their diversion to other uses. The government will also encourage dry beneficiation of coal at pithead so that the load on transport system is lowered.
- b) Ensure speedy implementation of the already approved Jharia Action Plan (JAP).
- c) Draw up long term Fuel Supply agreement (FSA) between coal companies and Sponge Iron producers and other integrated steel plants (ISPs)
- d) Encourage integrated steel producers to set up their own washeries and beneficiate raw coking coal procured from CIL to produce washed coal of required quality.

Manganese Ore and Chromite Ore

- 6.15 The other critical raw materials for steel making of which India has sizable reserves are Manganese and Chromite ores. However, with increasing exports witnessed in the recent years there is an urgent need to conserve these resources for future domestic value-addition and use in the Indian steel sector. This takes on a special significance as high grade ores are in danger of being depleted in the near future. For both of these raw materials there is a need to curb unfettered direct export of mined ores.
- 6.16 The government will further strengthen and rationalize the existing policy framework so that export of ores, especially high grade ores, is reduced keeping in view the rising consumption of the Indian steel industry. Apart from restraining exports, the government will also encourage investments in beneficiation of low grade ores through necessary incentives.
- 6.17 The government will encourage exploration of deep sea nodules for manganese ore. For this, the government may consider providing equity funding to the existing PSUs to set up subsidiaries to undertake these specific activities.
- 6.18 The government will discourage export of chromite ore for conserving the same for domestic value addition

Limestone

- 6.19 In this area the key policy concerns are :
- In view of very limited availability of steel grade limestone deposits in India, the government will act to ensure that steel grade limestone are not wasted by supplying them to cement producers. It needs to be conserved for utilization by steel plants only.

Ferro- Alloys

- Government may also consider allocation of coal blocks on captive basis to power plants attached to ferro-alloys producing units.
- There is a need for government sponsored research in collaboration with industry in the area of beneficiation of low grade manganese ore for utilization by domestic ferro-alloy industry.

Refractories

- 6.20 Enhanced R&D efforts are required for increasing the use of indigenous inputs by developing suitable technical specifications.

7.0 Infrastructure Support

Projected Location of Steel Capacities based on Current Investment Intentions

7.1 Expressed investment intentions and progress of the various on-going steel projects indicate concentration of steel capacity close to the sources of raw material i.e., in the iron ore rich states of Odisha (25%), Chhattisgarh (13%), Jharkhand (14%), Karnataka (9%) and the adjoining areas of Andhra Pradesh. With anticipated pre-dominance of technologies using hot metal, it is expected that this geographical distribution of steel-making capacity would continue over the next 20 - 25 years, with marginal variation in the latter years as availability of steel-making scrap (obsolete and process) increases in the industrial regions of the South and the West. Clearly, most of the infrastructural needs of transportation, energy, land and water would be concentrated in and around these centers of steel activity in the next 20-25 years.

Alternative/ Ideal Location of Steel Plant

7.2 Choice of locating a steel plant is a business decision taken by individual producers on considerations of specific business interest. Currently, an overwhelmingly large proportion of the new capacities are concentrated in and around the iron-ore bearing states. Transportation network in the iron ore-rich states, which also happen to be rich in other essential minerals, is already highly congested giving rise to a number of negative externalities. Moreover, many of the chosen locations are situated in ecologically and sociologically sensitive areas where acquisition of land for building adequate transportation network poses significant problems.

7.3 Taking into account the considerable social and environmental costs of concentration of extractive production units within a limited geographical area along with the growing import dependence of Indian steel plants for coking coal, efforts will be made to support diversified location of steel plants away from the current hotspots to shore-based facilities. This will reinforce the private choices already evident in a few of the new project proposals.

Transportation Infrastructure - Rail, Road, Port & Slurry Pipeline

7.4 In the Base Case Scenario of demand and supply, total transportation needs of the steel sector (i.e., major raw materials, finished steel and pig iron) is slated to more than double from around 325 million tonnes in 2011-12 to about 815 million tonnes in 2025-26. Rising share of large producers in total steel production indicates that around 70-75% of this will be transported by rail and the remaining by road.

Railways

7.5 Apart from the general drawbacks of the Indian Railway system (e.g., very slow expansion of route length and fixed line capacity, congestion in main trunk routes, low capacity of rolling stock etc.), the specific areas of concern for the Indian steel industry where immediate action is needed include – a) strengthening and augmenting railway links between ports and steel plants as Indian steel is expected to become increasingly dependent on imported coking coal/coke; b) capacity planning, mobilization of funds and timely execution of railway projects in the iron ore mining areas; and c) Most importantly, augmentation of rail infrastructure in the eastern and southern states where large steel capacities are being planned in close proximity to major sources of iron ore in the country. The government will take appropriate actions in this regards.

7.6 Further, the government will seek to

a) Create a **Mineral Development Fund** for building infrastructure in the mining belts

b) The government will bring in necessary policy changes in respect of railways and promote private sector participation in specific projects involving secondary infrastructure such as dedicated railways lines connecting mines to plants, etc..

c) The government will priorities funding of the projects connected with Dedicated Freight Corridor already approved.

Roads

7.7 The modal switch of steel related transportation away from railways to the road sector after deregulation has been caused primarily by the dispersed geographical spread of the proliferating small/medium scale units apart from the inadequacies in the railway transportation system in handling the bulk transportation needs of the expanding Indian steel industry. The reason for increasing importance of road transportation has also emerged in the context of the need for efficient last mile distribution of finished steel to end-users located in distant areas. Lastly, road transportation has become an important element in a multi-modal transportation matrix, especially, as part of the port related transportation network for import of raw materials and export of finished steel.

7.8 Specific concerns for the steel industry in road transportation include low road density and poor quality of roads in the three iron-ore rich states resulting in high transaction costs due to delay and loss of materials in transit. A second source of problem is the inadequate network of state and district level roads connecting mines and plants to the National Highways, especially in the mining areas in the eastern sectors. In view of the rising importance of road network in steel related transportation, efforts will be made to promote and encourage PPP mode of funding of road projects as

a vital link in multi-modal transportation system, especially in relation to port and mine connectivity and distribution of steel in remote areas.

Ports

7.9 Assuming imports of 85% of coking coal, 20% of non-coking coal and 30% of scrap and imports and exports of steel at 10% of consumption and production by 2025-26, total steel-related port traffic is projected to increase two-folds from around 64 Million Tonnes in 2016-17 to an estimated level of 130 million tonnes in the Base Case.

7.10 As far as ports are concerned, the major problem is not inadequacy of capacity but of low productivity of operations attributed mainly to slow evacuation of cargo leading to increased transaction costs and loss of competitiveness of the Indian steel industry. The government will take specific measures in this respect focusing on:

- a) Acceleration in the rate of evacuation through seamless connectivity of ports with a multimodal system of land transportation i.e., railways and roads, under the PPP route with active collaboration amongst steel investors, the state governments and other related agencies providing transport-related services.
- b) Providing required assistance in building of deep draft ports so that larger vessels can be berthed and economies of scale are achieved.

Slurry Pipelines

7.11 Alternative modes of transporting raw materials e.g., through slurry pipelines will go a long way in reducing the problems of congested transportation network in the mining areas. Such efforts also deserve encouragement and support. The government will actively support investment on slurry pipelines through appropriate fiscal incentives such as tax breaks.

Coastal Waterways and Shipping

7.12 Given the sources of raw materials and increased dependence on imported raw materials such as coal, it is likely that more and more steel plants will be located in the coastal areas. This means, there will be strong potential for coastal movement of raw materials and finished products from one place to another in the country itself. Coastal transportation can also take place partially in a multi modal system if the plants are located in the hinterland. The government will actively encourage this mode of transportation to reduce pressure on the existing railways and roadways system and create the necessary infrastructure for the same.

Power

7.13 In the Base Case scenario, power required by the steel industry is estimated to increase to 16,000 MW in 2025-26 from around 8200MW in 2016-17. The top four steel producing states of Odisha, Jharkhand, Chhattisgarh and Karnataka are power surplus as far as generation is concerned. However, deficits in peak power and energy levels occur and are likely to continue as these states are under obligation to transfer power to other regions. For steel projects, especially the large with captive power plants, the problems will be less severe. However, dependence on grid will continue to be high for small and medium steel units. As power generating capacities rise in the country with mega projects under construction, the government will ensure adequate assured supply of power to the domestic industry through the national grid. The government, at the same time, will constantly encourage use of energy intensive technologies in the production of steel.

Water

7.14 Consumption of water by the steel industry is estimated to go up from 360 million cu. m. in 2016-17 to around 650 million cu. m. in 2025-26 in the Base Case Scenario. Total requirement of water by steel is a minute fraction of total consumption in the country i.e., steel's share was only 0.04% in 2006-07 at 215 million cu. m. out of a total of 62900 Million Cu. M. Total industrial usage during that year was 5 per cent.

7.15 The three largest iron-ore bearing states of Odisha, Jharkhand and Chhattisgarh have large surface water sources (i.e., river basins) and also account for 10% of all ground water reserves in the country. Despite this, steel projects may face problems on account of low priority accorded to the industry in allocation of water. Moreover, the need for steel producers to build external infrastructure for accessing water as a result of inadequate public storage infrastructure and low public water supply also pose serious problems for the steel industry. Very often such efforts result in excessive dependence on ground water resources

7.16 To minimize the deleterious inter-generational environmental and social impacts of depletion in ground water resources and contamination of water sources by industrial effluents, efforts will be made to:

- a) Involve all stake-holders i.e., local community, the steel plants, the state agencies, in chalking out an optimum water sharing agreement and monitoring of the quality of water in the various water sources in the vicinity of steel units.
- b) The government will initiate water footprint mapping and rainwater harvesting in steel industry and related mining areas.

- c) Fix a system of penalty and rewards aimed at bridging the gap between international best practice norms of water use or recycling in steel plants and the Indian standard practices.

Land

7.17 One of the major impediments to growth for the Indian steel industry in the past decade has come in the form of delays in acquisition of adequate 'Land' at the preferred locations.

7.18 It is expected that the benefits of speedy transfer of land will far outweigh the extra private costs incurred on account of added social responsibility. However, as land becomes more expensive, it is expected that the plants will use this resource more efficiently and that there will be some substitution of land by capital at the margin. In a deregulated steel economy such a process will be triggered by forces of competition.

7.19 However, in order to reduce requirement for land, the government will encourage the industry to have vertically arranged facilities in compact designs which take significantly less land even if capital costs for such plants may be very high.

7.20 Similarly, formation of steel clusters, especially for small and medium sized units/ service/steel processing centres and creation of related common infrastructure on a consortium basis will be encouraged and supported for optimizing land use through scale economies. Efforts will be made to provide fiscal/financial/administrative help for such shared infrastructure in steel clusters.

8.0 Issues in Technology, R&D and Environmental Management

Major Areas of Concern and Related Strategies

8.1 National Mission for Enhanced Energy Efficiency (NMEEE) aims at reducing the emission intensity of India's GDP by 20-25 percent by 2020 from the 2005 level. The potential of the initiatives devised by NMEEE should be fully exploited by steel companies, especially the small and medium enterprises, if they are to survive in a stricter regulatory environment aimed at compliance with the stated goals. Ministry of Steel will facilitate the Industry in the process of utilizing opportunities available under the NMEEE.

8.2 It is now being increasingly appreciated that competitiveness of the Indian steel Industry cannot be sustained in the long run purely on the basis of low labor costs and cheaper raw materials. Technological excellence, innovation and adoption environment-friendly techniques in all stages of production from extraction of minerals to treatment of wastes - are the key to sustained growth in this sector.

8.3 (a) Major areas of concern and related strategies are placed below:

- i) The government in partnership with the steel companies needs to frame specific strategies towards reduction of pollution level (PM) below 0.5 kg per tonne of crude steel, zero effluent (water) discharge and drastically reduce water consumption.
 - ii) Absence of a common methodology in reporting environment performance with respect to the status on resource consumption, emissions, effluent and waste recycling makes comparison of relative performance of the steel plants difficult. This calls for development of an internet based tool, which adopts a common and verifiable procedure for reporting of environment data by the steel plants.
 - iii) Documents on best available technologies (BAT) for energy efficiency and environment protection shall be made available to the Industry, especially small and medium enterprises, to ensure faster progress towards the goal of sustainable development. In accordance with the world wide trend in adoption of such technologies, the government shall encourage/mandate Indian industry to make use of the available technologies.
 - iv) Strict enforcement of existing environmental laws and a phased movement towards the international best practice norms will be followed to regulate the growth of environmentally damaging steel units. Stricter enforcement of tax laws to ensure that growth of the industry is not at the cost of environment and loss of public revenue.
 - v) Steel plants will be encouraged to achieve the goals of zero waste generation through 100% recycling of wastes generated. A nation-wide policy in line with fly ash utilization shall be formulated to make use of LD/EAF slag.
- b) Promote Smelting Reduction (SR) technologies which can use low grade iron ore/slimes and indigenously available non-coking coal. R&D intervention and speedy implementation of these technologies compatible with India's indigenous resource base will be encouraged.
- c) Currently, expenditure on Research & Development has been quite low varying in the range of 0.15 to 0.3 per cent of turnover. The extremely low level of expenditure on R&D in the steel sector poses a grave challenge to the prospects of long term growth of this industry. The strategies proposed to promote R&D in the steel sector are:
- i) Leverage the Government grants for R&D through Public-Private Partnerships to achieve the strategic goal of R&D expenditure at 1.5 -2% of turnover.

ii) A few dedicated Centres of Excellence could be set up, preferably with involvement of the private sector in industrial sites to address relevant issues relating to:

- a) Research and technology development, and product development
- b) Human Resource Development through pursuing M.Tech, Ph.D and Post Doctoral programmes for creating a talent pool for research activities.

iii) Efforts shall be made to improve linkages between laboratory-based R&D and actual industrial application. This needs to be done through extensive market-driven translational research customized to the needs of the industry.

iv) The priority areas to be considered for incentivizing the industry as well as for public funding of research projects shall be:

- a) Environment management
- b) Energy efficiency and reduction in GHG emissions
- c) Optimum utilization of indigenously available natural resources – beneficiation, agglomeration and adoption of SR technologies
- d) Product development for strategic areas such as Defence, Space Research and Nuclear Energy
- e) Optimum utilization of land, especially in green-field steel plants by vertical space management, irrespective of process routes.

d) In the absence of good design, engineering and manufacturing facilities in the country, the steel producers have to depend on import of modern plants and facilities at phenomenal cost. It is desirable that a beginning is made in this area to avoid long term dependence on imports of equipments. Some of the viable policy options are given below:

i) To overcome resource constraints for creating manufacturing facilities, pooling of resources by steel companies through a MOU may be undertaken with Government providing necessary incentives/ subsidy. Revival of HEC into a modern manufacturing center may be explored as one the viable options.

ii) Steel companies may associate themselves with known equipment suppliers individually or as a group to promote new process development activities. Generation of key knowledge and IPRs from such collaborations will make the process easily adoptable during the commercialization stage. Government may think of suitable incentives for such activities

lii) Encourage leading global equipment manufacturers to set up their manufacturing base in India

e) Shortage of professional/ Experts due to perceptible decline of interest in pursuing career in metallurgical industries amongst B Techs, M Techs and PhDs is an area of concern. Education systems and corporate policies are to be tuned to facilitate and generate domain experts in every walk of steel plants to achieve higher efficiency and productivity.

f) There is a need for instituting a professional body on the lines of World Steel Association, Japanese Iron & Steel Federation etc for knowledge sharing, information dissemination and evolving nation wide strategies.

9.0 Promotion of Steel Use/Consumption

9.1 Promotion of steel consumption is to be undertaken primarily by the steel producers. However, government will encourage steel consumption, supporting R&D projects such as for product design and generic campaign in specific areas which help in addressing concerns related to environment, climate change, human health, housing for the masses and higher rural penetration for inclusive growth. Advantages of steel use in terms of sustainability, durability, amenable design and life cycle costing compared to alternate materials like plastics and wood will be made more visible and adequately propagated through sustained programmes of awareness. Some of the application areas which may qualify for the special treatment are as follows:

- a) In specific applications where steel can substitute a competing product on the promise of greater environmental safeguards.
- b) Promotion of stainless steel in infrastructure such as bridges, ports etc.. in the coastal areas which are prone to severe and extreme corrosion.
- c) Promotion of stainless steel in railway coaches for longer life and passenger safety.
- d) Application of high strength steel and support to R&D for their use in automotive and appliance industries.
- e) Promotion of application research involving tubular frames and other pre-fabricated products for use in energy efficient high rise structures aimed at bringing in affordable housing to accommodate India's growing urban population.
- f)The government will encourage use of steel in areas where it has the potential to mitigate the risks associated with natural calamities such as earthquakes.

g) In promoting and providing safe packaging, in particular for food products, to replace competing toxic packaging materials and discouraging use of seconds and defective steel materials.

9.2 The Government will facilitate, strengthen or even engage appropriate agencies to undertake collection, processing and dissemination of technical information on steel with a view to promoting steel consumption backed by development of appropriate products, cost reduction and quality enhancement.

9.3 The Government will take a lead in creating an institutional platform for knowledge sharing for suitable product development and reliable market assessment for specific steel products by bringing together representatives of consumers, producers, designers, R&D institutions and other stake-holders.

10.0 Trade Policy Issues

10.1 While deciding on import tariff levels for steel, implications of possibilities of global oversupply due to slowdown in major steel producing countries and predatory pricing shall be kept in sight. The government will also have to take into account the potential erosion of cost competitiveness of Indian steel industry vis-à-vis the global peers due to changes in relative prices of raw materials and energy, costs of capital and infrastructure constraints.

10.2 While deciding on the terms of bi-lateral/regional trade agreements care shall be taken to ensure a level playing field to the Indian steel industry – especially vis-à-vis trading partners with mature steel industry. This will be done keeping in view the basic tenets of free trade and international competitiveness and the possibility of trade distortions hampering the progress of the growing Indian steel industry. In specific instances, where FTAs may lead to substantial overall gains for the economy, concerns of the steel sector may be addressed by not including steel in the list of items for preferential or free tariff regime when FTAs and PTAs involve nations with strong and competitive steel industries. .

10.3 The government will encourage the steel industry to follow an aggressive export strategy to tap the opportunities in the global market fully. As the developed economies, mainly in Europe, are struggling through a major financial crisis, the outlook on exports to these countries does not look promising. Further associated with various trade disputes, the country's steel industry will have to diversify its exports to markets such as Africa, Latin America and Asia including ASEAN member nations. Thrust on exports is also desirable to mitigate the adverse effects of current account deficits and neutralize the impact of possible rise in imports of coking coal and proposed reduction in iron ore exports on net earnings of foreign exchange by the steel industry.

11.0 Conclusions

In summary, with the above policy objectives and concrete actions emanating therefrom, the Indian Steel Industry will grow to produce over 275 million tonnes of crude steel by 2025-26 to cater to the growing domestic demand. The industry will also be firm footed fully realizing the competitive advantages to raise the production level further to tap opportunities in the global market. The industry would be placed in a conducive policy environment to attain global standards in product quality and develop a product mix in line with the current pattern of demand in the global and domestic markets. The industry, through its own actions will be expected to attain high levels of energy and material efficiency in production. The industry would attain the highest levels in information technology application to be a world leader in this field. Labour productivity will be expected to reach the international standards to make the industry globally competitive. The industry would grow to provide to the nation technical and notional self sufficiency in steel by 2015. Efforts at domestic market development would increase steel consumption in the country to provide an impetus for continuous growth to the domestic industry. A rejuvenated and restructured industry with full back up of information would provide stability to its growth. The industry will gain from improved infrastructure and high level of efficiency in the sectors linked as backward integration like minerals and other raw materials. With all the improvements envisaged the Indian Steel Industry will stand up to global focus to establish its place of eminence.

ANNEXURE I

SWOT ANALYSIS

Strengths

1. Easy availability of iron ore for short and medium terms.
2. Low wage rates in India in global comparison.
3. Potential future availability of manpower with requisite technical & managerial skills
4. New plants, technology and production efficiency approaching international benchmarks.
5. Higher efficiency gains expected from the existing integrated steel plants, currently undergoing modernization and expansion of capacity.
6. Strong legal institutions and administrative framework to support competition within the industry to maximize consumer interests.
7. A resilient domestic economy with potential of sustained growth in domestic steel demand.

Weaknesses

1. Uncertainties in regard to future availability of iron ore due to environmental, legal and social challenges in addition to potential exhaustion risks due to excessive exports.
2. A significant portion of the steel industry continues with obsolete technologies and produces poor quality steel, generates high level of pollution and CO2 emissions. Socio-economic costs of continuation or of closure can be very high. Higher transport costs, being one of the highest in the world, has the potential to rob the domestic industry of vital competitive strength.
3. Inadequate availability of land in right size at the right place.
4. Very slow implementation of the projects due to variety of problems including delays in land acquisition.
5. Inadequate efforts to develop necessary R&D base within the steel industry.
6. High dependence on imported coal due to low quality of domestic coking coal. 8. Lack of Indigenous capability to design and manufacture iron/steel equipments leading to high capital cost
7. Slow progress in acquiring and developing overseas mineral assets
8. High level of litigations especially related to grant of mineral assets and environmental clearances

Opportunities

1. Strongly expanding economy with a low steel consumption base, a large and growing young population with the prospect of raising steel consumption base, , backlog of investment in infrastructure ready to be cleared by visionary government spending and potential expansion of the industrial base to raise steel consumption base in the country.

2. Opportunities in rural markets are likely to increase significantly due to rising rural incomes, development plans of the government with focus in housing and construction of rural infrastructure such as bridges, etc. to support a stronger rural steel consumption base.
3. Significant scope of reducing costs by improving efficiency levels
4. More clarity on important policy issues such as land acquisition, grant of mineral assets likely to emerge on enactment of related bills

Threats

1. Fear of the new steel plants losing competitiveness due to high costs of land, labour, capital and higher provisions for protection of environment, CSR and increases in costs towards use of infrastructure such as power, railways, roads and ports.
2. Euro-zone financial crisis and slowdown in other developed world may continue longer than expected. Slowdown in China may lead to oversupply, dumping of steel and depression of steel prices
3. Social tensions & environmental concerns related with supply of water to industry likely to pose a bigger threat in future
4. Rising trend in wage rates in the context of inadequate growth in labour productivity leading to erosion of labour cost advantage of the Indian industry.
5. Drop in efficiency level in general in Indian manufacturing sector as a whole which may impact steel demand growth at one level and higher capital equipment costs for the industry at another.

Annexure-II

Strategic Goals:

| Parameter/Area | Unit | Existing Level | Strategic Goal/Projection by 2025-26 |
|---|-----------------------------|----------------|--------------------------------------|
| 1. Specific Energy Consumption | G. Cal | 6.3 | 4.5 |
| 2. CO ₂ emissions | T/T of C Steel | 2.5 | 2.0 |
| 3. Material Efficiency | % | 93.5 | 98.0 |
| 4. Specific Make up Water Consumption (Works excluding power plant) | T/T of C Steel | 3.3 | 2.0 |
| 5. Utilization of BOF slag | % | 30 | 100 |
| 6. Share of continuous cast production | % | 70.0 | 95.0 |
| 7. BF Productivity | T/M3/Day | 1.9 | 2.8 |
| 8. BOF productivity | No. of Heats/Converter/year | 7800 | 12000 |
| 9. R&D expenditure/turnover | % | 0.2 | 1.5 |

Annexure-III

| Growth Scenario | Projected Demand for Finished steel (MT) | | | Implicit GDP elasticity |
|------------------------|---|----------------|----------------|------------------------------------|
| | 2011-12 (ACTUAL) | 2025-26 | CAGR(%) | |
| <u>GDP@6%</u> | 70.92 | 175 | 6.7% | 1.11 |

**Demand for Raw Materials for Steel Industry at 6.0% GDP Growth Rates
(2025-26)**

| | 6% GDP Growth Rate |
|----------------------------|---------------------------|
| Crude Steel Production | 192.5 |
| Merchant Pig Iron for Sale | 14.3 |
| Steel Scrap | 16.5 |
| Iron Ore | 292.1 |
| P C I | 7.0 |
| Coking Coal | 138.5 |
| Non Coking coal | 49.7 |