

## Heavy Industries in the Second Plan

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**H**EAVERY industries and particularly engineering and chemical industries are the key to the industrialisation of any country because from them flow the large-scale industries, the big enterprises, the medium sized industries and the important and widespread ancillary and feeder small-scale and cottage industries. Heavy industries and the engineering and chemical industries are producers of the vital capital goods and industrial raw materials that are needed by the other chains of industries. Any country's progress can be easily measured by the state of its engineering, chemical and heavy industries. These key and heavy industries have a very vital rôle today in the industrial development of our country or, if I may say so, in industrialising our national economy.

2. Our industrial index stands today at 136.5 (February, 1956) taking base year 1951 as 100. This is undoubtedly satisfying, but the picture of the development of engineering and chemical industries is far more encouraging. On an average, the industrial index of the engineering group of industries today

stands at 192 and chemical industries at 165 taking basic year 1951 as 100. This shows that these industries have developed far more than the other sectors of the industries. This is particularly gratifying because unless the production of capital and producer goods moves faster than the production of other manufactures, it will not be possible for our economy to accelerate the tempo of industrialisation. It is an obvious truism that industry which builds industries has to progress faster and has got to be more broad-based so as to assist production; and in any backward economy the emphasis has rightly to be placed on heavy engineering industries, heavy chemical industries, on machine building, on machine tools, on manufacture of capital goods and manufacture of industrial raw Materials.

3. From the results of our First Five Year Plan I would now give in brief an outline of increase in production in a few major components of heavy industries and also our targets of production for the Second Five Year Plan of the more important items of key and heavy industries.

|                          | Actual production. |                | Target for                     |
|--------------------------|--------------------|----------------|--------------------------------|
|                          | 1951               | 1955-56        | 1960-61.                       |
| 1. Steel                 | 11,00,000 tons     | 13,80,000 tons | 45,00,000 to<br>55,00,000 tons |
| 2. Pig Iron              | 3,50,000 tons      | 3,80,000 tons  | 8,00,000 to<br>10,00,000 tons  |
| 3. Ferro Manganese       | 28,000 tons        | 28,000 tons    | 2,00,000 tons                  |
| 4. Aluminium             | 3,677 tons         | 7,500 tons     | 40,000 to<br>50,000 tons       |
| 5. Paper and Paper Board | 1,14,000 tons      | 2,00,000 tons  | 6,00,000 to<br>8,00,000 tons   |
| 6. Newsprint             | —                  | 4,200 tons     | 1,00,000 to<br>1,25,000 tons   |

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|  | Actual production.                |                 | Target for                   |
|--|-----------------------------------|-----------------|------------------------------|
|  | 1951                              | 1955-56         | 1960-61                      |
| 7. Rayon   | 0.4 mil. lbs.                     | 15 mil. lbs.    | 100 mil. lbs.                |
| 8. Staple fibre                                      | —                                 | 16.2 mil. lbs.  | 32 mil. lbs.                 |
| 9. Chemical pulp                                     | —                                 | —               | 30,000 tons                  |
| 10. Petroleum  | 0.25 mil. tons<br>(capacity)      | 3.6 mil. tons   | 6 to 7 mil.<br>tons.         |
| 11. Coal   | 32.3 mil. tons                    | 38 mil. tons    | 60 to 65 mil.<br>tons.       |
| 12. All types of motor<br>vehicles                   | (all assembly<br>only or imports) | 21,610 Nos.     | 80,000 to<br>90,000 Nos.     |
| 13. Diesel Engines<br>(up to 30 H.P.)                | 7,246 Nos.                        | 10,220 Nos.     | 20,000 Nos.                  |
| 14. Textile Machinery                                | Rs. 1.30 crores                   | Rs. 4 crores    | Rs. 17 to 20<br>crores       |
| 15. Tea processing machines.                         | Rs. 0.33 crores                   | Rs. 0.68 crores | —                            |
| 16. Machine tools                                    | Rs. 0.45 crores                   | Rs. 0.80 crores | Rs. 10 to 12<br>crores       |
| 17. Transformers                                     | 1,93,791 KVA                      | 5,64,713 KVA    | 13,60,000 KVA                |
| 18. Electric Motors                                  | 1,42,799 HP                       | 2,51,897 HP     | 6,00,000 HP                  |
| 19. A.C.S.R. & all aluminium<br>conductors.          | 1,720 tons                        | 8,045 tons      | 18,000 to<br>20,000 tons     |
| 20. Rubber & Plastic insula-<br>ted electric cables. | 41.9 mil. yards                   | 86.13 mil. yds. | 250 mil. yds.                |
| 21. House Service meters.                            | N. A.                             | 2,55,348 Nos.   | 6,00,000 Nos.                |
| 22. Fluorescent lamps                                | N. A.                             | 7,21,098 Nos.   | 20,00,000 Nos.               |
| 23. Electric goods worth                             | Rs. 15 to 20<br>crores            | Rs. 35 crores   | Rs. 60 to 70<br>crores       |
| 24. Steel structurals                                | 30,486 tons                       | 90,000 tons     | 4,00,000 to<br>5,00,000 tons |
| 25. Roller bearing<br>(axle box assembly)            | —                                 | 850 tons        | 2,600 tons                   |
| 26. Steel castings                                   | 8,567 tons                        | 15,000 tons     | 50,000 tons                  |
| 27. Ammonium sulphate                                | 50,604 tons                       | 3,93,095 tons   | 20,00,000 tons               |
| 28. Superphosphate                                   | 61,020 tons                       | 74,165 tons     | 720,000 tons                 |
| 29. Sulphuric acid                                   | 106,932 tons                      | 164,842 tons    | 5 to 6 lakh<br>tons          |
| 30. Soda Ash   | 47,532 tons                       | 77,272 tons     | 250,000 to<br>300,000 tons.  |
| 31. Caustic Soda                                     | 14,724 tons                       | 34,253 tons     | 200,000 tons                 |
| 32. Liquid Chlorine                                  | 5,268 tons                        | 11,577 tons     | 25,000 tons                  |
| 33. Bleaching Powder                                 | 3,588 tons                        | 2,698 tons      | 25,000 tons                  |
| 34. Bichromates                                      | 3,271 tons                        | 2,929 tons      | 6,000 tons                   |
| 35. Sodium bicarbonate                               | 1,630 tons                        | 4,125 tons      | 8,000 tons                   |
| 36. Potassium chlorate                               | 1,593 tons                        | 2,125 tons      | 3,800 tons                   |

|                       | Actual production. |             | Target for               |
|-----------------------|--------------------|-------------|--------------------------|
|                       | 1951               | 1955-56     | 1960-61                  |
| 37. Calcium Carbide   | Nil                | 3,110 tons  | 30,000 to<br>40,000 tons |
| 38. Alum              | 2,460 tons         | 4,370 tons  | } 50,000 tons            |
| 39. Alum sulphate     | 19,350 tons        | 27,690 tons |                          |
| 40. Copper sulphate   | 505 tons           | 1,045 tons  |                          |
| 41. Ammonium chloride | —                  | 1,683 tons  | 5,000 tons               |

4. This brief narration is only illustrative and gives us a picture of how we have moved so far. I have also mentioned the estimated targets which we have got before us for the Second Five Year Plan against the above few items. This shows how fast we propose to move in the heavy industries. This roughly represents two to three times production in most of the fields and four to five times in several industries.

5. The above targets for the period of Second Five Year Plan are only tentative and if I may say so, they represent the minima and not the maxima. We hope that with the co-operation of the industries and the Government and the consuming public, we will be able to outstrip all these targets, if possible within the first three years of the Plan. As our Prime Minister has often said, our national plan is a flexible plan and it is under continuous and constant review by the planners. The main value of these targets is that they indicate to us the milestones that we have to reach in order to be able to establish further milestones of higher and higher targets of production within the plan period. It should, therefore, be our endeavour to so plan our activities as to reach these targets as early as possible. The Government is there always ready to help.

6. I would now mention what our new steel plants are going to do. Rourkela is scheduled to go into production by September, 1958; Bhilai will follow and is expected to start production by

October, 1958, and Durgapur by June, 1959. Between the three plants, we hope to produce 2.25 million tons of finished steel and 6.5 lakh tons of pig iron. The Tata Iron & Steel Co., Mysore Steel Works and the Indian Iron and Steel Company will have completed their expansion programmes and reached the figure of 2.4 million tons of finished steel and 2,00,000 tons of pig iron annually as against their present production of 1.14 million tons of steel and 3,14,000 tons of pig iron. This will mean that as against our last year's production of 1.2 million tons of indigenous steel and about 3,00,000 tons of pig iron, we will have 4.68 million tons of steel and 8,85,000 tons of pig iron by the end of the Second Five Year Plan. Possibly we will be able to produce somewhat larger quantities than this, say upto 5.5 to 6 million tons by the end of the Second Plan period.

7. Preparations are afoot also for establishment of a plant or plants for heavy forgings, grey castings and steel castings. These one or more units may be started with an annual production of 6,000/7,000 tons of forgings, 12,000 tons of grey castings and 14,000 tons of steel castings and will be so designed as to be capable of expansion to 12,000 tons forgings, 30,000 tons of grey castings and 30,000 tons of steel castings as soon as necessary. The Sizes of individual forgings and castings which could be produced upto 50 tons in the initial stages will be arranged to be increased even upto 100 tons pieces

in due course. These figures of sizes and capacities are still tentative and are subject to revision while making our detailed plans as per advice of our consultants. These facilities are not only expected to meet the requirements of castings and forgings of the machinery units that will come into existence in the future but will also meet the future demands of machinery manufacturers in diverse directions in the country.

8. A possible site for a fourth steel plant at Bokaro is also being investigated and proposed to be developed. Also several other developments are under consideration in the direction of producing more iron and steel.

9. The experiments on low shaft furnaces, particularly in Germany, have been very promising. Uptil now, it was not very profitable and practicable to utilise inferior grades of iron ore and inferior non-coking coals. Now these inferior grades are being utilised for production of pig iron and steel. In several countries, there are plants working on inferior grade ores and inferior coals but before the advent of low shaft furnaces, this manufacture had not a very widespread application.

10. Our Council of Scientific & Industrial Research is establishing a 20-ton per day pig iron low-shaft furnace plant at Jamshedpur on an experimental basis. An industrialist also is setting up a similar plant in Orissa. The success of the low-shaft furnace in our country is likely to revolutionise the manufacture of pig iron, particularly because it will enable medium size and small size decentralised production of pig iron on a very widespread basis. There are several areas in our country where inferior ores, lignite and non-coking coals are available in small and big quantities. With the working of the low shaft furnace, it will be quite possible to set up small 10,000, 20,000, 50,000 and 100,000 tons per annum plants for the production of pig iron of different qualities. This

will enable various foundry industries and other ferrous industries to be developed in every part of the country. This will also reduce the burden on the pig iron and steel plants and will enable most of the pig iron of the big steel plants to be utilised for the manufacture of steel. If the low shaft furnace succeeds and proves economic, it will also enable a very much bigger production of pig iron than envisaged through the big steel plants in the Second Plan.

11. In the field of heavy machine building, the Russian Team is with us. It is touring round the country and will advise us on setting up of the central heavy machine building factory or factories. We are also receiving a British Team for advising us on the setting up of heavy engineering industry. Whereas the Russian Team is going to advise us on the heavy machine building factory, the British Team will survey heavy engineering industry and suggest ways and means of enlarging and diversifying it. The National Industrial Development Corporation also will be consulting different experts in this connection. Thus, during the Second Five Year Plan period, we shall have laid the foundation both for heavy machine building and heavy engineering industries in the country. You are also aware of the establishment of the heavy electrical equipment plant at Bhopal. This factory will produce for us A.C. and D.C. Rotating machinery, Rectifiers, Transformers, Switchgears, Traction and Control Gears, Industrial control Gears, D.C. Motor Starters, Capacitors and Water Wheel Turbines, and also Switchboard instruments, meters and relays, insulating materials and steam turbines, with ancillary equipment, and other items at a later stage. Many of the heavy forgings, grey castings and steel castings required for this heavy electrical equipment plant will be available from the units to be established by the National Industrial Development Corporation for heavy forgings, grey castings and heavy steel castings.

12. We have also to consider the import and purchase policies in respect of machinery and engineering goods. The import policy regarding such items is framed after very careful consideration of individual items which run into hundreds. Full scope and incentives are being given to every item of indigenous manufacture, for local consumption as well as for export purposes. Only in cases—and such cases are few—where either the present production is inadequate and qualities of manufactured goods unsatisfactory, and the manufacturer wants some protection and help in view of the anticipated production, we have to be somewhat careful. In anticipation of any production which very often does not materialise, it will not be wise to restrict or retard other manufacturing industries for want of required machinery or required engineering goods. Government is continuously examining the position so that the internal production gets fullest impetus and encouragement.

13. As regards the purchase policy, it has for its objective the encouragement of industries. Preference is given to indigenous manufactures and special consideration is shown to the products of medium and small-sized units by the Central Government and all the State Governments.

14. Active steps are being taken to encourage the establishment of plants, structural shops and fabrication shops for the production of cement manufacturing machinery, sugar machinery, steel plant machinery, machinery of several industries and other machine tool industries. The textile machinery manufacture and the automobile and commercial vehicle manufacture are already going apace. We will be in a position in five years to manufacture most of our requirements of textile machinery almost amounting to over 15 crores a year; cement manufacturing machinery for cement plants for an annual production

of 1.5 to 2 million tons of cement costing over Rs. 10 crores a year; sugar machinery for eight to twelve complete sugar mills per year; machine tools worth about Rs. 10 to 11 crores per year; more or less complete self-sufficiency in road rollers with a capacity of 200 to 400 road rollers a year; jute, paper, chemicals and rayon machinery in large measure and printing machinery, boilers and other machinery and equipment in good quantities. As a result of all these series of steps in the private industries and the Government owned industries, we hope that at the end of the 2nd Five Year Plan we shall be in a position to manufacture about 60 per cent of our country's requirements of machinery, or over a 100 crores worth of machinery manufacture annually by 1960, and to that extent our dependence on foreign imports of these machines and equipments will be reduced. This will also, directly or indirectly, give a great fillip to the increased production of capital goods and to the setting up of consumer goods industries.

15. In the field of chemicals, drugs and dyestuffs, our present annual imports are Rs. 23 crores of chemicals and fertilisers, Rs. 18 crores of dyestuffs and Rs. 15 crores of drugs and pharmaceuticals as against our indigenous annual production of Rs. 28 crores of chemicals and fertilisers, Rs. 48 crores of drugs and medicines and Rs. 3 crores of finished dyes. At the end of Second Plan, we are planning for self-sufficiency in chemicals and fertilisers and about 75 per cent of national requirement of drugs, dyes and intermediates aggregating to over Rs. 75 crores per year.

16. We are all aware that considerable handicap is experienced at present due to transport difficulties of both raw materials and finished products. The Railways have themselves a heavy programme for overcoming the situation. However, in this connection, it would be very wise to consider dispersal of manufacturing units in various regions if possible in

proximity to consuming centres or availability of essential raw materials so as to avoid considerable cross movement of the products. These aspects have to be kept in mind in the planning for industries in general and heavy and key industries in particular.

17. All these industries will need a very large number of technical personnel. For our three national steel plants, we will need about 1,650 trained graduate engineers, 200 chemical engineers, 800 electrical and mechanical engineers and 650 metallurgists and 15,000 skilled workers. For the three steel plants, therefore, this means so many engineers will be required and so many trained certificate and diploma holder skilled workers will be needed. Many, many more times this number will be required for numerous private industries and other industries in the public sector and various hydro-electric projects, thermal plants, irrigation projects and road works. It is, therefore, very necessary that we should make arrangements to train apprentices, draughtsmen, tracers, overseers, surveyors, supervisors, foremen and all categories of technical personnel in different technical institutions, Engineering Colleges and industries. In view of the large need of skilled workers and trained technical personnel, it will be very necessary that co-operation of industries in training a minimum percentage of their normal strength of personnel—say 5 per cent or more should be seriously considered. This will open up great opportunities for the young technicians of this country and will also directly help the process of industrialisation of the country.

18. Undoubtedly, the Second Five Year Plan provisions have been drawn up in a bold manner providing for increasing tempo of economic activity in all sectors and fields of industrial development. But the National Plan can, after all, be only a focal point of the various activities in the different fields.

The enormous manpower that we have got is naturally capable of doing far, far more than what the Plan can comprehend. In a country so big and so wide as ours, if the organizational effort is directed towards energising the activity of every man and woman in every part of the country, it is obvious that the individual cells, energised in their respective spheres, could achieve tremendous results. Development in its very nature has got to be both intensive and extensive if it is to be self-propagating. We have to concentrate our attention and direct our energies towards that end.

19. It is in this context that development including development of industries has got to be spread over the national field as well as in the different regions. Thus regional economic development, particularly in the industrial sector, occupies as much vital rôle as the overall national development. It is the development of each region which will ultimately go to establish a balanced development and also a sense of national satisfaction in every area of this vast country. This alone can generate creative forces which could be multiplied manifold for increasing developmental activities. The regional urges of development are an integral part of national urges. Prosperity like poverty is indivisible. Thus the scope and opportunities for progress have got to be both intensive and extensive so as to be widespread in their origin as well as tempo. Through the proper satiation of regional urges for development, we can harmonise and achieve satiation of national urges.

20. It is in this light that industrial development has to be looked into. Every district and State in this country has to strengthen its economic resources in order to make the country economically strong and healthy. We are, therefore, giving increasing attention to this aspect of economic development and this applies in a very great measure to the field of industrial development.

21. This will also build up strong bonds of economic inter-dependence between a region and a region between different regions and the whole country. Thus along with national development, regional development will create a healthy spirit of co-operation and mutual inter-dependence between the different areas of the country. The benefit of economic utilisation of natural resources as far as possible at sites near about the sources of raw materials would contribute greatly to overall progress of the country, and will also ease the burden on the transport systems of the country. It is obvious that unless and until every area feels the impact of the new creative urges released in every region, the sense of national satisfaction could not be easily achieved.

22. The vital gaps in production in our economy have got to be quickly filled and in filling these gaps, wherever necessary, the State will move in fast enough in the Public Sector in order to

fill up the gaps so as to create a balanced dynamic equilibrium in our national economy. I personally see no conflict between the State enterprise and the private industries. The State has to move in and that too fast enough in the public sector in order to fill in the vital gaps in the economy of the country. If in the venture capital for any reason of history or tradition has not come forward in a particular field of production, whatever the reasons may be, the State has got to move fast in the Public Sector to fill in this gap because as everyone knows, in the modern technological world the missing links, if left unfilled, are likely to upset and imbalance the whole economy. And there is enough room for all those activities whether at the State level or at the private level in a country so large and whose consumption propensities are so enormous. Thus the co-operation and well co-ordinated efforts of the people and the Government will go to establish the firm foundations of our future economy and prosperity.