

## **Abstract**

Manufacturing industry is the engine of economic growth of a nation. It includes all activities in product life, starting from customer inputs for concept design, through conversion of materials and ending with product disposal. These activities provide gainful employment, create the products required to maintain and improve the standard of living and generate the wealth required for future development.

India can and will transform itself into a developed nation through the growth of its manufacturing industry, but this must be achieved in a responsible and sustainable manner, creating a role model for other developing nations. Conventional prescriptions emphasizing increased technology transfers, infrastructure projects, tax incentives and R&D spending are not sufficient to ensure manufacturing competitiveness – continuous improvement in price, quality and response. We therefore need a comprehensive vision, long-term mission and novel policies for sustainable growth of the manufacturing industry, evolved after a study of the past, present and future factors.

The history and geography of manufacturing reveals the influence of waves of technology, local resources and conditions existing in different countries at different periods. We also note that ancient India gave science and engineering to the world and medieval India was the leader in manufacture and exports of textile and metal products. At present, however, with less than 1% share of global trade and a poor rank in terms of competitiveness, India has to move aggressively to catch up with other nations.

The future manufacturing industry will be driven by global cooperation and intellectual property rights. Technological drivers include artificial intelligence, green materials and direct manufacturing processes. To ride these waves, new vehicles will be needed: bionics, reverse engineering, continuous innovation, knowledge management and product life-cycle engineering. These will lead to entirely new products and processes.

The vision is to create and regenerate all types of wealth – material, natural, intellectual and cultural – by encouraging and supporting appropriate manufacturing activities that respect nature and maintain a balance among various resources. This can be achieved through a mission to identify, train, deploy and support manufacturing leaders – individuals as well as firms. The policies to achieve these are presented as the interfaces between the Government, academia and industry.

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