

**ELECTRICAL MACHINERY INDUSTRY IN INDIA -
A TECHNO-ECONOMIC STUDY**

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ELECTRICAL MACHINERY INDUSTRY IN INDIA—
A TECHNO - ECONOMIC STUDY

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P R E F A C E

This study deals with four subgroups of electrical machinery industry in India, viz. Motors, Transformers, Switchgears and Fans.

The problem of unutilised capacity of the manufacturing plants in some of these industries has been studied using linear programming technique. The analysis may bring out to the reader the multifaceted nature of the problem. It also throws out useful engineering data for further economic research.

Earlier attempts towards the analysis of the problem of unutilised capacity have been reviewed in Chapter I. This chapter also discusses in brief certain issues like the nature of the larger complex of metal working industries of which the four sectors studied in this work are part and the use of engineering & technical data for this study.

Chapter II presents certain aspects of the industry relevant to the problem. The purpose of this chapter is mainly to give a broad outline of the four industries being looked into.

Chapter III gives an account of the supply position in respect of raw materials. Inadequate supply of raw materials of the requisite quality forms a constraint on the production in the case of many industrial units. Later, in Chapter V, in the linear programming models of the firms, this constraint has been assumed away, for the limited purpose of analysis. However, the importance of this constraint in the context of some of the Indian industries is fully appreciated. A discussion of the supply position in respect of raw materials was, therefore, thought necessary.

Chapter IV gives a technical background to the analysis and data presented in Chapter V.

In Chapter V, the concept of capacity of a manufacturing plant has been developed. Measures of unutilised machine capacities under a variety of conditions are obtained and discussed.

Chapter VI summarises the important points in and the issues brought out by this study.

Much of the technical details have been relegated to the end as appendices.

The research underlying this study was carried out at the Gokhale Institute of Politics and Economics, Poona-4. It was preceded by a one year pre-doctoral training programme at the Institute. The work was made possible by the award of a junior fellowship and later by a senior fellowship by the Gokhale Institute. I had the advantage of the excellent library facilities, congenial atmosphere and free and frank discussions with colleagues and elders. I wish to express my sincere thanks to the authorities of the Institute for giving me an opportunity to work at this place.

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LIST OF ABBREVIATIONS AND TECHNICAL TERMSAbbreviations

MSP	Monthly Statistics of the Production of Selected Industries of India.
DGTD	Directorate General of Technical Development.
DGSD	Directorate General of Supplies and Disposal.
HEIL	Heavy Electricals India Ltd.
BHEL	Bharat Heavy Electricals Ltd.
TISCO	Tata Iron and Steel Co. Ltd. (India)
ASI	Annual Survey of Industries (India).
Rs.	Rupees

Technical Terms

HP	Horsepower
KV	Kilovolt
KVA	Kilovolt-ampere
MVA	Megavolt-ampere
TWh	Terawatt hour
KWh	Kilowatt hour
KW	Kilowatt
MW	Megawatt
AC	Alternating Current
DC	Direct Current
HT	High Tension
LT	Low Tension
CRGO Steel	Cold rolled grain oriented steel
SWG	Standard wire gauge
RPM	Revolutions per minute
Hydel	Hydro-electric
EMU	Electro magnetic units

Equivalents

1 lakh =	10^5
1 crore =	10^7
1 million =	10^6

MW (Megawatt) = 1000 KW (Kilowatts)
 TWh (Terawatt hour) = 10^9 KWh (Kilowatt hour)
 Rupees = \$ 0.133 US (approximately).