
Seminar Title	: Energy Efficiency of Indian Manufacturing Industries: Evidence from Unit-level Analysis
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Venue	: Room No. MN - 436, Seminar Room, HS Department, Near Lift, Third Floor, Academic Building, NIT Rourkela
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Abstract	: Being ranked third in the world's energy consumption and CO ₂ emission globally, Indian manufacturing industries are the principal end-users. Previous literature adopted a piecemeal empirical exercise and, hardly any comprehensive effort exists that can combine a scientific measurement process of energy efficiency, exploration of its determinants, impacts, and spillover effects considering the unit-level database. Therefore, in this present research, our objectives are fourfold. First, this study computes the energy efficiency scores of Indian manufacturing plants controlling their desirable and undesirable outputs. Second, the research investigates the role of different plant and industry-specific factors that determine the energy efficiency scores of Indian manufacturing industries. Third, the study examines the impact of energy efficiency on plants' performance. Fourth, it investigates the spillover channels and their mediating effects on the plants. The present study is based on secondary data and the sources include unit-level panel data from the ASI, CMIE, CSEP, and the Input-Output Transaction Table. The study covers twenty-one industries at the individual, group, and aggregate levels following two-digit NIC classification. A total of 2251 plants are studied from the 2001 to 2018 period. The study applies three variants of Data Envelopment Analysis: Directional Distance Function, Slack-Based Measure, and the Non-Separable Hybrid Model to compute the energy efficiency scores and it uses fractional regression models to identify the determinants. The study further involves POLS, FEE, 3SLS, and SUR to investigate the impact of energy efficiency on manufacturing plant performance. However, the result demonstrated that few industries have higher efficiency scores even after high energy consumption. The study further indicates that the plant-specific non-energy, energy-related, and industry-specific characteristics significantly influence energy efficiency levels in the Indian manufacturing sector. Additionally, the study finds positive spillover effects both horizontally and vertically. The study provides comprehensive policy suggestions for India's sustainable development.