



## **Global Conference on Multidisciplinary Research and Innovation**

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### **COMPARATIVE ANALYSIS OF INTERNATIONAL PRACTICES FOR IMPROVING RESOURCE EFFICIENCY IN INDUSTRIAL ENTERPRISES**

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#### **Abstract**

This study presents a comparative analysis of international experience in improving the economic efficiency of resource utilization in industry using the examples of Sweden, Singapore, and South Korea. The study examines modern approaches to industrial resource management, including green industrial transformation, energy efficiency systems, and smart manufacturing technologies. Particular attention is paid to the possibility of adapting international practices to developing economies. analyzes the impact of digital transformation on productivity growth in global apparel value chains. The study focuses on the application of advanced technologies such as artificial intelligence, automation systems, and digital supply chain platforms in the textile and garment industry. In the context of globalization, apparel production is organized through complex international networks, where efficiency depends on coordination, information flow, and technological integration. The research is based on the analysis of international reports and academic literature from international organizations.

**Keywords:** resource efficiency, industrial development, smart manufacturing, energy efficiency, green industry, Sweden, Singapore, South Korea



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### Introduction

In modern economic conditions, industrial enterprises face increasing pressure related to rising production costs, energy consumption, and global competition. As a result, improving the efficiency of resource utilization has become one of the main priorities of industrial policy in many countries. International experience shows that sustainable industrial growth depends not only on technological modernization, but also on effective resource management and innovation-oriented development strategies.

Today, different countries apply various approaches to increasing industrial efficiency. Some states prioritize environmental sustainability, while others focus on digital transformation and automation of production processes. Therefore, the analysis of international practices allows identifying the most effective mechanisms for improving industrial competitiveness.

### Main part

Among European countries, Sweden demonstrates one of the most advanced approaches to improving industrial resource efficiency. The country actively develops the concept of “green steel” production based on the HYBRIT project, which uses hydrogen instead of coal in steel manufacturing. This technology significantly reduces carbon emissions and energy losses in metallurgical production. According to OECD reports, Sweden’s industrial transition is supported by long-term climate policy, investments in renewable energy, and modernization of industrial infrastructure.

At the same time, Singapore focuses on improving energy efficiency through state-supported industrial management systems. The government implements mandatory energy management practices for manufacturing enterprises and provides financial



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support for energy-efficient technologies. Such measures help industrial companies reduce operational costs and improve productivity.

Another important example can be observed in South Korea, where industrial enterprises actively introduce smart manufacturing technologies and digital monitoring systems. The integration of automation and data analysis into production processes has allowed companies to optimize the use of raw materials and energy resources while increasing production flexibility.

In contrast to Asian countries that mainly emphasize digital technologies and industrial automation, Scandinavian countries prioritize environmental sustainability and low-carbon industrial transformation. Nevertheless, both approaches aim at achieving the same objective — increasing industrial competitiveness through more efficient resource utilization.

**Table 1 — International Approaches to Resource Efficiency Improvement**

Country	Main Approach	Tools and Methods	Result
Sweden	Green industrial transformation	hydrogen-based steel production, renewable energy	reduction of carbon emissions and energy losses
Singapore	Energy efficiency management	state support programs, industrial energy monitoring	lower operational costs and higher productivity
South Korea	Smart manufacturing	automation, AI technologies, digital monitoring	Optimization of resource utilization and production flexibility

Table 1 presents a comparison of international approaches to improving industrial resource efficiency in Sweden, Singapore, and South Korea. The comparison includes the main development direction, applied technologies, and economic results achieved in each country.



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International experience shows that sustainable industrial development depends not only on technological modernization, but also on effective state policy, innovation support, and long-term investment in industrial infrastructure.

### Conclusion

The analysis of international experience demonstrates that improving the economic efficiency of resource utilization requires a comprehensive approach that combines technological innovation, digitalization, and effective industrial policy. The practices implemented in Sweden, Singapore, and South Korea confirm that sustainable industrial development can be achieved through modernization, energy-efficient technologies, and intelligent production management systems. These approaches may also serve as valuable models for developing economies seeking to increase industrial competitiveness and resource efficiency.

### References

1. OECD (2023). OECD Economic Surveys: Sweden 2023. Organisation for Economic Co-operation and Development. <https://www.oecd.org/economy/sweden-economic-snapshot/>
2. European Commission (2022). Industry 5.0: Towards a sustainable, human-centric and resilient European industry. [https://commission.europa.eu/research-and-innovation\\_en](https://commission.europa.eu/research-and-innovation_en)
3. World Economic Forum (2024). Global Manufacturing Report: Industry Transformation. <https://www.weforum.org/reports>
4. International Energy Agency (IEA) (2023). Energy Efficiency 2023. <https://www.iea.org/reports/energy-efficiency-2023>
5. Ministry of Trade and Industry Singapore (2025). Energy Efficiency in Industry. <https://www.mti.gov.sg/energy-and-carbon>
6. McKinsey & Company (2022). Smart Manufacturing and Industry 4.0. <https://www.mckinsey.com/capabilities/operations/our-insights>