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# Challenges and opportunities for long-term development and decarbonization of the Electric Power Industry of Serbia

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Review article

## *Highlights*

- Review of new literature on decarbonization, transition and circular economy
- Proposal of a decarbonized power system model, based on the example of Serbia
- Opportunities and challenges for energy sources diversification and application of new technologies
- Proposal of ways to transfer knowledge in the energy sector of academia into the domain of industry / economy

## *Abstract*

*Environmental pollution and resources consumption for the industry operation and development of national economies have made it inevitable to find technical and technological solutions that will enable sustainable future development. Decarbonization, circular economy and diversification of energy sources are therefore imposed as a solution. In the (power) energy sector, they imply energy transition, primarily from the current mass use of fossil fuels to ecologically more acceptable primary energy sources, with an increase in energy efficiency, including an increase in waste heat's and waste materials' usage in the processes of heat and electricity production. Decarbonisation, however, raises complex issues and problems; from technical-technological, economic and financial ones - that long-term process' manners, dynamics and implementation costs, to the issue of its acceptability, fairness and the need to acquire appropriate knowledge and awareness. The example of Serbia, its electric power system (EPS) and "Electric Power Industry of Serbia" (EPIS) shows that it is necessary to establish gradually such a production mix, which would be based and relied on different, environmentally friendly energy sources and on new technology, which will be not only feasible and sustainable in the long term, but also technically, financially and economically optimal for Serbian conditions and opportunities, as well as socially acceptable. That mix must allow the profitable operation of EPIS and be able to ensure the stability and reliability of Serbian EPS operation, security of supply to end-users, the highest possible level of energy independence and security of the Republic of Serbia, and the satisfaction of end-users and EPIS employees. At the same time, the principles that will lead to an increase in energy efficiency, the establishment of a circular economy and the reduction of negative impacts on the environment, as well as on the social aspect should be respected and applied. The selection of the most suitable and appropriate new technologies and particular technical solutions for new capacities for the electricity generation and heat production in the future should be made on the basis of opinions and conclusions reached by experts from scientific and professional circles, through their joint work and synergistic action.*

## *Keywords*

**Circular Economy, Decarbonization, Diversification, Energy Efficiency, Energy Sources, Energy Transition**

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***Note:***
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