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Review

Assessing energy security: An overview of commonly used methodologies

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Highlights

- â€¢ We classify a broad range of methodologies in a framework.
- â€¢ Different methodologies give conflicting recommendations on how to increase security.
- â€¢ Methodological combinations could be used to identify robust policies.

Abstract

This paper provides an overview of methodologies used for quantitative evaluations of security of supply. The studied material is mainly based on peer-reviewed articles and the methodologies are classified according to which stage in the supply chain their main focus is directed to, as well as their scientific background. Our overview shows that a broad variety of approaches is used, but that there are still some important gaps, especially if the aim is to study energy security in a future-oriented way.

First, there is a need to better understand how sources of insecurity can develop over time and how they are affected by the development of the energy system. Second, the current tendency to study the security of supply for each energy carrier separately needs to be complemented by comparisons of different energy carrier's supply chains. Finally, the mainly static perspective on system structure should be complemented with perspectives that to a greater extent take the systems' adaptive capacity and transformability into account, as factors with a potential to reduce the systems vulnerabilities. Furthermore, it may be beneficial to use methodological combinations, conduct more thorough sensitivity analysis and alter the mind-set from securing energy flows to securing energy services.



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Keywords

Energy security; Methodology; Security of supply

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