

Designing backcasting scenarios for resilient energy futures

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Author(s): Yusuke Kishita, Benjamin C. McLellan, Damien Giurco, Kazumasu Aoki, Go Yoshizawa, Itsuki C. Handoh

The concept of resilience is a crucial part in crafting visions of desirable futures designed to withstand the widest variety of external shocks to the system. Backcasting scenarios are widely used to envision desirable futures with a discontinuous change from the present in mind. However, less effort has been devoted to developing theoretical frameworks and methods for building backcasting scenarios with a particular focus on resilience, although resilience has been explored in related sustainability fields. This paper proposes a method that helps design backcasting scenarios for resilient futures. A characteristic of the method is to delineate “collapse” futures, based upon which resilient futures are described to avoid the various collapsed states. In the process of designing backcasting scenarios, fault tree analysis (FTA) is used to support the generation of various risk factors and countermeasures to improve resilience. In order to test the effectiveness of the proposed method, we provide a case study to describe resilient energy systems for a Japanese community to 2030. Four expert workshops involving researchers from different disciplines were organized to generate diversified ideas on resilient energy systems. The results show that three scenarios of collapsed energy systems were described, in which policy options to be taken toward achieving resilient energy systems were derived.

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