

The role of future scenarios to understand deep uncertainty

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The environment and its interaction with human systems (economic, social and political) is complex and dynamic. Key drivers may disrupt system dynamics in unforeseen ways, making it difficult to predict future conditions precisely. This kind of deep uncertainty presents a challenge to organizations faced with making decisions about the future, including those involved in air quality management. Scenario analysis is an important tool that can benefit decision-makers under these conditions. We propose the application of the future scenarios method to air quality management because it provides a structured means of sifting through and understanding an overwhelming number of driving forces and their dynamics, helping to identify robust policy choices within deeply uncertain systems. Clarity about relevant driving forces can assist in the choice of emission reduction strategies to anticipate cost-effective outcomes and avoid missed opportunities. The application of the scenarios method is a novel approach for air quality management for the U.S. We use the MARKAL model to illustrate the scenarios and gain further insights into the role of different drivers and their consequences for air quality, as well as to understand the robustness of different emission reductions strategies.

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