

The Renewable Energy Transition: Truths and Consequences

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Background/Objectives. I will discuss renewable energy resources in terms of their natural resources constituent parts and frame the energy transition in terms of the supply and demand of these resources. The presentation is intended for a general audience with zero advanced science background. Attendees will learn about the complexities associated with the energy transition, including geologic controls on resources supply, socio-political constraints, economic constraints, and public policy related to renewable energy.

Approach/Activities. I will start with an overview of our local, regional, national and global energy consumption, including primary and secondary energy resources. I will then guide attendees through an exercise where we replace all use of coal, natural gas and oil with photovoltaic solar, wind turbines and grid-scale battery storage. Then I will help the audience break down these resources in terms of the resources they require. Finally, we will evaluate the total resources demand required to achieve national and global carbon neutrality.

Results/Lessons Learned. Students will gain perspective on the requirements for carbon neutrality through a fact-based, opinion-free assessment of carbon neutrality. They will learn about the differences between primary and secondary energy resources. They will learn about energy flows at the local, regional, national and global scales. They will be able to discuss renewable energy through the lens of the required natural resources. They will gain an appreciation for the complexity of the energy transition through the lens of the economic importance of fossil fuels to states and countries around the world.