
Energize: An interactive evaluation tool for engaging the general public with energy decision making

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ABSTRACT:

The public has an ever increasing interest in the economic, environmental, and social impacts of the global energy production. The Fukushima Daiichi accident brought renewed awareness to the international implications of nuclear energy. However, to make marked impact on climate change, nuclear energy is a vital component of the overall electrical energy portfolio. To support informed decision making, the scientific community has a responsibility to communicate reliable and straight-forward information to the general public, in an engaging way, regarding energy systems and how choices made at different stages of an energy technology life cycle can impact the cost, amount of materials used, and waste produced.

We propose to develop an interactive electrical energy simulator through which users can interact with one another in their quest to develop an electrical energy portfolio that optimizes economic (e.g., gross domestic product), environmental (e.g., reduced CO₂ emissions), and social (e.g., public opinion) impacts. Individual users will be introduced to the simulation environment as follows: “*Congratulations on your new appointment as the **Regional Energy Director (RED)** for your state. As RED, you make both operational and policy decisions about your state’s electrical energy portfolio. Concerns such as improving emissions standards and reducing consumer costs are examples of the issues you will face. Best of luck!*”. Each user will be presented with a map of their state, given an initial electrical energy portfolio, and prompted to start taking action. Users will work individually and within the simulation community to meet target energy demands while limiting cost and environmental impact by adjusting their energy portfolio. Particular emphasis will be placed on the nuclear fuel cycle, comparing different fuel cycle technologies using the data from the DOE Nuclear Fuel Cycle Options Catalog.

Design and development of the simulation tool will be an interdisciplinary process involving a team of software developers and testers, instructional designers, and energy content specialists. We will design the simulator in parallel with data collection to ensure effective data collection and appropriateness of the simulation platform. The energy systems (e.g., nuclear, gas, solar) will be quantitatively compared using life cycle assessment modeling. Beta-testing will be performed throughout the grant period to ensure timely and successful development of a deployable evaluation tool. Subject matter experts, university students, and technically-oriented laypersons will form focus groups for beta testing, where subject matter experts will provide technical feedback on the accuracy of the simulation while laypersons will provide feedback on simulation accessibility.