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FORCE: A modeling approach to increase the value proposition for SMRs in non-electric applications

Traditionally, nuclear power plants exist to make electricity, but they also must produce a lot of heat. Today, roughly 40% of all energy is wasted. More efficient energy use would be better for the environment and for the plant owner. The U.S. Department of Energy's Office of Nuclear Energy supports a national laboratory Integrated Energy System (IES) program. The program conducts research, development, and deployment activities to expand the role of advanced nuclear energy including SMRs beyond supporting the electricity grid. Expanded roles include supplying energy to various industrial and transportation applications. The IES program has developed the FORCE computational framework. FORCE is applied to conduct analysis of the technical and economic viability of a range of possible nuclear energy IES configurations and, at the end, to optimize those configurations within different markets. For example, energy arbitrage with thermal energy storage or hydrogen production and storage has been evaluated using FORCE. In addition, an evaluation of gas, diesel and jet fuels synthesis using nuclear power has been completed. The full paper will detail the capabilities of the FORCE tool suite and provide an overview of currently studied application cases.

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Confirm that the work is original and has not been published anywhere else

YES

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