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## Development and Multipurpose Applications of Small Modular Sodium-cooled Fast Reactors in Two Component Nuclear System

**ABSTRACT:** The Sodium-cooled Fast Reactor (SFR) has the advantages of proliferation and transmutation, coupled with the pressurized water reactors (PWR), forming the two-component nuclear energy system which holds significant importance for the sustainable development of nuclear energy under the nuclear tripling declaration at COP28. This article investigates the potential application and economic evaluation of small modular sodium-cooled fast reactors in areas such as power generation, hydrogen production, and industrial steam supply, simultaneously. Based on the current status of nuclear energy development, this study predicts and analyzes the development prospects of small sodium-cooled fast reactors within the framework of the two-component nuclear system in the future.

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

YES

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