



## Heat Storage for Gen IV Reactors for Variable Electricity from Base-Load Reactors

*Changing Markets, Technology, Nuclear-Renewable Integration and Synergisms with Solar Thermal Power Systems*

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**Gédéon Mauger** holds an engineering diploma (master's degree) in nuclear energy engineering from Grenoble INP, France. He joined the French Alternative Energies and Atomic Energy Commission (CEA) as a thermal-hydraulics research engineer in 2013. He works on the development and the validation of new physical models in the CATHARE thermal-hydraulics system code. He was in charge of the dynamic modeling of a high-pressure nitrogen Brayton cycle [1] investigated as an innovative power conversion system for ASTRID sodium fast reactor [2]. He also contributes to the sizing and the modeling of innovative systems: a cold storage for the flexibility of thermal power plants coupled to a Brayton cycle [3], water Rankine cycles, organic Rankine cycles and supercritical CO<sub>2</sub> Brayton cycles. Currently, he is also involved in safety studies for the lifetime extension of the French Pressurized Water Reactors (PWR) in collaboration with EDF and FRAMATOME. In this framework, he contributes to the development of new thermal-hydraulic models needed to evaluate the resistance of the reactor vessel in case of Pressurized Thermal Shock (PTS) situations due to the Emergency Core Coolant (ECC) system. He teaches nuclear reactor modeling at INSTN and Grenoble INP.



[1] G. Mauger, N. Tauveron, F. Benvivoglio, A. Ruby, "On the dynamic modeling of Brayton cycle power conversion systems with the CATHARE-3 code," *Energy*, 168, pp 1002-1016, 2019.

[2] F. Bertrand, G. Mauger, M. Bensalah, P. Gauthé, Transient behavior of ASTRID with a gas power conversion system, *Nuclear Engineering and Design*, Volume 308, 20-29, 2016.

[3] INPI, Bulletin officiel de la propriété industrielle, Brevets d'invention, n°18/24, June 15, 2018.