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## CIEMAT'S CONTRIBUTIONS TO THE RESEARCH ON SMR SAFETY AND DESIGN

On the way to the decarbonization of human activities, most studies of energy scenarios to mid this century highlight the key role nuclear energy is called to play in terms of security, cost, environment, and reliability. In such a context, Small Modular Reactors (SMRs) are seen as a promising technology to be deployed in the short and medium term both in Europe and elsewhere. Regardless the local context of nuclear electricity in Spain, CIEMAT, the national centre for energy, environment and technology research, has been committed for more than a decade with research on safety of advanced reactors, with a direct projection to SMRs.

CIEMAT's investigation on SMRs may be synthesized according to the different technologies addressed: HTGRs, SFRs and LWR-SMR. In addition to these studies, which describe roughly a decade of research, CIEMAT developed capabilities closely related to the water-cooled SMR technologies related to safety passive engineering features. In particular, CIEMAT developed phenomenological models of the passive containment cooling systems of mid- and large-size nuclear reactors that have inspired some of those included in the SMR designs. Nevertheless, their implementation in SMRs might need specific research. In some cases, these might mean to investigate enveloping conservative scenarios to prove their safe response under the expected conditions.

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

Yes

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