

PROJETO COFINANCIADO PELA UNIÃO EUROPEIA

Acrónimo - Título	SSTAR - Innovative HV Solid-State TrAnsformer for maximizing Renewable energy penetration in energy distribution and transmission systems
Concurso/aviso	HORIZON EUROPE ENERGY (Project N° 101069702)
Duração	2022-2025
Orçamento total (% Incentivo)	351 562€ (100%)
Objetivo geral	<p>The on-going energy transition towards a decarbonized economy is changing profoundly the infrastructure of the power grids worldwide. Conventional high-power transformers are not fully prepared to overcome these challenges, as they do not have intrinsic capabilities regarding active system support. Instead, Solid-State Transformers (SSTs) have emerged in the last years as a disruptive technology able to extend the typical functionalities of a regular transformer, optimizing the power flows and introducing a high degree of digitalization and intelligence in the network. However, SSTs are not still a mature technology and only prototypes of up to 15 kV. Therefore, their use is currently restricted to low-voltage applications.</p> <p>In this context, SSTAR aims to increase the operation voltage level of SSTs to enlarge their applications within the energy power sector while improving its performance in a reliable, cost-optimized and sustainable way. To do so, three main R&I Lines will be developed. The combined effect of these innovations will be validated at TRL 4 in two certified test-beds in Spain and Portugal. Hence, SSTAR seeks to pave the way for the development of new disruptive HV SST devices more attractive for commercial purposes than the prototypes made so far, and able to be used in distribution and transmissions grids.</p>
Promotores	<ul style="list-style-type: none">• Fundación CIRCE - centro de investigación de recursos y consumos energéticos• CERTH - centre for research & technology HELLAS• Efacec Energia - Máquinas e Equipamentos Eléctricos S.A• Novamont S.A• Rina Consulting SPA• Fondazione ICONS
Resultados esperados	<ol style="list-style-type: none">1) Sustainable biobased dielectric fluid able to increase the SST modules insulation voltage while achieving up to 50% of CO2 saving comparing to traditional oils.2) New SST module based on SiC with a bidirectional Inductive Power Transfer (IPT) system able to increase the individual voltage and switching frequency of SST modules up to 1.5 kV and 50kHz respectively with a total efficiency of 98.5%

3) Decentralized control cascade H-bridge (CHB) converter to scale-up the number of modules in a single SST device to achieve the voltage levels of transmission grids