

Challenge@PoliTo *_By Firms*

5S - Sustainable Solid State Switches for power Systems *_By ENEL Grids*

March 2023 – June 2023



CALL FOR IDEAS

The electrical grid is the infrastructure that enables the energy transition, interconnecting renewable generation and final consumers. The necessity to connect distributed renewable sources brought new complex problems to be solved in terms of dispatching an increasing amount of electricity from renewable sources, managing the increased consumption of our customers, as well as the growing number of types of electrical players connected to the grid, guaranteeing the full reliability of the electricity service aiming to eliminate interruptions. Enel Grids, a subsidiary of Enel S.p.A., aims to constantly improve the reliability of its service, leveraging both revolutionary technologies and innovative projects, introducing systems capable of interrupting extreme currents very quickly, preventing disconnections and failures that would cause problematic downtime to facilities could be used.

The Challenge calls for the implementation and analysis of surveys, insights, critical aspects and short- and medium-term perspectives on the use of solid-state electronic components in the redesign of equipment for medium- and low-voltage power grids: transformers, circuit breakers, switchgear, solid-state LV switch etc.

The study will also need to include aspects related to the change of scenario regarding the raw materials that would be involved in the transition, sustainability and environmental impact, and the reconversion of key production chains.

Specifically, with regard to the LV solid-state switch, teams will need to focus on:

- description of operation, main components, technology;
- technology scouting: identify which of the higher-tech players have invented it or are proposing it;
- compatibility/shortages toward current switches adopted on networks (e.g., 250/350 A 25 kA);
- cost/benefit analysis also in view of future developments or changed scenarios;
- sustainability and life cycle analysis (LCA).

Challenge@PoliTo are worth 8 curricular or extracurricular credits. Check your degree programme to verify it. Places are limited. For any questions, write to clik@polito.it



**Politecnico
di Torino**

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