ENEL 2023 Challenges

During this Eureka-Enel online session, innovation teams from Enel Green Power, Enel Grids, and Enel X, three of Enel Divisions, will present their current challenges, which range from new materials and technologies, construction automation, asset end-of-life-management, robotics and AI based solutions for construction and O&M, non-lithium batteries and thermal storage, new products and services for end-customers, and community and biodiversity impact.

We encourage you to go through the challenges abstract (below) presented by Enel, to identify potential synergies with solutions you have developed. Challenges will be further explained during the webinar.

ENEL CHALLENGES ABSTRACT

ENEL GREEN POWER CHALLENGES

- PV supply independence: Securing sustainable energy technologies supply chain.
- Materials and Techs for sustainable energy generation: Accelerate sustainable net zero generation, by engaging the supply chain to introduce low-carbon materials and technologies.
- Low cost green H2: Enable new value streams by acceleration of green hydrogen solutions go-to-market.
- Automation of PV construction: Foster competitiveness in PV construction, through automation and AI.
- Asset new life: Reduce end-of-life management cost and improve REN sustainability, by leveraging on circular economy.
- New business and stakeholders’ engagement models: Promoting REN generation economic, social and environmental integration within local communities.
- More competitive design and development: Foster competitiveness through new plant layout, new solutions and digital tools.
- Asset performance boost: Boost production through automation, robotic, AI and revamping solutions.
• “End-to-End” zero impacts: Maximize safety standards, environmental performances and biodiversity preservation, over the whole value chain.
• Improved and resilient O&M: Building resiliency to maximize performance and unlock the long-term value of assets.

**ENEL GRIDS CHALLENGES**

• Room-temperature superconductive material for innovative cables.
• Self-healing insulation materials for grid’s assets.
• Robotic solutions designed for applying anti-icing coatings on overhead conductors in medium voltage grids (to operate on energized lines without interrupting grid services and adapt to various conductor diameters, offering advanced functionalities)
• COBOTs able to perform operational tasks in collaboration with operators (locally and/or remotely) in primary substation to reduce the effort in relevant maintenance activities.
• Solutions able to operate inspections during or after extreme weather conditions in overhead lines, underground lines, and power stations (primary and secondary substations), including rough grounds, areas submerged by water, landslides, etc.
• Microrobot solutions able to perform inspections on both overhead and underground power lines.
• Solutions to optimize and simplify the underground cable installation process and related activities.

**ENEL X CHALLENGES**

• Heat Pump for apartments: Air-Water heat pumps able to substitute traditional gas fired boilers used by most domestic customers for heating and domestic hot water. Within scope intelligent control systems to reduce the size of the water storage tank (if already working with large suppliers).
- Photovoltaic Solar Awning: rollable, flexible or rigid solar awning, fully retractable (by motor actuator), with a maximum power output lower than 800W, maximum 50 kg weight, and approximately 2.5m (width) x 2m (depth) (other power ratings and dimensions may be considered).
- BIPV - Building integrated photovoltaic modules: Technical solutions for "opaque" not transparent PV module installations on vertical building facades (PV modules or integrated modules and support structure solution).
- Beyond Lithium, battery storage technologies: Novel storage batteries (not lithium based) for application in residential, C&I or Industrial sites.
- Novel thermal storage technologies: Innovative thermal storage solutions to be coupled with medium-high temperature industrial processes that normally require the use of gas. Use cases of interest: High T applications (>400 °C) and Medium T applications (120 °C - 400 °C). Technologies based on PCM (phase changing materials) could be of interest.
- Small asset aggregators, including residential use cases and services for PV owners: Aggregate smart devices into a virtual asset, that will suffice the basic requirements for market participation and 1) calculate/forecast virtual asset availability to the market; 2) execute dispatch order according to a provided baseline and required performance; 3) communicate availability shortage/extra availability to enable dynamic dispatch. Even optimization services for residential PV owners are in scope.