SSD 2024
1 – 2 July

Invited Speaker

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CTO
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SOFC-based generators from SolydEra with high power density and improved serviceability

S0401

TALK TITLE

SOFC-based generators from SolydEra
with high power density and improved serviceability

ABOUT

50 years old. Married with two children, leaving in Italy. PhD in Materials Engineering in 2004.

CTO of SolydEra, formerly known as SOLIDpower, founded in Italy in 2006 to develop electrochemical energy conversion devices based on Solid Oxide Fuel Cell technology. Since then, he has been responsible for R&D activities, including technology and product development, due-diligence and know-how acquisition, as well as supporting CEO with deputy functions as General Manager Italy. Over the years he gained a large experience in transferring new technologies from Lab. to production, leading the development of high efficiency generators for the European market, as well bringing the proprietary stack technology up to the level to be manufactured at industrial scale in the today's largest EU manufacturing plant started in 2020. Over the last 5 years he has supervised the development of a larger stack platform addressing applications in

both Gas-to-Power and Power-to-Gas application as well the development of Solid Oxide Electrolyzers and reversible systems. As CTO he is currently responsible for a team of 60 researchers and engineers, working in three Innovation and Technology Centers located in Italy, Switzerland and Australia, respectively. He oversees a portfolio of several internal and public cofunded projects in cooperation with industrial and Academic partners. In the period 2021-22, He has been in the Board of Italian Hydrogen Association (H2-IT). He is co-author of numerous scientific publications in international journals and proceedings.

ABSTRACT

SolydEra is a European technology provider offering high performance, field-proven, and cost-effective solutions based on proprietary Solid Oxide stacks with 20 years follow up experience in development and manufacturing. Since 2020, the company operates the largest stack manufacturing factory in Europe with a nominal capacity of 25 MW per year, a first-in-kind production facility for the high level of industrialization and process automation implemented.

In order to address applications in the heavy-duty and hard-to-abate sectors which are difficult to be fully electrified, SolydEra has developed a larger stack platform with a nominal power of 8 kW,

which has been successfully integrated in multi-stack modules both in power production as well as in electrolysis. Particularly, the company has identified the maritime sector and the use of SOFC modules for Auxiliary Power Units in the shipping industry as one of the best-fit applications where added value can be offered in terms of high efficiency, fuel flexibility, high availability and reduced footprint.

In 2020 SolydEra has joined the NAUTILUS project, aiming at developing, testing, and validating a highly efficient and dynamic SOFC fueled by LNG for long-haul passenger ships. The company has been responsible in the project for multiple activities, including the delivery of a 32 kW LSM (Large Stack Module) successfully tested in DLR Labs., stack testing in tilting conditions up to 30° in both static and dynamic mode, as well as integrating multiple stacks in a 60 kW SOFC system. In 2023 SolydEra has also joined the project AMON addressing the development of a SOFC-based generator using ammonia as a fuel, being responsible for delivering 8 kW stacks to partners for integration in the system. The presentation will give an update about the progress so far on these two important projects.

Finally, the speech will provide some insights in the unique stack integration approach developed by SolydEra for a very compact and

easy-to-maintain installation of SOFC-based power generators on board of ships with a specific power density up to 45 kW/sqm, as well as a general update on the progresses in obtaining the AiP from Classification Society in cooperation with a large shipyard and shipowners for the integration of APU generators for hotel loads in cruise ships.