

A First for Africa: EEHC's GE LM6000 Unit Generates Power Using Hydrogen-Blended Fuel at the Implementation COP

Sharm El Sheikh, Egypt; 16th November, 2022: H.E. Dr. Mohamed Shaker El-Markabi, Minister of Electricity and Renewable Energy of Egypt, announced the successful operation of a GE LM6000 aeroderivative gas turbine on hydrogen-natural gas blended fuel at the Sharm El Sheikh Power Plant. The demonstrations of the unit running on the mixed fuel ran at different times during the United Nations Framework Convention on Climate Change's (UNFCCC's) 27th session of the Conference of the Parties (COP27), termed the 'Implementation COP'.

A proof of concept, the project illustrates that it is, in fact, possible to generate lower carbon, reliable, on demand power by burning hydrogen-blended fuels in gas turbines. The project was executed less than five months after a strategic cooperation agreement (SCA) was signed among Egyptian Electricity Holding Company (EEHC), GE, Hassan Allam Construction, and PGESCO. It is the first time that GE's LM6000 gas turbine was run on hydrogen-blended fuel on the African continent.

H.E. Dr. Mohamed Shaker El-Markabi said, "We must all take urgent actions to address the climate challenge. We need to act today - not years from now - to invest in solutions that can provide lower carbon energy, and Egypt is well-positioned to play a leading role in this energy transition. Today, as I announce the successful operation of a GE LM6000 aeroderivative gas turbine on hydrogen-blended fuel right here in the city of Sharm El Sheikh during Energy Day at COP27, the world can see what is possible when you bring big dreams, strong resolve, and committed partners together. The combination of EEHC's commitment and facilitation, GE's global, industry-leading expertise in hydrogen-fueled power

projects, and Hassan Allam and PGESCO's strong on-the-ground construction and engineering capabilities, led to the extraordinary achievement of the safe, on time, and successful completion of this demonstration pilot."

EEHC owns and operates the Sharm El Sheikh Power Plant. GE led the conception, planning, and execution of the project, as well as the building of the hydrogen-natural gas blending system. Hassan Allam supplied the manpower and equipment needed for installation, related civil works, hydrogen needed for testing, and the piping and cabling system that transported hydrogen to the mixing skid and the turbine. PGESCO helped design the project and provided engineering expertise.

"We commend the strong actions being taken by the Government of Egypt to bring the world together at COP27 to remain focused on creating a lower carbon energy future," said **Joseph Anis, President and CEO of GE Gas Power in Europe, Middle East, and Africa**. "GE is committed to collaborating closely with the Government of Egypt, as well as other customers and partners to address the climate challenge. We were honored to design the overall hydrogen-natural gas demonstration project at Sharm El Sheikh; identify various parties to lead engineering, procurement, construction, hydrogen supply, safety initiatives, and other works; provide the critical blending skids needed to mix the hydrogen and natural gas; and then drive coordination efforts among all parties involved to bring the project to successful completion. This is an excellent example of what it means to be together for implementation."

GE has over 30 years of experience with more than 100 gas turbines that have operated on fuels that contain hydrogen globally, accumulating more than 8 million operating hours. Earlier in 2021, [GE announced](#) a collaboration in North America to run an LM6000 unit on a blend of hydrogen and natural gas. Learnings from the project were applied by GE at Sharm El Sheikh and shared with other project

partners, leading not just to the successful completion of the project, but also to a significant transfer of knowledge and local capacity building in the utilization of hydrogen as a fuel for power generation.

“We are proud to take part in this innovative project. With decades of experience in the power industry, Hassan Allam Construction is well positioned to take part in Egypt’s transition towards sustainable energy. Our contribution to the hydrogen-natural gas fuel blend project was comprehensive, covering the critical areas of procurement, construction, and electromechanical scopes. With COP27 being hosted in Egypt, we are looking forward to the role the country will play in building global sustainability platforms, in which Hassan Allam Holding will be a key player,” said **Hassan Allam, CEO of Hassan Allam Holding.**

“The progress made on such a mega project in less than five months is a testimony to what national Egyptian conglomerates can achieve with our partners,” said **Ahmed Ramadan, CEO of PGESCO.** “Despite the project’s narrow timeframe and challenging nature, PGESCO, with its extended local and regional expertise in managing power projects, built rapid capabilities to overcome various challenges, including the management of hydrogen for electricity generation at a live power plant. This project is a milestone in Africa and the region, illuminating how we can use hydrogen-blended fuels for future energy production.”

The project illustrates that gas turbines offer great potential to operate at lower carbon intensity and can complement the growth of variable renewables by providing on demand electricity to firm the grid. The safe execution of the demonstration also tells us that while hydrogen does present certain unique challenges with transportation, storage, and use at site for power generation, those obstacles can be overcome with the right arrangements, trainings, and precautions. Finally, the successful adaptation of an existing installed unit to run on

hydrogen-blended fuel also clearly highlights that today's gas power generation assets can be a destination technology, not just a bridging technology, as the world scales up the production of hydrogen. This is important for countries that have made considerable investments of billions of dollars in these assets. Looking ahead, learnings from this project can be studied by organizations around the world, to potentially improve the execution of future hydrogen-fueled power all over the world.

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Notes to editors

About Egyptian Electricity Holding Company:

The Egyptian Electricity Holding Company works on saving electrical energy for economic, social development projects and all-purposes cross the unified electrical grid through the necessary capacities and the highest level of technical specifications. It also takes in consideration all safeguards for the stability and continuity of electrical nutrition without interruption in all cases with the optimal use of all resources to maximize profitability.

About GE Gas Power:

GE Gas Power, an integral part of GE Vernova, is a world leader in natural gas power technology, services, and solutions. Through relentless innovation and



continuous collaboration with our customers, we are providing more advanced, cleaner, and efficient power that people depend on today and building the energy technologies of the future. With the world's largest installed base of gas turbines and more than 670 million operating hours across GE's installed fleet, we offer advanced technology and a level of experience that's unmatched in the industry to build, operate, and maintain leading gas power plants. For more information, please visit www.ge.com/power/gas and follow GE's gas power businesses on Twitter and LinkedIn.

GE Vernova, a dynamic accelerator comprised of our Power, Renewable Energy, Digital and Energy Financial Services businesses, focused on supporting customers' transformations during the global energy transition.

About Hassan Allam Construction:

Hassan Allam Construction is Hassan Allam Holding's flagship subsidiary and one of the leading contractors in Egypt and the MENA region. Leveraging its solid track record, the Company is a partner of choice in major construction projects throughout Egypt and abroad, delivering timely unparalleled construction and infrastructure projects across a wide range of sectors. Established in 1936, it is one of the oldest construction franchises in the MENA region, and boasts a solid reputation, superior technical capabilities, and a diversified portfolio. With a legacy of identifying attractive infrastructure projects, it has delivered hundreds of projects. The company is ranked among the Engineering News-Record list of the top 250 global contractors. For more information, visit www.hassanallam.com

About PGESCO:



Established in 1993, PGESCO provides engineering, project control, site management, quality management, prime contracts, and procurement services, as well as comprehensive PMC solutions. It also provides integrated project solutions from the development phase through commercial operations. Lately, the Company began to operate in renewables, electricity distribution, water & wastewater treatment as well as logistics. Moreover, the Company supports in various decarbonization strategies for the Oil & Gas sector as well as industrial applications. Backed by its unrivalled service provision, PGESCO was on the ENR's Top International Design Firms List in 2020. The Company is planning to further diversify its verticals to include transportation and digitalization industries. For more information, please visit <https://www.pgesco.com/>

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