

# World's Largest Renewable Energy Storage Project Announced in Utah

*Grid-scale energy storage with renewable hydrogen production and utilization form core of Advanced Clean Energy Storage project in central Utah*

**SALT LAKE CITY – May 30, 2019** – Mitsubishi Hitachi Power Systems (MHPS) and Magnum Development today joined The Honorable Gary Herbert, Governor of Utah, to announce an initiative to launch the Advanced Clean Energy Storage (ACES) project in central Utah. In the world's largest project of its kind, the ACES initiative will develop 1,000 megawatts of 100 percent clean energy storage, thereby deploying technologies and strategies essential to a decarbonized future for the power grid of the Western United States.

According to researchers at Carnegie Mellon University, carbon emissions from the U.S. power sector have dropped 30 percent since 2005 ([www.emissionsindex.org](http://www.emissionsindex.org)), because of a combination of natural gas and renewable power replacing retiring coal-fired power plants. MHPS has been instrumental in this transition and last year became the global market share leader for heavy duty gas turbines. As a next step in decarbonization, MHPS has developed gas turbine technology that enables a mixture of renewable hydrogen and natural gas to produce power with even lower carbon emissions. The MHPS technology roadmap aims to use 100 percent renewable hydrogen as a fuel source, which will allow gas turbines to produce electricity with zero carbon emissions.

Magnum Development owns and controls the only known "Gulf Coast" style domal-quality salt formation in the western United States. With five salt caverns already in operation for liquid fuels storage, Magnum is continuing to develop Compressed Air Energy Storage and renewable hydrogen storage options. Strategically located adjacent to the Intermountain Power Project, the Magnum site is positioned to integrate seamlessly with the western U.S. power grid utilizing existing infrastructure.

In many parts of the western United States, there are times of day when demand for electricity is lower than the production of renewable power. This leads to curtailment of renewable generation and negative electricity pricing. Continued deployment of renewables will require that excess power be stored for later use. To serve the needs of the entire western United States, many gigawatt-hours of storage capacity are required.

Initially developing enough energy storage to completely serve the needs of 150,000 households for an entire year, the ACES initiative will deploy four types of clean energy storage at utility scale. These energy storage technologies include:

- Renewable hydrogen
- Compressed Air Energy Storage
- Large scale flow batteries
- Solid oxide fuel cells

"For 20 years, we've been reducing carbon emissions of the U.S. power grid using natural gas in combination with renewable power to replace retiring coal-fired power generation. In California and other states in the western United States, which will soon have retired all of their coal-fired power generation, we need the next step in decarbonization. Mixing natural gas and storage, and eventually using 100 percent renewable storage, is that next step. The technologies we are deploying will store

electricity on time scales from seconds to seasons of the year,” said Paul Browning, President and CEO of MHPS Americas. “For example, when we add gas turbines powered with renewable hydrogen to a hydrogen storage salt-dome, we have a solution that stores and generates electricity with zero carbon emissions.”

“Central Utah is the ideal location for this project, and Utah is a business friendly state for projects like this. Magnum’s site adjacent to the Intermountain Power Project is positioned to take full advantage of existing regional electricity grid connections, fully developed transportation infrastructure, ample solar and wind development capacity, a skilled workforce currently transitioning away from coal, and, of course, the unique salt dome opportunity,” said Craig Broussard, CEO of Magnum. “Magnum and MHPS are great partners. Magnum has the below-ground technologies necessary to store energy at utility scale, while MHPS has the above-ground technologies such as hydrogen-fired gas turbines, compressed air storage, solid oxide fuel cells and battery storage technology, to supply electricity at grid scale. With the ACES initiative, we will dramatically accelerate the vision of a western renewable energy hub that we launched over a decade ago.”

"The unmatched investment and innovation brought forward by MHPS and Magnum Development to rural Utah again demonstrates the power of the forward-looking energy policy I have advanced throughout my administration. Utah continues to set the standard among states for driving next generation solutions to market," said Gov. Herbert. "I'm proud that Millard County's skilled workforce, strategic energy infrastructure and unique geological salt domes have put Utah on the map as the epicenter of utility-scale storage for the Western United States."

"The Governor's Office of Energy Development is committed to creating and building the strategic partnerships that provide local, regional and global leadership for powering a sustainable, reliable and affordable energy economy," said Laura Nelson, the Governor's energy advisor and executive director of the Governor's Office of Energy Development. "Governor Herbert's strategic energy plan continues to accelerate unprecedented investment, innovation and workforce opportunities for Utah's diverse energy landscape and provide the energy future that delivers global solutions to meet ever-evolving market demands."

The ACES project will engineer, finance, construct, own, and operate facilities to be located in Millard County, Utah. Over the coming weeks and months, additional strategic and financial partners will be invited to participate.

## **CONTACTS**

For MHPS  
Sharon Prater  
+1 407-688-6200  
[Sharon.Prater@amer.mhps.com](mailto:Sharon.Prater@amer.mhps.com)

For Magnum Development  
Rob Webster  
+1 801-993-7001  
[RWebster@westernenergyhub.com](mailto:RWebster@westernenergyhub.com)

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About Mitsubishi Hitachi Power Systems Americas, Inc.

Headquartered in Lake Mary, FL, MHPS Americas employs more than 2,000 people who design, manufacture, install, monitor and service natural gas, steam and geothermal power generation products, environmental control systems solutions, distributed renewable power projects and energy storage systems throughout North and South America. MHPS is the reigning annual global market share leader for Heavy Duty Gas Turbines, and is leading the development of the digital power plant of the future through its digital solutions, MHPS-TOMONI™. MHPS Americas is a subsidiary of Mitsubishi Hitachi Power Systems, a joint venture between Mitsubishi Heavy Industries, Ltd. and Hitachi, Ltd. integrating their operations in power generation systems.

Learn more about MHPS by visiting [www.changeinpower.com](http://www.changeinpower.com).

#### **About Magnum Development**

Magnum Development, LLC owns and controls the only known “Gulf Coast” style domal-quality salt formation in the western United States. Magnum was originally funded by Haddington Energy Partners III, LP in 2008 to support a variety of projects centered around a large salt body near Delta, Utah. Site viability and profitability has been proven with one business, Magnum NGLs, LLC, which was successfully developed, brought to commercialization, and sold in 2015. In March 2018, Magnum entered into a joint venture with Sawtooth by contributing its refined products business for an 8% ownership interest in the Sawtooth JV. Magnum is focused on developing multiple portfolio companies, which are in various stages of development: natural gas, Compressed Air Energy Storage (CAES), refined products, and industrial gases (hydrogen and helium).

Learn more about Magnum by visiting [www.magnumdev.com](http://www.magnumdev.com).