MITSUBISHI POWER

NEXT

Mitsubishi Power Energy Storage Solutions

CHANGE IN POWER.

DELIVERED

Mitsubishi Power is wholly owned by **Mitsubishi Heavy Industries (MHI)** – a global leader in engineering & manufacturing spanning energy, infrastructure, transportation, aerospace and defense.

300+
DOMESTIC & OVERSEAS COMPANIES

31,783
PATENTS GLOBALLY

82,728
EMPLOYEES WORLDWIDE

$35B+
ANNUAL REVENUE

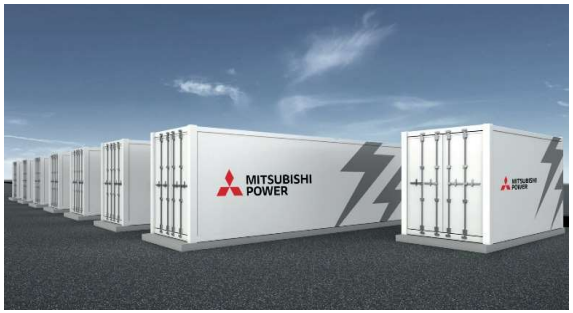
130+
YEARS DOMAIN EXPERIENCE

Solutions for Change in Power

Hydrogen Ready Gas Turbines

PV Solar

Offshore Wind



Battery Energy Storage Systems

Hydrogen Energy Storage

Carbon Capture, Utilization & Storage

MITSUBISHI POWER

ACROSS THE AMERICAS

2,000
EMPLOYEES

25+
OFFICES & FACTORIES

Our Mission in the Americas

We will provide power generation and storage solutions to our customers, empowering them to affordably and reliably combat climate change and advance human prosperity.

NEXT: Energy Storage Solutions

Oriden: Solar + ESS Project Development

Emergence of the Energy Storage Markets

Utility Scale (Front-of-Meter)

Energy storage allows utilities to offset costs to upgrade transmission & distribution systems, provide peak power, and integrate with base load generation.

Distributed (Behind-the-Meter)

Energy storage provides C&I facilities with back up power, demand charge management, and peak shaving capability.

Renewable Integration

Energy storage allows renewable energy projects to smooth out the intermittency of generation and store clipped power.

Hybrid Generation

Energy storage allows the integration of multiple generation sources to provide firming and backup energy.

Grid Services

Energy storage provides grid operators the ability to improve frequency regulation, voltage support, and reserves.

Trading

Energy storage allows traders to manage energy arbitrage.

As the world prepares for a new era of energy, energy storage holds the key to achieving net-zero carbon.

Mitsubishi Power Energy Storage Technologies

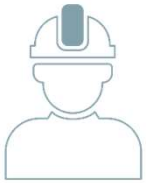
Lithium Ion
(<6 hours)

Flow, etc.
(6-24 hours)

Renewable Hydrogen
(>24 hours)

Commercial & Industrial	Renewables + Batteries	Utility Scale Energy Storage	Microgrids Fuel Cell + Solar Storage + …	Gas Turbines + Batteries/H_2
500 kW – 3 MW's	**> 5 MW's**	**> 5 MW's**	**> 500 kW's**	**> 20 MW's**

Mitsubishi Power Energy Storage Offerings



Engineering

Equipment Supply

SCADA/EMS Integration

Permitting Support

Construction / Commissioning

Solutions for the Life Cycle

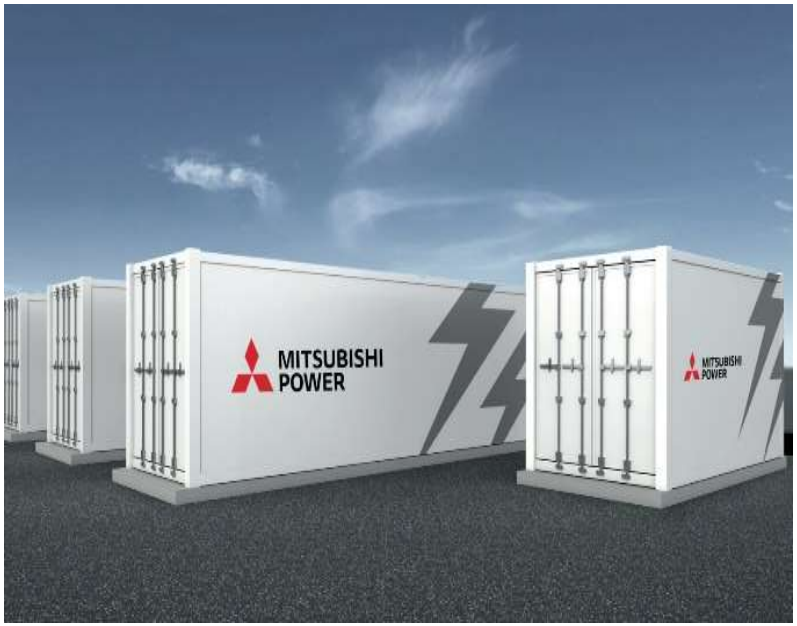
Long Term Service Programs

Financing

Extended Warranties

End of Life Recycling

Mitsubishi Power Battery Energy Storage Experience



~ 487MW / 1293 MWh delivered / under contract

Hydrogen Energy Storage

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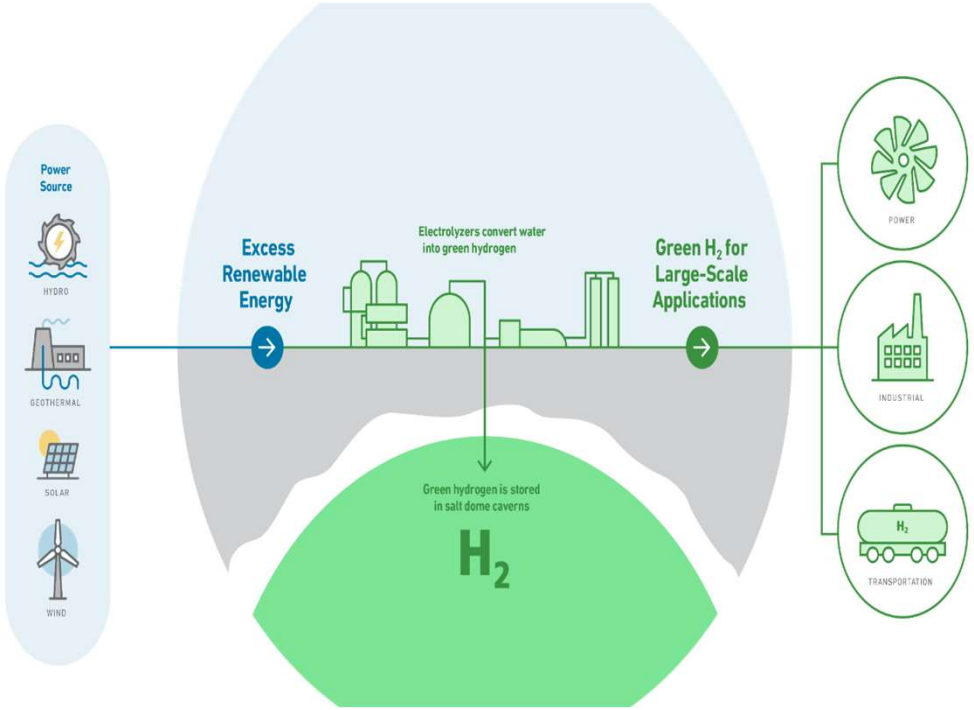
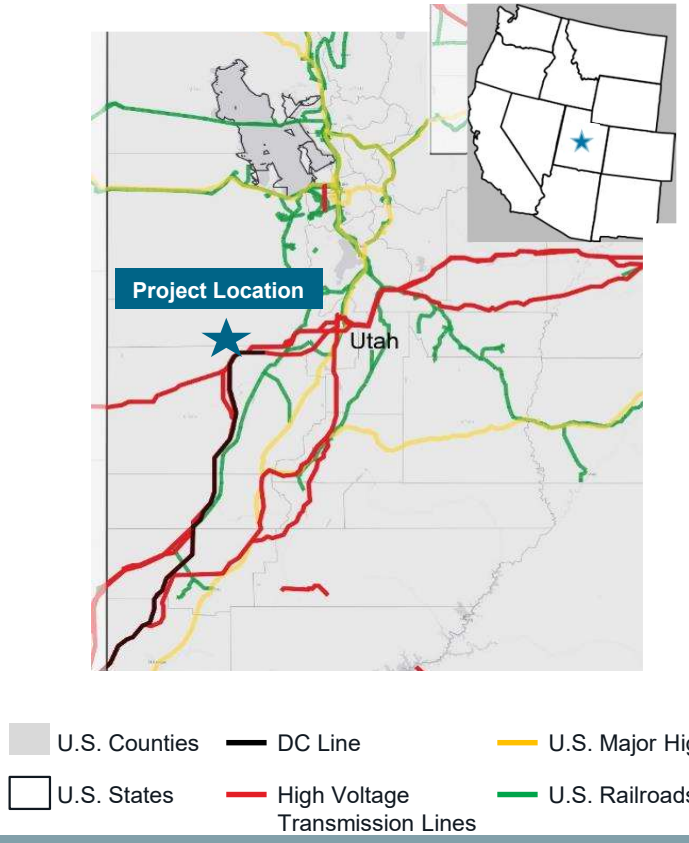
- March 10, 2020 - Mitsubishi Power awarded contract for 2 hydrogen gas turbines
- The **1st Advanced Class Gas Turbine project** specifically **designed for Green Hydrogen fuel**
- **840MW of reliable energy** to Los Angeles and municipalities in other parts of California and Utah
- **In 2025, 30% Green Hydrogen** & 70% natural gas fuel mix when plant operations begin
- By **2045**, **100% Green Hydrogen** capable to support California carbon-free goals

Advanced Clean Energy Storage Project

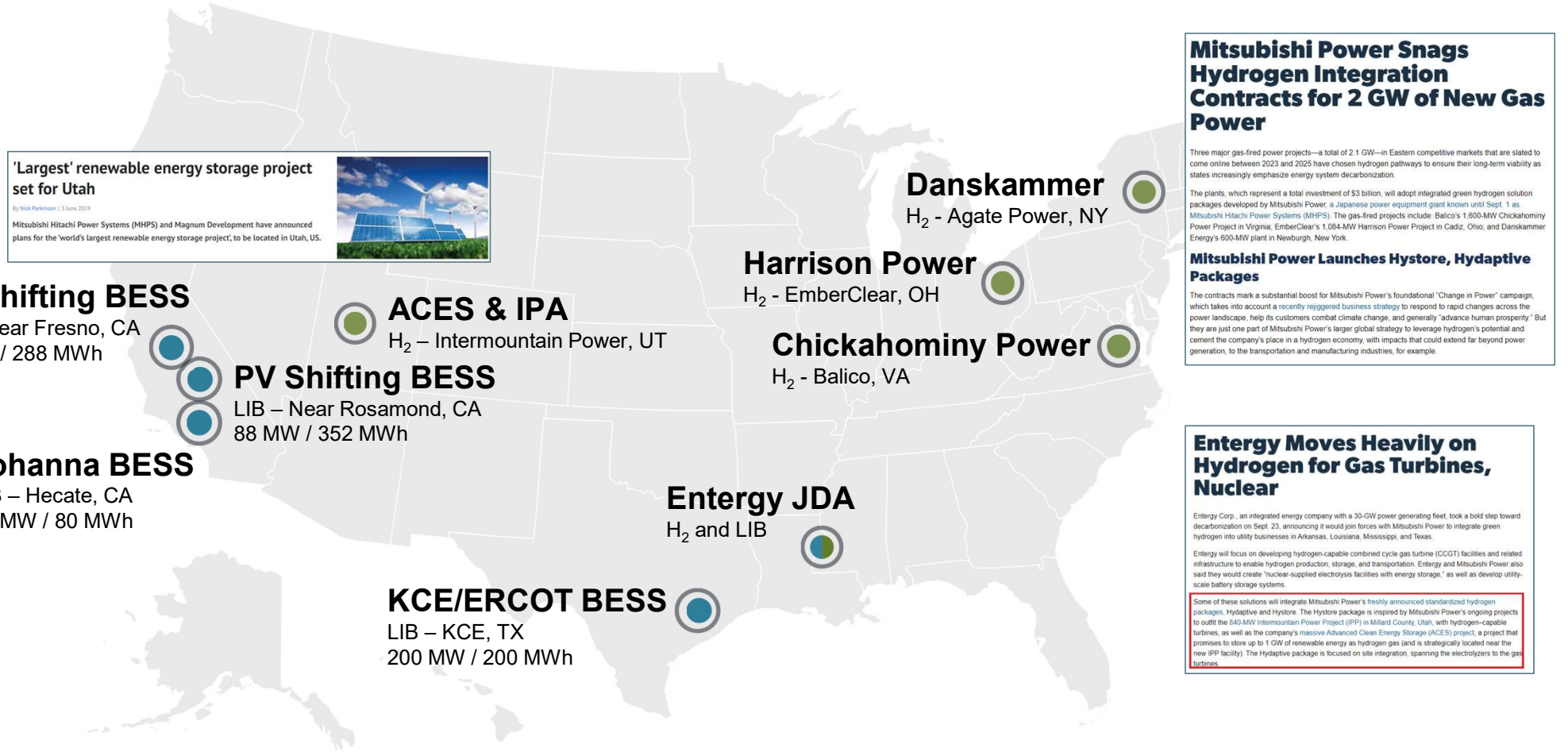
Hydrogen Storage Using Salt Caverns & Gas Turbines



Green H_2 Regional Infrastructure to Decarbonize "Hard to Electrify" Sectors



Mitsubishi Power Momentum for Energy Storage Projects Continues



PV Shifting BESS
LIB – Near Fresno, CA
72 MW / 288 MWh

PV Shifting BESS
LIB – Near Rosamond, CA
88 MW / 352 MWh

Johanna BESS
LIB – Hecate, CA
20 MW / 80 MWh

ACES & IPA
H_2 – Intermountain Power, UT

Harrison Power
H_2 - EmberClear, OH

Danskammer
H_2 - Agate Power, NY

Chickahominy Power
H_2 - Balico, VA

Entergy JDA
H_2 and LIB

KCE/ERCOT BESS
LIB – KCE, TX
200 MW / 200 MWh

'Largest' renewable energy storage project set for Utah

By Nick Parkinson | 3 June 2019

Mitsubishi Hitachi Power Systems (MHPS) and Magnum Development have announced plans for the 'world's largest renewable energy storage project', to be located in Utah, US.

Mitsubishi Power Snags Hydrogen Integration Contracts for 2 GW of New Gas Power

Three major gas-fired power projects—a total of 2.1 GW—in Eastern competitive markets that are slated to come online between 2023 and 2025 have chosen hydrogen pathways to ensure their long-term viability as states increasingly emphasize energy system decarbonization.

The plants, which represent a total investment of $3 billion, will adopt integrated green hydrogen solution packages developed by Mitsubishi Power, a Japanese power equipment giant known until Sept. 1 as Mitsubishi Hitachi Power Systems (MHPS). The gas-fired projects include: Balico's 1,600-MW Chickahominy Power Project in Virginia; EmberClear's 1,084-MW Harrison Power Project in Cadiz, Ohio; and Danskammer Energy's 600-MW plant in Newburgh, New York.

Mitsubishi Power Launches Hystore, Hydaptive Packages

The contracts mark a substantial boost for Mitsubishi Power's foundational "Change in Power" campaign, which takes into account a recently rejiggered business strategy to respond to rapid changes across the power landscape, help its customers combat climate change, and generally "advance human prosperity." But they are just one part of Mitsubishi Power's larger global strategy to leverage hydrogen's potential and cement the company's place in a hydrogen economy, with impacts that could extend far beyond power generation, to the transportation and manufacturing industries, for example.

Entergy Moves Heavily on Hydrogen for Gas Turbines, Nuclear

Entergy Corp., an integrated energy company with a 30-GW power generating fleet, took a bold step toward decarbonization on Sept. 23, announcing it would join forces with Mitsubishi Power to integrate green hydrogen into utility businesses in Arkansas, Louisiana, Mississippi, and Texas.

Entergy will focus on developing hydrogen-capable combined cycle gas turbine (CCGT) facilities and related infrastructure to enable hydrogen production, storage, and transportation. Entergy and Mitsubishi Power also said they would create "nuclear-supplied electrolysis facilities with energy storage," as well as develop utility-scale battery storage systems.

Some of these solutions will integrate Mitsubishi Power's freshly announced standardized hydrogen packages, Hydaptive and Hystore. The Hystore package is inspired by Mitsubishi Power's ongoing projects to outfit the 840-MW Intermountain Power Project (IPP) in Millard County, Utah, with hydrogen–capable turbines, as well as the company's massive Advanced Clean Energy Storage (ACES) project, a project that promises to store up to 1 GW of renewable energy as hydrogen gas (and is strategically located near the new IPP facility). The Hydaptive package is focused on site integration, spanning the electrolyzers to the gas turbines.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