

Grid Scale Energy Storage

April | 2020
BULLETIN

FutureBridge



WHAT'S INSIDE!

- Pumped Hydro Energy Storage and Gravity Energy Storage received funding
- Mongolia receives \$100 million loan from ADB for 125 MW Battery Energy Storage System
- Gravity based Energy Storage by Gravitricity in spotlight

01



OMPS receives \$951,000 funding for Pumped Hydro Energy Storage system

02



Gravitricity secures £300k funding from Innovate UK to explore South Africa's mine shaft potential

03



Gresham House to buy 50-MW battery storage project in Suffolk, East Anglia

04



ADB approves \$100 million loan to Mongolia for 125 MW Battery Energy Storage System

05

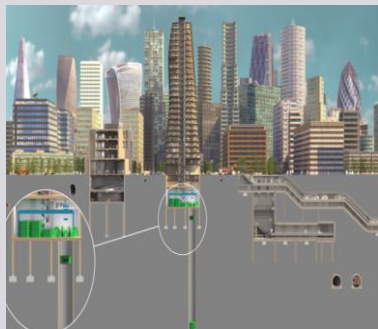


Wärtsilä to deliver 70MW energy storage system in California

06



ISNA and ESNA partner with Strategen Consulting to develop and implement 2021 Conference Program



Innovate UK's investment into Gravitricity marks yet another milestone in development of gravity based energy storage. Energy Vault, a gravity and kinetic energy based storage solution provider, raised \$100 billion fund from SoftBank's Vision Fund in August 2019. The need of competitive long duration energy storage solution is driving the development of gravity based storage technology.

02 April 2020

OMPS receives \$951,000 funding for Pumped Hydro Energy Storage system



ARENA



- Australian Renewable Energy Agency (ARENA) has announced funding of \$951,000 to Oven Mountain Pumped Storage Pty Ltd (OMPS) to carry out a study analyzing the benefits of Pumped Hydro Energy Storage (PHES) for development of the New England Renewable Energy Zone (REZ) in northern NSW.

OMPS will investigate benefits of PHES facility for improving system strength, storing and enabling variable renewable energy generation, unlocking network constraints and helping to reduce marginal loss factors.

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03 April 2020

Gravitricity secures £300k funding from Innovate UK to explore South Africa's mine shaft potential

gravitricity

Innovate UK

- Energy storage start-up Gravitricity has received £300k funding from government agency Innovate UK to explore South Africa's mine shaft potential. Gravitricity has partnered with South African energy consultancy RESA to help solve the country's energy problem.

Gravitricity energy battery works by raising weights totaling 12,000 tonnes in a deep mineshaft and releasing them when energy is required. The system requires half the lifetime cost of lithium-ion batteries. The additional advantage is the deeper mines in South Africa that enable storage of greater quantity of energy.

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The project in Mongolia pegs to be among the largest battery storage systems globally. By facilitating the loan, ADB seems to help developing countries to decarbonize their energy sector. Mongolia's energy sector is the largest contributor to its greenhouse gas emissions as the country is heavily coal dependent for power generation. Large scale energy storage projects like this can help Mongolia deploy its rich renewable energy potential.

14 April 2020

Gresham House to buy 50-MW battery storage project in Suffolk, East Anglia



- **Gresham House Energy Storage Fund Plc. has signed a conditional agreement to buy a 50-MW battery storage project in Suffolk, East Anglia. The site will be purchased from developers Gresham House DevCo Limited and Noriker Power Ltd. for undisclosed value.**

The battery storage project will fetch revenues from asset optimization, earning income from the wholesale market and the National Grid's balancing mechanism.

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30 April 2020

ADB approves \$100 million loan to Mongolia for 125 MW Battery Energy Storage System



- **The Asian Development Bank (ADB) has lent \$100 Million for a 125 MW advanced Battery Energy Storage System in Mongolia. The total cost of the project is \$114.95 million and the project is due for completion in September 2024.**

The storage system will supply 44 gigawatt-hours of clean peaking power annually to support the integration of an additional 859 gigawatt-hours of renewable electricity into the energy system grid, avoiding 842,039 tons of carbon dioxide emissions annually by 2025.

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diversified
COMMUNICATIONS

Energy Storage North America was acquired by Diversified Communications in March 2020, joining Intersolar North America in its growing portfolio for the renewable energy industry.

29 April 2020

Wärtsilä to deliver 70MW energy storage system in California



- **Wärtsilä is set to deliver 70MW energy storage and energy management system in the California Independent System Operator (CAISO) energy market. The project will be integrated with Wärtsilä's GEMS platform to achieve increased system efficiencies and is expected to be concluded in mid-2020.**

The project design features system safety with the use of lithium iron phosphate battery option which has a lower thermal runaway temperature and very low-temperature rise rate. Apart from that, temperature, smoke, fire detection and suppression system are designed for early detection and prevention of any safety-related incidents.

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29 April 2020

ISNA and ESNA partner with Strategen Consulting to develop and implement 2021 Conference Program



- **Intersolar North America (ISNA) and Energy Storage North America (ESNA) have announced a partnership with Strategen to develop and implement conference programming for the two events taking place January 12-14, 2021 in Long Beach, CA.**

The 2021 conference program will focus on the latest developments driving market and technical progress in solar, storage, and transportation electrification and will cover the latest technologies and techniques for the optimization and integration of these segments.

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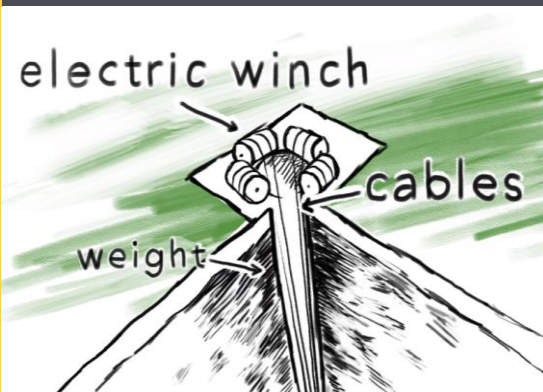
SPOTLIGHT



Gravitricity is a London based start-up founded in 2011. The company is developing a novel storage technology which offers some of the best characteristics of lithium batteries and pumped storage. The gravity based energy storage technology operates in the 1MW to 20 MW power range and uses mine shaft to store energy.

We have captured similar Gravity Energy Storage technology by Energy Vault in [June 2019 Bulletin](#) and [Q2 2019 Pulse](#).

Gravity Based Energy Storage by Gravitricity

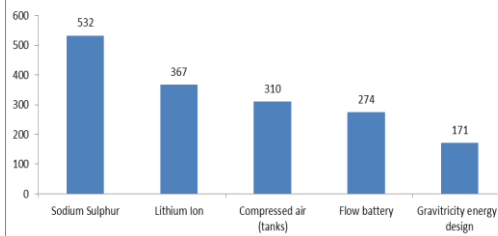


- The Gravitricity system suspends weights of 500 - 5000 tonnes in a deep shaft by a number of cables, each of which is engaged with a winch capable of lifting its share of the weight.
- Electrical power is then absorbed or generated by raising or lowering the weight.
- The weight is guided by a system of tensioned guide wires (patents applied for) to prevent it from swinging and damaging the shaft.
- The winch system can be accurately controlled through the electrical drives to keep the weight stable in the hole.

UNIQUE CHARACTERISTICS

- 50-year design life – with no cycle limit or degradation
- Response time – zero to full power in less than one second
- Efficiency – between 80 and 90 percent
- Versatile – can run slowly at low power or fast at high power
- Simple – easy to construct near networks
- Cost effective – levelised costs well below lithium batteries

Levelised cost of storage (US\$/MWh)



Imperial College Analysis suggests early Gravitricity projects will be cheaper than lithium for frequency response applications

- Gravitricity is raising 'SeedPlus' equity in May and June 2020
- The company raised grant of £300k from UK Government in March 2020
- It raised £754,000 in October 2019

Early systems planned in Europe, South Africa and Australia

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