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# Renewable Energy Worldwide: 100%: Renewable Energy Worldwide: 100% Depends on Utility Scale Energy Storage, Storage Density, Safety, and Recharge Cycle Efficiency

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## Abstracts

LEXINGTON, Massachusetts (January 18, 2020) – WinterGreen Research announces that it has a new study on Renewable Energy Worldwide: 100%. The 2020 study has 268 pages, 148 tables and figures. Zero-carbon emissions mean that no carbon is being produced from fuel burning to get power. Oil, gasoline, coal, and gas fuels are used now by burning them to create energy, thereby creating carbon and other emissions. Al l fuels when burned throw poison into the air. This is bad for humans. Poison is bad.

Zero-carbon electricity worldwide is provided by a 100% renewable energy supplies backed by utility scale storage systems. Utility scale energy storage is an essential aspect of achieving a no carbon world energy profile. The renewable energy generated from wind and solar sources is intermittent, so efficient storage in needed to make it work.

The next generation of people need to ban together to motivate their workpla ces and their communities to install utility scale energy storage packaged with renewable energy solar and wind generators. Only people working together will get the job done, the task takes all of us. This study shows the opportunity for companies in the renewable energy business to leverage storage as a way to gain strategic advantage in the market.

Batteries are changing in response to the implementation of wind and solar renewable energy systems. Lithium Ion batteries represent the state of the art now. Solid state batteries represent the next generation of power storage for vehicles. Nanotechnology permits units to be miniaturized, standalone, and portable. Utility scale lithium flow

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batteries have been developed to offer utility scale advantages. Advantages are evident in power and density: lowpower draw and high-energy density. They have limitations that are still being addressed by vendors. But they are good enough to be installed and to be bankable. Projects using the utility scale storage can be financed.

A wave of advances is bringing a new generation of utility scale batteries. Flow batteries support deployment of wind and solar power on a grand scale. Flow batteries can be implemented as a type of fuel cell. Demand for storage increases as the value it provides is recognized. Utility scale energy storage is useful in balancing the proportion of variable, renewable generation. Variability in generation in the electricity system is managed as storage is put in place and realized. Batteries increasingly will be chosen to manage this dynamic supply and demand mix of renewable energy. Once the flow batteries are in place uptake of renewable energy will be rapid, Energy storage is a practical alternative to existing utility networks. Behind-the-meter storage is used increasingly to provide system services on top of customer applications.

The total demand for batteries from the stationary storage and electric transport sectors is dependent on the will of the people on earth to move away from carbon emitting poison gas emitting fuels that are burned. The move has to be from poison fuel to renewable energy.

Energy storage of electricity is a promising foundation for renewable energy, providing a major opportunity for battery makers and miners of component metals such as lithium, cobalt and nickel. These vendors are charged with telling their story through marketing campaigns that emphasize the emergency faced by all people because of shifts in the weather and to lay out the alternative of real solutions available.

Global energy storage is on an upward trend in any case, promising a multi-fold increase every year. SolarReserve offers CSP large energy storage capacity. It is a large battery on the US grid, adding 400 MWh. Sandstone will have 20,000 MWh of storage.

The AES battery that was bid into SCE’s storage in 2015 is due online in 2021, at the same time as SolarReserve’s Sandstone project. The AES battery is 100 MW for 4 hours, 400 MWh. Sandstone has 20,000 MWh. The study documents the cost and the timeline needed to take the world to 100% renewable energy. The question remains as to whether this will happen.

The study documents companies whose employees have made an effort to get that

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company to 100% renewab le or headed in that direction. This provides a model for how the market could evolve. According to Susan Eustis, the principal author of the study, it will take $70 trillion to take the world to 100% renewable.

WinterGreen Research is an independent research organization funded by the sale of market research studies all over the world and by the implementation of ROI models that are used to calculate the total cost of ownership of equipment, services, and software. The company has 35 distributors worldwide, including Global Information Info Shop, Market Research.com, Research and Markets, Report Linker, Electronics.CA

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