

Augwind Reports AirBattery's Efficiency Assessment

Augwind's Storage System – AirBattery – brings the storage world breakthrough news

Following the company's reports on the construction of a testing and demonstration facility with a Beta site for its innovative storage system, AirBattery, at the company's site in Yakum, the company announces today the results of the tests performed in the proof of technological feasibility stage and assessment of the efficiency of the AirBattery system. The overall efficiency of the system in the context of commercial facilities with a capacity above five megawatts is expected to be in the range of approximately **75-81%**, depending on the characteristics and the various requirements of each storage project, and the storage system components it comprises.

According to Or Yogev, CEO and Founder of Augwind, "The data presented by Augwind today is excellent news for the world of renewable energies in general and the world of energy storage in particular, both in comparison with lithium batteries and alternative storage solutions. Augwind's AirBattery system has an energy efficiency that is generally similar to the efficiency of pumped storage stations.

Compared to a storage system based on lithium batteries, despite their higher initial efficiency, lithium batteries have an obvious disadvantage in that their efficiency and structural capacity fade over the years and necessitate replacement and upgrade for a new storage system every few years or cycles. In addition, lithium-ion systems contain chemical components, some of which are not recyclable, while Augwind's solution is designed for decades, while also being green, environmentally friendly, and based solely on water and air."

The advantages of the AirBattery system compared with existing systems:

- It's green news: a first system of its kind, made from water and air.
- It's a storage system with decades-long durability compared with lithium batteries which require replacement and upgrading every few years.
- It's a safe underground storage system that does not require daily maintenance unlike lithium batteries, which require air conditioning systems and strict temperature control (for safety purposes).
- It provides uniform and fixed efficiency that does not fade compared with battery efficiency since the latter fade over the years and in consequence require replacement and upgrading with a new battery system.
- It's a multi-use system that allows for an unlimited number of cycles.

- It's a modular storage system with a range of storage volumes from tens of megawatts per hour and through to hundreds of megawatts per hour without geographic dependency and at a competitive cost compared with lithium-ion technologies.
- Unlike lithium-ion systems that are inherently at risk of catching fire, the AirBattery system, which is made of air and water, is an underground system that is green and safe both in the operational aspect and in the security aspect (it's protected from rockets).

Dr. Yogev further added: “Augwind’s AirBattery system, in addition to high efficiency, is breakthrough news as it provides a better solution vis-à-vis lithium battery solutions at almost every possible level. Our storage system, the first of its kind, is made of water, air and earth, which distinguishes it from other storage systems, some of which pollute. AirBattery can be used inexhaustibly without any degradation in performance over decades. Our additional significant advantage lies in our abilities to construct a modular storage system and create storage stations from tens of megawatts per hour and through to hundreds of megawatts per hour without any geographic dependence and at a low cost compared with lithium technologies.”

“Any entrepreneurial company setting up solar farms must today address the huge environmental damage caused by using polluting storage systems that are dangerous to the environment compared with the tremendous advantage of AirBattery. A storage solution based on lithium batteries is an environmentally polluting system in the process of manufacturing the batteries, the use of metals that are not readily available, such as lithium, cobalt and nickel, and above all the inability to recycle the batteries at the end of their lifecycle.

“The efficiency data we announce today are based on a beta AirBattery system installed at Yakum at the beginning of the year, which has been tested over many months at all levels of its technology, applied in practice in compression processes using pumps, storage in AirX tanks, and discharge using water turbines. Each charge-discharge cycle was examined from end to end and tested for efficiency. The figures we present today are based on continuous measurements conducted over the past months.”

Israel, Yakum, 13th December 2020 – (TASE: AUGN) Augwind today announces the results of the proof of technological feasibility testing and assessment of the efficiency of its innovative storage system AirBattery – an energy storage system that comprises two main processes – a charging process (in which the storage system is charged by use of electrical energy) and a discharge process (during which energy stored in the system is converted into electrical energy), where efficiency is defined as the ratio between the energy generated in the discharge process compared with the energy consumed in the charging process.

1. Results of the technological feasibility testing and assessment of the efficiency of these processes met the criteria set by the company at a satisfactory rate, also

noting the target energetic efficiency rate of 80% set by the company, as stated in its presentation to the capital market, released on 30th April 2020.

2. Tests of the charging process included operation of a system of water pumps in an optimal manner in accordance with a unique algorithm, developed by the company for an air compression process, while examining several diverse physical values tested cyclically, including pressure, rate of flow and temperature. The results of the compression system testing indicated efficiency at a rate of approximately 97% compared with the nominal efficiency of the systems of water pumps used for the air compression. The charging process was proven to be highly efficient with insignificant changes in temperature (almost negligible), involving minimal energy loss.
3. The discharge process testing included operation of a water turbine using a flow of water powered by a unique technology developed by the company, which includes conversion of potential energy from air pressure to kinetic energy. Results of the discharge system testing indicated efficiency at a rate of approximately 95.2% compared with the nominal efficiency of the water turbine used in production.
4. Based on the test data for these charging and discharge processes, and based on the nominal efficiency data for the pumps and water turbines that enable work on a commercial scale, which lie within a range of approximately 90%-92% and approximately 93%-95% respectively, the company estimates that the overall efficiency of the AirBattery system installed in commercial facilities with a capacity exceeding five megawatts, is expected to be in the range of approximately 75-81%, depending on the characteristics and diverse requirements of each storage project, and the storage system components it comprises (including the various ranges of efficiency of the pumps and water turbines, as mentioned above).
5. The tests also checked the possibility of increasing the efficiency of energy discharge from compressed air by making use of low-temperature residual heat, from which it arose that it is possible to increase the energy discharge output of the AirBattery system by an additional 10% using existing, long-standing and proven technology for heating water with renewable energy, which can be integrated into the storage system.

Link to the [company's website](#).

About Augwind:

Augwind was founded in 2012 by Or Yogev. The company specializes in the development and installation of compressed air storage systems to increase energy efficiency (AirSmart) and for storing energy for the electricity sector and, among other things, doing so from renewable energy electricity generation sources such as PV or wind, which include the storage system developed by Augwind (AirBattery).

Augwind operates on two fronts: the energy storage market and the air compressor market. It operates in both using an underground air compression technology that enables savings of up to 40% in the energy consumption required to compress the air at high pressure. The company's customers include, among others, global company PepsiCo, Tnuva, Strauss, Iscar, Yotvata, Rapac, IAI, Nesher Cement Industries, Plastic Industries, NILIT, Keter Plastic, Elidan Plastics, and Shalam Packaging Group.