



Energy storage on a gigawatt-hours scale

Thermal Energy Platform NADINE starts with Nobel Prize winner lecture at the University of Stuttgart

Storing the daily energy requirements of a metropolis economically and independent of place is one of the biggest problems worldwide in terms of developing renewable energies. In a step towards finding a solution, the German Aerospace Center (DLR), the Karlsruhe Institute of Technology (KIT) and the University of Stuttgart are researching the concept of a so-called isentropic energy storage device and to do this they want to create the thermal energy platform NADINE. The launch will take place in the framework of an energy storage week from 8th October 2018.

A highlight for the public will probably be the English lecture given by the physics Nobel Prize winner from 1998, Professor Robert B. Laughlin (Stanford University, California) on 10th October at 6 pm (Campus Stuttgart Vaihingen, Pfaffenwaldring 7, Auditorium 7.02). His topic will be, "Heat and wind: an energy strategy that will really work (without bankrupting us)". The signing of the "Memorandum of Understanding" for the thermal energy platform NADINE will take place on 8th October at the International Meeting Center at the University of Stuttgart. A scientific convention will follow on 9th and 10th October, which will give a representative overview about state of the art technology in the field of Carnot batteries, unique in this way. The energy storage week will be rounded off with an industry workshop on 10th and 11th October 2018 (both Hotel Campus.Guest, Universitätsstraße 34, 70569 Stuttgart-Vaihingen).

Media representatives are cordially invited to all events. Registration requested to [henner.kerskes \(at\) igte.uni-stuttgart.de](mailto:henner.kerskes@igte.uni-stuttgart.de). Further information <https://iwcb2018.besl-eventservice.de>

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Project description NADINE

The problem with energy storage on a gigawatt-hours scale can be solved in principle with pump storage plants and batteries. Yet the potential for pump storage plants has been largely exhausted and battery storage devices are currently too expensive and not sufficiently long lasting (cycle resistant). There is hope of finding a way out of this dilemma through isentropic energy storage devices. These irreversibly convert electrical power to heat or other forms of energy such as mechanical or chemical energy. The maximum level of efficiency of such a system theoretically comprises 100 percent. In English the technology is called "Pumped Heat Thermal Electricity Storage" (PTES) or described as Carnot battery. It has the potential to overcome the disadvantages of high costs and low cycle-resistance and furthermore is able to be installed anywhere in the world.

The new test facility NADINE (National Demonstrator for IseNtropic Energy Storage) is to contribute towards answering the technical and scientific questions regarding converting this technology. In future individual components (for example heat accumulators, cooling units and heat pumps) as well as complete energy storage systems can be investigated on the "thermal energy platform". In the framework of a design project funded by the Federal Ministry for Economic Affairs (BMWi) and the State of Baden-Württemberg, DLR, KIT and the University of Stuttgart are developing the technical parameters of the thermal energy platform NADINE. The worldwide unique infrastructure is to be available to users from science and industry after its completion as well as for fundamental research and for targeted technology development.

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