

## **Solar nanogrids with Audi e-tron battery modules: Audi Environmental Foundation and start-up Nunam enter into second project phase**

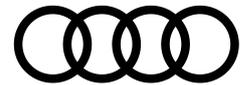
- **New purpose for used battery modules: Nunam tests prototype of a second-life energy storage system in Indian state of Uttar Pradesh**
- **Initial results: Two battery modules supply electricity to roughly 50 small shops for just under a week**
- **Rüdiger Recknagel, Managing Director of the Audi Environmental Foundation: “Technology can be sustainable if you consider not only its initial purpose during development but also a second or even third one”**

**Ingolstadt, March 4, 2021 – Second life instead of premature recycling: German-Indian startup Nunam and its cofounder, Berlin-based Prodip Chatterjee along with his team have turned two Audi e-tron battery modules from test vehicles into a solar nanogrid. The newly developed energy storage system is currently being tested in daily use at a local energy service provider in India. The prototype currently allows roughly 50 shopkeepers and small businesses to continue working even after dark. The Audi Environmental Foundation is supporting the nonprofit start-up to advance research into the technical requirements for second-life power storage systems made of used batteries.**

“In parts of Uttar Pradesh, hours-long power outages regularly make life difficult for the people who live there,” says the 30-year-old cofounder of Nunam, Prodip Chatterjee. While visiting family, he came up with the idea to complement the electricity supply with mobile second-life energy storage systems to ensure that important everyday items such as lamps continue to work. Shops are open late in the rural area – without light, many tradespeople lose their source of income. The Audi Environmental Foundation already funded the first part of the pilot phase of the project, in which cells from old laptop batteries were converted into energy storage systems for low-power applications such as lamps or smartphones. In the second project phase, the eleven-person local Nunam team is extending the possible applications and using two considerably more powerful battery modules from Audi e-tron test vehicles. “Second-life batteries offer immense opportunities for greater sustainability, especially if they are powered by green electricity. We prevent the premature recycling of intact battery modules while ensuring that people can get cheap access to electricity. Our vision is to establish such [battery storage systems as backup solutions](#),” says Prodip Chatterjee.

### **The focus of the test phase is on output, life cycle, and performance**

At the end of their useful life in the vehicle, batteries of electric cars are likely to still retain a large portion of their performance capability. The technical condition of the individual battery modules is first checked in terms of capacity, voltage curve, and temperature distribution. If you transfer the experience from the laptop batteries to these battery cells, modules with a remaining capacity of at least two thirds can be considered for a second-life use provided that other quality and safety requirements are satisfied. The prototype is currently in use in a solar



nanogrid at a local energy provider. The batteries replace four lead-acid batteries in the solar nanogrid that wear out much more quickly. The prototype is connected to the internet via a SIM card and regularly transmits data that Nunam evaluates in order to draw conclusions about the state of (dis)charge of the battery. The nonprofit start-up will soon provide the data online on an open-source platform in order to make the knowledge gained available to possible imitators. The first results from the nanogrid are promising: When the battery modules are fully charged, they can supply roughly 50 small shops independently with electricity for LED lights for up to one week

“As a result of the increasing electrification of the global vehicle fleet, we need to address possible purposes for the batteries of electric cars,” says Rüdiger Recknagel, Managing Director of the Audi Environmental Foundation. “By supporting Nunam, we want to set an example. For one, we want to prove that modern technology can be sustainable if you consider not only its initial purpose during development but also a second or even third one. Furthermore, we want to support young researchers in particular who do not have access to the same resources as established companies. Environmental education and an inquisitive spirit are essential for a livable future.”

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**Audi Environmental Foundation**

Sabrina Kolb

Phone: +49 841 89-42048

E-mail: [sabrina.kolb@audi.de](mailto:sabrina.kolb@audi.de)

[audi-umweltstiftung.de](http://audi-umweltstiftung.de)



The Audi Environmental Foundation (Audi Stiftung für Umwelt GmbH) is an active promoter of research into new technologies and scientific methods for a future worth living. Its stated goal is to make a contribution to environmental protection and to create and promote ways of sustainable action. The foundation focuses in particular on the promotion and development of environmentally compatible technologies, environmental educational activities and the protection of the natural resources of humans, animals and plants. It was established in 2009 by AUDI AG as a wholly owned subsidiary and is part of its social and environmental commitment.