Press Release

International Research Collaboration
Turning Rough Roads into Energy

Nov 24, 2021 - An international collaboration on advanced vehicle suspension energy harvesting was awarded an International Scientific and Technological Cooperation Grant under the Shenzhen government scheme for Shenzhen innovation in electric vehicles and sustainable energy.

- To develop a working prototype suspension energy harvester of low-speed electric vehicles.
- Team comprises experts in intelligent energy harvesting from SUSTech University, sunE e-trike operator in the Philippines, and Hessner developer of onboard energy harvesting and intelligent power management for low-speed electric vehicles in Hong Kong.
- Shenzhen government recognizing the value of this project awarded it a grant.

Traditional vehicle shock absorbers aim to reduce a vehicle's shaking while maintaining good contact between tires and the road surface. Ideas to recover energy lost from suspension systems were first explored in the mid-90s but unlike regenerative braking, common on many modern vehicles, few of the solutions have gone beyond prototyping. The dominance of the passive suspension systems is due to their simple structures, high reliability, and low costs.

An international team comprising of experts in fundamental physics of energy efficiency from SUSTech University in Shenzhen, electric tricycles service operator and developer of solar and electric vehicle technologies sunE in the Philippines, Hessner Technologies (Hong Kong Science and Technology Park incubatee) an electric vehicle onboard energy harvesting and

intelligent power management developer in Hong Kong, together with international experts in electronics -TroubleMaker- and business development in Shenzhen are hoping to change that.

The group was recently awarded an International Scientific and Technological Cooperation Grant under the Shenzhen government scheme for Shenzhen innovation in electric vehicles and sustainable energy to complete a project taking new concepts in energy harvesting of suspension energy into the field over 2 years.

Roads used by low-speed electric vehicles in rural areas of China, the Philippines, and other developing countries are significantly more rough than those in urban areas. This along with new technology provides an opportunity for solutions to capture and use energy to help power these vehicles taking them one step closer to net-zero.

"Every watt-hour harvested from the suspension is 1 less required from the overburdened grid!" says Clayton Gray of Hessner Technologies.

The SUSTech physics team, led by Oscar Dahlsten, provides physics analysis and ideas. Pietro Mincuzzi of TroubleMaker builds and designs the hardware in collaboration with Dr. Kwadwo Ansah-Antwi, CEO/CTO of Hessner Technologies. The lab-based experiments will take place in SUSTech's new School of Design. The field testing will be led by Allan Gray of SunE. Commercialization will be done by Emil Jersling of SUSTech and Clayton Gray of Hessner.

Following in the footsteps of other Shenzhen-based veterans in electric vehicles (EV), such as Build Your Dreams (BYD), one of the largest EV makers in the world, we aim to develop and realize new concepts in energy harvesting technologies.

"We have theoretical-physics ideas for extracting more energy from pseudo-random sources. In this project we can test and develop these ideas with direct feedback and input from the end-user," says Oscar Dahlsten Associate Professor of Quantum information of SUSTech.

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