Battery research and development egypt

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Dr. Shouman sketches the current energy landscape of Egypt, which is highly reliant on natural gas and comparatively fewer in other resources than neighboring countries. “Egypt has many energy challenges, including energy resources,” he says. “Unlike Saudi Arabia or the UAE, Egypt relies mainly on natural gas, and we’re not very satisfied with our production.” He highlights the potential of solar power in addressing these challenges, noting Egypt"s vast deserts as ideal for solar energy projects. He also mentions hydropower as another viable solution.

The Center of Excellence for Energy plays a critical role in the fulfillment of renewable energy goals in Egypt, with the leadership of Arizona State University. “The center can help in promoting research and offering finance for those projects that offer practical solutions,” said Dr. Shouman. “It can help Egypt by encouraging researchers to focus on renewable energy and new solutions such as batteries and hydrogen production,” he explained.

Dr. Shouman’s work deals with thermal management of electric vehicle batteries. He explains the central problem is that batteries usually heat up while discharging or charging. These increasing temperatures may cause the degradation of the battery health over time. To address this issue, Dr Shouman’s team is busy working on a cutting-edge method.

“We are using phase-change material to control this behavior,” he says. “These materials--like wax--maintain a constant temperature through the melting process and help stabilize the temperature of the battery to improve lifespan. This method may replace the current more complex water-cooled systems being used; this offers a much simpler and arguably more effective solution.”

“In Egypt, we are still at the very beginning in terms of electric vehicle development,” he says. “Collaboration with international researchers helps us understand battery technology better and apply it effectively.” He further explains that knowledge transfer is not simply reading but rather getting firsthand experience from such partnerships.

Dr. Shouman added that his experience at ASU has had an impact on not only his research but his teaching as well. “I had never worked with batteries experimentally before I came here,” he said. All the practical work he acquired with ASU has enabled him to develop a skill in handling batteries, among other skills, which he plans to transfer back to Egypt.

"I now understand how to operate equipment and deal with batteries, which are dangerous and require careful handling," he says. This experience has also given him the confidence to take necessary risks to achieve progress.

At Mansoura University, Dr. Shouman leads a team of post-graduate students engaged in battery research themselves. He is excited about the opportunity to transfer his new knowledge to the students and to his undergraduate courses.

“I can include some of what I learned here in my courses and maybe investigate the possibilities of converting conventional vehicles to electric,” he states. This vision, undoubtedly, will not only be of great benefit to his students but will also benefit the larger academic community in Egypt.

Working with Professor Kannan at ASU has been a highlight for Dr. Shouman. He praises Professor Kannan"s openness and willingness to share knowledge. "Professor Kannan is a decent man who gave me reliable advice and guidance throughout my work," he says.

As Egypt embraces electric vehicle technology, research and international experience by Dr. Shouman will be critical in informing the future of the country"s energy education and industry practices.

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