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KAUST and ARMOR collaborate on next gen solar tech

King Abdullah University of Science and Technology (KAUST) in collaboration with ARMOR, a global technology company and pioneer of solar solutions has created a new style of outdoor seating, incorporating flexible, lightweight and semi-transparent solar technologies.

Installation of the new solar street furniture on KAUST campus in Saudi Arabia has been completed. This latest generation of connected, modular urban furniture provides an autonomous source of renewable solar energy. The project features the application of KAUST's pioneering research in the area of photovoltaics while enabling ARMOR to reinforce its growing presence in the Middle East and North Africa (MENA) region.

"KAUST Solar Center is committed to demonstrating the utility and translational impact of the technology we develop. This collaboration with ARMOR, facilitated through the KAUST Office of Sponsored Research, gave us the opportunity to evaluate the potential of our new materials and fabrication processes in an industrially viable context," says Professor of Chemical Science, Iain McCulloch, Director of KSC.

Sporting a futuristic design the new smart seat enables an occupant to stretch out comfortably and charge a device thanks to solar energy. Once this solar energy is collected, it is stored in the device batteries that power two USB ports. The ASCA® film also acts as a sensor, detecting falling luminosity and automatically switches on the bench lighting, powered by the energy stored in the batteries.

For this installation, the ASCA® photovoltaic film draws on technology and materials co-developed by researchers at KAUST Solar Center. This film is produced by printing semiconducting inks onto plastic film, providing a cost effective technology for future mass production.

"One of the unique properties of organic photovoltaics (OPV) is their semi-transparency, and the ability to adjust the absorption window, by engineering the band gap of the absorber. These characteristics lead to many new opportunities for applications in building integrated photovoltaics (BIPV) such as glass windows, greenhouses, architectural structures or even as we see here, a solar bench for KAUST campus," says Dr. Derya Baran, Assistant Professor of Material Science and Engineering at KAUST.

Unlike traditional solar panels that have the disadvantage of being rigid, the ASCA® film is lightweight, semi-transparent and flexible, enabling it to take on complex shapes such as the curved features of the bench, whose parties can be assembled to form a helix. This is the third ARMOR project in the Middle East where the company finds a unique field of experimentation in terms of exposure to the sun.

"These partnerships in the Gulf Region are an exciting opportunity for ARMOR to spread the ASCA® organic photovoltaic film technology within the MENA region, which offers extremely high development potential," says Hubert de Boisredon, CEO of ARMOR.

This partnership between KAUST and ARMOR goes further than simply a technical project. All the energy data collected is remotely monitored and available to ARMOR and university researchers, enhancing the understanding of how the ASCA® module performs in a very hot and humid climate, which may provide additional insights for solar innovation.

Notes to Editors:

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About KAUST

Established in 2009, King Abdullah University of Science and Technology (KAUST) is a graduate research university devoted to finding solutions for some of the world's most pressing scientific and technological challenges in the areas of food, water, energy and the environment. With 19 research areas related to these themes and state-of-the art labs, KAUST has created a collaborative and interdisciplinary problem- solving environment, which has resulted in over 11,000 published papers to date.

With over 100 different nationalities living, working and studying on campus, KAUST has brought together the best minds and ideas from around the world with the goal of advancing science and technology through distinctive and collaborative research. KAUST is a catalyst for innovation, economic development and social prosperity in Saudi Arabia and the world.

www.kaust.edu.sa

About ARMOR

ARMOR specializes in the industrial formulation of inks and the coating of fine layers onto thin films. The Group is the global market leader in the design and manufacture of thermal transfer ribbons for printing variable traceability data on labels and flexible packaging. The European market leader in innovative and sustainable printing services and consumables, the Group is a pioneer in the development and production of industrial inks and innovative materials, such as organic solar films, coated collectors for electric batteries and bespoke filaments for additive manufacturing. With an international presence, ARMOR has nearly 1,900 employees in some 20 different countries. In 2018 it posted annual revenue of €265m. Each year the group invests nearly €30m in industrial equipment and R&D. ARMOR is a responsible company committed to stimulating innovation within society.

www.armor-group.com

"The KAUST Solar Center (KSC) is on a mission to create new science and technology in the field of solar energy conversion, providing an environment for interdisciplinary research, training, and innovation. Within this, it actively carries out research on applications for organic photovoltaic technology," says Professor of Chemical Science, Iain McCulloch, Director of KSC.