

PRESS RELEASE

Cutting-Edge Research on Energy and Water Security Presented at HBKU's Qatar Environment and Energy Research Institute Portfolio Workshop

Doha, June 18, 2017 – Researchers from the Qatar Environment and Energy Research Institute (QEERI), one of Hamad Bin Khalifa University's (HBKU) three national research institutes, gathered last week to present their research progress at QEERI's second quarterly portfolio review workshop. The three-day workshop was held at Education City, and highlighted key areas of scientific discovery undertaken by QEERI, within its recently consolidated six research portfolios – Water Security, Photovoltaics, Smart Grid, Energy Storage, Energy Efficiency and Value Added Products, and Air Quality and Climate Change.

The quarterly portfolio review workshop is a scholarly forum for QEERI scientists to facilitate synergy, collaboration and dialogue. It enables the QEERI team to assess their recent successes and identify areas for improvement, and to continuously ensure that they are advancing towards the achievement of each portfolio's research goals.

Dr. Marwan Khraisheh, Acting Executive Director at QEERI, said: "Our research agenda is committed to meeting the needs of Qatar, in alignment with the country's energy and water security grand challenges. We consolidated our research activities in an effort to optimize our core competencies that led to the development of six well-defined and integrated research portfolios."

"We then established a platform to review the progress on a regular basis, to identify opportunities for engaging with internal and external stakeholders, and to develop new innovations and technologies. Through the quarterly review workshops, we ensure that the work undertaken within the research portfolios aligns with Qatar's needs. The workshop allows us to enhance synergies and collaborations within HBKU."

The review workshop showcased several key achievements for QEERI across the various pillars of the different research portfolios undertaken by the Institute. Within the Smart Grid Portfolio, QEERI has been working closely with several stakeholders including KAHRAMAA, Qatar Electricity and Water Company, Qatar Petroleum, and Qatar Meteorological Department to help the nation achieve its renewable energy targets, and increase the effectiveness and safety of its power grid structure. Researchers have developed several power system solutions that enable the integration of solar photovoltaic (PV) systems into the power distribution system in a reliable

and efficient manner, and have made tremendous progress in the creation of tools that map and forecast solar resources to support the development of PV systems both at residential and utility scales. Likewise, significant advancements have been made in establishing a database of electricity demand profiles to promote the design of measures aimed at empowering consumers to reduce or shift their electricity usage during peak periods in response to financial incentives.

Furthermore, in the field of Solar Photovoltaics (PV), QEERI has developed unique capabilities and know-how in the region that enable the Institute to design and produce solar cells of high performance for the desert environment. This has enabled QEERI researchers to join international forums and committees to come up with new standards and procedures to effectively test and assess PV panels under desert environment. With a unique outdoor solar testing facility and a team of dedicated scientists working on developing solar PV technologies, QEERI has three filed patents and an inventions disclosure on their novel materials and solar cell design in the recent months.

In addition to their work in solar energy, QEERI has achieved significant milestones in its Energy Storage portfolio. The Institute has successfully developed systems that evaluate the operating conditions of a large-sized battery for grid support in the solar test facility. This battery is based on the high energy density lithium ion battery technology. Modified carbon material, which improves the electrochemical performance of redox flow battery system, were also investigated by the team, and promising results were obtained with nitrogen doping of carbon materials.

QEERI, under its Energy Efficiency Research Portfolio, is partnering with KAHRAMAA for a two-year research collaboration to improve the energy efficiency of district cooling systems by 10-20 percent, thus reducing energy costs and minimizing adverse impact on the environment. In addition, QEERI has recently filed a provisional patent application on a new “smart” energy efficient thermostat, with the proof of concept already showing potential. In addition, QEERI scientists are working on reducing industrial energy requirements by improving the Acid-Gas Removal procedure in the oil and gas processes and significant progress has been made in establishing a functional High Throughput Catalysis Laboratory to support the oil and gas industry in developing higher value added products.

With a significant number of patents, published papers in high-impact journals, and several external grants, QEERI's Water Security Research Portfolio reinforced the Institute's commitment to enhancing sustainable water resources in Qatar. Research presented at the workshop highlighted QEERI's progress in providing solutions for efficient water desalination, wastewater treatment and reuse, and groundwater mapping, thus paving the way for secure and sustainable water resources management in Qatar. Very promising results have been achieved in oil/water separation, with a newly developed polymeric membrane; therefore, a scale-up application has been initiated to increase the efficiency of oil/water separation in oil and gas operations. Researchers are also working on state-of-the-art approaches to address the efficient usage of Treated Sewage Effluent in district cooling, in close collaboration with Qatar Cool and Ministry of Municipality and Environment.

At the workshop, QEERI researchers presented their extensive work in the development of national environmental regulations for air quality. In close collaboration with the Ministry of Municipality and Environment, QEERI's scientists have built frameworks and technologies to measure, manage and mitigate pollutants in the air, thus contributing towards better standards and practices in the fields of air quality and climate change.

Dr. Khraisheh also commented on the rapid pace of advancements at the Institute, and how a collaborative spirit of innovation and discovery drives the scientists.

He said: "The discussions at the Second Quarterly Review Workshop showcased several significant achievements and key challenges across the research portfolios, and clearly demonstrated that we are on the on the right track. QEERI is positioned to deliver on its mandate in assisting Qatar to tackle its energy and water security needs."

QEERI works closely with the local public and private sectors along with international organizations to help the government meet the goals set forth by the Qatar National Vision 2030, in moving towards a knowledge-based and sustainable economy.

To learn more about HBKU and its research initiatives, please visit hbku.edu.qa

ENDS

About Hamad Bin Khalifa University

Hamad Bin Khalifa University (HBKU), a member of Qatar Foundation for Education, Science and Community Development, is an emerging research university that is building its foundation

upon unique collaborations with local and international partners. Located in Education City, HBKU delivers undergraduate and graduate programs through its College of Science and Engineering, College of Law and Public Policy, College of Health and Life Sciences, College of Islamic Studies, and its College of Humanities and Social Sciences. It also provides unparalleled opportunities for research and scholarship through its research institutes, and its Executive Education Center delivers customized programs for the business community of Qatar and the region, in line with Qatar National Vision 2030.