Ministry of Science and Technology
Department of Science and Technology
Technology Mission Division

Report on Mission Innovation Workshop on Clean Energy Materials Challenge at Mexico City from 11-14 September 2017

The Department of Science and Technology (DST) participated in Mission Innovation's (MI's) Clean Energy Materials Innovation Challenge, an international experts' workshop on a fundamental element that underpins advancements in all energy areas: materials discovery. DST was represented in the workshop by Dr. Ranjith Krishna Pai, Scientist 'D' / Principal Scientific Officer Technology Mission Division, DST. From 11–14 September, over 130 attendees representing 17 countries and the European Commission gathered in Mexico City to support the Innovation Challenge's goal of accelerating the exploration, discovery, and use of new, high-performance, low-cost clean energy materials by at least ten times. Leading scientists from throughout the world identified and explored the most promising basic research opportunities for realizing this goal.

The meeting followed the workshop methodology developed for MI based on the proven model of Basic Research Needs workshops in the United States. The MI workshop was sponsored by the Mexican Ministry of Energy (SENER) and the U.S. Department of Energy (DOE), in partnership with the Canadian Institute for Advanced Research (CIFAR), and Co-Chaired by Professors Alán Aspuru-Guzik and Kristin Persson. SENER Deputy Secretary for Planning and Energy Transition Leonardo Beltrán Rodríguez opened the event, which took place along with Mexico's Energy Summit "Dialogues for the Future of Energy Mexico" (DEMEX).

In MI's first deep-dive workshop among the seven MI Innovation Challenge topics, participants engaged in technical discussions on combining advanced theoretical and applied physical chemistry with next-generation computing, machine learning, and robotics, with the aim of developing an integrated materials innovation approach. The workshop focused on organic and inorganic functional materials, nanomaterials, and composites.

Outcomes of the MI workshop

Workshop results will be published in a detailed report that includes the scientists' insights on basic research challenges and opportunities for dramatically accelerating clean energy materials innovation. The report will inform policymakers and other stakeholders regarding research investments and for soliciting and supporting projects that take advantage of these opportunities. The report will be published on the MI website and distributed to the 23 MI members and research institutions worldwide by end of 2017.

Follow-up action

DST will consider launching call for bilateral projects to address the gaps and opportunities identified by the leading experts and perhaps follow some of their recommendations to meet MI challenge. These collaborations could include, for example, public-private partnerships and R&D initiatives to discover advanced materials. Moving forward, this Challenge intends to commence the development of a fully integrated platform in the form of new laboratories that incorporate automated synthesis and characterization facilities, together with the modelling and theoretical work. With this platform, it is expected that more and faster materials discoveries across superconducting materials, batteries, fuel cells, Photovoltaics, etc. will be observed, from computational predictions validated by experiments, using the tools developed for this initiative.