

Top minds and renowned international research institutions converge at the CREATE Symposium to explore new technologies to build more sustainable cities for the future

Eminent scientists and renowned international research institutions converged in Singapore to showcase new technologies and innovations that will drive a new age of sustainable cities.

Themed “Science of Sustainable Cities” this year, the **CREATE Symposium** focused on three key sub-themes: future healthy cities, environmental systems, and the future of food. The one-day Symposium drew a crowd of over 400 people consisting of researchers, policy makers, industry partners and the public.

The event was launched by Singapore’s Deputy Prime Minister, Coordinating Minister for Economic Policies, and Chairman of the National Research Foundation, Singapore (NRF), **Mr Heng Swee Keat**, who was the Guest-of-Honour.

The Symposium showcased innovations and technologies that will support building sustainable cities for the future. These were presented by eminent scientists through keynote lectures, plenaries, and panel discussions where key issues such as decarbonisation, food security and technologies for smart and resilient cities were discussed.

Various renowned research institutions also exhibited their innovations, such as plant metabolic nano sensors that help improve agriculture yield, technologies that recycle industrial carbon waste into high-value products, COVID-19 surveillance systems, and 3D-printed smart grippers for soft robotics.

The CREATE Symposium is organised by the Campus for Research Excellence and Technological Enterprise (CREATE), an initiative under NRF.

Mr Beh Kian Teik, NRF Chief Executive Officer, said, “I am glad that we have reconvened the Symposium this year to showcase the good work achieved through the partnerships between Singapore’s universities and leading international research institutions both locally and globally. Throughout the years, CREATE as an international research hub has consistently attracted top-notch talent worldwide to produce cutting-edge research that tackles complex challenges facing Singapore and other countries around the world such as climate change.

“Building sustainable cities is a goal that many countries are working towards, and CREATE’s research institutes have made significant contributions in various areas of research towards this goal. The synergies built from these partnerships bode well for Singapore’s Research, Innovation and Enterprise ecosystem – and the research ecosystems globally – as we strive towards a collective effort in making the world a more liveable and resilient place for everyone.”

Industry-relevant discussions with societal impact

The CREATE Symposium played host to four keynote lectures, two plenary sessions and a panel discussion, involving academics, as well as industry and government representatives. The various discussions not only touched on key issues that society faced but also unearthed insights into emerging technologies that can pave the way for more sustainable and resilient cities.

For example, Prof Hideaki Kobayashi from Tohoku University spoke on the feasibility of using ammonia as a fuel to spearhead the decarbonisation of power and industrial sectors. In a similar vein, Prof Niall Mac Dowell from the Imperial College London compared the costs and performance implications of various energy systems that relied on energy storage, shedding light on better energy storage technologies.

The 'Future of Food' panel discussion deliberated on the challenges and opportunities for Singapore's future food system, touching on ways to build a sustainable food supply system and potential collaboration opportunities that the food community can leverage on.

Two national-level programmes launched

The CREATE initiative enables effective and coherent collaborations for global challenges to be addressed at a scale that achieves real impact. Targeted selection of projects, active management of CREATE programmes, and having the best people lead CREATE programmes – these are the key ingredients that have enabled CREATE to remain relevant to Singapore's RIE priorities.

Two new CREATE programmes were launched during the Symposium to address important topics for Singapore, Asia, and beyond.

Firstly, the Singapore–MIT alliance (SMART), Singapore Management University (SMU), and National University of Singapore (NUS), have collaborated on the **Mens, Manus and Machina (M3S) programme** which aims to assess and provide the tools for understanding and shaping the evolving human-machine relationship, as well as the public and private institutions which govern these relationships. The programme will improve the understanding of the nature of work and rethink people's relationship with technology, environment, and social structures.

Secondly, the Hebrew University of Jerusalem (HUJ), Nanyang Technological University (NTU), NUS, and Sungkyukwan University (SKKU) are working together on the new **Bioengineering Tools for Next-Generation Cellular Agriculture (CellAg) programme** which will develop biosensors and mitigation tactics to prevent microbial contamination during the production of cultured meat and other cell-based foods. This will not only help spur cell-based bioprocessing and improve food safety efforts, but also nurture relevant talent in cell agriculture to support local and global industry needs.

Last year, CREATE had also launched a **Proteins4Singapore programme**, which focuses on non-animal protein sources to improve Singapore's food security and resilience. Specifically, the programme aims to develop processing and extraction methods and novel reverse food engineering techniques for the proteins, and complement this with indoor cultivation of soybean and micro-algae. On the latter, one of the research thrusts seeks to develop a synergistic co-cultivation system for soybeans and algae in a controlled environment that will be the source of raw materials for further processing. This helps produce a circular closed system for better sustainability.

Accelerating research excellence

Today, CREATE is an international research hub, with nine overseas partner universities – Cambridge University, the French National Centre for Scientific Research (Centre National de la Recherche Scientifique; CNRS), ETH Zurich, Hebrew University of Jerusalem (HUJ), Massachusetts Institute of Technology (MIT), Shanghai Jiao Tong University (SJTU), Technical University of Munich (TUM), University of California Berkeley (UCB), and University of Illinois Urbana-Champaign (UIUC) – that collaborate with Singapore’s universities and institutions in 15 interdisciplinary programmes.

More than 1,000 people from multiple countries are engaged at CREATE – comprising about 470 research staff and 140 research students from National University of Singapore (NUS), Nanyang Technological University, Singapore (NTU), and Singapore University of Technology and Design (SUTD) under the guidance of about 230 principal investigators (PIs) from overseas partners, and 220 academics from NUS, NTU, SUTD, Singapore Management University (SMU), Singapore Institute of Technology (SIT) and the Agency for Science, Research and Technology (A*STAR).

CREATE was established in 2006 as part of Singapore’s national strategy to increase the vibrancy and diversity of our research, innovation, and enterprise ecosystem. To-date, CREATE has yielded 903 patent applications, 542 invention disclosures, and 31 spin-off companies.

Please see [Annex A](#) for the Symposium programme and visit <https://createsymposium.sg> for more info on the various talks.

About CREATE [早越研究与科技企业学园]

CREATE is an international collaboratory housing research centres set up by top universities. At CREATE, researchers from diverse disciplines and backgrounds work closely together to perform cutting-edge research in strategic areas of interest, for translation into practical applications leading to positive economic and societal outcomes for Singapore. The interdisciplinary research centres at CREATE focus on four areas of interdisciplinary thematic areas of research, namely human systems, energy systems, environmental systems and urban systems.

About the National Research Foundation, Singapore (NRF)

The National Research Foundation is a department within the Prime Minister’s Office. The NRF sets the national direction for research and development (R&D) by developing policies, plans and strategies for research, innovation and enterprise. It also funds strategic initiatives and builds up R&D capabilities by nurturing research talent. The NRF aims to transform Singapore into a vibrant science and technology hub, with R&D contributing significantly to a knowledge intensive, innovation and entrepreneurial economy.