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ExxonMobil Technology and Engineering Company (ExxonMobil), Nanyang Technological University, Singapore (NTU Singapore), and the Agency for Science, Technology and Research (A*STAR) on Tuesday (26 April) said they have established the ExxonMobil-NTU-A*STAR Corporate Lab to develop solutions that would help lower carbon emissions, contribute to resource efficiency, and help build a more sustainable future.

The Corporate Lab was officially launched today by Mr. Heng Swee Keat, Deputy Prime Minister, Coordinating Minister for Economic Policies and Chairman of the National Research Foundation (NRF). Corporate labs allow companies to draw on Singapore's strong foundation of scientific capabilities to address real-world challenges. The partnership between industry and academia helps to strengthen the industry relevance of researchers' R&D and enables innovative enterprises to stay globally competitive through gaining insights into new application possibilities.

Researchers in the SGD 60 million Corporate Lab will apply their expertise to advance global research efforts in lower-emissions technologies in five areas:

- Convert biomass into lower greenhouse gas (GHG) emission fuels for adoption in aviation, maritime and chemical sectors that are potentially more cost-effective and efficient;
- Carbon capture and utilisation using by-product industrial brines, such as desalination brine to produce alternative construction materials, turning industrial side streams into useful materials;
- Turn methane into low-carbon hydrogen and solid carbon materials: Develop new process technologies to produce hydrogen from natural gas, while identifying potential and new applications for carbon;
- Develop efficient carbon capture and carbonation technology for industry by-products: To produce solid carbonates for use in building and infrastructure applications;
- Large-scale application of carbon in concrete: Produce and validate concrete with carbon materials for large-scale deployment to enable, durable, and sustainable building and construction applications.

The new Corporate Lab - the latest addition to over 20 corporate laboratories across Singapore – is hosted by NTU's Energy Research Institute @NTU (ERI@N) and A*STAR's Institute of Sustainability for Chemicals, Energy and Environment (ISCE2), through the Industry Alignment Fund-Industry Collaboration Project (IAF-ICP) initiative, and will work on joint research programmes over the next five years. These will be focused on helping to reduce greenhouse gas emissions and enhance resource efficiency. The IAF-ICP initiative is a grant scheme under Singapore's Research, Innovation and Enterprise 2025 (RIE2025) plan to increase the base of enterprises engaging in research and innovation activities in Singapore. It aims to foster industry-relevant public sector R&D efforts, and advances collaboration between public sector researchers with industry, with a line of sight to potential economic outcomes.

Working to meet Singapore's and society's growing needs for stable supplies of energy and essential products while also reducing greenhouse gas emissions in support of a lower-emission future, will require unprecedented innovation and collaboration at scale.

The research programmes identified by the Corporate Lab can contribute to Singapore's energy security, unlock new socio-economic potential, and help support its progress towards a net-zero future.

NTU Vice President (Industry) Professor Lam Khin Yong, said: "The partnership between NTU, ExxonMobil and A*STAR is an example of how close collaboration with academia, industry, and public agencies is crucial in developing innovative solutions to address real world challenges. This is in line with NTU's long-term strategic efforts to tackle grand challenges facing humanity and will build on NTU's deep expertise in sustainability to help amplify Singapore's on-going efforts to develop low carbon solutions. The new corporate lab ensures that our research results have the opportunity to be translated into impactful, real-world innovations, bringing us closer to a cleaner and greener future."

ExxonMobil Asia Pacific Pte. Ltd. Chairman and Managing director Geraldine Chin, said: "I'm excited that ExxonMobil with its global leadership in energy and material technology, will continue to work with Singapore's world-class researchers to accelerate research development for a lower-carbon future. Our involvement in the translational R&D stages can help scale up projects for commercial deployment. We look forward to collaborating with our corporate lab partners on innovative discoveries that can help change our industry and the world."

A*STAR's Assistant Chief Executive, Science and Engineering Research Council, Professor Lim Keng Hui, said: "A*STAR's collaboration with ExxonMobil and NTU signifies our shared commitment to achieving a carbon circular economy through technological innovations. The corporate lab combines ExxonMobil's industry expertise with A*STAR's and NTU's cutting-edge research, to accelerate technological deployments for a more resource-efficient future in support of Singapore's net zero goals."

Singapore Economic Development Board Executive Vice President Lim Wey-Len, said: "The Corporate Lab by ExxonMobil, NTU and A*STAR is a first in Singapore launched with a global energy player. The joint lab is a valuable addition to our ecosystem that will spur solutions for a greener future, while developing home-grown talent in R&D and sustainability here. Singapore is a location where innovation and diverse partnerships thrive, and we continue to welcome like-minded players to join us in developing low carbon solutions from Singapore for the world."

Leading the Corporate Lab as co-directors are NTU's Professor Xu Rong, School of Chemistry, Chemical Engineering and Biotechnology and Research

Director for Engineering and Physical Sciences, and Dr. Saifudin Abubakar, ExxonMobil strategic portfolio manager for technology & engineering research, and advisor to the Singapore Energy Consortium.

The five research programmes undertaken by the new Corporate Lab are expected to generate several technical disclosures, patents, and prototypes. Additionally, it provides an excellent platform to train a talent pool of graduates, research engineers, postgraduates, and postdoctoral fellows in the emerging field of carbon circular economy.

The Corporate Lab will bring together more than 50 researchers, postgraduate and undergraduate students, and engineers from ExxonMobil, NTU, and A*STAR. The collaboration presents unique opportunities for our talent to grow practical skillsets and gain insights beyond research capabilities.

Photo credit: Nanyang Technological University Singapore
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