NTU Singapore and RGE launch S$6 million joint research centre to tackle textile waste

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By Nanyang Technological University, Singapore ; RGE

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SINGAPORE - Media OutReach - 5 August 2022 - **Nanyang Technological University, Singapore (NTU Singapore)** and **Royal Golden Eagle (RGE)**, a global resources-based manufacturing group, today launched the **RGE-NTU Sustainable Textile Research Centre (RGE-NTU SusTex)** to accelerate innovation in textile recycling and translate research outcomes into practical solutions that can be deployed in urban settings like Singapore.

Researchers in the S$6 million joint research centre will look into areas such as next-generation eco-friendly and sustainable textiles, and refabricating textile waste into fibre. The aim is to study the chemistry of various textile materials and determine the optimal processes and techniques required to bring us closer to a circular textile economy. This is in line with Singapore's Zero Waste vision, as well as the Singapore Green Plan 2030.

The research centre, located at NTU's School of Materials Science and Engineering, was officially launched today by **Ms Grace Fu, Singapore's Minister for Sustainability and the Environment**.

ADVERTISING

It comes at a time when an estimated 92 million tonnes of textile waste[1] is created globally each year. Only 12 per cent of the material used for clothing ends up being recycled. The textile industry itself is responsible for 10 per cent of global greenhouse gas emissions[2] – more than international flights and maritime shipping combined.

NTU President Professor Subra Suresh said: "The goal of the RGE-NTU Sustainable Textile Research Centre (RGE-NTU SusTex) is very much aligned with Singapore's zero waste vision to build a sustainable, resource-efficient and climate-resilient nation. This partnership between NTU and RGE draws on RGE's industry experience as a global resources-based manufacturing group and leverages NTU's intellectual assets in materials and environmental chemistry."

RGE Executive Director, Perry Lim, said: "We want to contribute where we can achieve the most impact. More countries are banning the import of waste including textile waste. However, current textile recycling technologies, which rely on a bleaching and separation process using heavy chemicals, cannot be implemented in urban settings such as Singapore. This is where RGE can help, drawing on our 20 years of experience in viscose fibre making, to provide S$6 million in funding to establish the research centre and fund its work; share our global R&D expertise as the world's largest viscose producer; and to potentially scale up the viable innovations and solutions across our global operations. Backed by Singapore's strong research ecosystem and

leveraging NTU's engineering capabilities, we aim to catalyse innovation and develop a first-of-its-kind urban-fit textile recycling solution."

NTU Senior Vice President (Research) Professor Lam Khin Yong said: "Collaboration between universities and the industry has never been more important to tackle today's complex social, environmental and economic challenges. The RGE-NTU SusTex is yet another example of how the culture of collaboration with industry is embedded in NTU's innovation ecosystem. Such collaborations allow for a healthy exchange of ideas and know-how between industry and academia, and help pave the way for the translation of research ideas, maximising the reach and impact of NTU's research for society's benefit."

Singapore Economic Development Board's (EDB) Senior Vice President, Dino Tan said: "The successful launch of RGE-NTU SusTex is a testament to EDB's efforts in connecting our corporates with Singapore's research institutes. We are confident that by combining RGE's manufacturing expertise with NTU's research capabilities, the new research centre will represent a significant step towards meeting Singapore's sustainable manufacturing goals. We look forward to forging more such partnerships, to support the development of innovative green technologies and solutions that can be scaled in Singapore and the region."

The joint research centre is part of NTU's ambition and efforts to mitigate our impact on the environment under its **NTU 2025 strategic plan**, and builds on RGE's sustainability commitment, part of which is to explore how waste can also be used as a resource to generate new materials.

Driving high-impact research through interdisciplinary collaboration

The RGE-NTU SusTex leverages the University's emphasis on interdisciplinary collaboration to catalyse high-impact research and take innovative ideas from the lab to the real world. It also builds on RGE's wealth of industry experience and strong manufacturing capabilities. EDB seeded the relationship between NTU and RGE when the idea of an urban-fit textile recycling centre was first germinated last year.

The joint research centre will draw upon the expertise of NTU scientists in the School of Materials Science and Engineering and the School of Chemical and Biomedical Engineering.

It will look into four research areas:

- **Cleaner and more energy efficient methods of recycling**: looking at greener ways of textile recycling, with a focus on cellulose-based fabrics including rayon, viscose and cotton, minimising the degradation of fabric properties, and refabricating textile waste into fibre;

- **Automated sorting of textile waste**: using a combination of advanced spectroscopic techniques and machine learning capabilities for identifying and sorting textile waste based on fibre composition, and developing an automated system to remove accessories such as zips and buttons;

- **Eco-friendly dye removal**: developing eco-friendly methods of removing dye from textile waste using little to zero chlorinated chemicals, and formulating greener and biodegradable dye substitutes;

- **New textiles**: finding alternative uses for textile by-products and developing a new generation of eco-friendly and smart textiles with attributes such as moisture insensitivity, electrical conductivity, and infrared/ ultraviolet radiation reflectivity.

Leading the joint research centre in these research projects is **Professor Hu Xiao** from the NTU School of Materials Science and Engineering, who is also the director of the Environmental Chemistry & Materials Centre at NTU's Nanyang Environment & Water Research Institute.

In conjunction with the establishment of the RGE-NTU SusTex, RGE plans to build a textile recycling pilot plant that is low carbon, low chemical emissions, and energy efficient in Singapore. The new sustainable textile recycling solutions developed under the RGE-NTU SusTex are expected to be test bedded in this pilot plant.

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[1] *Why clothes are so hard to recycle, BBC, 13 Jul 2020*

[2] *The impact of textile production and waste on the environment, European Parliament News, 26 Apr 2022*