

## PRESS RELEASE

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10 February 2021

### **ETH Zurich collaborates with Singapore's NUS, NTU and SUTD on project to help cities achieve sustainable growth**

*A new five-year research collaboration between ETH Zurich and three Singapore universities will see scientists from both countries come together to develop solutions to help cities and their surrounding regions achieve sustainable growth. Launched on 1 Dec 2020, the collaborative venture will bring together 120 engineers, architects, environmental scientists, economists and social scientists.*

According to a United Nations report, two-thirds of the world's population will be living in cities by 2050. This rapid growth poses challenges for the regions surrounding cities, such as urban sprawl, pollution and the exploitation of resources, which in turn, threatens the survival of the cities themselves.

In response, ETH Zurich and the Singapore universities – National University of Singapore (NUS), Nanyang Technological University, Singapore (NTU Singapore) and the Singapore University of Technology and Design (SUTD) – have embarked on an international, interdisciplinary research collaboration called Future Cities Lab Global (FCL Global).

Supported by Singapore's National Research Foundation (NRF), the collaboration will be co-hosted in two research labs – one in the Singapore-ETH Centre (SEC), a partnership established in 2010 between ETH and NRF at the Campus for Research Excellence and Technological Enterprise (CREATE), and the other in ETH Zurich.

#### **Creating a knowledge loop**

FCL Global comes on the back of the SEC's now-completed Future Cities Laboratory (FCL) programme. Over the last 10 years, research projects at FCL in Singapore have dealt with various aspects of urban sustainability. Of central importance was the relationship between people and ecosystems and the role of urban planning in achieving liveability and sustainability. Based on the research results, the FCL has developed future scenarios and outlined corresponding strategies for decision-makers.

The FCL programme's success was enabled by close working relationships with Singapore universities, government agencies and industry partners. The new FCL Global will extend this model of collaboration to Switzerland as well. The new programme aims to create a knowledge loop between the two countries.

"The programme serves as a bridge. We now have two hubs in different climate zones researching similar topics and exchanging compiled knowledge as well as practice-oriented methods for sustainable urban development strategies," said ETH architecture professor and FCL Global co-director Sacha Menz.

FCL Global addresses the globally significant challenges of expanding urbanisation, where existing cities are enlarging and new cities are emerging to accommodate rapid population growth. FCL Global also aims to create a better understanding of the relationship between the city and its surrounding region, so as to make it more sustainable. As such, while conducted from the perspective of the city, the programme will have a broadened scope which will include settlement systems around cities as well.

“The ecological and economic benefits of high-density, low-footprint cities are being outweighed by urban sprawl in the regions around and between those cities. Our capacity to mitigate climate change in the coming century will hinge on how well these contrasting forms of urbanisation are planned,” explained Stephen Cairns, FCL Global’s co-director and ETH architecture professor in Singapore.

### **Effects of urbanisation in cities and surrounding regions**

While FCL’s research focused on cities and their development, research projects under FCL Global will expand that focus to address corridors and networks between cities and the surrounding regions – in other words roads, ports, rivers, and airports, as well as their impact on land use and ecology. This will also spark new research methods and approaches, helping to shape urbanisation in a more holistic way.

Currently, the researchers are working on eight projects, with others in the pipeline. These projects cover the following topics:

- Green buildings and neighbourhoods in dense urban areas
- New technologies for recycling building materials
- Construction methods that use renewable materials, including composite materials derived from fungi root networks
- Solutions to aid cities and surrounding regions that are distressed or at risk of flooding
- Ways to achieve sustainable food systems across cities and surrounding regions

“FCL Global combines several of ETH’s strengths, ranging from basic research to application,” said Detlef Günther, ETH Vice President for Research. “Every research project dovetails scientific analysis, design, engineering and governance,” he added. He noted that this comprehensive approach is essential for conducting future-oriented urban research and applying its findings, and hailed this research as a key step towards achieving the UN Sustainable Development Goals for 2050.

### **Deepening collaboration in Singapore**

NUS, NTU Singapore and SUTD are no strangers to the research programme when it first started, then known as FCL. The strengthening of these academic links in the form of the refreshed FCL Global signals a joint commitment to further interdisciplinary research to tackle broader sustainability issues.

NUS Deputy President (Research and Technology) Professor Chen Tsuhan said: “NUS is pleased to collaborate with ETH Zurich, NTU and SUTD through FCL Global to tackle this complex and multi-faceted research challenge. At NUS, we adopt a systems approach to solving real-world problems concerning climate change and sustainability. Harnessing our deep and broad expertise in areas such as green technologies, design, engineering, sciences, social sciences and public policy, we aim to advance integrated sustainability solutions that are optimised and resilient for tropical, urban and Asian settings.”

Projects in FCL Global are also aligned with Singapore’s research goals and aspirations for a greener and more sustainable future.

NTU Senior Vice President (Research), Professor Lam Khin Yong said, “NTU’s collaboration with FCL Global will leverage the university’s deep expertise in the areas of urban sustainability, energy, food technology and climate science, including creating synergies with various pioneering innovations test-bedded at the NTU Smart Campus. The joint research areas are aligned very closely with Singapore’s Research Innovation and Enterprise 2025 strategic plan, and the key pillars of research and innovation in NTU’s five-year strategic roadmap, NTU 2025, unveiled last month.”

SUTD’s Professor Yeo Kiat Seng, Associate Provost, Research and International Relations said: "SUTD is pleased to collaborate with ETH Zurich for the FCL Global programme. Our joint project aims to develop sustainable integrated districts that will help provide a good testbed for future urban innovations and systems solutions that can be deployed and integrated into high-density green cities."

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## **About ETH Zurich**

Freedom and individual responsibility, entrepreneurial spirit and open-mindedness: ETH Zurich stands on a bedrock of true Swiss values. At ETH Zurich, students discover an ideal environment for independent thinking, researchers a climate which inspires top performance. Situated in the heart of Europe, yet forging connections all over the world, our university for science and technology is pioneering effective solutions to the global challenges of today and tomorrow.

## **About the Singapore-ETH Centre**

The Singapore-ETH Centre was established in 2010 by ETH Zurich and Singapore's National Research Foundation (NRF), as part of the NRF's CREATE campus. As ETH Zurich's only research centre outside of Switzerland, it has strengthened the research capacity to develop sustainable solutions to global challenges in Singapore, Switzerland and the surrounding regions through its programmes: Future Cities Lab Global, Future Resilient Systems, Future Health Technologies and other projects.

## **About the National Research Foundation Singapore**

The National Research Foundation (NRF) is a department within the Prime Minister's Office. The NRF sets the national direction for research, innovation and enterprise (RIE) in Singapore. It seeks to invest in science, technology and engineering, build up the technological capacity of our companies, encourage innovation by industry to exploit new opportunities that drive economic growth, and facilitate public-private partnerships to address national challenges.