NTU Taps Into A Potential Sunrise Industry

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With its strengths in sustainability research, NTU will work with Austrian researchers and industry to see how sustainable energy can be used to boost energy efficiency of buildings.

Nanyang Technological University (NTU) signs two agreements today with Austrian researchers and industry to see how the sun's energy can be tapped to improve the energy efficiency of homes and other buildings.

"These research projects will sow the seeds of a sunrise industry - tapping on the sun as a form of alternative energy for Singapore. Energy security and environmental sustainability are essential public policy priorities and these are key focus areas of NTU's sustainability research," said NTU President-Designate and Provost, Professor Bertil Andersson.

The two agreements are with the Austrian Institute of Technology GmbH (AIT), a leading research and development expert in sustainable building technologies in Europe, and SOLID ASIA, one of the world's leading engineer, key equipment manufacturer and operator of large solar thermal plants. SOLID ASIA will work with NTU to optimise the use of solar thermal energy for tropical environments like Singapore and have plans to set up a Centre of Excellence in Solar Thermal.

Embedded pipes in walls

Under the agreement with AIT, NTU researchers will work with the Austrians to study the feasibility of embedding pipes in walls and ceilings to carry cooled water. This will improve the overall energy efficiency of cooling systems such as air-conditioning and other air-handling units.

This method of embedding water pipes is currently used for heating and cooling buildings in temperate countries. But there is insufficient understanding of how it can work effectively in the tropics. The researchers will study how renewable energies and de-humidification strategies can be combined with these technologies.

Private developers and government agencies have shown interest in this project and are expected to contribute up to S$1million to fund this research.

Centre of Excellence in Solar Thermal

The researchers are also studying how to harvest solar thermal energy on a large scale effectively and efficiently. Currently, most solar thermal systems are designed to 'collect' direct and intense sunlight, which is prevalent in low-humidity, low-cloud climates.

However, tropical countries like Singapore experience frequent cloud cover and high humidity, which diffuses the sunlight in multiple directions. This reduces the effectiveness and efficiency of solar thermal heat collection.

To address the problem of tapping solar thermal energy in tropical environments, NTU researchers are partnering SOLID ASIA, one of the world's leading company in the field of large-scale solar thermal plants, to optimise these systems for use in countries like Singapore.

The Centre of Excellence in Solar Thermal to be jointly established by NTU and SOLID ASIA will conduct research to develop advanced thermal materials and systems which can harness solar thermal energy more effectively.

The centre is likely to be set up in the upcoming CleanTech Park, adjacent to the NTU campus, with expected funding of up to S$2 million from industry partners and government agencies.

Representing NTU in these collaborations with AIT and SOLID ASIA is the Energy Research Institute @ NTU (ERI@N). ERI@N's key research focus is on alternative sources of energy, its usage and applications, and improving the efficiency of current energy systems.

With more than S$830 million in research funding in sustainability alone, NTU is fast becoming a global research powerhouse in environmental technologies. Besides ERI@N, NTU has several other centres engaged in sustainability research, including the Earth Observatory of Singapore, Nanyang Environment and Water Research Institute, and the TUM-Create Centre for Electromobility.

Austrian President and delegation visit NTU

The two agreements will be signed this afternoon in the presence of His Excellency, the Federal President of the Republic of Austria, Dr Heinz Fischer. Accompanying him will be his wife, Mrs Margit Fischer; Federal Minister of Health, Mr Alois StÃ¶ger; Federal Minister of Science and Research, Dr Beatrix Karl; and a 90-strong Austrian delegation.

During his visit to NTU, the President and his delegation will learn about the university's plans to offer a joint PhD programme with AIT and another Austrian university, the University of Natural Resources and Life Sciences (BOKU). Under this programme, which starts in August 2011 and includes nanobiotechnology and energy research, NTU students will spend up to two years studying in Vienna. Their Austrian counterparts will similarly pursue their research at NTU.

The NTU-AIT-BOKU collaboration in nanobiotechnology has been further boosted by the addition of a fourth partner - Sweden's LinkÃ¶ping University. This has led to the formation of the Centre for Biomimetic Sensor Science at NTU's Research TechnoPlaza.

The centre's research focuses on developing biosensors that can detect disease

markers in a small amount of blood, or pick out traces of toxins and poisons in air and water. This has potential applications in biomedical research, environmental monitoring, food production and homeland security.

"Through such strategic joint research projects with leading European partners like AIT, SOLID ASIA, BOKU, and LinkÃ¶ping University, NTU will promote the best of international research, and raise the level of academic interaction and scientific collaboration between Singapore and Europe in general, and with Austria in particular," said Professor Andersson, who hosts President Fischer's visit to NTU.

They last met in November 2010, when Prof Andersson was in Vienna to receive the prestigious Wihelm Exner Medal, presented in recognition of his research relating to artificial leaves and his contributions to European and Austrian research. This medal has been awarded since 1921 to scientists and inventors whose work has shaped the world today.

During his visit to NTU, President Fischer and his delegation will also meet with Austrian faculty, PhD students, and undergraduate exchange students teaching and studying at NTU.

The Austrian visitors will also view a display of exhibits put up by ERI@N, SOLID ASIA and the Centre for Biomimetic Sensor Science, and tour NTU's lush 200-hectare Yunnan Garden Campus.

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