

Sustainable Green Building Taiwan Team “1 House for All” Going to Europe on an Expedition

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On May 11, 2022, the Transdisciplinary Design Innovation Shop (TDIS), National Yang Ming Chiao Tung University (NYCU) held a “NYCU Sustainable Green Building Taiwan Team Pre-departure Press Conference.” On May 15, the team departed for Germany to participate in a competition. The entry submitted for the competition, “1 House for All,” showcased the achievements of the industry, government, academia, and research sectors in Taiwan. Specifically, the first-ever heavy wooden structure building in Taiwan codeveloped by the Forest Bureau and the Practice Factory of the Office of Experimental Forest Management, National Taiwan University; the circular building system researched and developed through the joint efforts of Tung Ho Steel Enterprise, Excellentechnik Inc., Chungan Wellsun Co., Ltd., and Nan Ya Plastics. Numerous domestic top enterprises sponsored funding and materials, and the government provided funding and technical support. After 2 years and 8 months of research, development, and preparation, the Taiwan Team was ready for the competition in Europe.

At the press conference, units from the industry, government, academia, and research sectors were all present to wish the TDIS team a success in competing in the Solar Decathlon Europe 21/22, a world's top architectural practice competition. The “Sustainable Green Building Taiwan Team” led by TDIS, NYCU involved teachers and students from different departments conducting cross-domain, out-of-the-box thinking to propose an innovative problem-solving project.



The world is undergoing drastic changes following the COVID-19 pandemic. How can contemporary architecture help people lead a healthier life? University Chair Professor C. David Tseng and Director of the TDIS stated, “The paradigm of the global architecture has been changing continuously, from green building to healthy building and from healthy building to the most critical sustainable urban building at present. What remains unchanged is the search for a sustainable harmony between people, the natural environment, and the social environment.” The project manager of this competition, Assistant Professor Tseng Sheng-kai, further explained, “The entry for this competition aimed for net-zero energy consumption and net-zero carbon emissions. Facing the ten challenges in the competition, we used Taipei as the design target, hoping that we can provide a sustainable building with zero energy consumption and zero carbon emissions as the opportunity for urban renewal, making Taiwan an outstanding example for sustainable cities in the world.”

The TDIS team for this competition offered three design solutions. They employed the energy-conservation design concept of passive houses and integrated the Artificial Intelligence of Things indoor automatic adjustment to achieve an energy-sharing station with net-zero energy consumption. Using the circular building design method and industry integration, they created a net-zero carbon emission transitional housing to achieve the vision of housing equality. Finally, they combined carbon trading with the business model of social enterprises to create social-enterprise housing to achieve the goals of sustainable operation and sustainable development. The team considered contemporary living predicaments that Taiwan faces, such as the high level of energy consumption of urban buildings, housing justice, and urban renewal stagnation, and proposed a sustainable urban development strategy white paper for developed cities in Taipei, Germany, and in the world. The “1 House for All” that is low-carbon emissions, affordable, offers healthy living, and promotes the wellbeing of multiple generations is to be spread from Taiwan to the world. President Lin Chi-hung was gratified and stated, “It was the first time since the merge of National Yang Ming University and National Chiao Tung University to have a university-level research center to lead a team to participate in an Olympic-level competition in Europe regarding green buildings. This reflected that NYCU as a grand university has great social responsibilities, which is to bring the developed cities in the world with low-carbon emissions, affordable, and cross-generational coprosperity using sustainable urban development.”

In addition, the entry for the competition also established a new milestone for forestry in Taiwan. Chiu Li-wen, the Chief Secretary of the Forest Bureau, stated, “Under the joint effort of the Wood Utilization Factory of the Experimental Forest of National Taiwan University and the TDIS team of NYCU, we created the first 100% made-in-Taiwan heavy wood structure building in Taiwan! The Forest Bureau set 2017 as the First Year of Domestic Timber and announced the goal of increasing the utilization rate of wood. In the meantime, it developed new tree-planting, forest management, and domestic timber production. Through this competition, we would like to inform domestic and foreign people and industry practitioners that Taiwan has rich forest resources. We also have strong research and development, production, and manufacturing skills. We welcome domestic and foreign construction industry practitioners to take a look at Taiwan's heavy wood structure, allowing this sustainable carbon negative building to spread around Taiwan!”



Earlier this year, the team conducted a trial assembly of the prototype of the building in NYCU and shipped it to Germany. The team members arrived in Germany to participate in the competition on May 16. On May 20, the students started assembling the “1 House for All” prototype in 10 days in Wuppertal, Germany. On June 10, after the opening ceremony, an international jury will evaluate the building based on ten green building indicators. Taiwan Team will compete against 19 university teams from 11 countries for the grand awards, and it will provide English tours for participants from around the world. On June 25, they will hold a Taiwan Culture Day. Afterwards, the building will be turned into a 3-year Living Lab on the competition site as the sustainable building research and exchange base for Taiwan and Germany. This is not only the first for this competition but also a great achievement for the Taiwan Team!

