

The Largest Wooden Building in Asia Unveiled

The building project is built using an innovative construction technology known as mass engineered timber.

By Nanyang Technological University

May 18, 2023



Source: NTU Singapore

Nanyang Technological University, Singapore (NTU Singapore), has officially launched its eighth zero energy building on Wednesday (17 May), adding to its list of green developments as part of the university's commitment to sustainability.

Named Gaia after the Greek goddess of Earth, the 6-story development is the largest wooden building in Asia, and is a space for learning, research and innovation, where NTU students, faculty and staff can meet and connect to uncover new opportunities for collaboration and discovery.

Gaia is the eighth building project on the NTU campus that has received the Green Mark Platinum (Zero Energy) – the highest award issued by the Building and Construction Authority of Singapore to recognize buildings that consume as much energy as they produce. Presently, there are 16 certified zero energy buildings in the country, of which half are located on NTU grounds. This makes NTU the greenest campus in Singapore.

The building project is built using an innovative construction technology known as mass engineered timber. The green technology was first adopted for the construction of NTU's mega sports hall, The Wave, launched in 2017. The two buildings are the works of Japanese architect, Toyo Ito, a Pritzker Prize recipient known for designs that incorporate elements of nature. The award is commonly referred to as the "Nobel Prize" of architecture.

The launch ceremony today was attended by Minister for Education, Mr Chan Chun Sing and NTU President Professor Ho Teck Hua. Among those present were NTU Pro-Chancellor Ms Jennie Chua, Chair, NTU Board of Trustees, Ms Goh Swee Chen, other board members, university partners and industry collaborators.

Guest-of-Honor Mr Chan, said, "I am heartened that our Institutes of Higher Learning (IHLs) are deeply committed to building and sustaining green campuses. As part of the Singapore Green Plan 2030, our IHLs play an important role in making sustainability a competitive advantage for Singapore. Gaia is a testament of NTU's continued efforts to be a leading sustainable university. I look forward to more innovations from the community, as we all do our part to create a sustainable future."

Professor Ho said: "The building was designed to connect humans to their natural surroundings. Students and faculty benefit from the extensive open spaces for study and collaboration. The spaces have ample natural light, creating an environment conducive to social interaction. People will experience first-hand what it means to work, learn, and socialize in a sustainable environment."

Championing sustainability

As its name suggests, Gaia is constructed with sustainability in mind. Compared to a normal building, Gaia produces about 2,500 fewer tonnes of carbon dioxide (CO₂) per year - equivalent to more than 7,000 roundtrip flights from Singapore to Hong Kong.

The emission reduction is achieved through energy efficient systems and renewable technologies.

Timber used for the construction of Gaia were sourced from sustainably managed forests, which means new trees are planted to replace those that are harvested. The carbon offset from planting trees to replace those used in Gaia totals 5,800 tons of CO₂ – same as the carbon footprint of about 17,000 return flights between Singapore and Hong Kong.

Solar photovoltaic (PV) panels installed on the rooftop churn out 516,000 kilowatt-hours (kWh) of clean energy to power the building annually – enough to power 169 three-room HDB flats for a year.

Instead of fans, Gaia has sun shading fins along parts of its facade and incorporates extensive open areas, terraces, and air wells to increase ventilation.

Its air-conditioning system saves energy by using passive cooling coils to chill the air without the use of fans (Passive Displacement Ventilation). These coils work by creating a natural convection cycle, cooling the air as it sinks downwards, which displaces the warm air upwards.

External façade bricks from the NTU Innovation Centre, which previously stood at where Gaia is located, were preserved, and re-used to build a decorative wall in the building, in a nod to NTU's heritage.

Nanyang Business School to occupy new space

The 43,500m square-meter facility is home to the Nanyang Business School (NBS).

As part of NTU's Smart Campus initiative, all of Gaia's classrooms and laboratories are equipped with the latest technologies, providing students and faculty access to world-class facilities to support flexible and collaborative learning into the future.

The new building will also allow NBS to showcase its sustainability capabilities. Plans for sustainability related programs in Gaia are underway, in collaboration with

industrial collaborators, to inspire more to learn and live sustainably through an in-person experience.

Mr Ethan Ong, a third-year double degree Accountancy & Business student and Vice President (Policy), NTU Students' Union, said, "My friends and I are excited to be moving into Gaia because it has a lot more open areas for communal activities compared to our current Business School premise. We look forward to utilizing the space for student bonding activities. There are also not many buildings in the world that are constructed entirely from wood, and we recognize just how meaningful it is to be studying in this special building, which symbolizes the university's commitment to sustainability."