



## **A.I. technology that cuts energy use by more than 20%, wins top prize at inaugural innovation challenge by ENGIE, NTU Singapore and JurongHealth Campus**

**SINGAPORE, 26 June 2020** – A prototype that enables the air-conditioning system to be controlled by artificial intelligence (AI) took home the top prize at the inaugural **ENGIE x NTU Innovation Challenge** held by ENGIE Factory Asia-Pacific, the innovation arm of ENGIE Asia Pacific.

In the trial environment for the challenge, the winning team *EcoBuilding* from Nanyang Technological University, Singapore (NTU Singapore), used a system of multi-variant sensing for predictive controls of air-conditioning. They achieved more than 20% energy savings and improved comfort through machine learning of room occupancy and air quality metrics. The final judging of the top three teams was held virtually on 24 June 2020.

Open to all university students in Singapore, the challenge is jointly organised by ENGIE and NTUitive, the innovation and enterprise company of NTU Singapore.

Over an 8-month period, participants had special access to the facilities of the JurongHealth Campus (Ng Teng Fong General Hospital and Jurong Community Hospital) to creatively solve challenges and achieve energy-efficiency and smart building solutions. The teams were mentored by industry executives in sustainability, energy and smart city technology, and received up to S\$10,000 in prototype funding.

### **Introducing AI to hospital operations**

Ensuring service efficiency and optimisation of electrical systems is an important part of ENGIE's services for its customers. Through the partnership with NTFGH, the students proved how artificial intelligence and other technologies can be incorporated seamlessly into hospital operations for predictive maintenance, digitisation of services and ultimately, autonomous building management.

"We are delighted by this opportunity to collaborate with NTU and the JurongHealth Campus to support our customers' low carbon transition initiatives. We are impressed by the works of the participating students and we are glad that through this engaging challenge, we will discover innovative solutions for the benefits and continual improvement of our customers. This partnership is the testament of our commitment to further enhancing energy efficiency for the country, especially in the healthcare sector, through our expertise in provision of sustainable client solutions," said Pierre Cheyron, CEO, ENGIE South East Asia.

Mr Ng Kian Swan, Chief Operating Officer of NTFGH and JCH, and Director of Jurong Medical Centre explained, "Healthcare institutions are critical areas where we need to continually innovate and adopt the latest technologies to improve the health environment for safe and quality care. Hosting the student on our campus was an important gateway in the competition



where they were able to work with live data and test the feasibility of their theories when applied to an actual environment – and further refine their ideas for a scalable solution.”

Highlighting the importance to develop youth in the community, Quentin Vaquette, Managing Director of ENGIE Factory Asia-Pacific said, “We believe that entrepreneurs will play a pivotal role in driving the energy transition toward renewable and sustainable sources. This collaboration represents a platform for nurturing talents who are tackling massive challenges in the future of energy and smart city.”

Echoing this, Dr Alex Lin, Interim Chief Executive Officer of NTUitive, said, “Innovation Challenges are an excellent avenue that exposes students to realistic business problems. Working with industry mentors, business owners, and multi-disciplinary peers, students gain deeper insights into the issues and discover possible solutions. The ENGIE x NTU Innovation Challenge doesn’t just find a solution to the problem, it enables ENGIE to discover talents, and allows students to learn outside the standard curriculum.”

Yet another key milestone, the ENGIE x NTU Innovation Challenge strengthens the collective goal to accelerate energy transition together with entrepreneurs and startups. The winning team, together with the other two finalist teams at the final presentation have also received prototyping awards. Following this challenge, all three teams will continue to explore how to build a startup with ENGIE and access further venture capital funding.

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#### **About ENGIE Factory Asia-Pacific**

ENGIE Group is a global energy and services group that focuses on three core activities: low-carbon power generation (mainly based on natural gas and renewable energy), global networks of energy infrastructure and customer solutions (focused on smart cities). ENGIE Factory Asia-Pacific, the innovation arm of the ENGIE Group in Asia, has a mission is to accelerate the transition to a zero-carbon society by partnering with startups and aspiring founders who share the same drive to deliver real impact. We build, scale and invest in startups and individual founders who believe they can solve these global challenges. How we do this is in three different approaches.

In the first approach, we commit to innovative idea right from the beginning. We identify great founders and entrepreneurial teams to co-create new business models and start impactful companies. In the second approach, we partner with high growth startups to expand solutions to global customers. We are always on the lookout for startup solutions that can open new business opportunities or solve pain points that we have identified in our ENGIE businesses. Last but not least, our third approach is to invest in startups from the sectors of sustainability and smart cities. We invest through our Engie New Ventures €180 million fund and take minority stakes in technology startups that complement existing activities and resources to spur internal innovation within Engie Group. Visit [www.apac.engiefactory.com](http://www.apac.engiefactory.com) for more information.

#### **About ENGIE**

Our group is a global reference in low-carbon energy and services. Our purpose (“raison d’être”) is to act to accelerate the transition towards a carbon-neutral world, through reduced energy consumption and more environmentally-friendly solutions, reconciling economic performance with a positive impact on people and the planet. We rely on our key businesses (gas, renewable energy, services) to offer competitive solutions to our customers. With our 170,000 employees, our customers, partners and stakeholders, we are a community of Imaginative Builders, committed every day to more harmonious progress.

Turnover in 2019: 60.1 billion Euros. The Group is listed on the Paris and Brussels stock exchanges (ENGI) and is represented in the main financial indices (CAC 40, DJ Euro Stoxx 50, Euronext 100, FTSE Eurotop 100, MSCI



Europe) and non-financial indices (DJSI World, DJSI Europe and Euronext Vigeo Eiris - World 120, Eurozone 120, Europe 120, France 20, CAC 40 Governance).

### **About Nanyang Technological University, Singapore**

A research-intensive public university, Nanyang Technological University, Singapore (NTU Singapore) has 33,000 undergraduate and postgraduate students in the Engineering, Business, Science, Humanities, Arts, & Social Sciences, and Graduate colleges. It also has a medical school, the Lee Kong Chian School of Medicine, set up jointly with Imperial College London.

NTU is also home to world-class autonomous institutes – the National Institute of Education, S Rajaratnam School of International Studies, Earth Observatory of Singapore, and Singapore Centre for Environmental Life Sciences Engineering – and various leading research centres such as the Nanyang Environment & Water Research Institute (NEWRI) and Energy Research Institute @ NTU (ERI@N).

Ranked amongst the world's top universities by QS, NTU has been placed the world's top young university for the past seven years. The University's main campus is frequently listed among the Top 15 most beautiful university campuses in the world and it has 57 Green Mark-certified (equivalent to LEED-certified) building projects, of which 95% are certified Green Mark Platinum. Apart from its main campus, NTU also has a campus in Novena, Singapore's healthcare district. For more information, visit [www.ntu.edu.sg](http://www.ntu.edu.sg).

### **About JurongHealth Campus**

JurongHealth Campus is a part of the National University Health System (NUHS) group, serving the community in the western region.

JurongHealth Campus comprises the integrated 700-bed Ng Teng Fong General Hospital (NTFGH) and 400-bed Jurong Community Hospital (JCH) which were designed and built together from the ground up as an integrated development to complement each other for better patient care, greater efficiency and convenience. NTFGH and JCH were envisioned to transform the way healthcare is provided, and together with the National University Hospital, National University Polyclinics, Jurong Medical Centre, family clinics and community partners, to better integrate healthcare services and care processes for the community in the west.

Visit [www.juronghealthcampus.com.sg](http://www.juronghealthcampus.com.sg) for more information.

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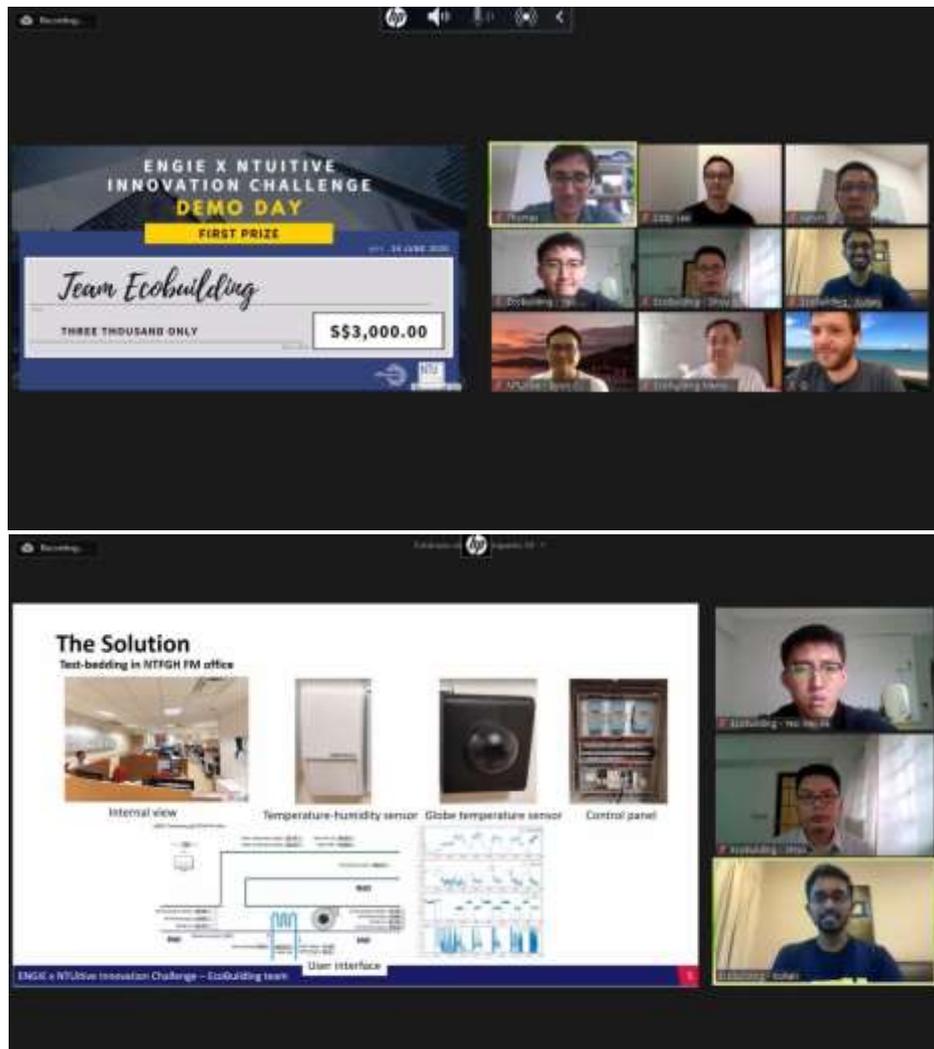
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## Annex: List of Finalists

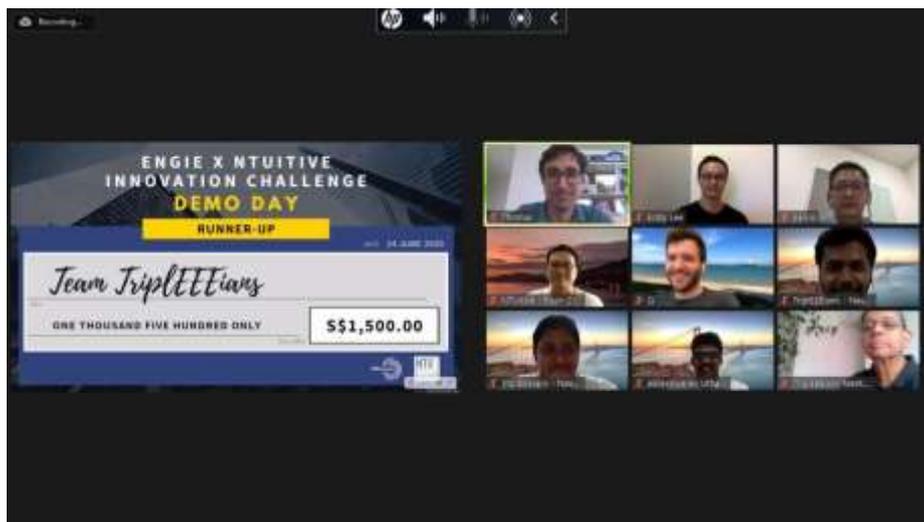
### Winning Team – EcoBuilding

The HVAC of a building is responsible up to 56% of energy consumption, and much wasted through overcooling. Team EcoBuilding has created a system of multivariant sensing (humidity, radiant heat, CO<sub>2</sub>, etc) for predictive control of air-conditioning. The trial achieved more than 20% savings and better comfort through narrowing temperature swings. The proposed solution uses multiple parameters to make predictive decision on air-conditioning control as opposed to only temperature in existing systems.



### Team – TripleEEians

Mission critical facilities such as the operating theatre requires 100% uptime but current methods using circuit breakers or handheld thermal sensors are insufficient to predict and prevent failures. Team TripleEEians has created continuous thermal analysis through a DB panel-mounted camera. Image analysis enables detection of high currents that allow intervention before critical failure. Further development is required to improve calibration of thermal imaging to enable a complete predictive solution.



### Team – Axonense

Technicians spend a significant portion of their day surveying facilities to identify electrical, lighting or other faults. Team Axonense has created a mobile sensor network initially comprising of light sensors are mounted on cleaner push carts to alleviate manual work. The proposed solution is unique is its low cost implementation and use of simple sensors to provide robust coverage of hospital grounds. This is also a platform where air quality and other sensors can be incorporated in the future.

