ST Engineering and NTU Singapore Launch Singapore's First Integrated Smart Car Park and EV Charging System

Singapore, *8 May 2023* - ST Engineering and Nanyang Technological University, Singapore (NTU Singapore) today announced the deployment of Singapore's first integrated Smart Car Park and Electric Vehicle (EV) Charging System, GoParkin™, on NTU's main campus. The new-generation Smart Car Park System allows EV users to park, charge and transact easily on a single mobile app. ST Engineering's Urban Solutions business will build and operate the university's campus-wide EV charging network, as part of NTU's sustainability goals.

Under the NTU Sustainability Manifesto, NTU is committed to decarbonisation and sustainable development, where it strives to achieve carbon neutrality, along with a 50 per cent reduction in carbon emissions by 2035. Providing an EV infrastructure on campus also supports Singapore's efforts to encourage EV adoption.

Seamless convenience for EV users

The GoParkin Smart Car Park System allows EV users to find available parking and EV charging points at NTU, charge their vehicle, monitor their charging status, and make payment easily through the GoParkin mobile app, eliminating the need for separate parking and EV charging apps.

Other new-to-market features that enable a seamless parking and EV charging experience include:

- **Plug-n-Charge:** GoParkin EV users at NTU can automatically start a charging session when the charging cable is connected to their vehicle, removing the need to manually activate a charging session. This is enabled through Automatic Number Plate Recognition (ANPR) technology which allows the Smart Car Park System to verify and validate the vehicle licence plate as the vehicle enters the EV charging lot. Plug-n-Charge is currently available at NTU Car Park A and Car Park B located at the main academic complexes, and there are plans to roll this out to more campus car parks in the future.

- **EV lot hogging detection:** To improve EV charging accessibility at NTU, the Smart Car Park System can detect and identify EVs that have completed their charging session but continue to occupy the lot, as well as non-EVs that occupy an EV charging lot. This is unlike existing EV charging systems that are unable to detect lot hogging by non-EVs. Through ANPR technology, the licence plates of errant vehicles can be read and automatically routed to the parking enforcement team for follow-up. At launch, this feature will be available at NTU Car Park A and Car Park B where there is high demand for parking lots.

Cost savings and operational insights for car park owners and operators

The cloud-based GoParkin Smart Car Park System provides operational and maintenance cost savings to NTU in various ways. Besides being interoperable with various EV charging hardware, the Smart Car Park System leverages ANPR technology which is cost-effective, easy to deploy and low maintenance compared to conventional electronic parking systems. Additionally, the system provides a real-time, centralised view of EV charging and car park operations across NTU's multiple car parks on a unified platform, enabling easy monitoring and control as well as better optimisation of manpower deployment.

The Smart Car Park System also provides advanced analytics that generate useful insights such as EV charging patterns to optimise operations and revenue streams, to facilitate planning of future services.

Campus-wide EV charging network

Six EV charging points have been installed in Car Parks A, B and Q at NTU's Jurong campus, with eight charging points to be rolled out at four more car parks by June 2023. Most car parks will be fitted with 11kW AC chargers while one car park will have a 120kW DC charger for fast charging. There are plans to extend the EV charging network to more car parks to keep pace with future charging demand.

Mr Ang Kim Siah, Head of Mobility Road, Urban Solutions, ST Engineering, said: "Designed to enable a seamless and effortless parking and charging experience, our integrated solution benefits both motorists and car park operators, addressing the pain point of having to use multiple parking and charging platforms. With our expertise in smart car park

and EV charging systems, we are well-positioned to provide the market with an integrated, reliable and cost-effective solution that addresses the evolving challenges of drivers, car park owners and operators sustainably. NTU is our long-time partner and we are pleased to further our collaboration to bring new user benefits and contribute to NTU's Smart Campus vision and sustainability goals."

Ms Tan Aik Na, Senior Vice President (Administration), NTU Singapore, said: "The new integrated Smart Car Park and Electric Vehicle Charging System supports both NTU's Smart Campus vision and the goals of our Sustainability Manifesto. The hassle-free park and charge system will bring greater convenience as EV adoption increases on our campus."

In 2020, ST Engineering and NTU launched Singapore's first barrier-free Smart Car Park System at NTU's Jurong campus. The barrier-free Smart Car Park is currently operational at all 59 NTU car parks across its Jurong, Novena and one-north campuses, covering over 4,000 parking lots.

Annex A: New GoParkin Smart Car Park features
Annex B: EV charging points at NTU

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About ST Engineering

ST Engineering is a global technology, defence and engineering group with a diverse portfolio of businesses across the aerospace, smart city, defence and public security segments. The Group harnesses technology and innovation to solve real-world problems, enabling a more secure and sustainable world. Headquartered in Singapore, it has operations spanning Asia, Europe, the Middle East and the U.S., serving customers in more than 100 countries. ST Engineering reported revenue of $9b in FY2022 and ranks among the largest companies listed on the Singapore Exchange. It is a component stock of the FTSE Straits Times Index, Dow Jones Sustainability Asia Pacific Index, iEdge SG ESG Transparency Index and iEdge SG ESG Leaders Index.

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, Medicine, Humanities, Arts, & Social Sciences, and Graduate colleges.

NTU is also home to world-renowned 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).

Under the NTU Smart Campus vision, the University harnesses the power of digital technology and tech-enabled solutions to support better learning and living experiences, the discovery of new knowledge, and the sustainability of resources.

Ranked amongst the world's top universities, the University's main campus is also frequently listed among the world's most beautiful. Known for its sustainability, over 95% of its building projects are certified Green Mark Platinum. Apart from its main campus, NTU also has a medical campus in Novena, Singapore's healthcare district.

For more information, visit www.ntu.edu.sg

New GoParkin Smart Car Park Features at NTU

- **Plug-n-Charge:**
    - The Smart Car Park System uses ANPR technology to verify and validate the vehicle licence plate when the EV enters the charging lot.
    - Once validated, GoParkin EV users can automatically start a charging session when the charging cable is connected to their vehicle, without the need to launch the GoParkin app.
    - Available at Car Parks A and B (at the main academic complexes).

- **EV lot hogging detection:**
    - Through ANPR technology, non-EVs that park in an EV charging lot can be detected, and their vehicle licence plates will be captured and routed to the parking enforcement team for follow-up.
    - EV users who have completed their charging session will be notified via the GoParkin app to move their vehicle. If the system detects continued vehicle presence in the charging lot after a grace period, the licence plate will be captured and routed to the parking enforcement team for follow-up.
    - Available at Car Parks A and B (at the main academic complexes).

- **Integration with parking enforcement team** for targeted and faster on-ground response.

- **Automated detection and identification of vehicles that violate traffic rules** (eg. entering/exiting car park in the wrong direction).

- **Group Season Parking Pass** application where up to three vehicles can share one season parking pass.

- **Ad hoc parking payments** on the GoParkin mobile app for users without a GoParkin account to enable payment on-the-go.

- **Biometric login** on the GoParkin mobile app for added security and convenience.

Depending on the car park owners' or operators' requirements, the new-generation Smart Car Park System is capable of other features such as reservation of parking lots and EV charging lots, as well as enabling in-app lifestyle promotions for motorists.

EV Charging Points at NTU

Current:
- Car Park A: 2x AC11kW chargers
- Car Park B: 2x AC11kW chargers
- Car Park Q (at The Hive Learning Hub): 1x DC120kW charger with 2 charging plugs

To be installed by June 2023:
- Car Park D (near College of Engineering): 2x AC7kW chargers
- Crescent Hall Car Park: 2x AC11kW chargers
- North Hill Car Park: 2x AC7kW chargers
- School of Biological Sciences Car Park: 2x AC11kW chargers