Annex A – ST Engineering Land Systems' CTC Grant projects supported by NTUC and ST Engineering Staff Union

CTC Grant Project	Description of project	Benefits of project in enhancing productivity
3D Scanning	The 3D area scanner enables rapid creation of digital twins for mixed reality projects. Utilising laser technology, the 3D scanner swiftly captures the intricate details and visual essence of real-world environments, culminating in the creation of highly-accurate 3D virtual environments. With seamless integration of 3D scanning into the workflow, ST Engineering Land Systems has enhanced the efficiency and precision in creating its 3D assets – significantly reducing development time and maximising manpower resources.	3D scanning transforms the traditional method of creating 3D digital assets, which tended to be time-consuming and manpower intensive. With 3D scanners incorporated into the 3D asset creation pipeline, ST Engineering Land System has experienced: • Shorter development timeline (i.e., time-savings): With the 3D asset creation workflow now optimised, development time is cut down by at least 50%, resulting in enhanced productivity. Less manpower required for each 3D assignment (i.e., manpower-savings): 3D artists are freed up to take on more 3D graphic assignments or work concurrently on more than one 3D assignment, hence optimising manpower resources. • New skills learnt: Employees are trained with new skills to implement 3D scanning, which is likely to become the norm in creating 3D models for digital twin use cases.

Robotic Spray Painting	The robotic painting solution reduces dependency on human labour and effectively mimics hand spray painting with improved quality and repeatability. The automation solution, which is specially built to carry out spray painting on large structure to vehicle platforms, helps bring about higher paint consistency and quality. This solution also enhances workplace safety by eliminating employee exposure to hazardous fumes and reducing the risk of accidents associated with manual painting. Moreover, the precise control offered by the solution translates into a substantial reduction in material wastage, resulting in both cost savings and environmental sustainability.	The successful implementation of Robotic Spray Painting and Telescopic Cobot Welding System helped to replace traditional spray painting and manual welding. Painting activities are quicker by at least 50% with improved consistency and painting quality. The implementation of these innovative systems has helped to increase productivity and improved workplace safety and environment. Robotic and automation also address the challenges posed by shortages of skilled welders/painters whilst upskilling employees to be future-ready to operate and handle such technologies.
Telescopic Cobot Welding	The Telescopic Cobot Welding solution leverages collaborative robots, or "cobots," equipped with advanced welding capabilities. These cobots seamlessly integrate into existing manufacturing workflows, working alongside the manufacturing team to perform various welding tasks with precision and consistency. By combining the strengths of the team's expertise with the precision and repeatability of robotic automation, ST Engineering Land Systems experienced improved efficiency and quality in welding tasks. By automating repetitive and labor-intensive welding tasks, the team is able to focus on more complex and value-added	

	activities, thereby optimising resources allocation and maximising productivity. Additionally, the collaborative nature of cobots ensures a safe working environment, minimising the risk of accidents and injuries associated with traditional welding processes. The flexibility afforded by this cobot welding solution also allows the team to quickly adapt to changing production demands and requirements.	