

# Driving the Development of Innovative and Sustainable Industrial Infrastructure Solutions in Singapore

**The Sustainable Singapore Blueprint 2015 outlines Singapore's national vision and plans for a more liveable and sustainable Singapore, and one of the goals is to be a leader in green sustainable buildings. As the lead government agency responsible for the development of industrial infrastructure to support and catalyse the growth of industries and enterprises in Singapore, JTC remains committed to creating eco-sustainable industrial estates and developments to enable industrialists and their employees to benefit from potential energy savings and a greener working environment.**

Since its inception in 1968, JTC has played a major role in Singapore's economic development journey by developing land and space to support the transformation of industries and create quality jobs.

From building basic industrial infrastructure in the early days, JTC has moved up the technological ladder to provide more sophisticated and integrated industrial infrastructure for its customers in response to the changing economic landscape. Today, landmark projects by JTC include Jurong Industrial Estate, Jurong Island for energy and chemical industries, business and specialised parks such as Airport Logistics Park of Singapore, International and Changi Business Parks, Seletar Aerospace Park, Tuas Biomedical Park, and a new work-live-play-&-learn development at one-north. JTC also develops innovative space solutions such as JTC Surface Engineering Hub @ Tanjong Kling and JTC Food Hub @ Senoko, which incorporate innovative features and shared infrastructure to enable industrialists to start their operations quickly and enhance productivity.

## **Promoting sustainability through innovation**

In the development of innovative industrial infrastructure solutions, JTC actively adopts green and eco-friendly features across its developments. The 50-hectare CleanTech Park, for instance, stands out as the greenest and most sustainable of JTC's developments. Green solutions implemented at CleanTech Park include a comprehensive storm water management design that effectively retains 63 per cent of storm water runoff within the park, to provide a sustainable source of non-potable water; active strategies such as a 1 MW fuel cell plant for renewable energy; and passive design strategies to increase energy efficiency and reduce cooling loads.

Within CleanTech Park, JTC CleanTech One @ CleanTech Park is the first multi-tenanted BCA Green Mark Platinum building developed by JTC. The development is currently home to a vibrant cleantech ecosystem comprising cleantech businesses, practitioners and academia seeking to catalyse innovation in cleantech research and is designed with green features such as a sky trellis, landscaped sky gardens and a green perforated facade that help to reduce heat gain.

Located across the road from JTC CleanTech One, JTC CleanTech Two @ CleanTech Park, the second building in the eco-business park, is set to add another dimension to R&D in clean technology as an epicenter for the growth of remanufacturing technologies that promote environmental sustainability for the manufacturing sector. Slated to open in early 2015, JTC CleanTech Two is integrated with unique sustainable features and innovative energy savings strategies, and is specially configured to

support research and prototyping activities that require heavier loadings, higher height clearances and greater electrical power requirements.

JTC aims to green its current estimated Gross Floor Area of 1.3 million square metres of industrial space by 2018. To help JTC overcome issues such as environmental and land-use challenges, an Environmental Sustainability Framework was also incorporated in JTC's business value chain. Sustainable planning systems such as climatic mapping and automatic carbon tools are also used for the planning of existing and future industrial developments such as one-north.

### **Expanding JTC's Innovation Capacity**

To encourage open innovation through partnerships, JTC has signed a Memorandum of Understanding (MOU) with the Sustainable Energy Association of Singapore (SEAS) to collaborate on energy efficiency and other sustainability solutions for buildings in JTC's business parks and industrial estates. Under this three-year MOU, JTC and SEAS will jointly review and provide recommendations for energy efficiency solutions such as harnessing solar energy, converting manufacturing waste to energy, improved lighting technologies, and energy management and control system to help monitor energy for better use.

The partnership with SEAS, the association for more than 190 sustainable energy companies in Singapore, will provide JTC with a ready pool of expertise to recommend and develop sustainable solutions that can bring about savings in operating costs through improved processes and technologies, such as solar panels, new lighting technologies and new sustainable materials for buildings.

At the MOU signing, Mr Heah Soon Poh, Assistant CEO (Cluster Development Group), JTC, said, "As the leading industrial infrastructure developer in Singapore, JTC is committed to environmental sustainability and seeks to address environmental challenges in a pragmatic manner. This collaboration is part of JTC's Environmental Sustainability Framework, where we aim to explore and implement smart and sustainable solutions in our new and existing developments, and in turn, our tenants can stand to benefit from energy savings and a greener environment."

JTC has also partnered SPRING Singapore in jointly launching an inaugural grant call inviting industrialists and companies to submit proposals on sustainable technologies for test-bedding in JTC's developments or facilities. This opportunity provides these companies with a platform for large-scale experimentation in a real world environment as they develop their own track records.

### **Creating new land and space**

Apart from creating new land and space through land reclamation and the development of high-rise innovative facilities that make productive use of land in land-constrained Singapore, JTC has pioneered creative usable spaces underground. The Jurong Rock Caverns, for example, is Singapore's first subterranean cavern storage facility for liquid hydrocarbons. Located 150m underground with a storage capacity of 1.47 million cubic metres, the Jurong Rock Caverns free up about 60 hectares of land, which can then be used for other high value-added activities. As the nation's industrial developer, JTC will continue to take the lead in driving innovation, sustainability and construction productivity as it pioneers more future-ready industrial developments to support and catalyse the growth of industries and enterprises in Singapore.