

Diversified Businesses



Waste to Energy for a Greener World

We are a leader in the technology of converting biomass materials such as bio-grease and agricultural waste into renewable energy, initially as substitutes for fossil fuels. We are now producing advanced biofuels that will help to create a greener world.



Diversified Businesses

Through the diversified businesses we operate, we are offering innovative green solutions and contributing to the global effort to decarbonise our world. Although 2021 was a year filled with challenges and high commodity prices, our businesses continued to perform at a satisfactory level. We are now set to launch new projects, using our own patented technologies, and to carry out upgrades to our existing facilities that will contribute to our profit growth in the years ahead.



Our HVO plant in Zhangjiagang, Jiangsu province, which has expanded its daily production capacity to 1,000 tonnes, offering a higher value product mix.

New Renewable Energies

As biomass could be one of the key solutions for attaining carbon neutrality, we grouped all our businesses that make use of biomass as feedstock into a single platform, and gave it a new identity – EcoCeres, Inc (EcoCeres). All our related patented technologies and R&D capabilities will be

transferred to the new platform.

In the past year, we raised US\$108 million in investor capital for this new platform in a Series A fundraising. More rounds of fundraising are planned to finance its rapid commercial development.

We have proprietary technologies to convert waste-based bio-grease, such as used cooking oil or palm

oil mill effluent (POME), into hydro-treated vegetable oil (HVO). Our plant in Jiangsu province has been going through a period of transformation with the introduction of better catalysts, enhanced production capacity and a higher value product mix. During the year, EcoCeres produced 185,000 tonnes of HVO, all of



Cellulosic ethanol, a clean fuel in high demand in European markets, is expected to begin trial production in the second half of 2022 at our plant in Cangzhou, Hebei province.

which was exported to Europe where it is used as an advanced biofuel, with a 90 per cent reduction in greenhouse gas emissions. In 2021 we completed the upgrade of our Jiangsu plant, which expanded production capacity by 40 per cent to 1,000 tonnes per day. We also gave our plant a new capability for converting some of the HVO that is produced into sustainable aviation fuel (SAF). Given the proven technologies and processes that go into our HVO project, we are now exploring other possible sites, such as in Southeast Asia, for a plant closer to feedstock sources for utilising the abundant POME waste there.

Another proprietary technology owned by EcoCeres makes use of agricultural waste (the inedible portion of harvested crops) as feedstock. This technology involves

decomposing agricultural waste into its basic components of hemicellulose, cellulose and lignin, which then become the precursors for the production of renewable products, including furfural and cellulosic ethanol, the latter of which is in high demand in European markets. Two pilot projects are under way in Hebei province. The project in Tangshan for producing furfural as the main product is currently in the trial production stage, while the one in Cangzhou is expected to enter trial production of cellulosic ethanol in the second half of 2022.

The successful production of cellulosic ethanol will probably make EcoCeres the only company in the world capable of producing the full spectrum of advanced biofuels from waste, namely HVO for diesel, SAF for jet fuel and cellulosic ethanol for gasoline,

using its proprietary technologies. EcoCeres' decarbonisation journey utilising biomass would not end with advanced biofuels, however, and could lead to the further development of block bio-chemicals and bio-materials that are much needed for a carbon neutral world.

The pioneering coalbed methane project in Shanxi province for producing liquefied natural gas (LNG) recorded excellent performance in 2021. Owing to much higher LNG prices during the year, this project has proved to be an outstanding investment, both in financial and environmental terms. We also reinforced our LNG production with the commissioning of a new coke oven gas-to-LNG plant in Ningxia Hui Autonomous Region. This plant will be a key supplier of clean fuel for road transport in the western region of the country.

Diversified Businesses

TGT joined Henderson Land Development Company Limited to provide a 5G mobile communication application service and augmented reality (AR) for an exciting new entertainment and shopping experience.

Our R&D efforts to produce high value-added carbon materials from coal pitch came closer to commercialisation during the year. The proprietary technology will set a platform for an advanced new materials business offering carbon fibre, thermal interface material, carbon paper and super-activated carbon for electric/new energy vehicles as well as energy storage industries.

Telecommunications

With solid infrastructure and resources, Towngas Telecommunications Company Limited (TGT), a wholly-owned subsidiary of the Group, provides services to Hong Kong, the Chinese mainland and international telecommunications service providers, operators and corporations. TGT today has world-class data centres across Hong Kong and the Chinese mainland, offering strong connectivity and advanced data services such as fog and cloud computing.



In 2021 TGT began expanding its Data Centre 2 in Hong Kong in order to satisfy the growing market demand for big data and 5G communications services. Moreover, TGT installed the “5G Sharing System” that will offer high speed, low latency and stable 5G mobile communication application service, as well as related applications for the convenience of customers in residential and commercial areas. In future, TGT will continue exploring additional growth opportunities and introducing new technologies such as smart home applications.

Information Technology

Our wholly-owned subsidiary, S-Tech Technology Holdings Limited (S-Tech), was established to provide our city-gas companies with information technology that supports customer service management. Currently, this business is engaged in cloud

software development, solutions implementation and systems integration services. With these services, our city-gas businesses are able to manage their advanced customer service and gas piping network systems more efficiently. The Towngas Customer Information System (TCIS) developed by S-Tech covers 93 per cent of the Group’s city-gas companies on the mainland. In 2021 the cloud and non-cloud based versions of TCIS3.0 were implemented in 154 city-gas companies, achieving 100 per cent availability.

Manufacturing

M-Tech Metering Solutions Company Limited (M-Tech) is a wholly-owned subsidiary of the Group that develops and markets smart gas meters. Many of these devices incorporate the latest developments in advanced technology, including Micro-Electro Mechanical Systems and

Narrowband Internet of Things (NB-IoT), to provide products with smart features that enhance customer safety and services, as well as wider measuring ranges. In 2021 M-Tech sold 460,000 residential NB-IoT meters, which was more than twice the number sold the year before. By integrating this product with an S-Tech platform, an SMS warning can be sent automatically to registered users' mobile phones. M-Tech also introduced an ultrasonic gas meter during the year to offer commercial and industrial customers a more accurate, sensitive and durable product.

Another wholly-owned subsidiary of the Group, G-Tech Piping System (Zhongshan) Company Limited (G-Tech), supplies high-quality polyethylene (PE) piping and

related ancillary products with the support of GH-Fusion Corporation Limited, a joint venture between Towngas and Fusion Group (United Kingdom) specialising in PE pipe fittings. Its two production sites, located in Zhongshan, Guangdong province and Maanshan, Anhui province, reached a total production capacity of 20,000 tonnes of pipes in 2021. Together with its two logistics centres, G-Tech offers quality products, high distribution efficiency and excellent customer service.

Civil and Building Services Engineering

Utilising its technical expertise and trenchless technologies, U-Tech Engineering Company Limited (U-Tech) provides its clients

with a comprehensive one-stop-shop service. In the second half of 2021, U-Tech won a number of large projects in Hong Kong from the Government and private sector based on the strength of its technical competence and competitive prices. The new projects include electrical installation and fire services contracts for two residential developments in the Kai Tak Development area and a three-year term contract for the Water Supplies Department. The latter project, which involves the rehabilitation of aging water mains on Hong Kong Island and the outlying islands, is one of the largest water works contracts ever secured by U-Tech. At the end of 2021, U-Tech had contracts amounting to over HK\$1 billion.



Utilising its advanced polyethylene pipe jointing technology, U-Tech is building 1.9km submarine sewage outfall at Sha Tau Kok for the Drainage Services Department.