


# NEW ENERGY AND DIVERSIFIED BUSINESSES

## Moving Forward







Cutting-edge technology  
enables us to use  
**coke oven gas** as feedstock  
for the production of LNG

Our plant in Inner Mongolia  
paves the way to upgrade  
methanol into **high-value**  
fuel products

**G-Tech**, which provides  
PE pipe system solutions, is  
now fully operational

## NEW ENERGY AND DIVERSIFIED BUSINESSES

It has been another dynamic year for our new energy business. We continued to develop our liquefied natural gas (LNG) value chain, advanced our capability to upgrade methanol into clean and high-value gasoline-type chemical products, and embarked on a new project to transform plant fatty-acids into green diesel-type products. As we focus on “Expanding New Horizons”, we are primed to move ahead and build the next chapter in the story of our growth.

### New ECO Energy

Since the company was founded as a wholly-owned subsidiary of the Group in 2000, ECO Environmental Investments Limited (ECO) has been playing a key role in our business expansion to become a new energy pioneer. A trailblazer in the field of new energy and committed to protecting the environment, ECO drives innovation in new technologies and environmentally-friendly energy businesses by focusing on fuel products that are low in emissions and pollutions. With a rich breadth of chemical processing knowledge and depth of engineering experience, we have refined our business portfolio and are ready to swiftly capture market demand.

In the fast-paced world of new energy, we remain focused on finding ways to turn low-grade resources and waste into high-grade products. Our Research and Development (R&D) Centre continues to develop innovative technologies for the production of clean

fuels and chemicals, which include converting coke oven gas into methane, cooling methane into LNG, converting coal to methanol, upgrading methanol to clean gasoline-type chemical products and transforming plant fatty-acids into green diesel-type chemical products.



Road tankers transport liquefied coalbed methane from our plant in Jincheng, Shanxi province.





Our clean coal-based methanol plant in Inner Mongolia is fully operational with an annual capacity of 240,000 tonnes.

Furthermore, research into the gasification of unwanted agricultural waste into sought-after fuels and chemicals is on-going. As our R&D and project implementation capabilities have evolved, we believe that encouraging economic benefits resulting from innovation lie ahead.

Meanwhile, our ECO Aviation Fuel Facility, which was opened in 2010 in Hong Kong, enjoyed another year of smooth operations providing aircraft fuel to Hong Kong International Airport. This specialised facility, which is capable of storing up to 264,000 cubic metres of aviation fuel, handled 5.56 million tonnes of fuel in 2013.

Following the gradual strain on global petroleum resources and associated price increases, mainland China is proactively developing alternative substitutes to meet its growing demand for energy and to reduce its reliance on imported crude oil. This has been reflected in the country's Twelfth Five-Year Plan to enhance environmental protection and drive consumption towards clean energy.

One way to achieve this is through the use of unconventional resources such as coalbed methane, a natural gas equivalent that exists in coal seams. After extraction, the gas can be processed through cryogenic liquefaction technology, reducing the gas to 1/625th of its original

volume. The resulting liquefied coalbed methane (LCBM) therefore has a higher energy density and is easily transportable. LCBM has a wide range of applications: it can be used as vehicular fuel, for industrial products, and to meet peak periods of demand for city-gas.

Our pioneering LCBM plant in Shanxi province has an annual production capacity of 250 million cubic metres. The facility has been operating smoothly, and we are currently exploring additional expansion opportunities. Our current efforts focus on the Qinshui Basin in southern Shanxi province, a region with some of the most abundant reserves of coalbed methane in China.



ECO gas filling stations in mainland China provide heavy-duty vehicles with a cleaner and more economical fuel.

Our LNG initiative accelerated this year as we began to utilise another unconventional gas resource – coke oven gas. Coke oven gas is a by-product of the coke making industry. The gas is rich in hydrogen and carbon monoxide, which can be synthesised into methane and further refrigerated into LNG. We will soon launch two facilities in Jiangsu and Shanxi provinces respectively that will greatly enhance our supply capability when the plants are operational in 2015.

On the demand side, we have 25 vehicular fuel stations in operation, under planning or construction on the mainland. Operations are continuing to run smoothly. The stations provide clean LNG and compressed natural gas primarily to commercial vehicles including taxis and heavy-duty trucks. In line with the mainland Government's initiative to deal with issues on air pollution, we will maintain our momentum to develop more stations in the future.

Another exciting venture is our coal-based methanol plant in Inner Mongolia, which employs clean coal technology to generate syngas before it is further synthesised into methanol, an excellent feedstock for additional chemical upgrading. The plant is now fully operational. Annual production in 2013 reached 240,000 tonnes, 20 per cent higher than originally planned. To further enhance our production capacity, we will look into de-bottlenecking current processes. Moreover, we began constructing an add-on methanol upgrading process to turn methanol into high-value gasoline-type chemicals, for which there is superb market potential.

After years of consistently strengthening our R&D capabilities, in 2014, we will start to upgrade plant fatty-acids, including palm acid oil and used cooking oil, into green diesel-type chemical products in Jiangsu province. This patented process is particularly significant as it was developed in-house. The planned capacity for phase one is to turn 150,000 tonnes of feedstock into 120,000 tonnes of clean fuel products.

### Telecommunications

Towngas Telecommunications Limited (Towngas Telecom) is strongly positioned to capitalise on the boom in cloud computing and rapid digitalisation of our workplace. The ability to lay fibre optic infrastructure inside gas pipes or alongside newly-constructed gas networks provides us with an unparalleled competitive advantage in terms of cost and speed of deployment. Consequently, the move towards cloud computing and the cost efficiencies of contracting out data centres and data management has been an area of rapid growth for the Company.

Large corporations, service providers and telecommunications carriers rely on us for our well-developed infrastructure facilities to host a number of cloud computing applications. To support our operations, we open the second data centre, with a floor area of 22,000 square metres in the Tseung Kwan O Industrial Estate, in 2014.

In mainland China, to meet the increasing demands of the IT industry, Towngas Telecom is currently establishing world-class data centre clusters in the provinces of Guangdong, Liaoning and Heilongjiang. Together with the existing data centres in Hong Kong and Shandong province, we are primed to capture the data storage, processing and transmission businesses between Hong Kong and mainland China. Given the continued trend towards outsourcing hosting and telecommunication services, we believe this will be a lively area of potential growth as the market is expected to expand exponentially.

### Civil and Building Services Engineering

U-Tech Engineering Company Limited (U-Tech) enjoyed another excellent year providing consultancy services and working on utilities

installation, infrastructure and building services projects for public and private organisations in Hong Kong and Macau.

During the year, we completed the electrical installation at a new residential complex of 2,500 flats in Yuen Long. Another electrical installation project covering 2,000 flats across phases two and three of a residential development in Lok Wo Sha, Shatin also made good progress. Furthermore, we

participated in the construction of infrastructure for the Kai Tak Development Area and also began laying a 2 kilometre-long main water pipe in Tai Po, due to be finished at the end of 2016.

These projects, once completed, will continue to enhance our reputation as a leading one-stop utility contractor for gas, water, drainage, sewerage, telecommunications and building services projects in Hong Kong.



M-Tech's new generation of gas meter uses Micro-Electro-Mechanical Systems technology to measure mass flow and is now in production at the manufacturing plant in Longgang, Guangdong province.



G-Tech's manufacturing plant in Zhongshan was fully operational in 2013.

## Manufacturing Facilities

As part of our commitment to maintaining the highest standards of safety across the supply chain, we design and manufacture polyethylene (PE) fittings and jointing parts for both gas and water systems. This year, G-Tech Piping System (Zhongshan) Company Limited, our wholly-owned subsidiary, began to supply piped gas operators with quality PE pipes manufactured under a stringent quality control system. We also established logistics hubs and regional warehouses in Jiangsu and Liaoning provinces to support the expansion of the business and

supply to our customers across a diverse geographical network. The business has been supported by GH-Fusion Corporation Limited, our joint venture with the British Fusion Group, which develops additional PE fittings to more comprehensively serve the mainland China gas market.

Advancing this approach, M-TECH Metering Solutions Company Limited (M-Tech) has developed and offered new smart metering solutions that have been well received in the market. In the past year, over 60 of our mainland ventures have purchased the Micro-Electro-Mechanical Systems

meters, the first of its kind in the gas metering industry, and we have also been granted a licence to produce industrial meters. These smart meters can help reduce unaccounted gas losses due to ambient temperature and pressure fluctuations. M-Tech will also release a new series of products to replace the traditional diaphragm meters currently used by small commercial businesses. At the same time, we are actively looking into entering the European market and preparing for the launch of our new residential meters to capture the vast markets in mainland China and abroad.



## New Energy and Other Projects in 2013

	Year of Establishment	Project Investment Rmb M	Registered Capital Rmb M	Equity Share %
<b>NEW ENERGY PROJECTS</b>				
<b>Coal Mining</b>				
Jiangxi Fengcheng	2008	1,100	236	25 %
Inner Mongolia Erdos Xiaoyugou	2009	447	120	70.1 %
Inner Mongolia Erdos Kejian	2011	450	150	100 %
<b>Coal-based Chemical</b>				
Jiangxi Fengcheng	2009	1,250	350	40 %
Inner Mongolia Erdos	2009	1,170	400	70.1 %
<b>CNG/LNG Filling Stations</b>				
Shaanxi Xianyang	2008	12	12	100 %
Shaanxi Huitai	2010	54	27	100 %
Anhui Maanshan	2006	15	11	30 %
Shanxi Yuanping	2008	40	20	42 %
Dalian DETA	2010	40	20	49 %
Shandong Chiping	2010	30	15	70 %
Shandong Jining	2010	30	15	51 %
Shandong Dongping	2010	43	26	91 %
Henan Xinmi	2010	29	15	100 %
Shandong Jiaxiang	2012	50	28	70 %
Henan Anyang	2012	29	14	100 %
Shanxi Lingshi	2013	25	20	75 %
Guangdong Guangzhou	2013	26	13	100 %
Henan Kaifeng	2013	29	15	100 %
Henan Linzhou	2013	30	20	100 %
<b>Upstream Projects</b>				
Shanxi LCBM	2006	600	200	70 %
Jilin Tianyuan	2007	140	5	50 %
LCMM Project	2010	520	180	50 %
<b>Coal Logistic Project</b>				
Shandong Jining Jiaxianggang Logistic Port	2011	540	180	55 %

## TELECOMMUNICATION PROJECTS

Shandong Jinan	2008	80	40	90.1 %
Shandong Jinan Chibo	2009	170	68	65.5 %
Liaoning Dalian DETA	2010	14	10	49 %
Dalian Yida	2011	190	76	90 %
Shandong Laiyang	2011	14	10	90 %
Xuzhou Fengxian	2011	11	8	100 %
Xuzhou Peixian	2013	13	9	100 %
Harbin	2013	158	63	80 %
Dongguan	2013	240	80	60 %

## OTHER PROJECTS

Shenyang Sanquan Construction Supervisory	2011	4	3	60 %
M-Tech	2011	30	30	100 %
GH-Fusion	2002	87	43	50 %
Towngas Technology	2011	30	21	90.1 %
Suzhou Industrial Park Broad Energy Services	2012	170	71	25 %
G-Tech	2013	27	13.5	100 %
GH Yixing Ecology	2013	184	184	100 %

	Year of Establishment	Project Investment USD M	Registered Capital USD	Equity Share %
<b>OILFIELD PROJECT</b>				
Phetchabun Province in Thailand	2012	181	12,000	100 %