



## MAINLAND UTILITY BUSINESSES

# Green

Total gas sales increased to a record-high of about 19,500 million cubic metres, an increase of 14 per cent over the previous year, while customer accounts exceeded 25 million, an increase of over 2 million.

Nearly 30,000 residential combi boilers and around 20,000 residential gas clothes dryers, a new appliance in this market, were sold during the year.



# City Gas

+ Good progress was made on the plant construction of our Hua Yan Water pilot project to convert food waste into gas and solid fuel. It is targeted for commissioning by the end of 2018.

+ The Mia Cucina kitchen cabinet brand expanded to include our Total Kitchen Solution, which offers a complete portfolio of kitchen equipment to complement the cabinets sold to property developers and individual home owners.

# MAINLAND UTILITY BUSINESSES

In the improved economic environment of 2017, we aggressively pursued opportunities to expand our city-gas and related businesses on the mainland. This has not only helped us to secure continued growth in this market but will also contribute to the Chinese government's vision of creating a greener China.



Foshan Gas Group Co., Ltd, an associate of Towngas China, was listed on the Shenzhen Stock Exchange in November 2017.

## City-gas Operations

During the year, we had 131 city-gas projects in 23 provinces, autonomous regions and municipalities in mainland China. The number of customers served during this period amounted to 25.38 million, an increase of over 2 million from the previous year.

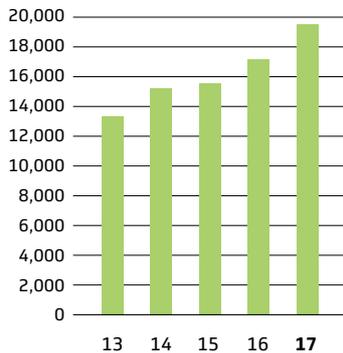
In 2017, the economy of mainland China rebounded to achieve a GDP growth rate of 6.9 per cent, which was 0.2 per cent higher than the year before and 0.4 per cent above the government's target for the year. This, together with the recovery of the renminbi and rise in commodity and oil prices, had a positive impact on our city-gas business.

The growth of our city-gas business has in large part been due to the Chinese government's policy, outlined in its Thirteenth Five-Year Plan, to reduce carbon intensity by 40 to 45 per cent from a 2005 baseline by the year 2020, with a 60 per cent ceiling by 2030. At the First Plenary Session of the Nineteenth Congress in October 2017, the government gave further support to environmental protection by pledging to accelerate the development of energy-saving, emission reduction,

waste-to-energy and recycling industries, which aligns well with the Group's gas business strategy.

This is to be achieved by replacing coal with cleaner fuels such as natural gas. In recent years, the amount of natural gas consumed on the mainland has grown substantially and is projected to continue rising. In 2017, total gas consumption was 237 billion cubic metres. By 2020, it is estimated to reach 360 billion cubic metres and, by 2030, up to 480 billion cubic metres.

## China Joint Ventures Gas Sales (million m<sup>3</sup>)



The Chinese government's strong directive to switch to natural gas led to gas sales of about 19,500 million cubic metres in total volume for our city-gas projects during the year, an increase of 14 per cent over 2016.

During the year, we took the further step of exploring new gas applications by promoting distributed energy systems, which deliver higher energy efficiency and will also contribute to the country's efforts to reduce its reliance on coal-fired power. These distributed energy systems include gas-fired power generators coupled with district cooling and heating networks. Generators using gas are environmentally-friendly, lower emitting and far more efficient than coal (80 per cent vs 60 per cent thermal efficiency).

In 2017, we established Towngas Energy Investment (Shenzhen) Company for managing our distributed energy system and central heating projects. Seven

direct investment projects started during the year, initially in regions of the east, north, and northeast China.

We launched strategic marketing campaigns targeted at commercial customers, particularly the restaurant industry, to encourage the switch to piped gas from bottled liquefied petroleum gas, a move that not only significantly reduces fuel costs but also enhances safety. In addition, we promoted the use of gas-powered hot water systems in the commercial market, including hotels, schools and fitness centres, across the country. During the year, we acquired 18,000 new commercial customers, accounting for 580 million cubic metres of annual gas volume.

We also see enormous potential in the residential market for cost-efficient gas furnaces and space heaters, which are common in areas of the country with cold winters. The growing popularity of gas clothes dryers, especially among China's affluent new middle class, together with the continuing trend towards urbanisation, should lead to a steady growth in average gas consumption per household.

As a company with a long history in Hong Kong, we are transferring our culture to the joint venture companies we partner with. In these collaborative partnerships, we take responsibility for managing project designs, materials and technology as well

as our own consolidated purchasing system to ensure better bargaining power with suppliers in terms of cost and quality. We have been building on our experience, systems, efficiency and customer service, as well as our reputation for safety, quality, and professionalism, for the past two decades in mainland China. With the Chinese government's determination to clean its air, water and soil, we are well positioned to become a green Hong Kong-based company in Greater China in the years ahead.

## Midstream Facilities

We continued to look for opportunities in the midstream natural gas business in 2017. By investing in long-haul pipelines, natural gas imports and gas storage in strategic locations, we hope to secure sufficient supplies of natural gas for our city-gas projects, particularly during peak winter months when gas consumption is high.

In early 2018, we invested in a liquefied natural gas (LNG) receiving terminal and supporting pier project at Huanghua port, Cangzhou, Hebei province. The project will be developed in phases to construct four LNG storage tanks and an uploading pier. It is expected to become a major channel to import LNG into Hebei province after completion, thus offering a new gas source for the province.

To improve air quality, we encouraged the use of natural gas boilers for central heating.



We also made significant progress building new underground gas storage facilities at Jintan in Jiangsu province. These facilities, which were converted from salt caverns, have a total storage capacity of approximately 440 million standard cubic metres. Construction of phase one of this project was completed in January 2018, with a capacity of approximately 140 million standard cubic metres. Phase two of the construction, commencing in the first quarter of 2018, will be to develop a storage capacity of approximately 300 million standard cubic metres. Once in full operation, the project will increase the Group's gas storage capabilities and enable us to enter the gas trading business in future.

## Water Supply and Wastewater Operation

Since 2005, we have been engaged in the water supply and waste water treatment business through our subsidiary, Hong Kong & China Water Limited (Hua Yan Water). As of the end of 2017, this business had invested in or was managing six projects on the mainland, including city water supply, domestic sewage and industrial wastewater treatment projects. These included water supply joint ventures in Suzhou,

Jiangsu province and Wuhu, Anhui province, as well as wholly-owned water supply projects in Zhengpugang Xin Qu, Maanshan and in Jiangbei Xin Qu, Wuhu, both in Anhui province.

Hua Yan Water also operated an integrated water supply and wastewater treatment joint venture project, along with an integrated wastewater treatment joint venture project, for an international electronics firm in Suzhou Industrial Park in Jiangsu province.

During the review period, Hua Yan Water sold 467 million tonnes of water, an increase of 3 per cent over 2016. The Company as of the year end had more than 1.2 million customers.

Taking advantage of its experience in sewage treatment, Hua Yan Water in 2016 branched out into the bio-waste treatment business with a plant that is currently under

construction in Suzhou Industrial Park. This plant, which is another example of our commitment to environmental conservation, will convert food waste to make gas and organic fertiliser using Swedish technology and our own expertise in waste water treatment – the first venture of its kind for the Group. With its commissioning in the fourth quarter of 2018, the plant will be capable of handling 500 tonnes of food waste, green waste and landfill leachate a day for conversion into natural gas, oil products, solid fuel and fertilisers. After this trial project is successfully commissioned, we can extend this model into cities beyond Suzhou, since food waste has become an increasingly serious problem in the country. We are also looking into treating organic landscaping waste and expanding into incinerators and other garbage treatment facilities through Hua Yan Water.

All of these new ventures offer tremendous scope for the Group's business expansion as the Chinese government is eager to convert bio-waste into reusable fuel or materials in line with its commitment to promote green industries.

### Extended Service Businesses

For more than 25 million customers on the mainland, we provide a selection of high quality, contemporary products, ranging from home gas appliances to kitchen furnishings, as well as services such as gas-related insurance policies, convenient payment methods and customer service centres.

### Trusted products

We help fulfil the aspirations of China's rising middle class for a better life with safe, reliable, high quality residential gas appliances under our well-recognised Bauhinia brand. These products include gas stoves, clothes dryers, water heaters and space heating systems. In 2017, we sold 750,000 appliances, accumulating sales of more than 5 million units since the launch of the brand.

In response to the growing demand for more upmarket household products, we launched the Mia Cucina line of cabinets in 2016, as part of our Total Kitchen Solution concept first introduced in Hong Kong. These products



As a result of extensive marketing efforts, our residential gas clothes dryer has become widely accepted in the mainland market.

have been well received by property developers, who signed contracts for more than 2,000 Mia Cucina packages in 2017.

Also in 2017, we had 36 customer centres featuring cabinet displays in various cities as a test of the retail market. These centres serve as a showcase for our cabinets, so that property developers, architects and other customers can experience the concept and quality behind these products directly. Thanks to the importance we place on style, premium materials and quality control, the Mia Cucina brand has won a loyal following on the mainland.

To increase sales of residential combi boilers, we equipped them with a smart temperature control system that enables customers

not only to save energy but to learn about the safety features of space heating systems via the internet.

### Convenient services

Our digital service arm, Towngas Lifestyle, is a one-stop e-commerce platform that provides customers with a wide selection of high quality lifestyle services and products. In addition to over 3,000 types of kitchenware and related merchandise, the platform offers pollution-free cooking ingredients from all over the world as well as seasonal healthy food and user-friendly cooking recipes. To meet the market demand for healthy food, we are also planning to launch a meal delivery service in Suzhou as a pilot programme in collaboration with reliable restaurants.

To build customer loyalty, we launched the Towngas Card as part of our exclusive Towngas Membership Scheme during the year. Our members not only can enjoy various benefits such as health services and lucky draws but also redeem points for special events and featured products. During the year, the number of members reached nearly 1 million.

We continued to offer household gas insurance protection to our residential customers in partnership with China Ping An Property & Casualty Insurance and Huatai Property Insurance. Currently, this business is available through our city-gas projects across 65 cities and has accumulated total premiums of RMB45 million. Aside from household gas insurance, we also launched a comprehensive gas insurance plan for more than 1,000 industrial and commercial customers.

### Marketing promotions

To promote our gas clothes dryers, we make use of online channels, including geolocation advertising on WeChat groups. Additionally, we launched a free clothes drying service at local districts in selected sales markets to change consumer habits and ultimately increase the sales of our products.

We also organise Bauhinia's National Cooking Competition for children every year, a brand-building activity based on the idea of contributing to the community. In 2017, our volunteers brought the finalists and their families to visit children in remote mountain areas and distribute care packages to their families.

### Customer Service

During the review period, we expanded our service and sales network to 255 customer centres across 84 mainland cities, all in convenient, easily-accessible locations.

In serving our more than 25 million customers each year, our employees make over 100 million contacts with them through inquiries, appliance sales and installation, maintenance and hotline calls. Our goal is to leave a positive impression in every customer encounter by providing service that is above the market norm.

Although we have made a great effort to set a high standard of service on the mainland, we believe that we can always improve. During the year, we partnered with a consultancy firm to launch a nationwide customer satisfaction survey to identify areas for improvement. The results of the survey showed that we scored 93 per cent in terms of service excellence – the highest level of customer satisfaction as compared with local water, electricity, transportation and other public utilities. The results of our mystery customer survey also improved by another 5 per cent over the previous year, confirming that we have made a steady improvement in our service standards.

During the year, we upgraded our online service platform, the Virtual Customer Centre (VCC), and included Ganghua Pay, our own transaction platform for online payments. The VCC, which is widely accessible through websites, social media and mobile apps, allows our city-gas companies to offer greater online convenience to their customers. During the year, a total of 33 city-gas projects joined the platform and launched promotion campaigns that reached 6 million users. Our VCC platform was named as China's Top 10



Towngas Lifestyle, our e-commerce platform, offers a wide range of lifestyle services and products.

We conduct continuous and systematic inspections to ensure customer safety.



Hybrid Cloud User 2017 by the Open Source Cloud Alliance for Industry.

We also improved service standards among our customer service staff through our Three Courtesies service campaign. Forty frontline staff were recognised as ambassadors for practising these Courtesies – etiquette, politeness and care – in their daily interactions with customers. To promote these concepts among all employees, we launched a series of internal activities such as workshops, stories sharing and a video contest.

After-sales service is another important aspect of our service culture that has made the Bauhinia brand so well-trusted among consumers. All Bauhinia products come with a three-year warranty and comprehensive after-sales

services. To improve the service skills of our after-sales team, every year we organise a nationwide competition to motivate our staff to upgrade their skills.

### Safety

One of the main reasons we enjoy such an exemplary reputation on the mainland is our relentless focus on safety and efforts to raise safety standards in the gas industry. Taking a proactive approach to enhance safety levels, we conducted ongoing and systematic safety inspections of our mainland business locations. For example, in 2017, comprehensive safety visits were organised in northeast and north China in September and November, respectively. What's more, we conduct regular safety and risk audits every two years

and the assessment list of safety practices covered more than 800 items. In 2017, we evaluated the performance of 55 joint venture companies, with satisfactory results.

Another key approach to safety is to carry out regular safety inspections (RSI). We introduced RSI in Hong Kong in the 1990s and later brought the concept to mainland China when we began operating there. It has since become a policy for all mainland city-gas companies to conduct RSIs, and every gas user is required to have an inspection every 12 to 24 months.

As we believe in constantly improving safety, we offer comprehensive training to employees across our mainland operations. We have also developed a wide range of training materials, with information on laws and regulations, occupational safety and other practical topics, and established an e-learning platform for all joint venture companies. In 2017, we conducted an online safety quiz that attracted the participation of around 16,000 employees and increased their safety knowledge.

During the year, our safety initiatives achieved significant improvements, as demonstrated by our safety figures in which, for example, the Group's number of serious gas-related incidents fell by 30 per cent.

# 2017

## Utility Businesses in Mainland China

### Towngas Piped City-Gas Projects

#### GUANGDONG PROVINCE

	Year of Establishment	Project Investment Rmb M	Registered Capital Rmb M	Equity Share %
Panyu	1994	260	105	80%
Zhongshan	1995	240	96	70%
Dongyong	1998	178	75	82.6%
Shenzhen	2004	–	2,214	26.46%
Chaoan	2007	185	99	90%
Chaozhou Raoping	2011	189	106	60%

#### CENTRAL CHINA

Wuhan	2003	1,000	420	49%
Xinmi	2009	205	85	100%

#### EASTERN CHINA

Yixing	2001	246	124	80%
Taizhou	2002	200	83	65%
Zhangjiagang	2003	200	100	50%
Wujiang	2003	150	60	80%
Xuzhou	2004	245	125	80%
Suining	2009	155	67	100%
Fengxian	2009	60	31	100%
Peixian	2015	300	100	100%
Danyang	2004	150	60	80%
Jintan	2006	150	60	60%
Tongling	2006	240	100	70%
Suzhou Industrial Park	2001	600	200	55%
Changzhou	2003	248	166	50%
Nanjing	2003	1,200	700	49%
Fengcheng	2007	206	88	55%
Pingxiang	2009	297	105	100%
Jiangxi	2009	52	26	56%
Zhangshu	2009	86	34	100%
Yonganzhou	2010	100	68	93.9%
Hangzhou	2013	2,988	1,195	24%

#### SHANDONG PROVINCE

Jinan East	2003	610	470	49%
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#### NORTHERN CHINA

Jilin	2005	247	100	63%
Beijing Economic-technological Development Area	2005	111	44	49%
Hebei Jingxian	2011	186	79	81%

#### NORTHWESTERN CHINA

Xi'an	2006	1,668	1,000	49%
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#### HAINAN PROVINCE

Qionghai	2008	110	50	49%
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### Midstream Projects

Guangdong LNG	2004	8,595	2,578	3%
Anhui NG	2005	–	336	20.61%
Hebei NG	2005	2,760	920	43%
Jilin NG	2007	360	220	49%
Henan NG	2012	125	60	49%
Jintan NG	2013	180	100	64%
Huanghua Port LNG	2017	90	90	20%

### LNG Refilling Station

	Year of Establishment	Project Investment Rmb M	Registered Capital Rmb M	Equity Share %
Nanjing (Marine)	2014	600	217	32.95%

### Water Projects

Wujiang	2005	2,450	860	80%
Suzhou Industrial Park	2005	4,705	1,597	50%
Wuhu	2005	1,000	400	75%
Suzhou Industrial Park (Industrial Wastewater Treatment)	2011	550	185	49%
Maanshan	2013	607	213	100%
Jiangbei	2013	1,049	374	100%
Suzhou Industrial Park (Food Waste Processing and Utilisation)	2016	220	75	55%

### Towngas China Piped City-Gas Projects

#### GUANGDONG PROVINCE

Foshan  
Shaoguan  
Qingyuan  
Yangdong  
Fengxi

#### EASTERN CHINA

Nanjing Gaochun  
Dafeng  
Tongshan  
Hubei Zhongxiang  
Maanshan  
Bowang  
Zhengpugang Xin Qu  
Modern Industrial Zone  
Wuhu Fanchang  
Wuhu Jiangbei  
Anqing  
Chizhou  
Tunxi  
Huangshan  
Huizhou

Tongxiang  
Huzhou  
Yuhang  
Songyang  
Changjiu  
Fuzhou  
Jiujiang  
Wuning  
Xiushui  
Yifeng  
Changting

#### SHANDONG PROVINCE

Jimo  
Laoshan  
Zibo  
Zibo Lubo  
Longkou  
Jinan West  
Weifang  
Weihai  
Taian  
Chiping

Linqu  
Laiyang  
Zhaoyuan  
Pingyin  
Feicheng  
Boxing Economic  
Development Zone  
Yangxin  
Wulian

#### HUNAN PROVINCE

Miluo

#### NORTHEASTERN CHINA

Benxi  
Chaoyang  
Tieling  
Fuxin  
Shenyang Coastal  
Economic Zone  
Yingkou  
Dalian Changxingdao

Dalian Economic  
and Technical  
Development Zone  
Anshan  
Lvshun  
Kazuo  
Beipiao  
Wafangdian  
Xinqiu  
Jianping  
Changchun  
Gongzhuling  
Siping  
Qiqihar

#### HEBEI PROVINCE

Qinhuangdao  
Yanshan  
Cangxian  
Mengcun  
Shijiazhuang  
Baoding

#### INNER MONGOLIA

Baotou

#### SOUTHWESTERN CHINA

Ziyang  
Weiyuan  
Pengxi  
Lezhi  
Pingchang  
Dayi  
Yuechi  
Cangxi  
Chengdu  
Zhongjiang  
Jianyang  
Pengshan  
Mianyang  
Xinjin  
Xindu  
Mianzhu  
Jiajiang  
Qijiang  
Guilin  
Zhongwei (Fusui)  
Xingyi  
Luliang

### Midstream Projects

Xuancheng NG  
Taian Taigang  
Inner Mongolia NG

### CNG Refilling Stations

Qiqihar (Lianfu)  
Qiqihar (Xingqixiang)

### Other Projects

Zhuojia Public Engineering  
Sichuan Distributed Energy Systems  
Shenyang Economic and Technical  
Development Zone Distributed  
Energy System



**HONG KONG  
GAS BUSINESS**

# Quality

Our first combined heat and power system using landfill gas in Hong Kong is now in operation at the Alice Ho Miu Ling Nethersole Hospital in Tai Po – an award-winning breakthrough in clean energy for social good.



# Living

+

Our Mia Cucina high-end Total Kitchen Solution is growing in popularity, with more than 5,300 units sold in 2017, a 27 per cent increase in sales from the previous year.

+

The Towngas Cooking Centre celebrated its 40th anniversary of delivering exceptional experiences in flame cooking.

# HONG KONG GAS BUSINESS

For more than 150 years, Towngas has brought the people of Hong Kong a safe, dependable and clean source of energy, while providing innovative products that make life more comfortable and convenient. Our insistence on quality products and service has earned us the loyalty and trust of our customers and will continue to underpin our success in the years to come.

## Residential and Commercial Activities

During the year, our customer base further increased by 23,993 accounts to reach a total of 1,883,407. Total volume of gas sales was 29,049 million MJ, an increase of 0.8 per cent compared with the previous year.

To meet increasing operation and manpower costs, we adjusted the standard gas tariff upward by HK1.1 cents per MJ which, including the standard tariff and fuel cost adjustment, amounted to an actual increase equivalent to 4.3 per cent. We also pledged to keep the basic tariff unchanged for the next two years.

The year 2017 saw a brighter economic picture in Hong Kong, with GDP growth reaching 3.8 per cent as compared with 2.0 per cent in 2016. The booming stock and property markets as well as an increase in inbound tourist numbers helped to stimulate local spending, which benefited our



Ocean Park's new Water World project will use direct-gas fired absorption chillers to supply hot and cold water for indoor cooling and heating.

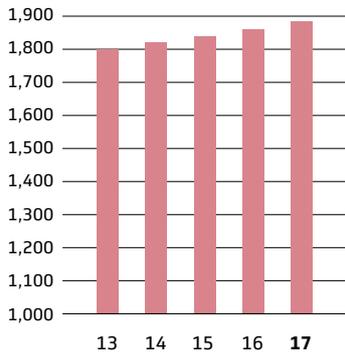
commercial clients and contributed to a positive growth in our sales of 2.6 per cent during the year.

Our commercial customers continued to look to us for cost-effective, environmentally-responsible energy solutions. Hong Kong's two theme parks

are currently using town gas in a wide range of applications, such as gas absorption chillers and dehumidification units, in place of their previous electricity-powered systems. In addition, we will be supplying gas to Ocean Park's new Water World and hotel for use in water heating as well as climate

## Number of Customers

Company (Thousand)



control in the park's swimming pools and water carnival features.

Another major customer acquired during the year was Vogue Laundry, one of the leading commercial laundry companies in Hong Kong. When this customer moved to a new plant in Yuen Long, we provided the gas for its expanded production lines to power the four 12-tonne boilers that generate the high-pressure steam used in its washing machines, dryers and pressing

machines. Also in Yuen Long, we helped a well-established soy sauce factory, Koon Chun, to convert its diesel steam boilers to town gas.

Our first combined heat and power system in Hong Kong, which runs on treated landfill gas from the North East New Territories landfill site, operated smoothly during the year at the Alice Ho Miu Ling Nethersole Hospital in Tai Po. The system generates power while simultaneously making use of waste heat to maximise energy efficiency by up to 85 per cent, thus helping our client to save fuel costs and lower carbon emissions. Moreover, we commissioned the new landfill gas treatment plant at the South East New Territories (SENT) landfill site in November 2017, creating new potential for renewable energy by our business customers in the area.

The hotel and restaurant trades represent a significant share of our

commercial sales. During the year, we continued to support various activities that promoted the development of the industry and cemented our relationships with these clients. In September, we sponsored an exclusive event, the Master Chefs Flame-cooking Demonstrations, during the 2017 World Master Chefs Competition for Cantonese Cuisine held in Hong Kong. This event attracted the participation of over 100 teams from 40 countries and regions.

Our residential business benefited from the thriving property market and our concerted marketing efforts during the year. In 2017, we sold a total of over 275,000 appliances.

As part of the Total Kitchen Solution we offer to customers, we launched a line of kitchen cabinets under the Mia Cucina brand in 2013. Made of Italian and other premium European materials and accessories, these cabinets are



We produced a new TV commercial highlighting the unique designs and special functions of the Mia Cucina products.



At the Towngas Cooking Centre's 40th Anniversary Celebration, Towngas was the title sponsor of the popular Ahistoric Grandpa Cooking Show.

highly competitive against comparable brands in the market and come with lifelong after-sales service, a competitive edge unique to Towngas. In 2017, we added kitchen white goods such as refrigerators and microwaves to the brand. These kitchen packages have been very well-received by both retail consumers and property developers, who ordered more than 5,300 units during the year. Today, roughly 30 per cent of new residential units in Hong Kong are installed with Mia Cucina kitchen cabinets, which are well-regarded for the quality and value they offer.

To add a new dimension in flame cooking, we collaborated with Sanrio to launch Hong Kong's first Hello Kitty kitchen appliance: the TGC X HELLO KITTY built-in

hob. We also introduced a wide range of Hello Kitty-inspired kitchenware, such as a clay pot, tamagoyaki fry pan and wok, to bring consumers a complete and delightful cooking experience. The launch of this popular product range received widespread media attention, and sales results have been encouraging.

What's more, we introduced a mini stovetop oven designed especially for flame cooking. The stovetop oven combines grill-steam-bake functions in an all-in-one compact appliance that does not need extra counter space. Launched during Home Delights Expo, it won the Creativity Award 2017 of the Hong Kong Brand Corporate Association.

To provide customers with a better bathing experience in less space, we brought a new

generation of small-sized temperature-modulated 11L gas water heaters to market under the SIMPA brand. We also developed our own superslim temperature-modulated gas water heater that can fit into almost any small-size flat in Hong Kong.

Since 1977, Towngas Cooking Centre has been a resource for people to learn about the advantages of flame cooking through content-rich courses taught by expert chefs. In celebration of the 40th Anniversary of the Towngas Cooking Centre, in 2017 we staged a series of promotions that included a TV programme – The Ahistoric Grandpa Cooking Show – hosted by a popular Chinese cuisine master, Lee Ka Ding. Mr Lee was also invited to run cooking classes as the grand finale of the celebration activities. In addition, we enriched the Disciples Escoffier Professional Diploma with a pastry course, which is currently being held in our new and expanded Cooking Centre.

## Customer Service

As a utility company offering services essential to daily life, we understand that meeting customer expectations is a key driver of our business. Throughout the year, we were honoured to receive nearly 6,000 written complimentary letters from customers as a testimony to our caring, high quality services and products.

## 2017 Results of Towngas Service Pledge



### reliability

Uninterrupted gas supply (over 99.99%)  
**99.991%**

3 days prior notification in case of supply interruption on account of maintenance or engineering work  
**100%**

Restoration of gas supply within 12 hours  
**100%**



### safety

Emergency Team average arrival time (within 25 minutes)  
**Average 22.57 minutes**



### appointments

Availability of maintenance and installation services within 2 working days  
**Average 1.11 days**



### service quality

Efficiency\*  
**8.91**

Courteous and friendly attitude\*  
**8.87**



### speed and convenience

Customer Service Hotline (calls answered within 4 rings)  
**94.98%**

Connect or disconnect gas supply within one working day  
**100%**  
(upon customer's request)

Deposit refunded at Customer Centres 2 hours after disconnection of gas supply (upon customer's request)  
**100%**



### handling suggestions

Reply within 3 working days  
**100%**

Resolution, or a statement of when the matter will be resolved, within 2 weeks  
**100%**

\* The results were based on surveys conducted by an independent research company. Our target is to exceed a score of 8 out of 10.

One of the hallmarks of Towngas service is the high safety level we offer. In addition to on-call maintenance services, we conduct regular safety inspections every 18 months to ensure these gas systems and appliances are safe and defect-free for our customers.

During the year, we also revamped our corporate website and online service platform to provide greater convenience as well as mobility for customers. To promote our paperless online services, we



The launch of the limited edition TGC X HELLO KITTY built-in hob brought the first-ever Hello Kitty themed kitchen appliance to Hong Kong.

The revamp of our corporate website and eService platform improved the user experience and increased eService usage.



### Number of Customers per km of Mains Company



rewarded newly-registered eBilling customers who successfully applied to pay their gas bills via bank autopay with a one-off HK\$50 gas charge rebate. We also offered monthly lucky draws for prizes of HK\$1,000 in gas charge rebates under this promotion.

In recognition of our commitment to service excellence, we received the Sing Tao Service Awards – After Sales Services for the ninth consecutive year, *East Week's*

Hong Kong Service Awards – Public Utilities for the seventh consecutive year, and the Hong Kong Call Centre Association's Gold Award of Mystery Caller Assessment (Phone-in) for the third year running. This year, we obtained the Hong Kong Top Service Brand Award jointly organised by The Hong Kong Brand Development Council and The Chinese Manufacturers' Association of Hong Kong, which further reinforced our reputation for service excellence.

### Gas Infrastructure

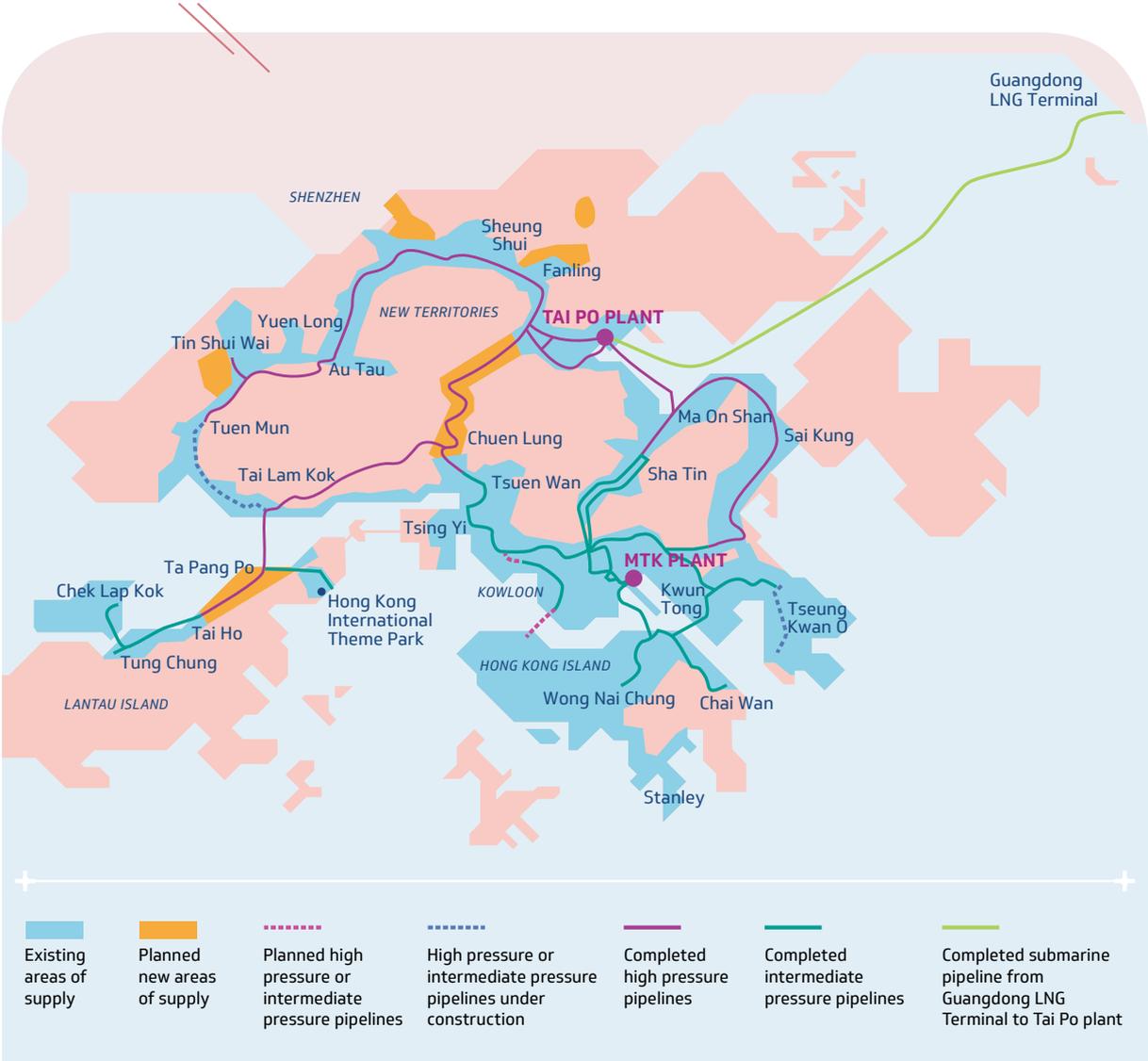
We are committed to long-term investment in the extension of our pipeline network in order to keep up with infrastructure development and meet Hong Kong's energy demands. These include the more than 15 kilometres of pipeline planned for the third runway at Hong Kong International Airport,

where more catering businesses are expected in the passenger terminal expansion.

Additionally, we will be significantly expanding our network coverage to reach the approximately 400,000 housing units in the New Territories that will be available for occupancy in phases throughout the next ten years. During the year under review, we continued to make progress on the network design for the residential developments in Fanling North, Kwu Tung North, Hung Shui Kiu and Tung Chung East.

To further enhance supply security, we made satisfactory progress linking up the supply network between Tuen Mun and Tsuen Wan and reinforcing the supply to major commercial and industrial customers in Tai Po and Yuen Long Industrial Estates, as well as the two theme parks in Hong Kong.

### Towngas Network in Hong Kong



In November 2017, we brought the SENT Landfill Gas Utilisation Project in Tseung Kwan O on stream. It is currently the largest landfill gas treatment facility of its kind in Asia. The landfill gas we collect will be converted into synthetic natural gas at the facility, then transported to the

offtake station in Tseng Lan Shue through a 12 km pipeline and integrated into the gas supply network.

Despite the low leakage rate of our gas pipeline network, we continued to seek ways to identify very minor cases of seepage, even those undetectable by

sophisticated equipment. For example, we employ highly sensitive sniffer dogs to pinpoint leaks at busy traffic locations and other challenging environments. This enables us to locate leakage points quickly and accelerate the repair process, while reducing the extent of road digging and disturbances to the public.



**NEW ENERGY  
AND DIVERSIFIED  
BUSINESSES**

# Energy

+

ECO has five projects in the construction phase for converting low-value feedstock into clean fuel and chemical products.

+

ECO constructed a new plant in Zhangjiagang, Jiangsu province, for converting inedible grease feedstock into high-value bio-diesel fuel.



# Innovation

+

ECO is planning to launch a pilot project for converting agricultural waste into furfural and paper pulp, underlining our commitment to green technology and sustainability.

+

We made great progress in developing advanced carbon materials for high performance batteries and super-capacitors that will help to revolutionise the transport industry.

# NEW ENERGY AND DIVERSIFIED BUSINESSES

ECO Environmental Investments Limited (ECO) operates a wide range of environmentally-friendly energy businesses across the mainland as well as liquefied petroleum gas (LPG) refilling stations, landfill gas projects and an aviation fuel storage facility in Hong Kong. These initiatives are helping us to fulfil our vision of a greener, low-carbon future.



A pilot project plant was established by ECO in Zhangjiagang, Jiangsu province to upgrade waste grease into hydro-treated vegetable oil (HVO) for use as bio-diesel.

## New ECO Energy

ECO was established in 2000 as the Group's platform for new energy projects. Since its founding, ECO has earned a strong reputation for innovative research and the development of alternative energy, such as turning low-grade waste materials into high-value energy products.

Currently, ECO has a product portfolio encompassing clean fuels including liquefied natural gas

(LNG) and methanol, with more high-value, environmentally-friendly fuel, chemical and material products soon to be added. By building a diverse energy portfolio based on low-value feedstock, ECO is helping mainland China meet its future energy requirements while simultaneously addressing environmental concerns.

In 2017, ECO delivered better performance than the previous year in an operating environment that was much more favourable

for our businesses. In Hong Kong, our aviation fuel and landfill gas businesses remained steady. On the mainland, we were set to bring two new projects online. One of these is a hydro-treated vegetable oil (HVO) facility – our first plant dedicated to renewable fuel production – in Zhangjiagang, Jiangsu province. This plant commenced trial production in November 2017. The other project is an ethylene glycol facility in Ordos, Inner Mongolia Autonomous Region. Construction work of this

facility was completed for the pilot production in the first quarter of 2018.

### ***Research & Development***

Our goal at ECO is to create business opportunities through the technological solutions we develop, with the ultimate aim of becoming a green industry leader. Going beyond fuels such as LNG and diesel substitutes, we have begun research on green chemicals and materials that will help to redefine our business in years to come.

New energy vehicles are being championed in many countries across the world, particularly in mainland China, to combat air pollution. The success of these vehicles, however, will depend on achieving a breakthrough in battery technology. At ECO, we have developed a patented technology for transforming coal tar oil into high-performance carbon materials, such as activated carbon with high specific surface area and graphitised anode material with high specific power-storage. High-performance activated carbon is an essential material in the production of super-capacitors, while high-grade anode material will be critical for making a breakthrough in battery technology. Both types of materials are currently being tested in preparation for commercial use.

Additionally, the carbon materials can readily be adapted for producing high-strength, light-weight carbon fibre suitable for carbon fibre reinforced polymer, which has wide applications in products such as car bodies and airliner fuselages as it is more pressure-resistant and less prone to vibration.

### ***Aviation Fuel***

Our aviation fuel business went into operation in 2002. ECO's aviation fuel facility supplies fuel for aircraft at Hong Kong International Airport from eight storage tanks, with a gross capacity of 264,000 cubic metres. Now a major logistics base for aviation fuel in Hong Kong, it is one of the largest airport based aviation fuel storage facilities in the world, with a 2017 turnover of about 6.55 million tonnes.

### ***Vehicular Fuel and Logistics Projects***

ECO has been operating LPG refilling stations in Hong Kong since 2000. Today, we have five designated stations providing taxis and minibuses in Hong Kong with 24-hour gas refilling services. Annual gas sales amount to over 60,000 tonnes, or about 30 per cent of the transportation LPG market in Hong Kong. In 2017, revenue from this business reached over HK\$350 million.

On the mainland, ECO has over 50 strategically-located natural gas refilling stations that form an extensive network in Shaanxi, Inner Mongolia, Ningxia, Shandong, Shanxi, Jiangsu, Henan, Hebei, etc. We are proactively developing the network in anticipation of the growth in gas-powered heavy truck fleets across the country.

### ***Coalbed Methane and Coke Oven Gas***

As LNG is in short supply in mainland China, one of our key strategies on the mainland is to develop a reliable supply of this fuel by converting various types of feedstock, including coalbed methane (CBM) and coke oven gas, into new form of clean energy.

Our plant in Shanxi province, where there is an abundant supply of CBM, is operated in partnership with the Shanxi Jincheng Anthracite Mining Group. Using the latest cryogenic technology, we convert coalbed methane into LNG (LCBM). The plant is currently the largest CBM liquefaction plant in mainland China with an annual production capacity of 250 million cubic metres. During the year, the LCBM operation achieved a remarkable profit growth due to the much higher market price of LNG.



Construction of the ethylene glycol facility in Ordos, Inner Mongolia Autonomous Region, was completed in 2017.

At another facility for producing LNG from coke oven gas, our new plant in Xuzhou, Jiangsu province is expected to start trial production in the first half of 2018 with a designed annual production capacity of 60,000 tonnes.

### **Clean Coal Chemicals**

We operate a methanol plant in Inner Mongolia Autonomous Region that makes use of clean coal technology to generate syngas, which is then processed into methanol. At present, this plant has a production capacity of more than 1,000 tonnes of methanol a day.

In 2017, we launched another project at this methanol plant to convert 40 per cent of the coal-based syngas we produce into

ethylene glycol, a high-value chemical product in great demand for the manufacture of polyester fibres and antifreeze formulations. With an annual designed capacity of 120,000 tonnes, this project is expected to start trial production in the first quarter of 2018. Once in operation, it will mark a significant step forward in our efforts to transform the coal chemical plant into a downstream value-adding facility for turning coal feedstock into environmentally-friendly chemical products.

### **Agricultural Waste**

China is one of the world's most productive agricultural countries, particularly in rice, wheat and corn. However, these crops also produce vast amounts of

agricultural waste after each harvest, which until recently was mostly burned off, causing significant amounts of pollution to be emitted into the atmosphere.

At ECO, our research and development team has developed technologies to decompose agricultural and forestry waste into hemicellulose, cellulose and lignin. The hemicellulose is converted to furfural, a chemical commodity much needed in mainland China, while the cellulose can be marketed as paper pulp or further upgraded into clean fuel additives such as levulinic acid. We are planning to launch a trial project in a region abundant in straw, a common agricultural waste.

### **Waste Grease Oil**

At a pilot project plant in Zhangjiagang, Jiangsu province, we are upgrading inedible grease feedstock into HVO for use as bio-diesel fuel, which is in particularly high demand in Europe as well as other potential markets around the world. This ISCC (International Sustainability and Carbon Certification) certified plant is currently in the trial production stage. Commercial production at this plant, which has a design capacity of 120,000 tonnes of feedstock per year, is expected to begin in 2018.

## Telecommunications

Towngas Telecommunications Company Limited (TGT) is in the business of providing connectivity as well as data centre and cloud computing services to meet customer demand for colocation, server hosting and other value-added services. The Company today operates networked data centres that can accommodate up to 16,000 server racks. We also work closely with our national network partners to lay a foundation for the development of the big data industry, cloud computing and related value-added services.

In 2017, we added TGT Beijing Data Centre 1 to our operations, bringing our portfolio up to a total of seven data centres in Hong Kong and mainland China. We also

formed a strategic partnership with a mainland gas company to start operating a new joint venture, Shenzhen Internet Exchange Co., Ltd., which focuses on the construction and operation of city networks.

A new product introduced in 2017, GOEZ!, provides all-in-one cloud services for SMEs and the catering industry, allowing them to enjoy convenient and reliable business support with our high speed internet.

In August 2017, TGT carried out an 1,800-metre fibre-optic network project inside our submarine gas pipeline running from Quarry Bay to Cha Kwo Ling. Using our proprietary technology, the project team installed fibre-optic cable into the submarine gas pipeline, inside a separate

protective polyethylene (PE) pipe. Combined with its existing telecom infrastructure, TGT now owns two cross-harbour submarine fibre-optic paths, which form a ring fibre-optic network that provides highly reliable transmission quality for customers.

TGT received numerous international awards and recognitions during the year, including a China IDC Industry Green Data Centre Award at the 11th China IDC Industry Annual Ceremony. Additionally, TGT Dongguan Data Centre 1 received LEED Gold, ISO9001, ISO20000-1, ISO27001 and GB/T 29490-2013 certifications.

With the coming of the new era in 5G wireless networks, big data and the Internet of Things, the demand for data with low latency will continue to grow rapidly around the world. In Hong Kong and mainland China, TGT is paving the way for this new business environment by developing an advanced fibre-optic network and maximising usage of our networked data centres and cloud platform, which will enable us to capitalise on business opportunities in this market.



Our coke oven gas plant in Xuzhou, Jiangsu province will commence trial production in the first half of 2018.

## Information Technology

The information technology needs of our customers are met by S-Tech Technology Holdings Limited (S-Tech), a wholly-owned subsidiary of the Group. Its principal businesses include software development, solution implementation and systems integration to satisfy the needs of city-gas businesses for advanced and diversified customer service and piping network management.

S-Tech's Towngas Customer Information Systems are provided to 78 per cent of the Group's city-gas joint ventures on the mainland, half of which are now using the latest cloud version to reduce operational costs as well as to shorten development cycles. By the end of 2017, the systems were serving over

12 million customers. To help save management costs and improve service quality, S-Tech offers several mobility applications for meter reading, Regular Safety Inspection and maintenance services.

S-Tech has also invested in the development of a Geographic Information System and Artificial Intelligent Call Centre System, which further enhance operational safety and service efficiency. In addition, the Company has diversified into Fintech by providing a payment gateway – Ganghua Pay – for utility management, as well as customised software and cloud services for the financial sector.

In 2017, S-Tech was awarded a Grade III Certificate by the Ministry of Public Security for the Graded Protection of State Information

Security of TCIS. In addition to serving the Group's system and software needs, S-Tech is also geared to provide these services in partnership with TGT to external clients.

## Civil and Building Services Engineering

U-Tech Engineering Company Limited (U-Tech), a wholly-owned subsidiary of the Group, provides consultancy and engineering contractor services in Hong Kong and Macau. It specialises in utilities installation, infrastructure construction, trenchless technologies, and civil and building services engineering for public and private projects.

For U-Tech, 2017 was another productive year. Among the year's highlights, it successfully completed several landmark projects, including the supply and installation of electrical works for the Double Cove Summit residential development at Wu Kai Sha and its first footbridge elevator installation project at Tin Shui Wai. In addition, U-Tech broadened its client base and secured several new contracts during the year. These included its first contract with the Housing Authority for detecting underground utilities over a two-year term, the first supply



TGT Beijing Data Centre 1 started operating in 2017.



Two G-Tech production facilities, in Maanshan, Anhui province and Zhongshan, Guangdong province, respectively, are currently providing high-quality PE pipes to city-gas operators.

and installation of electrical works with CITIC Limited for the residential development at Lok Wo Sha Lane, the first 3-year term contract with the Water Supplies Department for Lantau and Outlying Islands, and the installation of air-conditioning for a commercial development at Middle Road. Another contract will see the Company taking on the

civil construction work for the emergency rescue site at Shek Kong for the Express Rail Link of the MTR Corporation.

In recognition of its high quality and safety standards, U-Tech received the Safety Performance Award – Construction from the Occupational Safety and Health Council for the fourth consecutive year. With the gradual expansion of its business, U-Tech is set to become a major civil utility and building service contractor in the years ahead.

### Manufacturing

Our subsidiary, M-Tech Metering Solutions Company Limited (M-Tech), develops and markets proprietary smart gas meter solutions, which are based primarily on Micro-Electro-Mechanical Systems (MEMS) technology, for greater accuracy under various temperature and pressure conditions.

In 2017, M-Tech developed and launched an advanced small-scale commercial meter with MEMS technology to provide more options for gas users. This meter incorporates a Near Field Communication (NFC) payment capability as well as smart metering functions for the compilation of tier tariffs on the mainland. It allows tariff

prepayments, tier tariff settings and gas consumption records to avoid conflicts in the event of a tariff adjustment. The meter also has several gas safety functions, such as regular safety inspection alerts, excess flow cut-off and external interference alarms. Committed to customer satisfaction, M-Tech continues to develop smart meters based on our own technology for residential applications. These have proven especially popular in the European market, where customers are increasingly turning to smart meters.

G-Tech Piping System (Zhongshan) Company Limited (G-Tech) is in the business of manufacturing high-quality PE pipes, with support from a UK joint venture – GH-Fusion Corporation Limited – that specialises in PE fittings. In addition to its original extrusion plant in Zhongshan, Guangzhou province, G-Tech has built a second production site in Maanshan, Anhui province, doubling its output capacity.

Both M-Tech and G-Tech will be expanding their product range and markets, both within mainland China as well as overseas, to capture the rapidly-growing natural gas market worldwide and opportunities arising from the drive towards smart metering.

# 2017

## New Energy and Other Projects

	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 Ordos Kejian	2011	681	486	100%
<b>COAL-BASED CHEMICALS</b>				
Jiangxi Fengcheng	2009	1,250	350	40%
Inner Mongolia Ordos	2009	1,620	1,017	100%
<b>CNG/LNG REFILLING STATIONS</b>				
Shaanxi Xianyang	2008	12	12	100%
Shaanxi Huitai	2010	54	27	100%
Shaanxi Lueyang	2014	21	13	100%
Shaanxi Fengxiang	2014	30	15	100%
Shaanxi Shenmu	2015	60	38	100%
Shaanxi Baoji	2015	29	14	100%
Shaanxi Zhouzhi	2016	14	10	100%
Shaanxi Weinan Gushi	2016	21	14	100%
Shaanxi Weinan Tianshi	2016	15	11	100%
Shaanxi Hancheng	2016	46	41	90%
Shanxi Yuanping	2008	40	20	42%
Shanxi Lingshi	2013	25	20	75%
Shanxi Xinzhou	2016	30	15	100%
Shandong Chiping	2010	30	15	100%
Shandong Jining	2010	11	8	100%
Shandong Dongping	2010	43	26	91%
Shandong Jiayang	2012	50	28	70%
Shandong Weishan	2014	58	29	100%
Shandong Shanxian	2014	28	14	100%
Shandong Linqing	2014	22	13	100%
Shandong Heze	2015	23	13	90%
Hebei Shijiazhuang	2014	65	31	100%
Xingtai (Gangxing)	2014	20	17	80%
Xingtai (Xinghua)	2016	24	23	80%
Henan Xinmi	2010	29	15	100%
Henan Anyang	2012	29	14	100%
Henan Kaifeng	2013	29	15	100%
Henan Linzhou	2013	30	20	100%
Henan Nanyang	2015	14	10	100%
Henan Luoyang Yanshi	2016	15	10	100%
Henan Wuyang	2017		15	85%
Inner Mongolia Huhhot	2014	28	14	90%
Inner Mongolia Wulatezhong Qi	2015	11	8	100%
Inner Mongolia Xiuzhumuqin Qi	2015	30	15	100%
Inner Mongolia Chifeng	2015	30	15	100%
Inner Mongolia Chaha'eryouyiqian Qi	2015	30	15	100%
Inner Mongolia Xilingol	2016	30	15	100%
Inner Mongolia Ulanqab Huade	2016	29	14	100%
Inner Mongolia Ulanqab Chahar	2016	15	11	100%
Inner Mongolia Bayannur Uradqian Qi	2016	15	7	100%
Inner Mongolia Bayannur Linhe	2016	14	10	90%
Inner Mongolia Bayannur Hanggin	2016	13	10	90%
Ningxia Guangwuxian	2015	15	11	100%
Ningxia Qingtongxia	2015	21	15	100%
Ningxia Jinyintan	2015	28	14	100%
Ningxia Zhongwei	2016	18	12	100%

	Year of Establishment	Project Investment Rmb M	Registered Capital Rmb M	Equity Share %
<b>New Energy Projects</b>				
<b>CNG/LNG REFILLING STATIONS</b>				
Ningxia Zhongwei Haixing Development Zone	2016	30	15	100%
Jiangsu Xuzhou	2015	40	20	80%
Anhui Maanshan	2006	15	11	30%
Jiangxi Pengze	2015	45	30	70%
Guangdong Guangzhou	2013	26	13	100%
<b>UPSTREAM PROJECTS</b>				
Shanxi LCBM	2006	600	200	70%
Jilin Tianyuan	2007	140	5	50%
Xuzhou COG	2014	450	150	80%
Heze COG	2014	450	150	90%
<b>COAL LOGISTIC PROJECT</b>				
Shandong Jining Jiaxianggang Logistic Port	2011	540	180	88%
<b>BIOMASS</b>				
Zhangjiagang	2014	610	271	100%
Hubei Xingzhou	2017	170	134	100%
<b>Oilfield Project</b>				
Phetchabun Province in Thailand	2012	USD 181M	USD 12,000	100%
<b>Telecommunication Projects</b>				
Shandong Jinan	2008	80	40	90.1%
Shandong Jinan Chibo	2009	504	168	81.4%
Shandong Laiyang	2011	14	USD 1.6M	90%
Xuzhou Fengxian	2011	11	8	100%
Xuzhou Peixian	2012	13	9	100%
Liaoning Dalian DETA	2010	14	10	49%
Dalian Yida	2011	190	76	90%
Harbin	2013	158	63	80%
Beijing Zhongjing	2014	14	10	49%
Beijing Chibo	2014	14	10	98.14%
Dongguan	2013	240	80	60%
Shenzhen (Qianhai)	2014	59	30	100%
Shenzhen (Interlink Connectivity)	2015	100	40	30%
<b>Other Projects</b>				
Shenyang Sanquan Construction Supervisory	2011	4	3	60%
ECO Engineering Management (Xi'an)	2014	13	9	100%
Suzhou Industrial Park Broad Energy Services	2012	170	71	25%
GH Yixing Ecology	2013	184	184	100%
Dalian (New Energy Technology)	2015	USD 4.75M	USD 4.75M	55%
M-Tech	2011	60	30	100%
GH-Fusion	2001	87	43	50%
G-Tech	2012	77.5	31	100%
Towngas Technology	2011	30	21	100%
S-Tech (Zhuhai)	2014	14	10	100%
ECO Engineering Management (Shenzhen)	2014	30	15	100%
Towngas Life Style	2015	7	5	100%
Towngas Payment Technology (Shenzhen)	2015	50	28	100%
Hong Kong & China Gas International Energy Trading	2016	125	50	100%
Mia Cucina Kitchen Cabinets (Shenzhen)	2017	125	50	100%
Inner Mongolia Ordos Carbon Material	2017	640	240	100%



**CORPORATE  
SOCIAL  
RESPONSIBILITY**

# Caring

Our third landfill gas initiative, the South East New Territories (SENT) landfill gas treatment plant, was commissioned; it is expected to reduce annual carbon emissions by around 56,000 tonnes.

Towngas launched its first Green Bond to finance green projects, such as the SENT landfill gas project and waste conversion projects in mainland China.



# Community



We launched the Chef Anchor cooking programme, Hong Kong's first procedural learning method through cooking, to help alleviate Mild Cognitive Impairment (MCI) symptoms.



Our Gas Craft Apprentice Training Scheme, the first gas training scheme in Hong Kong, celebrated its 50th anniversary.

# CORPORATE SOCIAL RESPONSIBILITY

Our businesses touch the lives of millions of people in communities across Hong Kong and mainland China, as well as among our own staff. We acknowledge our obligations to these stakeholders with our commitment to safe, responsible and ethical behaviour at all times throughout our operations.

## Care and Conservation

Our unwavering commitment to environmental protection is reflected in the way we conduct our businesses. As an energy supplier, we strive to minimise our carbon footprints while developing clean energy for homes, businesses and vehicles, with the ultimate goal of creating a more sustainable future.

One of the highlights in our quest to become a green industry leader was the introduction of our first 10-year Green Bond in November 2017 through a HK\$600 million and a JPY2 billion transaction. We are the first energy utility to issue green bonds in Hong Kong. Proceeds from the Towngas Green Bond will be used to finance waste-to-energy initiatives, such as our landfill gas project at the SENT landfill site and other eligible green investments.

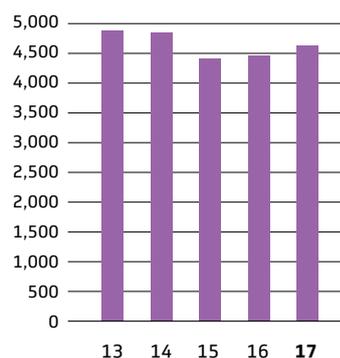
In line with mainland China's Thirteenth Five-Year Plan, we have been promoting coal-to-gas conversion to reduce coal

consumption. Our gas refilling stations and distributed energy projects also help meet the national goals of raising energy efficiency and reducing carbon emissions. To explore energy and resource alternatives, we have made a considerable effort in the research and development of new technology for converting waste into clean energy and useful chemical products.

In Hong Kong, we remained focused on developing renewable energy from waste. In November 2017, we made significant progress on our landfill gas initiative with the official commissioning of our

## Revenue per Employee

Company (HK\$ thousand)



In the Plantation Enrichment Project, 100 employees and customers joined in to plant tree seedlings at the Tiu Yue Yung Country Trail in Clearwater Bay.





third landfill gas utilisation project. Together with our landfill gas utilisation projects in Shuen Wan and the North East New Territories, the output of all three projects is expected to account for around 5 per cent of our total fuel mix. It is also projected to reduce carbon emissions by 87,600 tonnes annually, equivalent to the carbon absorption of 3.8 million planted trees per year.

The feedstock we use in Hong Kong, which includes a mix of natural gas, naphtha and landfill gas, is clean and has thus enabled us to reduce the carbon emissions per unit of town gas produced by over 20 per cent compared with 2005. In fact, in 2017 our greenhouse gas emissions were already below

1 per cent of all emissions in Hong Kong. Our plan is to further reduce our carbon footprint, with a 30 per cent target reduction in the carbon intensity of our Hong Kong gas production by the year 2020, as compared with 2005.

To improve the effectiveness of our environmental initiatives, public education is essential. In 2017, we have carried out a range of activities to share our environmental experience with stakeholders. These included promoting the concept of waste-to-energy through exhibition panels and a Virtual Reality game we designed for students, and introducing waste reduction and our utilisation of landfill gas at our renovated education centre at the SENT landfill site.

To help our customers reduce their carbon footprints, we collaborated with The Hong Kong Polytechnic University in a research project to develop practical cooking tips on reducing gas consumption and associated carbon emissions, as well as selecting healthy cooking methods and ingredients. We then promoted these tips through social media platforms and promotional leaflets, as well as a drawing competition for students.

We also continued to support the environmental efforts of green groups in the community. One of the initiatives we carried out during the year was the five-year Plantation Enrichment Project, managed by The Green Earth,

The Chef Anchor cooking programme, the first of its kind in Hong Kong, was designed to help elderly people alleviate the symptoms of MCI through a procedural learning method.



to increase biodiversity and the ecological value of country parks. To increase public awareness of nature conservation, we hosted a tree planting day for around 100 Towngas employees and customers at our planting site at Tiu Yue Yung Country Trail in Clear Water Bay.

For employees, we organise an annual carbon reduction competition in Hong Kong and mainland China. Since 2010, a total of 209 project submissions have been received in this competition, leading to a total annual reduction in carbon emissions of about 299,200 tonnes in our own operations.

In recognition of our environmental efforts, we have received the BOCHK Corporate Environmental Leadership Awards – Gold Award (Manufacturing section) for two consecutive years, as well as the Belt and Road Environmental Leadership Recognition Award 2016.

### Our Community Spirit

As a socially-responsible company, we firmly believe it is our obligation to give back to the communities in which we operate. Our Towngas Volunteer Service Team was established in 1999 to deliver a wide range of caring services. The staff members of this team have generously contributed their time and skills to help those in need. At the end of 2017, we had put in a total of 86,455 service hours on 282 community service projects in Hong Kong.

One of the major themes of our community service activities in Hong Kong is caring for the elderly. In 2017, we cooperated with Hong Kong Sheng Kung Hui Welfare Council to launch the Chef Anchor cooking programme. Designed by occupational therapists and Towngas Cooking Centre instructors, this programme offered cooking classes for elderly people suffering from MCI. Of the 90 participants in the first phase

of this programme, 90 per cent showed improvements in self-confidence, cooking skills and cognitive abilities. We will further expand the programme in local communities to include more beneficiaries in future.

To enable the elderly and patients suffering from dysphagia to enjoy mooncakes with their families, we joined St. James' Settlement to create Hong Kong's first Warming Mooncake series, developed by registered dietician and chef. The mooncakes were made in a way that allows patients to overcome difficulties in swallowing solid food, while retaining its original flavour. Warming Mooncakes were delivered to those in need and also made for charity sales. All proceeds went to St. James Settlement in support of their work and public education on dysphagia.

During the year, we received the Business for Social Good Award by Our Hong Kong Foundation in recognition of our landfill gas

utilisation project at Alice Ho Miu Ling Nethersole Hospital, which can create social and environmental benefits through profit-making businesses.

In mainland China, we continued to carry out a wide range of caring initiatives. These included the Gentle Breeze Movement programme for students from poverty-stricken families. In 2017, we rolled out the initiatives under the programme in Yangjiang, Guangdong province and Binzhou, Shandong province by donating teaching equipment and school supplies for more than 800 teachers and students. Since the launch of the Gentle Breeze Movement programme in 2013, we have donated RMB3.2 million to nearly 40 schools in provinces of Jiangxi, Anhui, Jiangsu, Shandong, Guizhou, Shaanxi, Liaoning, Sichuan, Guangdong and other provinces. The donations were used for refurbishing school buildings and constructing

Charity Libraries, as well as for buying uniforms, learning equipment, computers and other materials for improving the learning environment.

As an ongoing supporter of the Firefly Project run by the Shanghai Soong Ching Ling Foundation – BEA Charity Fund, we donated desks, chairs, computers and internet facilities for the 420 students of a primary school in Anqing, Anhui province.

## Human Resources

### *A Culture of Innovation and Quality*

Towngas recognises that maintaining a culture of innovation and quality is critical for helping the Group to prepare for future challenges, maintain its competitive position in the marketplace, and lay a foundation for its ongoing success. This approach has been embedded in our principle Growth = Innovation x Implementation (G=ixi),

which has stimulated many creative initiatives followed by practical solutions by our staff that continue to benefit our business.

During the year, we offered Innovation Series training workshops on topics such as multi-perspective thinking and leading change. We also encouraged employees to exchange ideas through social media platforms and internal forums. Our Managing Director's Award competition was especially popular this year, attracting over 100 creative proposals.

In 2017, we celebrated the 25th anniversary of our Superior Quality Service programme. With the enthusiastic participation of employees, the programme succeeded in generating a total of 1,486 projects for streamlining workflows and improving services. This programme has become integral to our quality culture, the cornerstone of our success



Rural school children in mainland China are benefiting from the teaching equipment we donate under the Towngas Gentle Breeze Movement programme.

over the years. Following our MasterCraft Award competitions in 2016, which focused on design and installation of gas system, in 2017 we promoted craftsmanship in our kitchen solution business as we believe that quality of installation is key to the success of this product line.

### Staff Development

We continued to build a competent talent pool that will enable us to keep pace with the growth of our businesses. During the year, we developed a set of career development schemes for providing staff with continuous professional learning as well as opportunities for vertical promotion and horizontal job rotation. One of the new programmes launched in 2017 was the two-year Network Supervisor Trainee Programme, which provided network technicians with technical and supervisory skills training as well as mentor guidance to prepare for future promotion.

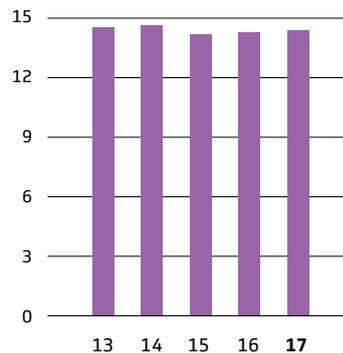
In addition, we initiated the Young Leadership Competence Accelerated programme designed to develop young talent as the future leaders of the Group. Twenty-three intakes from different businesses across geographical locations will participate in the two-year programme, which includes courses in mentorship,

management training by external institutes such as Tsing Hua University, and benchmarking visits to other companies.

Through the Towngas Engineering Academy, we have built up the technical competence and professionalism of Towngas employees throughout their careers with us. Towngas is the first and, until now, only gas company in mainland China to provide gas engineers with dedicated training schemes accredited by the Hong Kong Institution of Engineers (HKIE) and the UK based Institution of Gas Engineers and Managers (IGEM).

In Hong Kong, we worked with the Vocational Training Council (VTC) to launch the Diploma of Vocational Education in Gas Services Engineering – the first

### Town Gas Sales per Employee Company (million MJ)

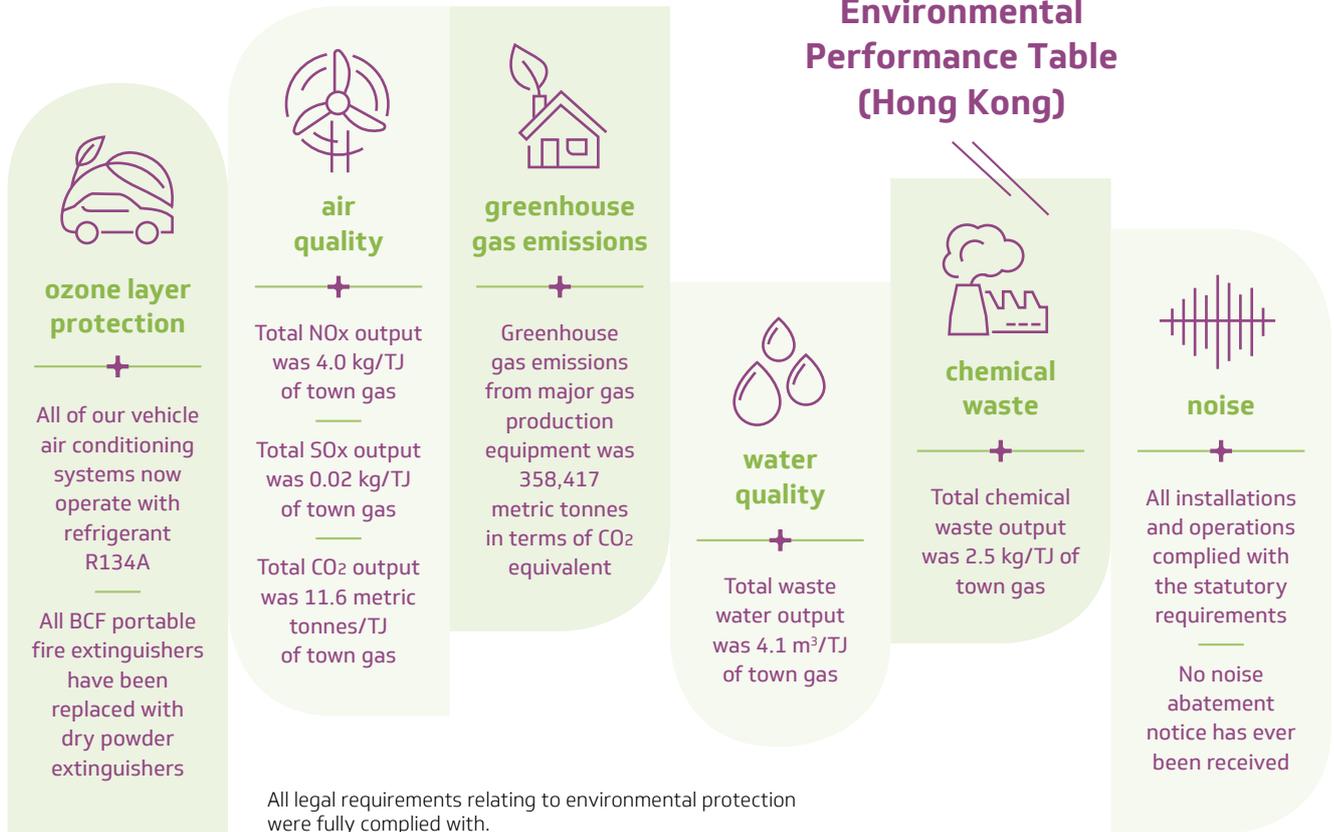


diploma programme in Hong Kong directly related to the gas industry – and the first batch of students graduated in 2017. We are now planning to roll out a Professional Diploma in Gas Engineering with VTC in 2018. This programme will pave the way for our employees and related trade practitioners to become professional engineers in the gas industry.



Avid young readers at a new Towngas China Charity Library, one of our caring initiatives in mainland China.

## 2017 Environmental Performance Table (Hong Kong)



Graduates of our Gas Apprentice Training Schemes are the backbone of our technical and management workforce, ensuring gas safety, efficient operations and the successful growth of the business. The year 2017 marked the 50th anniversary of the launch of the first scheme, the Gas Craft Apprentice Training Scheme. Following its success, two more training schemes, the Gas Technician Apprentice Training Scheme and Gas Network Fitter Training Scheme, were established in 1977 and 1982 respectively. Over 1,200 technical professionals have graduated from these three schemes so far.

In collaboration with the University of Technology in Sydney, Australia, we also offer a Master of Engineering Management degree, which is widely recognised in the engineering industry and the first of its kind in mainland China. Engineering staff participating in this 15-month programme, which integrates theoretical coursework and practical projects, will be able to earn a master’s degree and become eligible to apply for membership in IGEM. To date, seven postgraduates have become Member Managers under this programme.

### Supporting our Staff

We recognise the importance of providing an environment for our staff that is conducive to productivity and enables them to lead fulfilling lives both at work and at home. We also regularly review and upgrade staff benefits to accommodate changes in social conditions and keep up with market trends.

As an example of how we do this, at our headquarters building in Hong Kong we provide a library, fitness facilities and a clinic where staff can enjoy free medical services and medicines for the

We launched a sign language singing competition to promote inclusion in the workplace.



treatment of illness. We also have a Mother Care Room, which was doubled in size during the year, to give breastfeeding employees a clean and quiet space to prepare and store breast milk.

During the year, Towngas was named one of the HR Asia Best Companies to Work for in Asia 2017 by *HR Asia*, an authoritative HR publication in Asia. We also won the Friendly Employment Award under the Talent-Wise Employment Charter of the Labour and Welfare Bureau, recognising our commitment to employ people with disabilities.

### Supplier Relationships

Towngas not only encourages innovation in our own work but also among our suppliers, who are invited to come forward with ideas on how to effect improvements throughout the supply chain.

Issues covered can include raw materials selection, product design and packaging methods.

In 2017, we saw more suppliers in mainland China adopting the 6S methodology, a quality management approach that has helped them improve their performance by eliminating waste and optimising processes. Their feedback has been positive, and many successful cases show that the approach can lead to a safer, more efficient and effective workplace. The concept has since been expanded to include shop floor supervision among our suppliers.

Our Corporate Social Responsibility compliance audit was extended to cover the suppliers of our mainland businesses, and we are now carrying out a self-assessment survey and audits to ensure their compliance with our rules, regulations and laws.

### Occupational Health and Safety

Making sure our employees return home safely from work every day is our first priority at Towngas.

To ensure site works are carried out as safely as possible, we have developed innovative methods and tools that minimise the risk of injuries and occupational health illness to our employees and contractors. During road works, for example, we have a set of tools that include a self-assembled mechanical support arm to reduce the weight of a hydraulic breaker, an easy-to-control electronic trolley with hydraulic cylinders for lifting buckets, and a braking system to avoid tipping trolleys. We also have a pneumatic soil remover to reduce the harmful effect of repetitive actions in traditional soil removal work. The equipment is adjustable to fit the height of workers to ensure healthy posture.

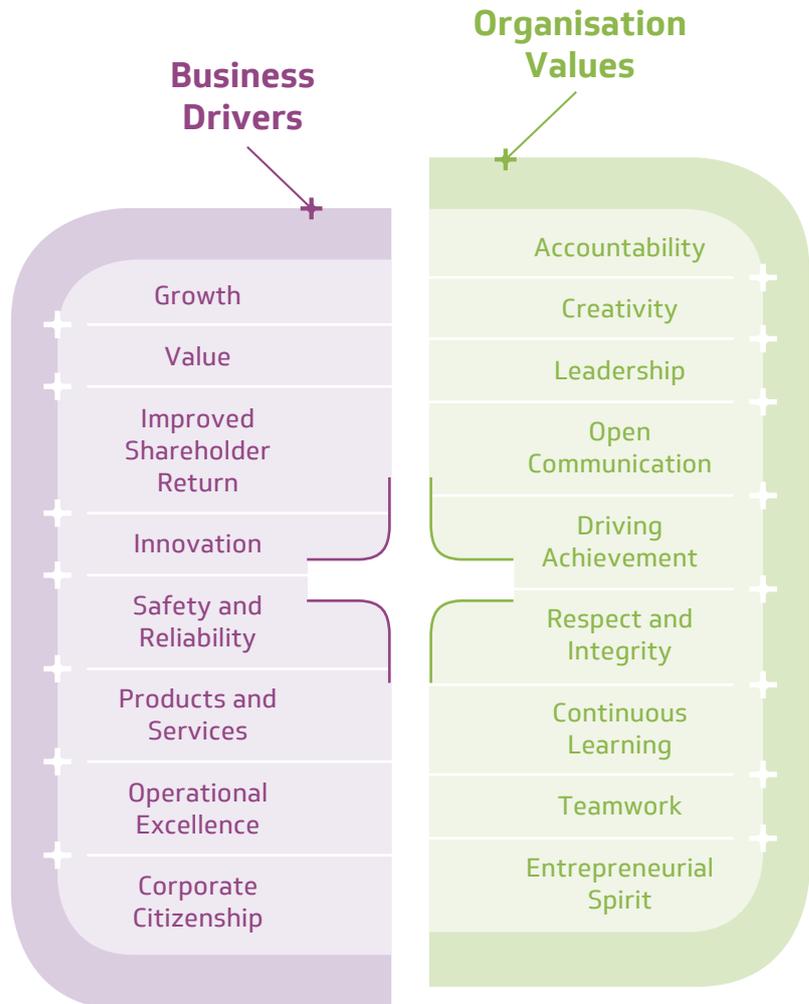
In late 2017, we organised Health, Safety and Environment (HSE) month and HSE day to promote safety among our staff and contractors. This activity featured experience sharing sessions and corporate visits as well as seminars on occupational safety and health, fire safety, security and environmental protection. We also carried out regular briefings and safety drills to prevent industrial accidents.

In recognition of our performance, we won numerous awards in Hong Kong during the year, including two Gold awards and one Silver award at the 16th Hong Kong Occupational Safety & Health Award, as well as one Excellence award at the Joyful@Healthy Workplace Best Practices Award.

### Driving Growth and Building Long-term Value

Since our business has a significant impact on communities and the environment, we believe it is essential to behave in a socially-responsible manner and to set the highest possible ethical standards for our staff, contractors and peers in the industry. This, we believe, is the foundation of our business and continuing success.

In order to fulfil our responsibilities, we are committed to living by our corporate values of quality, innovation, courtesy and environmental awareness.



In practice, this means working for the betterment of society, protecting the environment and ensuring a sustainable future for the next generation.

To achieve these aims, we introduced a new vision statement during the year: “To be Asia’s leading clean energy supplier and quality service provider, with a focus on innovation and environmental-friendliness.” The statement was widely promoted

within the Group as well as in our subsidiaries and joint ventures.

We also updated our management theme, which now calls on us to examine our past successes and to recognise how we can build on them for the future. This aligns with our long-term vision and reinforces our commitment to set the standard in the public utilities industry as a caring provider of clean energy.