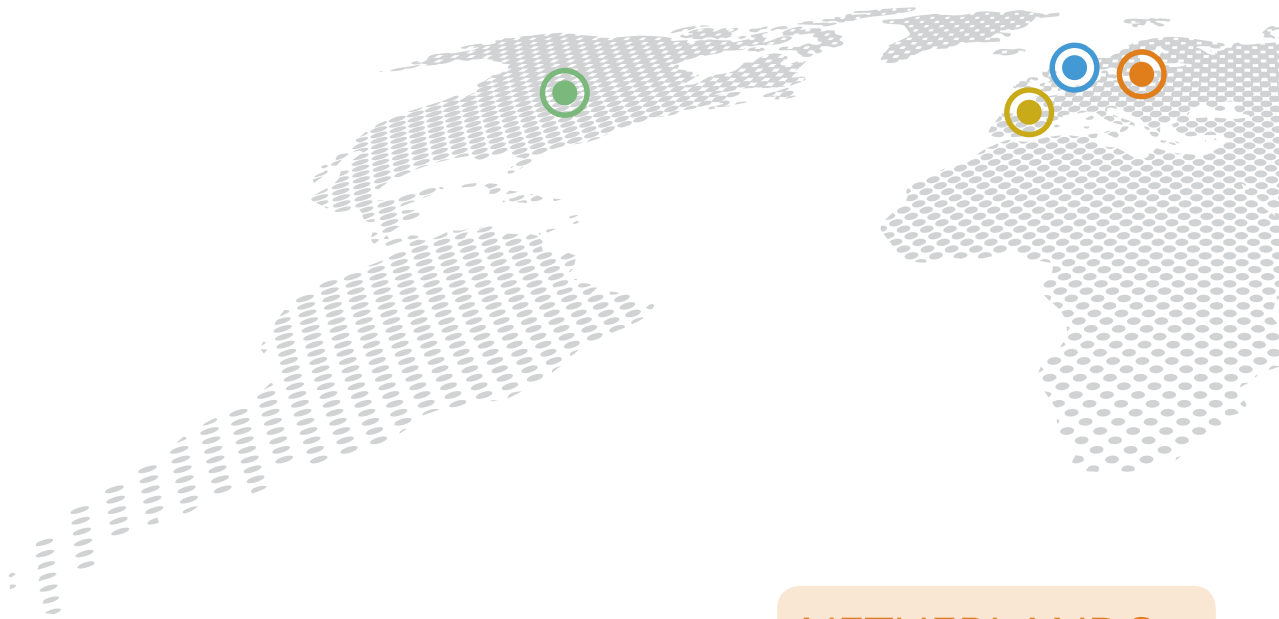






Power Assets is an energy investor with a presence in stable, well-regulated markets around the world. Our operating companies offer predictable income streams in the energy generation, transmission and distribution businesses. Our portfolio spans coal, gas, renewables and oil.

As a Group operating across territories with distinct local conditions, at different stages of development and in markets and segments with varying regulatory structures, our long-term success is defined by how all our operating companies come together to deliver consistent long-term growth. 2016 was a successful year for us from this perspective.



**Legends**

-  Generation
-  Transmission & Distribution
-  Gas Distribution
-  Renewables
-  Energy-from-waste
-  Oil Pipelines & Storage Facilities

**PORTUGAL**  
 Iberwind

**CANADA**  
 TransAlta Cogeneration  
 Meridian  
 Husky Midstream Limited Partnership

**NETHERLANDS**  
 Dutch Enviro Energy Holdings B.V.

**UNITED KINGDOM**  
 UK Power Networks  
 Northern Gas Networks  
 Wales & West Utilities  
 Seabank Power

In 2016, we acquired a 48.75% interest in the pipeline assets of Husky Energy in Canada, expanding our energy portfolio and strengthening our presence in the North American market.

Our acquisitions over the past few years, including AVR-Afvalverwerking B.V. (AVR) in the Netherlands, Iberwind in Portugal and Husky Energy's mid-stream assets in Canada, have not only contributed to the Group's revenues from day one, but also enriched our knowledge of different facets of the sector. Our operating companies share expertise and best practices and apply our proven strategy across the Group. We invest in world-class infrastructure

and the best talent in every market and support our customers with outstanding service.

In the UK, the 'Brexit' process has heralded some short-term uncertainty in the business environment and a decline in the value of the pound. However, the UK remains a low-risk, well-regulated energy market. Our prudent policies of local debt sourcing and an ongoing focus on regulated businesses have protected the Group from short-term market sentiments.


**Tsai Chao Chung, Charles**  
Chief Executive Officer



## MAINLAND CHINA

-  Zhuhai Power
-  Jinwan Power
-  Siping Cogeneration
-  Dali Wind Power
-  Laoting Wind Power

## THAILAND

-  Ratchaburi Power

## HONG KONG

-  HK Electric
- 
- 

## NEW ZEALAND

-  Wellington Electricity Lines

## AUSTRALIA

-  Australian Gas Networks
-  SA Power Networks
-  Victoria Power Networks
-  Australian Energy Operations



# UNITED KINGDOM

## UK Power Networks

Power Assets share: 40%  
Joined since: Oct 2010  
Network length: 187,800 km  
No. of customers: 8,247,000

## Northern Gas Networks

Power Assets share: 41.29%  
Joined since: Jun 2005  
Gas pipeline length: 36,100 km  
No. of customers: 2,700,000

## Wales & West Utilities

Power Assets share: 30%  
Joined since: Oct 2012  
Gas pipeline length: 35,000 km  
No. of customers: 2,533,000

## Seabank Power

Power Assets share: 25%  
Joined since: Jun 2010  
Gas-fired combined cycle gas turbine: 1,142 MW



UKPN staff in action at a network site to maintain reliability standards.

The UK remained the Group's biggest market in 2016, where our four businesses operate in the electricity generation, and electricity and gas distribution sectors. All four companies delivered creditable performance on the three key parameters of revenues, efficiency and customer service.

Our electricity and gas distribution networks operate under the RIIO (Revenue = Incentives + Innovation + Outputs) regulatory and incentive regime. The scheme, which incentivises innovation and performance, has proven positive for our operating companies, which share the group-wide ethos for such.

## UK Power Networks

UK Power Networks (UKPN) owns, operates and manages three of the 14 regulated electricity distribution networks in the UK. It is one of the largest electricity distribution network owners in the UK covering an area of approximately 30,000 km<sup>2</sup>. The company also operates a number of private networks on behalf of clients like the London Heathrow and Gatwick Airports and the Ministry of Defence.



UKPN undertaking works on a Powerline diversion over the M1 motorway.

## UKPN: Vauxhall-Nine Elms-Battersea project

An extensive urban regeneration project is under way in London's Vauxhall – Nine Elms – Battersea districts on the south bank of the river Thames. The regeneration will create a thriving community with improved transport, parks, squares and shops, a riverside path, schools and healthcare facilities. The regeneration zone includes more than 20 development sites.

UKPN has started work on the power infrastructure required to support the significant property developments involved in this project. The programme of works will deliver 40 MVA on a phased basis through to 2019 and includes the construction of a new purpose built primary substation at Stewarts Road, and two new 132kV circuits being installed in a combination of new and existing tunnels.



During 2016 detailed designs were completed, as well as demolition and enabling works including the diversion of cables.

UKPN's performance during the year was exceptionally strong. The company distributed 80,071 GWh of power, slightly above 2015 levels. The number of connected customers stood at 8.247 million and with network length of 187,800 km.

Operational performance was outstanding: UKPN maintained its impeccable standards of customer service and recorded just 30.4 customer minutes lost and 38.7 customer interruptions for the 2015/16 regulatory year, a significant improvement on last year's performance. It received incentive revenue from regulator Ofgem. To maintain these high operating standards, UKPN invested nearly £600 million in ongoing network reinforcement.

The company scored 8.6 out of 10 in customer satisfaction based on the regulator's metrics. It ranked second among UK electricity distribution businesses on stakeholder engagement. Customer engagement, satisfaction and safety performance are regarded as among the best across all distribution networks in the UK.

UKPN completed the rollout of its "Business Transformation Programme", initiated in 2013. Automation of processes such as customer service, new

connections, call centre services and asset management systems was completed during the year together with the roll out of tablet based technology to all front line field staff. Paperless processes across the operations, human resources and procurement functions are expected to boost operational performance and efficiency.

An employer of choice in the UK, UKPN was once again listed in The Sunday Times' "30 Best Big Companies to Work For" survey.

## Northern Gas Networks

**Northern Gas Networks (NGN) runs the North of England Gas Distribution Network, one of the eight gas distribution networks in the UK, transporting about 13% of the UK's gas. NGN also maintains and modernises gas mains within its network and provides essential gas connections and gas emergency services.**

NGN's total gas throughput for 2016 was 71,852 GWh, an increase of 3 percent over 2015.



*NGN engineer using a wireless sensor to locate underground apparatus.*

Performance in 2016 remained strong with NGN exceeding mandatory operational targets and regulatory standards. All key targets were achieved including iron pipe replacement and attending gas escapes. It retained its top rating in customer satisfaction, coming first in the industry's 2015/16 Ofgem customer surveys.

NGN's emphasis on safety and benchmarked standards continued in 2016. It was the first utility company to take part in the Considerate Constructors Scheme for planned works, reflecting its commitment to minimising impact on the public and the environment. As a result of ongoing efforts to reduce its carbon footprint and minimise waste, NGN achieved a reduction in leakage by 4% during the year.

## Wales & West Utilities

**Wales & West Utilities (WWU) is a gas distribution business operating pipelines in Wales and the South West of England, covering 17% of the UK's surface area, comprising 42,000 km<sup>2</sup> of a diverse mix of urban and rural geography.**

WWU supplied 64,799 GWh of gas to 2.5 million customers during the year. The company is well on track to achieve all RIIO targets in 2016/17 and has recorded outstanding performance with respect to customer service and environment targets.

The company reduced total carbon emissions by 12.7% against the 2013-2021 target of 16%, while business related carbon emissions were brought down by 9% against the 2013-2021 target of 10%. It continued to support the Government's efforts to promote biogas, connecting four more biomethane generating plants to its network, bringing the total to 16.

WWU won the Gas Industry Safety Award offered by the Institution of Gas Engineers and Managers in May 2016 and has removed 464 km of iron mains off risk. It is deeply involved in promoting awareness of the dangers of carbon monoxide.

*NGN's Warden Law offtake site in Northumberland is an important network node.*





WWU's Colwyn Bay depot upgrades to serve the North Eastern Wales community better.

WWU has undertaken a comprehensive process transformation programme to update key systems for better customer service, work scheduling, training and design. Development of a real time and smart management information system continued in 2016, which is expected to give a 360 degree visibility of RIIO outputs and performance across all areas of business.

WWU is the only independent gas network that was awarded contract work on smart meter installation, one of the biggest nationwide projects in the sector. Training of employees and reworking of processes are underway to gear up for large-scale deployment.



WWU staff carry out checks on network equipment.

## UK Capacity Market auctions supplementary generation revenues

In 2014, the UK regulator Ofgem introduced the Capacity Market Auction (CMA) scheme to ensure availability of sufficient electricity capacity to meet projected peak demand. Energy suppliers who are successful in their bids are mandated to provide electricity to meet system requirements. The CMA is seen as an innovative way to secure the country's energy supply, while delivering value to paying customers. By participating in the CMA Seabank has secured a reliable source of additional revenues while improving plant utilisation.

## Seabank Power

**Seabank Power (SPL) is the Group's UK generation business, located near Bristol. The company operates two combined-cycle gas turbine generating units – a 766 MW module and a 376 MW module. The plant's output is governed by a long-term power purchase agreement.**

2016 was a year of strong performance for SPL, with the company exceeding planned figures for availability, forced outage, starting performance and plant trips. It generated 4,450 GWh of electricity, against a budget of 3,894 GWh with availability standing at 86.4%.

SPL undertook major scheduled maintenance outages in 2016 for both its modules. The planned lifetime extension maintenance overhaul on Module 2 was completed on target.

The plant placed a successful bid to supply capacity to the national grid in Ofgem's Capacity Market Auction of 2020-21, which will generate additional revenues during the respective years. SPL also entered the 2017-18 auction in January 2017.



# HONG KONG

## The Hongkong Electric Company

Power Assets share: 33.37%

Year established: 1889

Total installed capacity: 3,737 MW

Network length: 6,300 km

No. of customers: 575,000



Construction of new gas-fired units in progress at HK Electric's Lamma Power Station.

## The Hongkong Electric Company

**The Hongkong Electric Company (HK Electric) is the Group's flagship business which has lit up the streets of Hong Kong since 1890. It generates, transmits and distributes affordable and reliable electricity to its customers located on Hong Kong and Lamma islands. With an excellent track record in supply reliability, customer service and emissions performance, HK Electric is an integral part of Hong Kong's community and economy.**

During the year, HK Electric achieved all its customer and shareholder commitments, delivering sales of 10,792 GWh against a backdrop of slowing electricity consumption following increased awareness and successful conservation initiatives by the Government and green groups. Erratic weather patterns mean that electricity consumption is less predictable than before.

HK Electric maintained an industry-leading supply reliability of over 99.999%, an achievement that it has consistently attained for two decades. On average, since 2009 a customer experiences under

a minute of unplanned power cuts during the year.

The company continued to deliver excellence in customer service, meeting or exceeding all of its eighteen pledged service standards.

To align with the preferences of Hong Kong's tech-savvy customers a mobile-optimised customer portal was launched during the year. The e-bill and e-payment channels were expanded via the Electronic Bill Presentment and Payment Service platform to provide more options for convenient settlement.

HK Electric engaged with the Government on discussions through the year to determine the future development of the electricity sector in Hong Kong. The company and the Group maintain that retaining the current Scheme of Control Agreement is the best way forward as it has proved effective in achieving the Government's energy objectives while encouraging investment. This view is also shared by the majority of the public who responded to the city-wide consultation in 2015.

HK Electric's 1-MW solar power system comprising 8,662 thin-film photovoltaic panels is one of the largest in Hong Kong.



To meet the Government's 2020 fuel mix target to reduce the carbon intensity of Hong Kong, HK Electric has to significantly increase gas-fired generating capacity at Lamma Power Station (LPS), HK Electric's primary generating facility.

This will be done with the installation at LPS of two new gas-fired combined cycle generating units. The first of these, L10, entered the construction phase with commissioning scheduled for 2020. L11, which was approved by the Government in 2016, has also progressed to the constructing stage and is set for commissioning in 2022. Jointly the two units will replace some of the older units and will increase the company's gas-fired capacity to about 55% of total output.

In October, the Government published Technical Memorandum no. 6, which further tightened annual emission allowances of sulphur dioxide, nitrogen oxides and respirable suspended particulates by 8%, 2% and 10% respectively for HK Electric from 2021 onwards. These new gas-fired units are also key initiatives for meeting the tightened emission allowances.

Following the Paris Agreement reached at the Paris UN Climate Change Conference (COP21), the Government is going to further reduce the city's carbon intensity by 2030. In this context, HK Electric will continue to accelerate the adoption of natural gas and reduce the use of coal, as it plans ahead for the long-term development of LPS.

To help secure alternative sources of natural gas, HK Electric and CLP Power Hong Kong Limited are jointly conducting an Environmental Impact Assessment for the development of an offshore liquefied natural gas

(LNG) terminal using floating storage and regasification technology for receiving LNG imported by sea. The terminal will enhance HK Electric's position as a buyer of natural gas while strengthening reliability of gas supply.

Electric vehicles (EVs) are gaining popularity in Hong Kong. As a long-time supporter of EV use, the company implemented a number of initiatives including an online advisory tool, a trial booking scheme and real-time occupancy updates on charging stations. It is expanding and upgrading charging station infrastructure to make it easier for consumers. In October 2016 HK Electric served as the official energy partner for the first Hong Kong ePrix, providing a unique opportunity for Hong Kong people to appreciate both the speed and performance of zero-emission EVs.

HK Electric's Smart Power Fund, established to help old residential buildings implement energy efficiency projects, approved 8 applications in 2016 with a total subsidy of about HK\$1.6 million. The funding limit has been doubled from 2017 to encourage more buildings to apply.

Working in alignment with its long-standing strategy of employee volunteerism, the company dedicated 5,647 man-hours in total to community involvement efforts during the year.

As a result of lower than expected fuel costs as well as Government refunds on rents and rates, HK Electric has reduced tariffs for 2017 by 17.2% on average per unit of electricity. The company's tariffs were frozen in 2014 and 2015 following which two successive reductions have now been implemented in 2016 and 2017.

## HK Electric: enabling reliable public transport services

The Hong Kong Mass Transit Railway, including the Airport Express network, comprises a total of 91 stations and carries an average of about 4.69 million passengers per day. HK Electric is a key energy partner to the MTR Corporation and constantly expands and enhances its infrastructure to support the network's growing needs, including the new South Island line which was launched in December 2016. Infrastructural work took place in the year to provide the power needed for the upcoming Shatin to Central Link/North-South Line (HK Section), with energisation set for 2020. A staged replacement of



two transformers at Admiralty substation with modern 132/33 kV 50 MVA gas-insulated transformers was also completed.





## AUSTRALIA

### Australian Gas Networks

Power Assets share: 27.51%  
 Joined since: Aug 2014  
 Gas pipeline length: 25,000 km  
 No. of customers: 1,246,000

### SA Power Networks

Power Assets share: 27.93%  
 Joined since: Jan 2000  
 Network length: 88,900 km  
 No. of customers: 856,000

### Victoria Power Networks

Power Assets share: 27.93%

#### CitiPower

Joined since: Jul 2002  
 Network length: 7,500 km  
 No. of customers: 329,000

#### Powercor

Joined since: Sep 2000  
 Network length: 86,800 km  
 No. of customers: 786,000

### Australian Energy Operations

Power Assets share: 50%  
 Joined since: Jul 2012  
 Network length: 42 km



*New high-voltage lines installed on the Powercor Network near Mildura in north-western Victoria.*

The Group has four operating companies in Australia, serving approximately 3.217 million customers over 183,200 km of electricity networks and 25,000 km of gas pipelines.

The Australian Energy Market Commission has just completed a regulatory reform process that will shape the industry going forward. Network efficiencies and effective capacity utilisation are the key components of the new regime, which has also introduced cost-reflective network tariffs. The parameters of all four Group companies have now been determined for the current regulatory period, ensuring a predictable income stream for the next five years.

## Australian Gas Networks

**Australian Gas Networks (AGN) is one of the leading distributors of natural gas in Australia.**

*SAPN staff on site at Whitmore Square substation in Adelaide, Australia.*

During 2016, AGN completed gas deliveries of 101.3 petajoules, a decline of 5% from 2015 results. The decrease was largely attributable to significantly warmer autumn and winter weather in the southern states, as well as the closure of some commercial customers in South Australia and Queensland.

In Queensland, construction commenced on a new pipeline to Bundaberg Port. The pipeline is expected to be fully commissioned by early 2017 at an estimated cost of A\$16.3 million. It is anticipated that the new pipeline will boost economic activity in the Port area, which will yield long-term revenue growth for AGN.

Major maintenance projects were undertaken during the year in Victoria and South Australia. A large-scale mains replacement programme to replace cast iron and unprotected steel pipelines with polyethylene pipes upgraded 334 kilometres of mains.



## SA Power Networks

**SA Power Networks (SAPN) is South Australia's sole electricity distributor. It also derives a portion of its revenues from unregulated projects with private organisations.**

Following submission of its 2015-2020 proposal to the Australian Energy Regulator in October 2014, SAPN submitted relevant proposals to arrive at a final determination for the period.

Starting May 2016, SAPN commenced Australia's largest trial of 100 units of combined solar and energy storage in a residential area in the town of Salisbury. The trial, involving the large-scale deployment of very high capacity storage batteries, tested the feasibility and benefits of combining solar energy and battery storage to meet growth in demand, as well as to accommodate electricity being fed into the grid from rooftop photovoltaic (PV) panels. The results of the tests will yield insights into how to manage distributed generation.

By the end of the year, SAPN has over 195,000 customers with solar PV panels, with about 777 MW of residential solar PV capacity connected to the network.

SAPN outperformed its annual targets for power supply reliability despite severe storms in July, September and December. The company received a financial reward under the regulator's service performance incentive scheme for 2015/16.

The National Broadband Network Fibre To The Node construction progressed ahead of industry average in South Australia with 46 work areas (85,000 premises) completed or in progress during the year. In 2016, SAPN was awarded the ElectraNet Transmission Asset Maintenance Services contract for a further 5 years, a

*A solar power installation feeding into the Powercor network in the Ballarat area.*



major contract that contributes to revenues, provides employment for over 100 people and gives the company a substantial competitive advantage in South Australia.

## Victoria Power Networks

**Victoria Power Networks (VPN) through CitiPower and Powercor operates electricity distribution networks in Victoria, Australia.**

CitiPower and Powercor distributed 5,877 GWh and 10,657 GWh of electricity respectively during the year. Operating parameters were maintained with network availability maintained at 99.99% and 99.97% for the respective companies.

In July 2016, Powercor energised the Ararat Terminal Station, connecting Australia's third largest wind farm to the grid. The 14-month cross-disciplinary project involved the construction of 106 poles for 22 km of transmission lines and conductor stringing and connection of a 250 MVA transformer to the terminal station. Despite its complexity, the project was delivered 22 days ahead of time and under budget.

VPN's new Energy Solutions business, established in 2015, is focussed on expanding existing unregulated business activities and developing emerging streams such as commercial solar, wind, storage and other energy services that will play a role in shaping Australia's energy future. In the twelve months since its inception, the Energy Solutions team has sold over 3 MW of solar panels.

## Australian Energy Operations

**Australian Energy Operations (AEO) built, owns and operates the connections for the Mt Mercer and Ararat wind farms to the Victorian electrical transmission network. The connections include the Terminal Stations which step the voltage up from 132 kV to 220 kV allowing the electricity to be transmitted across the national grid.**

During the year, AEO completed construction of the transmission connection assets for the Ararat wind farm, located on rural land, approximately 180 km northwest of Melbourne and between 9 km – 17 km northeast of Ararat in Victoria. AEO has agreements with Mt Mercer Wind Farm and Ararat Wind Farm, with pre-agreed monthly recurring revenues, ensuring a stable revenue stream.



### MAINLAND CHINA

#### Zhuhai Power

Power Assets share: 45%

Joined since: Apr 2009

Coal-fired: 1,400 MW

#### Jinwan Power

Power Assets share: 45%

Joined since: Apr 2009

Coal-fired: 1,200 MW

#### Siping Cogeneration

Power Assets share: 45%

Joined since: Apr 2009

Coal-fired cogeneration: 200 MW

#### Dali Wind Power

Power Assets share: 45%

Joined since: Dec 2007

Wind turbine: 48 MW

#### Laoting Wind Power

Power Assets share: 45%

Joined since: Jun 2008

Wind turbine: 49.5 MW

Power Assets has invested in five power companies in mainland China: wind farms in Dali (Yunnan province) and Laoting (Hebei province), coal-fired plants in Zhuhai and Jinwan (Guangdong province), and a cogeneration plant in Siping (Jilin province). The five units have a combined capacity of 2,898 MW.

The Chinese government has embarked on a programme of gradual and progressive reform of the power sector, moving steadily towards a more market economy driven model. The Group welcomes this direction, which is being implemented in a phased manner to allow market participants to adapt to the new conditions. We will monitor developments closely and look for investment opportunities for sustainable operations and steady growth.

### Zhuhai, Jinwan and Siping power plants

**Power Assets' investments in three thermal power companies in mainland China have seven generating units with a combined capacity of 2,800 MW.**

The Chinese coal-fired power sector faced disadvantageous conditions in 2016 due to a glut in power supply, combined with power reforms and increased adoption of renewable energy, leading to suppressed

running hours for coal-fired energy.

Despite these challenging conditions, all three power plants recorded reasonable performance. New steam consumers in Jinwan district led to a continued increase in the sale of heat, achieving an increase of 7.08%.

Jinwan power plant's Unit 3 was listed as a national and provincial 'Environmental Demonstration Project' and was among the few coal-fired units in the region to reduce emissions to almost zero early last year. This outstanding environmental performance has rendered the plant eligible for an extra tariff subsidy and an outstanding performance award.

The benchmark on-grid tariff in Guangdong Province was further reduced by RMB 0.023/kWh to RMB 0.4505/kWh. The impacts of reduced tariffs were offset by weak coal prices in the first half of the year.

### Dali and Laoting wind farms

**Power Assets operates two wind farms in Dali (Yunnan province) and Laoting (Hebei province), with a combined capacity of 97.5 MW.**

The performance of the two wind farms in Dali and Laoting was largely on par with the previous year. Lower wind loads in Dali led to a slight reduction in wind yield, which was partly offset by improved yield in the Laoting operation. The renewable energy generated by the two wind farms in 2016 has offset 186,000 tonnes of carbon emission in the respective regions.

In July 2016, Dali's successful turbine blade modification programme of 2014 was extended to cover 30 more wind turbines. This upgrade will boost yield significantly.

*Zhuhai power plant delivers satisfactory operating performance in 2016.*



## Ratchaburi Power Company

**Ratchaburi Power Company (RPCL) is a generation company situated in Ratchaburi province in southern Thailand. All the power generated by the plant is sold to the Electricity Generating Authority of Thailand under a 25-year take-or-pay power purchase agreement.**

RPCL generated 8,789 GWh of electricity in 2016, in line with its production plan, and improved plant availability to 94.3%. The plant once again achieved fuel cost savings through improved operating practices.

Following investment in process improvements RPCL outperformed its targets for plant performance and efficiencies, qualifying for an availability award from the Thai regulator. Earnings

were further boosted by fuel cost savings arising from better-than-budget plant performance and efficient operations.

RPCL continued its policy of engaging actively with the local community, scoring a positive rating of over 96.5% within its province. It complied with all relevant Thai government regulations on environmental protection, monitoring and mitigation.

*Ratchaburi power plant outperforms targets for performance and efficiencies.*



## THAILAND

### Ratchaburi Power

Power Assets share: 25%

Joined since: Oct 2001

Gas-fired combined cycle gas turbine: 1,400 MW

## Wellington Electricity Lines

**Wellington Electricity Lines (WELL) owns and operates the electricity distribution network in New Zealand's key cities including Wellington, Upper Hutt, Lower Hutt and Porirua.**

WELL strengthened its reputation as one of New Zealand's most reliable networks, outperforming regulatory performance thresholds in 2016.

Electricity delivered through the network stood at 2,293 GWh, a slight decline from the previous year. The decline was attributable to a milder winter in 2016, as against the colder conditions experienced in 2015.

To offer customer service aligned with consumer preferences, WELL launched "OutageCheck", a new smart phone application that provides customers with real time updates on power outages.

*Berm substation replacement in progress at WELL.*



## NEW ZEALAND

### Wellington Electricity Lines

Power Assets share: 50%

Joined since: Jul 2008

Network length: 4,700 km

No. of customers: 167,000



## NETHERLANDS

### Dutch Enviro Energy Holdings B.V.

Power Assets share: 20%

Joined since: Aug 2013

Waste-to-energy units: 115 MW

Biomass-fired units: 30 MW

Energy-from-waste: 1,730 kt/yr

Biomass energy: 144 kt/yr

Liquid waste treatment: 302 kt/yr

Paper residue incineration: 168 kt/yr

### Dutch Enviro Energy Holdings B.V.

**Dutch Enviro Energy Holdings B.V., which in turn owns AVR-Afvalverwerking B.V.(AVR), is a market leader in the energy-from-waste business in the Netherlands, generating electricity, heat and steam by incinerating waste. AVR has a total installed thermal capacity 700 MWth (heat and steam), of which approximately 60% is classified as renewable energy.**

AVR increased its output of steam, heat as well as electricity over 2015 levels to 468 kT, 5,647 TJ and 560 GWh respectively. Due to high availability and stable, optimised

production performance AVR achieved its strongest performance to date in throughput of combustible waste of over 1.7 million kilotons across the duration of the year. Furthermore, the Energy Desk in Rozenburg, instituted in 2015 was operational throughout the year, helping to optimise energy output further.

In 2016, AVR completed preparations and feasibility studies for large-scale structural and long-term changes in its infrastructure. These included research into capturing high quality carbon dioxide (CO<sub>2</sub>) and preparations to connect AVR's biomass facility to the district heating network. A feasibility study was conducted to extend this existing district heating network from Rozenburg and Rotterdam to The Hague, together with main stakeholders Eneco.

In June 2016, the Confederation of European Waste-to-Energy Plants held its annual conference in Rotterdam. Several AVR stakeholders and customers participated in the three-day programme, which included a tour to AVR's Rozenburg facility for over 90 participants.

AVR network pipes deliver steam to customers in Rotterdam Port.



## PORTUGAL

### Iberwind

Power Assets share: 50%

Joined since: Nov 2015

Wind turbine: 726 MW

### Iberwind

**Iberwind is a wind energy company located in Portugal. It is based in Oeiras council on the west coast of the country and became a member of the Group in 2015. Iberwind has the second highest market share in the Portuguese wind energy sector, with 339 wind turbines and 726 MW of installed capacity.**

During 2016, Iberwind produced 1,831 GWh of electricity, avoiding 688,500 tonnes of CO<sub>2</sub> emissions.

During its first full year of operations as a Group company, Iberwind pursued an extensive programme of redevelopment and improvement works. Additional capacity of 42 MW was commissioned across five locations following the completion of construction. Repowering works are under way at Villa Lobos, Iberwind's oldest wind farm, to improve efficiency and capacity through the use of the new technology and equipment.

Iberwind's Sra. da Vitória wind farm generates clean energy for Nazaré district.



## Canadian Power Holdings

**Canada Power Holdings (Canadian Power) is an electricity generation business which operates the Meridian Cogeneration gas-fired plant in Saskatchewan. It holds a 49.99% share of TransAlta Cogeneration, which operates five power plants in Ontario and Alberta.**

In 2016, the Meridian plant generated 1,762 GWh of electricity that was sold to SaskPower under a long-term off-take agreement. The plant also produced 1,448 kT of steam that was sold to Husky Energy.

Meridian performed ahead of budget on its operating parameters. Extensive routine maintenance activities completed in 2015 helped the plant achieve overall efficiency improvements in the range of 5%, and availability was improved to 98%.

The five TransAlta Cogeneration plants recorded a strong performance in 2016, maintaining performance efficiencies and achieving a total output of 4,142 GWh. The Windsor plant renewed its power purchase agreement with the Ontario Independent Electric System Operator, extending a long-term sales guarantee for its output.

*The eastern campus at HMLP which has since 2016 become a member of the Group.*

## Husky Midstream Limited Partnership

**Husky Midstream Limited Partnership (HMLP) was established in 2016 to assume ownership of midstream pipeline and terminal assets in the Lloydminster region of Alberta and Saskatchewan, Canada. Its asset portfolio includes approximately 1,900 km of oil pipeline, oil storage capacity of 4.1 million barrels, as well as other ancillary assets. Its pipeline gathering system has a blended crude capacity of nearly 309,000 barrels (bbl) per day and also supports synthetic crude and condensate transportation.**

HMLP became a member of the Power Assets Group in July 2016 upon the completion of the acquisition of a 48.75% interest by the Group. HMLP operates the gas pipeline and terminal infrastructure in the Lloydminster region of Alberta and Saskatchewan, Canada. The output is guaranteed by a long term 20-year off-take contract.

HMLP's average throughput for 2016 was 267,000 bbls per day. During the year it completed expansion work on the Saskatchewan Gathering System to transport production from heavy oil thermal developments in the region to Husky Energy's Upgrader and a terminal in Alberta. It is then delivered to third party mainline pipelines, which transport it to refineries in the United States.



# CANADA

### TransAlta Cogeneration

Power Assets share: 25%  
Joined since: Dec 2007  
Total installed capacity: 1,148 MW

### Meridian

Power Assets share: 50%  
Joined since: Dec 2007  
Gas-fired combined cycle cogeneration: 220 MW

### Husky Midstream Limited Partnership

Power Assets share: 48.75%  
Joined since: July 2016  
Oil pipeline length: 1,900 km  
Oil storage capacity: 4.1 million barrels  
Pipeline gathering system capacity: 309,000 bbls/day

