INFRASTRUCTURE

Serving society

The Infrastructure division aims to create a better future, today through its diversified investments in energy infrastructure, transportation infrastructure, water infrastructure, waste management, waste-to-energy, household infrastructure and infrastructure-related businesses.

Globally these businesses provide essential infrastructure; they are leading their industries in many low carbon innovations and partnering with governments to achieve their net zero ambitions; and they are engaging and supporting stakeholders in meaningful ways to deliver outcomes that really matter.

In delivering on this, the Infrastructure division therefore aims to –

Accelerate the transition to a sustainable future.

VPN installing rooftop solar

Material topics, goals and progress

The following table highlights the material topics identified for the Infrastructure division, as well as the relevant UN Sustainable Development Goals ("SDG"), division goals and progress made.

Material topics & SDGs	Goals	Highlights
Offering sustainable solutions and innovating for transformational impact 	• Be a partner of choice in helping customers and countries deliver on their net zero goals. • Incorporate climate change considerations into business strategies.	• At the forefront of the hydrogen transition in the UK and Australia (NGN, WWU, AGIG and UK Rails). • Achieving the highest penetration of distributed solar of any gigawatt scale energy system in the world (SA Power Networks). • Helping remote regions of Australia transition to reliable and clean energy with hybrid renewable projects (EDL). • Operating 58 landfill gas powered stations and began operations in renewable natural gas in the US (EDL). • The first European waste-to-energy company capable of large scale CO_2 capture; second CO_2 capture plant in development; trialling carbon storage options (AVR). • Developed the Distribution Future Energy Scenarios (UKPN) and Pathfinder 2050 (WWU) to evaluate future low carbon scenarios. • Assisting Hamilton City Council achieve its goal of 50% landfill diversion in the next 3 years (EnviroNZ).
Taking action on climate change 	• Set long-term targets to reduce carbon emissions and invest in impactful projects to reduce emissions in operations. • Address climate change risks as part of the risk management process.	• Ambitious targets set by eight businesses to help governments deliver on their net zero goals. • 3.8% reduction in scope 1 and 2 emissions in 2020 versus 2019 and 8.7% versus 2018. • NGN, WWU and AGIG replaced 422km, 337km and 417km of old gas pipelines respectively in 2020 with future significant fugitive emissions reductions. • Use of demand side response at the division's distribution network operators creating energy efficiencies and providing better value to customers. • High uptake of renewable energy in operations, for example, all of Northumbrian Water's 1,858 sites are now powered by renewable electricity. • Green fleet programmes across businesses with trials in hydrogen-powered fleet. • Flood mapping tools developed (WWU and UKPN) and millions invested in flood defences. • Extensive bushfire mitigation programmes and investment across Australian businesses.

Material topics & SDGs	Goals	Highlights
Creating a great place to work 	• Create a zero harm workplace and culture. • Protect employee wellbeing during the pandemic. • Attract, develop and retain high-performing talent. • Create quality and rewarding training programmes. • Promote and create inclusive and diverse teams.	• Culture of zero harm promoted across businesses and tone set from the top by: i) including safety KPIs in the compensation schemes of all its businesses CEOs and executive management; ii) making health and safety a focus of all its board meetings around the world; and iii) holding an annual health and safety conference including representatives from each of the Infrastructure businesses. • Extensive employee health, safety and wellbeing support in the face of the pandemic. • Emphasis on high impact apprenticeship programmes and maintaining talent. • Two-year degree under development with Leeds City College tailored to the future of energy and hydrogen (NGN). • Highlights from inclusion and diversity programmes: – EDL on track to meet its goal of 25% female representation by 2023; – UKPN retained its National Equality Standard accreditation and is ranked third on the list of the Inclusive Top 50 UK employers; and – NGN committed to the UK's Social Mobility Pledge. • Multiple top employer awards.
A steadfast commitment to customers and communities 	• Go above and beyond to engage customers and exceed their expectations. • Support vulnerable customers and turn the tide on fuel and water poverty.	• Multiple 2020 awards as leading services provider. • Fuel poverty programmes in place across the UK businesses and in development in Australia. • Northumbrian Water became the first utility to commit to zero water poverty in its regions by 2030.
Protecting natural resources (a focus on biodiversity) 	• Introduce a biodiversity net gain philosophy into the operational ethos of businesses.	• NGN committed to measure and report the natural capital value of up to 50 of its largest sites by 2026. • Northumbrian Water completed its first natural capital account and is developing a tool to evaluate the biodiversity value of all sites larger than 0.2 ha. • UKPN targets to increase the biodiversity value of 100 sites by up to 30% by 2021.
Ensuring responsible business practices (a focus on cyber security) 	• Implement leading practice approaches to cyber security.	• Cyber security policies, governance mechanisms and cyber-attack security plans in place to protect corporate information assets and critical infrastructure.
	• SDG 17, "Partnerships for the goals", underpins action on all material topics and enables the best possible impacts through collaboration and working with relevant partners.	

Offering sustainable solutions and innovating for transformational impact

The Infrastructure division is positioned at the forefront of leading innovation and technologies that are helping customers deliver on their goals to create a low carbon future including leadership in hydrogen, solar, waste-to-energy, carbon capture and storage, circular economy approaches and smart city developments. Highlight case studies next exemplify these efforts.

At the forefront of the UK hydrogen transition

In November 2020, the UK Government released its Ten-point Plan for a Green Industrial Revolution, which serves to help the UK reach its ambition of net zero emissions by 2050. The Plan lists hydrogen as a key component with the specific aim of heating a neighbourhood with hydrogen gas by 2023 and then an entire town, with tens of thousands of homes, by the end of the decade. With the UK gas grid accounting for one third the UK's total carbon footprint, finding solutions to decarbonise the gas grid is essential to achieving net zero.

H21 is a collaborative gas industry programme focused on demonstrating how converting the UK gas network to carry 100% hydrogen can tackle the UK's decarbonisation challenges. This project is being led by Northern Gas Networks ("NGN"), in partnership with Wales & West Utilities ("WWU"), two companies within the Infrastructure division, as well as Cadent and SGN.

Learn more about the H21 project and progress.

HyStreet – demonstration housing testing hydrogen

The H21 feasibility study, which looked at the possibility of converting the UK city of Leeds to hydrogen using existing pipes and equipment, concluded that it is technically possible and economically viable. The next phase of the project is demonstrating the safety case.

In addition, NGN is a partner in HyDeploy, a project to blend 20% hydrogen with natural gas. Following successful trials on a private network at Keele University, the next step will see NGN supply a 20% hydrogen blend to the community of Winlaton in Gateshead in 2021.

As part of the H21 project, Leeds Beckett University has been working with NGN to gain insight to public perceptions of hydrogen as a domestic fuel. Using innovative social science methods, the research team has explored, for the first time, public perceptions of moving the UK domestic fuel supply to 100% hydrogen.

At the forefront of the Australian hydrogen transition

South Australia is working towards net zero carbon emissions by 2050 and Australian Gas Networks ("AGN"), under the Australian Gas Infrastructure Group ("AGIG"), is working alongside the State Government to help deliver on this aim through its leadership in green hydrogen production. Using a 1.25 MW electrolyser powered by renewable electricity, Hydrogen Park South Australia ("HyP SA") is the first Australian project to produce green hydrogen for blending with natural gas for supply to domestic customers via AGN's existing gas distribution network in South Australia.

From early 2021, a 5% hydrogen blend will be supplied to nearby homes via the existing gas network. AGN is also supplying to industry with further aims to supply the transport sector.

In 2020, AGN also developed Hydrogen Park Gladstone ("HyP Gladstone") in Queensland with the aim to distribute a blend of up to a 10% green hydrogen to an entire city network, delivering another Australian-first. AGN is further developing detailed plans to introduce hydrogen into gas networks in both Victoria and South Australia through the Australian Hydrogen Centre.

Such projects are essential to progressively show the use and safety case of hydrogen before integrating higher levels, and eventually 100% green hydrogen.

HyP SA has received a number of accolades in recognition of its role in demonstrating the pathway to a cleaner energy future, including:

- 2020 SA Climate Leaders Awards' Business and Industry category winner;
- 2020 Australian Pipelines and Gas Association Environment Award winner;
- 2020 Engineers Australia Australian Engineering Excellence Award winner; and
- 2020 South Australian Premiers Awards for Energy and Mining's Innovation and Collaboration commendation.

Experience HyP SA's ground breaking ceremony.

The hydrogen-powered trains of tomorrow

To meet the UK's ambition to reach net zero by 2050, the UK's Department for Transport ("DfT") asked the rail industry to explore the possibility of removing all diesel-only trains from the network by 2040 in England and Wales. The Rail Industry Decarbonisation Taskforce has identified three possible traction technologies which are sufficiently mature to replace diesel – battery, electric and hydrogen.

UK Rails has been working in partnership with Alstom since 2017 to explore UK rail opportunities for hydrogen propulsion. In 2020, UK Rails and Alstom announced a bold plan and joint investment of £1 million to fast-track the hydrogen train industry in the UK by creating an entirely new class of train.

Designated Project Breeze, the rolling stock solution will be 100% powered by hydrogen through integrating the proven propulsion technology of Alstom's in-service Coradia iLint hydrogen multiple units within a modified version of the Class 321 Renatus electric multiple unit fleet proven on high-intensity services between London and East Anglia. This will create the Class 600 hydrogen multiple unit ("HMU"), with a maximum speed of 90mph and an operating range of over 600 miles.

The Class 600 specification has been developed with potential train operators, particularly Northern Trains, to ensure that it is fully aligned with their requirements to replace regional diesel trains as part of overall UK railway decarbonisation. A proposal for a fleet of 10 Class 600 HMUs to operate services in the Tees Valley area is awaiting DfT approval to proceed.

Subject to approval timescales, the first Class 600 HMU could be operational in 2024, with the full fleet in passenger service by 2025.

Making South Australia a leader in distributed solar

SA Power Networks has the highest penetration of distributed solar of any gigawatt-scale energy system in the world and it's also working on doubling its solar capacity in the next five years. This a huge feat given that in 2009 there were little to no solar panels connected to the grid and now one third of SA Power Network's customers (over 290,000 South Australian homes) have solar panels on their roofs capable of generating nearly 1,500 MW of electricity. Customers' rooftop solar photovoltaic ("PV") systems now have enough capacity to power the entire state on mild, sunny days.

To help accept even more solar energy into the grid, SA Power Networks is undertaking a range of initiatives including:

- Upgrading 130 major substations to facilitate greater solar exports;
- Partnering on the award-winning Tesla advanced virtual power plant grid integration project; and
- Developing its Flexible Exports service which means that more customers may benefit from investing in rooftop solar, with higher exports, less solar energy wasted, greater reliability of solar systems and a more stable electricity supply.

SA Power Networks' subsidiary, Enerven, is also working to enable the State's water services supplier, SA Water, which delivers water to 1.7 million South Australian customers, to transition to renewable energy. Enerven will install approximately 368,000 solar panels across SA Water's infrastructure that will generate 154 MW of green electricity and provide storage capability of 35 MWh.

Helping remote regions of Australia transition to reliable clean energy

Australia is the sixth largest country in the world. While most of its population lives in its major cities, there are many rural and remote towns dotted across this vast land, located hundreds of kilometres from the closest major centre. Most are not connected to the electricity network and rely on trucked diesel to fuel their energy supply, which also exposes them to price volatility, reduced energy security and high carbon emissions. Through hybrid renewable technology, EDL provides its remote customers with reliable, sustainable energy.

Coober Pedy

EDL provides 100% of the electricity to the remote mining town of Coober Pedy in South Australia. EDL owns and operates the Coober Pedy Hybrid Renewable Power Station which combines 4MW of wind generation, 1MW of solar generation, a 1MW/500 kWhr battery and other integration technologies, with the diesel power station as a backup, achieving generation of approximately 75% through renewable energy for the town's power.

This power station has delivered lower cost and more stable electricity for the community at world-leading renewable energy penetration rates setting a global benchmark for renewables in MW scale isolated grids. To date, the longest continuous period the project has operated on 100% renewables was 97 hours in December 2019.

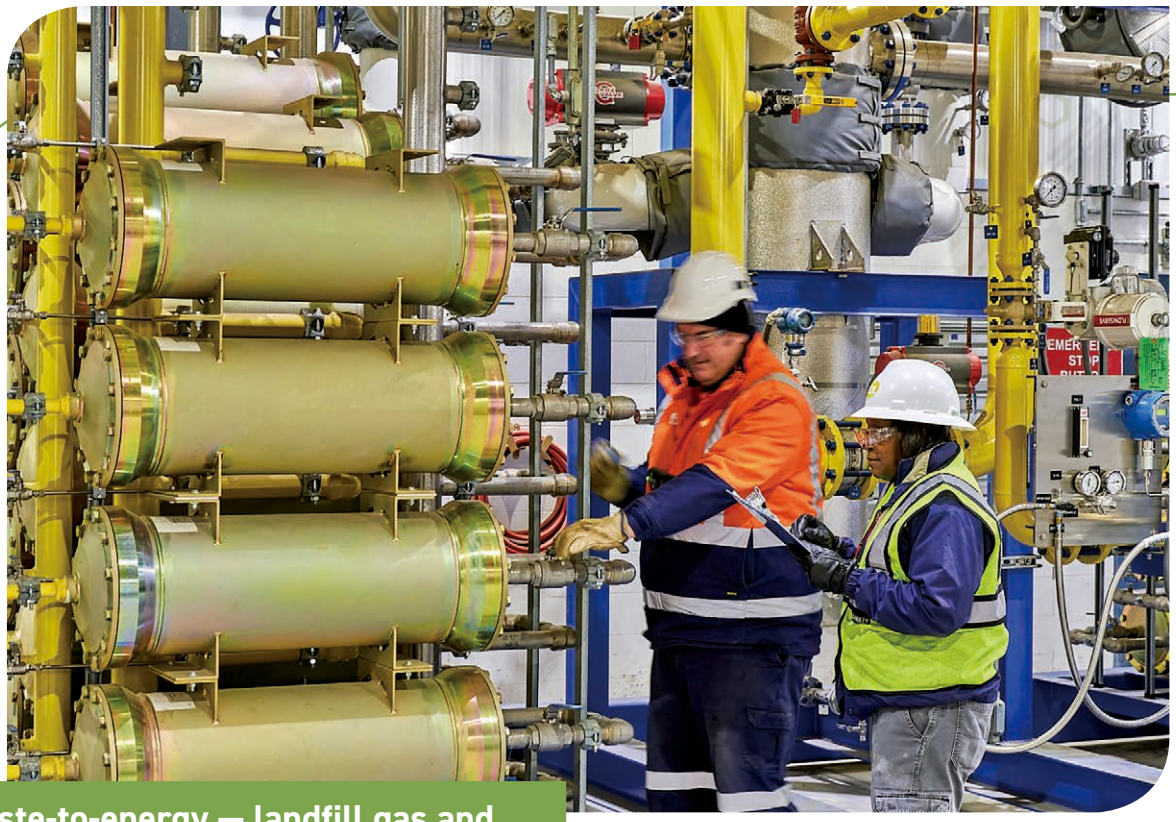
Agnew

Building on the success at Coober Pedy, in 2020, EDL completed the 56 MW Agnew Hybrid Renewable Project at the Agnew Gold Mine in Western Australia. Comprising five wind turbines, a solar farm, a battery system and an off-grid gas and diesel power plant, the project is Australia's largest hybrid renewable microgrid and supplies the mine with power that is more than 50% renewable, with 99.99% reliability. It is also the first mine in Australia to be powered by wind at a large scale. The project won several awards in 2020 including:

- 2020 Engineering Solution of the Year at the Global Energy Awards;
- 2020 Innovative Power Technology of the Year – Australia at the Asian Power Awards; and
- 2020 Western Australia Division winner at the Australian Engineering Excellence Awards.

Jabiru

In 2021, EDL will also commence construction of the Jabiru Hybrid Renewable Project in Australia's Northern Territory. Once completed, the hybrid renewable power station will provide the remote town of Jabiru with at least 50% renewable energy over the long term, without compromising power quality or reliability.



Waste-to-energy — landfill gas and renewable natural gas

EDL owns and operates a large portfolio of landfill gas ("LFG") powered stations in Australia, Europe and North America. Across 58 landfill sites globally, LFG is generated from methane produced by decomposing organic matter in refuse tips, that would otherwise be released to the atmosphere or flared. Instead, EDL converts the gas to electricity, significantly reducing carbon emissions. In 2020, EDL generated 2,169,559 MWh of electricity from its LFG power stations globally, abating 11,060,706 tonnes of carbon emissions.

EDL is investing in work that goes beyond the conversion of gas to electricity, to also develop renewable natural gas ("RNG"). RNG is LFG processed to pipeline-quality standards making it fully interchangeable with conventional natural gas for use in industry or transportation. To illustrate impact, when used as a vehicle fuel, RNG reduces emissions by 85% relative to diesel fuel.

In the United States, EDL and its joint venture partners completed the Indy High BTU RNG Plant at the Indianapolis South Side Landfill in April 2020, with the capacity to convert landfill methane gas into approximately eight million gallons of pipeline-quality RNG each year amounting to 41,000 tonnes of carbon emissions avoided annually.

Carbon capture, use and storage

In 2019, AVR (under Dutch Enviro Energy) became the first European waste-to-energy company capable of large-scale CO_2 capture through the launch of the operation in Duiven. The CO_2 captured by this plant is re-used in the greenhouse horticulture sector where it has meant natural gas-fired heat and power generators are no longer needed to produce CO_2 in the greenhouses.

Based on the volume of residual waste AVR currently processes, its target is to reduce its annual emissions by 800,000 tonnes of CO_2 emissions by 2030 and be a net zero operation by 2050.

Throughout 2020, AVR continued to make progress towards its net zero vision. Plans are in place to build a similar CO_2 capture installation at its location in Rozenburg. Exploring innovative solutions in storage, AVR is also collaborating with Carbon8, a UK based company, on a pilot programme to combine captured CO_2 with fly ash to produce a raw material for the construction industry. AVR is also looking to storage in depleted gas fields offshore as another opportunity.

Driving towards net zero

The transport sector accounts for 28% of all emissions in the UK, with the main source of emissions from this sector being the use of petrol and diesel in road transport. There are more than 100,000 electric vehicles already powered through UK Power Networks ("UKPN") and the business forecasts suggest 4.5 million electric vehicles could be on streets in London, the South and East of England by 2030.

UKPN is innovating to meet the technical challenge of an unprecedented large-scale shift to electric transport. Just one single 50 kW "rapid charger" can have the same impact on the network as a block of 25 new flats. The more electric vehicles are sold, and the more chargers installed, the more the business needs to innovate and create smart solutions to unlock capacity.

UKPN's comprehensive Electric Vehicle Strategy outlines the partnerships underway to develop, test and deliver technical and commercial solutions that facilitate the rapid uptake of electric vehicles and the whole systems approach planned to maximise the utilisation of its existing electrical infrastructure.

UKPN's dedicated net zero platform provides more information on the pivotal role it is playing more broadly in both connecting renewable energy and facilitating the uptake of low carbon technology.

Contributing to smart cities

Data forecasting

Data forecasting and planning is at the heart of facilitating net zero.

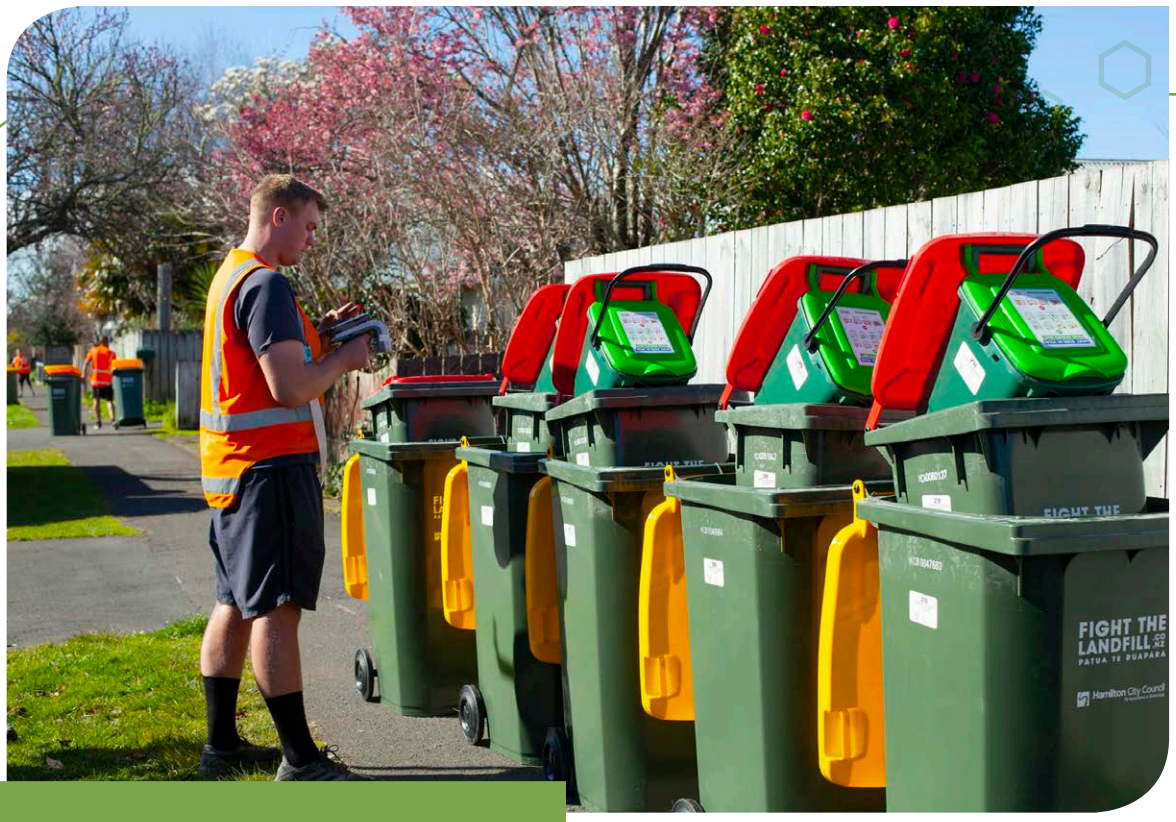
UKPN has developed and open-sourced Distribution Future Energy Scenarios including bespoke forecasts for approximately 11,000 geographic areas as well as an interactive map in partnership with the Open Data Institute.

WWU has developed a whole system model, Pathfinder 2050, that allows cities, regions and countries to evaluate future scenarios of low-carbon supplies for heat, power and transport, allowing users to view the impact of increased integration of the gas and electricity networks in terms of costs and CO_2 reduction. WWU has made this model available to local authorities and city councils to better understand their net zero options.

Smart energy management

UKPN is developing systems to collect and use both voltage-related data and smart meter energy consumption data to enable further improvements in the efficiency and cost-effectiveness of its electricity distribution network to provide a superior service to its customers. As of end 2020, there are approximately 3 million smart meters (equivalent to 40% of all domestic customers) installed in UKPN Regions.

Through ista's data-based suite of digital solutions for smart property management, ista enables residents and owners of buildings to take control of their energy consumption and contribute to climate protection. In Germany alone, 3.7 million tonnes of CO_2 are saved every year thanks to reductions made in the annual heating cost bills enabled through ista's solutions. ista's aim is to help customers and users reduce their CO_2 emissions from heat consumption by 10% by 2030.



Contributing to a circular economy

EnviroNZ champions the ethos of "trash to treasure" in many ways from the waste it recycles, to the landfill gas converted to energy, and to the landfill leachate that is treated to become high quality water and returned to the natural environment. At the core of its business model, EnviroNZ is dedicated to innovative and sustainable resource recovery and management, employing many first-in-New Zealand initiatives in this aim.

Significant EnviroNZ highlights include:

- Operating one of the largest landfills in New Zealand, the Hampton Power and Resource Recovery Centre operates a modern LFG installation, which generates approximately 1MW of electricity.
- EnviroNZ collects food scraps and green waste from locations across the country covering a range of municipal and commercial customers for processing at its composting facility in Hampton Downs. In 2020, the facility was upgraded to boost its organic processing capacity to 20,000 tonnes per annum.
- Hamilton City Council set a target to increase diversion from landfill by 50% within three years. EnviroNZ is playing a central role in making this target possible and is significantly expanding its recovery and recycling infrastructure. Actions have included the construction of a new NZ$10,000,000 Material Recovery Facility which will sort and bale around 8,000 tonnes of paper, cardboard, plastic and metals from local kerbside collections and commercial operators each year. A new food scraps collection service will also divert up to 6,000 tonnes per annum of organic material from landfill and convert it into a valuable compost product.

Taking action on climate change

The businesses within the Infrastructure division have set ambitious goals to help deliver on net zero, many of which are leading in their industries, including:

AGIG
- 10% renewable gas in networks by no later than 2030, delivering 100% renewable gas developments from 2025. Full decarbonisation of networks is targeted by no later than 2050, and by 2040 as a stretch target.

AVR
- Achieve net zero in operations by 2050.

ista
- Achieve net zero in scopes 1, 2 and 3 by 2050.

Northumbrian Water
- Achieve net zero in operations by 2027.

NGN
- Achieve net zero in operations by 2031 (excluding gas shrinkage) and 2050 (including gas shrinkage), in line with the UK net zero target.

SA Power Networks
- Achieve net zero in operations by 2050 in line with the State Government target.

UKPN
- Reduce the business carbon footprint by 2% per annum. UKPN will release a new target validated by the Science Based Target Initiative in 2021 and is set to be the first UK distribution network to do so.

WWU
- Reduce GHG emissions by 37.5% by 2035 versus 2020.
- Become a net zero ready carbon emission network by 2035.

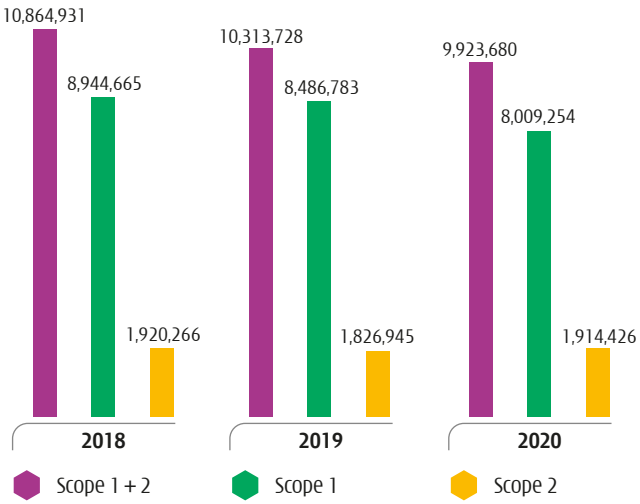
GHG management

Total scope 1 and 2 emissions decreased in 2020 by 3.8% versus 2019 and 8.7% versus 2018.

Accounting for 81% of emissions, scope 1 emissions include direct emissions from sources owned or controlled by the division. Scope 1 emissions decreased in 2020 by 5.6% versus 2019 and 10.5% since 2018.

Accounting for the remaining 19%, scope 2 emissions include emissions from purchased electricity, and those associated with losses in the transmission and distribution networks for the electricity distribution companies. Scope 2 emissions increased by 4.8% in 2020 versus 2019 due to a greater level of meter estimation by the industry owing to a lack of actual meter readings in the calculation of network losses during the COVID-19 pandemic. It is expected that the figures will be fine-tuned when the meter readings are updated.

Scope 1 and 2 emissions performance (tonne CO_2e)



Fugitive emissions

Addressing fugitive emissions is a significant opportunity area. The division's gas distribution networks have been replacing legacy pipe materials (cast iron, unprotected steel and other) in order to reduce fugitive emissions of methane from networks as well as move toward making networks hydrogen ready. During 2020, NGN, WWU and AGIG replaced 422km, 337km and 417km of old gas pipelines respectively. NGN and WWU are also ahead of their targets to reduce leakage:

- NGN has replaced 27% of pipelines versus an original target of 18% during the regulatory period from April 2013 to March 2021; and
- WWU has replaced 19.7% versus its target of 16% by March 2021.

To illustrate impact, between 2012-2020, NGN has replaced approximately 4,000km of pipe, saving over 500,000 tonnes of CO_2 emissions entering the atmosphere as a result of avoided leakage, the equivalent carbon emissions produced by 160,000 homes in an entire year in the UK.

Demand side management

Demand side response ("DSR") may either be demand-led or generation-led. In both cases end-users are incentivised to reduce their demand on the distribution network.

UKPN is investing in smart technologies to better manage electricity demand, create efficiencies and significantly reduce emissions. UKPN, through its flagship Flexibility programme uses DSR in situations where peak loads cannot be managed within existing firm capacity due to reduction, demand movement or autonomous network management. The deployment of predictive cooling on a number of major transformers in London networks enables UKPN to operate at an extended peak level for longer as transformer oil has been cooled prior to the peak load being experienced.

UKPN has also launched Domestic DSR projects which aim to provide services that deliver the best value to customers and address their changing needs. Three key projects were implemented to increase access for customers to Low Voltage flexibility: i) the Urban Energy Club, which supports customers living in small flats; ii) Home Response, which explores social innovation for customers living in social housing; and iii) Core4Grid, which provides individual home balancing with low carbon technologies. In 2020, UKPN achieved a world first by enabling domestic customers to participate in the flexibility market, marking the latest stage in the business' commitment to growing new markets for low carbon distributed energy resources.

Taking a different approach to demand side management, United Energy deployed its Summer Saver Programme for demand side load management where customers were given cash incentives to reduce electricity consumption. In addition, peak demand reduction helped defer network augmentations.

Other emissions reductions projects

Other techniques to reduce energy consumption across the division include:

- **Renewable energy:** Northumbrian Water's 1,858 sites are all powered by renewable electricity, meaning that 87,000 tonnes of CO_2 emissions are eliminated every year.
- **Green fleet:** Operating large fleets, the businesses are working to find low carbon alternatives. NGN aims to make 50% of its total vehicle fleet ultra-low emission or hybrid by 2026 and to enable this electric vehicle replacement, charging infrastructure will be installed across all offices and depots. WWU and NGN are also working to explore the possibility of using hydrogen to power their fleet and fleet infrastructure. To improve fuel efficiency, Northumbrian Water is trialling software solutions to enhance fleet scheduling to further reduce emissions.
- **Employee engagement:** Getting employees engaged and understanding the importance of their contribution is a priority across all businesses. ista's aim is for employees to invest at least 5,000 hours a year in promoting climate protection in society.
- **Procurement:** Northumbrian Water is developing its procurement process to give emissions appropriate weighting in contract awards and it is also adding greenhouse gas emissions to its service value framework ensuring new capital schemes are the lowest economic emissions option.
- **Third party assessments:** UKPN became the first electricity network operator to achieve the Carbon Trust Standard for Carbon in recognition of its achievement in carbon reduction and Northumbrian Water achieved third-party verification of its emission reports to ISO14064-1 for 2019/20.

Climate risk and resilience

There are two climate risks that are particularly prevalent for the businesses, flooding and bushfires, and steps are being taken to manage these risks.

Flooding

In 2011, responding to the UK Government's concerns on climate change, WWU took a leading role in developing a pioneering tool to help utilities take action to protect their assets from increased flood risks, working in partnership with Landmark and Ambiental Risk Analytics. Following four years of mapping in the pilot, the mapping product was launched in 2018 as Britain's first national flood map incorporating current and future predictive flood scenarios for 2020 and far beyond. WWU was also the first utility in the UK to use the data as part of its UK Climate Change Adaptation Risk Assessment, Reporting and Investment requirements.

UKPN has carried out a flood mapping exercise across its footprint, and site surveys have been undertaken to predict flood depths in extreme events to help design flood protection measures. It has invested more than £11 million in permanent flood defences to increase the resilience of equipment that serves millions of families in the UK.

Green fleet

Northumbrian Water delivered a multi-award winning scheme in Killingworth, North Tyneside, which worked to reduce flood risk in times of heavy rain protecting thousands of homes in the surrounding areas, as well as improve water quality and the surrounding biodiversity. Instead of flowing back to the sewerage system, overflows from the lake spill into natural grassed areas alongside the bank and drain back to a local watercourse instead. Three floating island eco-systems, which were designed and built by Biomatrix Water, have been installed in Killingworth Lake to improve biodiversity and provide natural habitats for wildlife such as fish and nesting birds in the area. The scheme won awards from Chartered Institution of Water and Environmental Management, the Environment Agency, and CECA Civil Engineering Contractors Association North East Awards in 2020.

Bushfire risk

The electricity distribution businesses in Australia are particularly at risk from bushfires which are exacerbated by rising temperatures. They therefore invest millions every year to reduce the risk of bushfire and loss of power supply in communities.

In hazardous bushfire risk areas, Victoria Power Networks ("VPN") is undergrounding power lines and installing high technology covers over power lines to protect them from climatic conditions. To further reduce fire risk, VPN uses advanced Light Detection and Ranging technology to continually improve the accuracy of scanning and detection of vegetation growing near power lines and ensure overhead conductor clearances remain compliant to Australian Standards throughout their lifetime.

Further risk mitigation activities are being explored, trialled and implemented as part of network innovation strategies as well as technical research and development. These include improved vegetation management activities, the installation of new bushfire safety devices such as Rapid Earth Fault Current Limiters and Early Fault Detection technology, upgrading fuses, among others.

SA Power Networks has also widened the use of drones for outage response work, particularly in the regional areas of South Australia. Remote control drones played a key role in restringing electricity power lines that were damaged by the devastating 2020 bushfires at Kohinoor Hill in Kangaroo Island.

Remote control drone at Kohinoor Hill on Kangaroo Island

Fostering positive work culture at EDL

Creating a great place to work

The division is committed to creating rewarding and inclusive workplaces for all employees with the firm belief that attracting and retaining the best talent the industry has to offer is fundamental to ongoing success.

Health and safety

For the Infrastructure division, safety is the number one priority. The division's management approaches are driven by a fundamental belief that all of its people, employees and contractors, have the right to go home safe and well to their families every day.

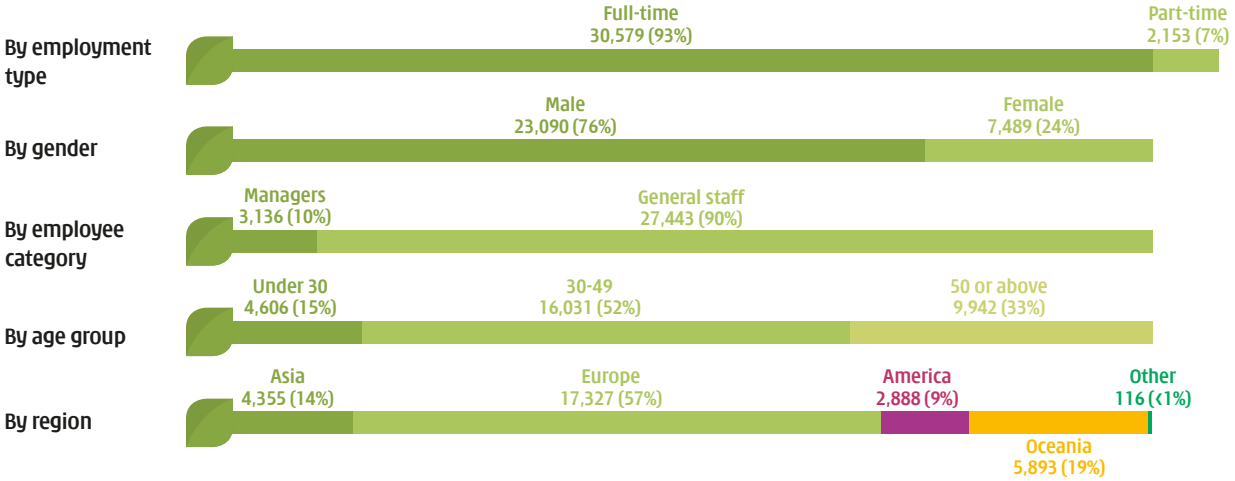
It is with great regret however to report the work-related deaths of one employee and one contractor in 2020. Intensive reviews and procedural adjustments have been undertaken and the unwavering commitment to zero harm continues.

Leadership

The Infrastructure division has made considerable progress in creating a culture of zero harm across its businesses and has set the tone by: i) including safety KPIs in the compensation schemes of all its businesses CEOs and executive management; ii) making health and safety the first item on the agenda of any of its global board meetings; and iii) holding an annual health and safety conference including representatives from each of the Infrastructure businesses. Top management's commitment to health & safety is further formalised in the Health & Safety Policy.

In order to foster a positive culture of health and safety, robust safety management systems exist across the businesses with many certified to ISO45001 or OHSAS 18001 and including procedures for hazard identification and risk assessment, industry-specific standard operating procedures, emergency preparedness procedures as well as ongoing monitoring and measurement.

Employee profile as at 31 December 2020



Continuous health and safety training

As an example of management approach, EDL's dedication to safety is embedded in its culture though a range of initiatives including:

- Oversight from the Global Safety Committee which meets monthly, with participation from corporate and operational support services staff;
- A comprehensive safety culture survey conducted every two years through an independent third party that monitors and ensures the business is enabling a consistent maturity of safety culture globally;
- The Safety Leadership Awards where the business is rewarding excellence in safety based on employee-led monthly nominations;
- The Take 5 initiative, which serves as a hazard and risk review prior to a task being conducted;
- EDL's Shared Analysis Management system which provides an effective hazard and incident management recording and reporting process; and
- Emergency Management and Crisis Management Awareness training to ensure senior managers are well-positioned to respond swiftly to emergencies and crises as well as annual update of the Crisis Management and Business Continuity Planning Programme.

The increased focus on safety leadership, improved reporting and the effective delivery of the Take 5 process has changed behaviours across the EDL global workforce resulting in improved safety performance.

Training

Continuous high-quality health and safety training for employees is fundamental. UKPN conducts regular health and safety training programmes using external and internal experts as facilitators. In 2020, 610 leaders participated in a three-day residential training programme designed to provide awareness, skills, tools and motivation to positively shift their approach to Safety Leadership and 470 employees attended a two-day residential safety training programme. All employees who conduct or influence high risk work were further provided with tailored training during 2020.

The SA Power Networks Safety Leadership Academy was launched in early 2018 to continue to mature the organisation's safety culture by encouraging and educating leaders and workers to challenge their existing approach to safety and leadership. The programme involves a challenging and interactive series of workshops, underpinned by SA Power Networks' Work Safe Values and Standards. It introduces the principles of "human factors" and their involvement in safety related events and the Just and Fair Framework to guide consequences for both positive and negative safety behaviours.

Experience SA power Networks' dedication to safety.

Training programmes that have influenced NGN's culture include:

- Safety Learning Clinics to review events with a view to identifying and taking forward improvement opportunities and create an increased sense of accountability and ownership within the business;
- A series of Behavioural Safety workshops delivered to employees and contract partners looking at what causes incidents; and
- The Leadership Development programme that has been completed by the Senior Operational Leadership team.

Monitoring and feedback

Health and safety monitoring systems and formal audit programmes are in place across all businesses. Audits on the safety management system at the corporate level, Transmission and Distribution Division-level and Generation Division-level are

conducted at least annually by registered safety auditors to ensure all necessary safety regulations and requirements are strictly followed.

VPN developed a High-Risk Controls Programme in 2020 including controls for the highest risk activities undertaken with the aim to reduce serious injuries. The standards are based on past incidents records, legislative requirements and industry best practice and have been communicated throughout the business.

With particular focus on proactively identifying and controlling key hazards and risks associated with site and fleet operations, EnviroNZ received a Highly Commended award in the Safe Vehicles category of the Australasian Fleet Champions Awards in 2020.

In further recognition of outstanding health and safety practices, WWU was awarded as Royal Society for the Prevention of Accidents' ("RoSPA") Oil & Gas Sector winner for the second year running in 2020, and along with NGN also collected a Gold Award.

Health and wellbeing in the face of the pandemic

The pandemic has further focused attention on employee wellbeing and ensuring employees both out in the field and or those working from home feel supported.

Communications during the lockdowns were led from the top, with many of the businesses CEOs sending daily or weekly videos and voice memos to employees, as well as additional and consistent communications from the executive teams at each business. For those working from home, there was rapid deployment of home working systems, revised working patterns and online collaboration. Additional support was provided to managers in helping their team members work remotely, deal with family loss, and transition back into the office smoothly and safely. Events were held online to enhance feelings of team support and recognition. For example, WWU held their people recognition awards "Celebrating Excellence", it's 15th birthday celebration and "It's Virtually Christmas" online. WWU also supplemented their communications with manager's guides, wellbeing newsletters, and wellbeing virtual cafés. As a result of this work they were recognised with the Responsible Business Champion Award from Business in the Community for its focus on employee wellbeing.

BUSINESS IN THE COMMUNITY

Responsible Business Champions Cymru 2020

SA Power Networks extended their online health hub in 2020 to include the Health Hub @ Home platform which focuses on the health challenges arising from working from home. Features such as mental health, first aid, mindfulness and resilience training courses, and a Traumatic Event Response service for workers exposed to distressing incidents have also been made available to support employees' physical and mental health.

Each of the businesses also acted quickly to support the wellbeing, and notably financial wellbeing, of the members of their communities. Examples include:

- The businesses in Australia participated in the Energy Networks Australia's COVID-19 programme, which provided relief to small business and residential customers who were experiencing financial hardship;
- Northumbrian Water launched a support programme offering payment breaks for people facing financial difficulty; more than 7,500 customers have benefited from a payment break; and
- UKPN also repurposed its Power Partners' £300,000 scheme to help people struggling to pay their energy bills while out of work and at home.

Attraction and retention

The Infrastructure businesses offer competitive market-based salaries for all employees as well as a range of non-statutory benefits, including monetary and non-monetary (such as wellbeing benefits) to ensure employees feel supported and rewarded.

Ensuring employees are heard and their feedback acted upon is critical to employee retention. Going above and beyond to understand employee sentiment, AGIG enlists the support of a third-party engagement expert biannually to provide a forensic and independent view of engagement. AGIG's 2020 Alignment and Engagement Survey results show continued improvement with the highest response to date (88% participation) with engagement levels in the top decile for the industry.

Learning and development

Employees across all levels benefit from structured development programmes with the understanding that quality training leads to improved results, productivity and engagement.

SA Power Networks has first-hand proof of how training and a rewarding workplace feeds directly into high levels of retention. More than 550 apprentices and 220 engineering graduates employed since 2003 are now in supervisory and leadership positions across the organisation, with another 105 apprentices in training. Over the past 20 years, the business has trained 575 electrical apprentices and it has retained almost all of them in the business (a 93% retention rate).

Employee health and wellbeing at Northumbrian Water

To protect both employees and customers during the pandemic, Northumbrian Water issued specific Toolbox Talks to give employees guidance on how to complete their daily tasks in a COVID-secure manner, including appropriate social distancing and use of PPE. Employees were asked to use the COVID 60 Second Check tool to look for health and safety issues at the start of a task. Employees completed over 66,000 COVID checks and Northumbrian Water suspended over 550 assignments by end 2020 after identifying concerns that needed to be addressed before they could be undertaken.

In January, Northumbrian Water became the first water company in England and Wales to launch a COVID-19 rapid testing programme with employees. Working closely with NHS Test and Trace, Defra and Water UK, they piloted a scheme for asymptomatic testing to be carried out on a voluntary basis for around 600 employees. Since then they have carried out more than 6,000 tests.

Northumbrian Water also stepped up its support for employee wellbeing, including through its LivingWell campaign to give employees additional access to a wide-range of resources, and it also launched new support groups such as the Parents' Network to assist colleagues facing childcare challenges.

These initiatives helped Northumbrian Water to be named a Centre of Excellence for Wellbeing by the Great Place to Work Institute, and it was also awarded Ambassador Status for wellbeing as part of the 2020 Better Health at Work Award assessment.

Apprentices at NGN

At AGIG, the Manager to Leader Program is designed to equip employees with the skills, capacity and mindset to lead long-term, and deliver sustainable growth and transformation as focused, accountable and visible leaders. The programme has been designed to enable employees to understand the strategic context in which they operate and adapt their leadership to the needs of AGIG and its people. In addition, participants have the opportunity to focus on their personal leadership journey through a combination of one-on-one mentorship and workshops.

With a focus on developing new talent and succession planning, Northumbrian Water currently has 45 employees studying for an apprenticeship qualification and over 50 employees studying for formal qualifications in areas such as water engineering to deepen their skillsets and expand their work horizons.

Also looking to develop a future pipeline, NGN is working with Leeds City College and Leeds College of Building to create a bespoke two-year foundation degree specifically tailored to the gas business and areas of NGN focus. At the heart of the programme will be a focus on the future of energy, particularly in hydrogen development. Students will also benefit by having the opportunity to intern with NGN and eventually seek employment.

Putting customers first, WWU has created a skills-building development programme supporting effective stakeholder engagement, including building rapport, collaboration, communication skills and emotional intelligence to deliver better outcomes for its customers. This is alongside well-embedded induction and management development programmes which focus on supporting colleagues from "Hire to Retire" and training for both coaching and development which is rooted in neuroscience.

In recognition of the division's dedication to employees, in 2020:

- ista was named an outstanding employer by the Top Employers Institute for the seventh year;
- SA Power Networks has been named Large Employer of the Year Australian Training Awards;
- UKPN came in ninth in the Sunday Times' Top 25 Best Big Companies To Work For 2020, a ranking which is based on a staff survey on topics ranging from the support the company gives communities, to development and training opportunities; and
- Northumbrian Water came 25th in the UK's 2020 Great Place to Work survey of employees.

Inclusive and diverse culture

The Infrastructure businesses have been actively trying to level the playing field of their traditionally male-dominated industries.

EDL has set a target of 25% female representation in its workforce by 2023. It is on track to meet this goal by achieving 20% in 2020. One of the initiatives in support of this includes a maternity leave policy of at least three months' full pay for the primary caregiver across all countries where EDL operates. EDL also rolled out online inclusion and diversity training globally, which will be refreshed every two years.

In 2020, UKPN retained its National Equality Standard accreditation, the UK's highest standard of recognition for best practice on equality, diversity and inclusion, and is ranked third on the list of the Inclusive Top 50 UK employers. In the three years since the introduction of the Gender Pay Regulations in 2017, the difference between Median men and women's pay has decreased by 18.5%, also demonstrating its commitment to gender pay equality at all levels in the business.

To support social mobility, NGN committed to The Social Mobility Pledge which champions organisations dedicated to levelling the playing field in the UK. With some of the country's widest opportunity gaps ("cold spots") located within NGN's service area, the network has built on its many areas of best practice to develop an Opportunity Action Plan that will take its efforts to an even higher level of ambition. The Plan includes:

- A targeted approach to supporting local communities;
- Lowering barriers to apprenticeships for the most disadvantaged youth;
- Creating a new work experience standard; and
- Monitoring the impact of COVID-19 on communities and adapting the Plan as needed.

In Australia, EDL provided summer internships to participants from CareerSeekers and CareerTrackers, not-for-profit organisations that provide mentorship and support to migrant and Aboriginal and Torres Strait Islander university students as they embark on their future careers. In 2018, EDL extended its commitment to CareerTrackers by signing up as a 10-Year Partner. EDL's Australian business also launched its first Reconciliation Action Plan, to improve opportunities for engagement and participation with First Nations people.

Other common approaches the businesses have taken include: covering inclusion and diversity into employee engagement surveys to track what else needs to be done; making workplaces as family friendly as possible through enhanced maternity leave; shared parental leave and flexible working policies; and unconscious bias training for recruitment managers.

A steadfast commitment to customers and communities

For the Infrastructure division, customers and communities are inherently intertwined where the businesses serve whole towns, cities and vast parts of countries through its essential services.

Resilient, efficient and affordable supply of services are of course top of mind, and the many accolades the businesses have achieved over the years are testament to this.

For example, in 2020:

- UKPN was awarded Network of the Year 2020 by the Network Awards;
- Northumbrian Water was awarded Water Company of the Year by the Water Industry Awards;
- SA Power Networks, CitiPower, Powercor and United Energy were ranked first, second, third and fourth respectively in the most efficient distribution network table in Australia in the Annual Benchmarking Report released by the Australian Energy Regulator;
- NGN and WWU were recognized by the Institute of Customer Service for customer satisfaction, maintaining their service mark accreditation; and
- In the Broad Measure of Customer Service Incentive Scheme devised by the Office of Gas and Electricity Markets ("Ofgem"), UKPN recorded the highest overall average score in 2020 making UKPN the top performing Distribution Network Operator in terms of customer service.

However, these businesses deliver value to customers and communities far beyond these benefits. They co-create their services and plans to fit the needs of customers and they build programmes that address the most vulnerable in society.

Proactive customer engagement

Delivering positive outcomes for customers, in the short and long term, is at the core of how the Infrastructure businesses are run. They develop plans and improve services every day by listening, understanding and responding to customer needs and expectations.

Operating mostly in regulated sectors, a high level of customer engagement is required by regulators to protect customers that are not able to choose their service providers. However, the businesses individually go above and beyond these requirements to engaging in tailored ways to identify their stakeholders' wants and needs while maximising the value they add for customers.

Common engagement methods include meetings, workshops, online surveys, research, and in-depth interviews by phone and face-to-face. The businesses also test more innovative engagement methods to enable them to hear the views of uninformed stakeholders on complex subjects, tailoring engagement and taking professional advice to help get the best results.

In light of the pandemic, WWU sought customer views on how comfortable they were with its team members returning to deliver planned mains replacement work. WWU did this through a survey that sought views from over 2,000 people, including those shielding across Wales and South West England; 74% of customers said they were comfortable with an engineer entering their homes to complete essential work as long as they maintained appropriate protection by wearing PPE, handwashing and social distancing.

Since 2017, as another way to engage stakeholders and collaborate for better solutions, Northumbrian Water has held its Innovation Festival which brings together thought leaders from the worlds of business, science, tech, engineering, utilities and customer services to tackle real world problems together in a series of sprints. In view of the COVID-19 pandemic, Northumbrian Water's Innovation Festival 2020 was held online for the first time with almost 3,000 individuals from 37 countries taking part to generate ideas to help tackle major societal and environmental challenges. After the Festival, eight different projects received financial backing from Northumbrian Water to help further improve the company's operations in the areas of customer service, staff wellbeing, leakage prevention and environmental impact.

Experience Northumbrian Water's Innovate East '19.

Customer vulnerability

Not everyone has the luxury of being able to afford energy and water. According to the latest UK Government statistics, 10.3% [1] of households in England are living in fuel poverty. Supporting customers in need is therefore a priority for the division.

Note 1: "Annual Fuel Poverty Statistics in England, 2020 (2018 data)", available at www.gov.uk/beis

Engaging customers

Tackling fuel poverty at WWU

WWU's fuel poverty support programme, Healthy Homes, Healthy People, takes a holistic approach and partnerships with Warm Wales and the Centre for Sustainable Energy are central to helping it engage and meet the needs of hard to reach groups. To identify and focus fuel poor support activities, WWU developed a vulnerability mapping tool in 2017 which identified fuel poor homes using property datasets, mass energy performance analysis and Experian data. This helps WWU to prioritise, alongside the Local Authority, areas of focus which are then further cross-checked with local knowledge and referrals from local doctors, health professionals and community organisations.

Once target areas are identified, local partners engage with people in their homes on energy efficiency and benefits checks. The results are monitored and analysed by source and geography through its dedicated social obligations dashboard.

In March, to maintain safe practices during the COVID-19 outbreak, the service was altered from face-to-face to telephone and referral pathways have been set up.

As a result of this work, more than 2,300 homes have benefited, delivering over £1.5 million in benefits. In 2020, WWU was re-accredited to the BS 18477 Inclusive Service Provision Standard.

Tackling water poverty: Northumbrian Water

Northumbrian Water was the first water company to make a pledge to eradicate water poverty by 2030. When it first set out on this journey, Northumbrian Water calculated that 18% of households (around 370,000 households) it served were defined as being in water poverty in 2018-19. This number has now been reduced to 10.4% in 2020, putting the business on its planned trajectory to 0% by 2030.

Early methods for addressing water poverty included making the best use of tools already available such as bill reduction schemes, metering, water efficiency education and ensuring all customers get the Government welfare benefits they are entitled to. In 2020, Northumbrian Water has been helping customers get on to the financial support schemes offered, strengthening partnership arrangements and using this network to promote support.

Protecting natural resources

While many discrete aspects of environmental management are relevant to each business, biodiversity protection is a common material focus area across all.

Many of the businesses are introducing an environmental "net gain" philosophy into their operational ethos and leading their industries with these approaches. Highlight projects from the businesses include:

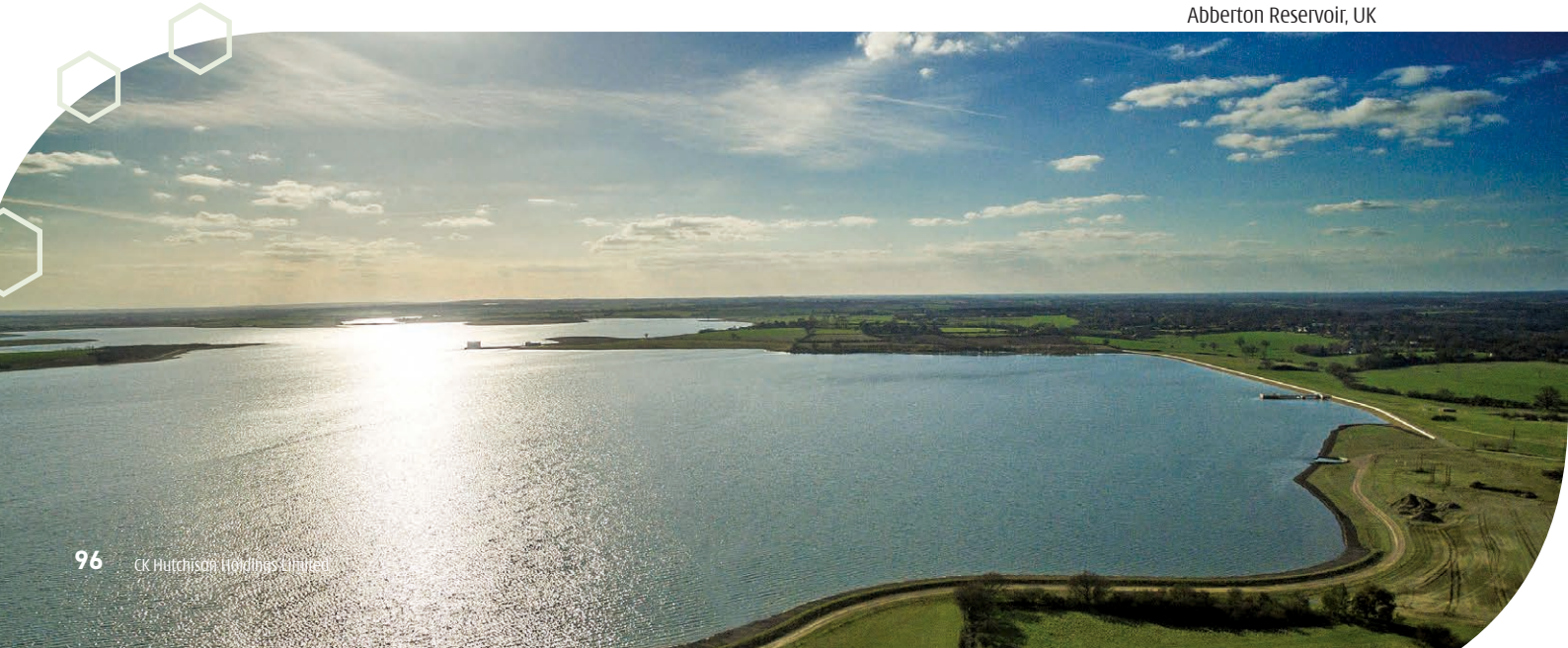
- NGN has committed to measure and report the natural capital value of up to 50 of its largest asset sites by 2026. Using a bespoke tool being developed for NGN by specialist consultants, the assessment will provide a valuation in both technical biodiversity units and financial cost for relevant ecosystem services provided by the sites. The assessment will be undertaken across the sites three times during the period to identify changes in natural capital in response to NGN land management activities. The findings of these assessments will be publicly reported in NGN's Annual Environmental Report. The tool can also be used to review and assess the natural capital impacts of different design solutions to inform project optioneering and business case production.

- Northumbrian Water has completed its first natural capital account for its southern landholding in Essex, Suffolk and Norfolk. The account combines data on the extent and condition of natural capital assets in the landholding, the benefits they produce, and the value of those benefits to society, in both non-monetary and monetary value. The account provides a baseline assessment of the landholding's natural capital and establishes a consistent way of measuring. Northumbrian Water is also working with specialists to develop an in-house tool to evaluate the biodiversity value of all sites larger that 0.2ha. Sites have been ranked from 1-10 so that they can start to monitor change of impact as well as identify sites that need more work.

- UKPN has committed to a Networks Green Action Plan to enhance biodiversity around its sites, in particular substation sites. As part of the Plan, UKPN identified 100 sites using the using the Department for Environment, Food and Rural Affairs ("DEFRA") calculator and partnered with ecological experts, ADAS and Wildlife Trusts, to assess the sites and determine a baseline biodiversity measurement. Following each survey, a biodiversity management plan was prepared with site-specific measures to enhance the biodiversity potential. By 2021, UKPN aims to increase the biodiversity value by up to 30% at these 100 sites.

As the only Infrastructure company in the division's portfolio delivering water-related services, Northumbrian Water dedicates itself to leading practices in water management. Northumbrian Water delivered industry-leading performance during 2020 for minimising interruptions to supply to customers. Preventing leakage in the water-stressed areas of Essex and Suffolk are of highest priority and testament to its approaches, these areas experience lower levels of leakage than delivered by any other Water and Sewerage Company in the country. Further, Northumbrian Water's investment in the Abberton Scheme in Essex increased the storage of Abberton reservoir by 60% to 41 billion litres of water. It is now investing in a pipeline enabling it to transfer water from Abberton to a wider area of Essex to increase resilience across the region. Northumbrian Water has also launched a free online programme, The Ripple Effect, aimed at 7-11 year olds to teach young people about the value of water in addition to playing a leading part in launching the UK's Water's Worth Saving campaign aimed at encouraging the public to save water.

Abberton Reservoir, UK



Enabling the public to champion biodiversity

Northumbrian Water's Branch Out Fund supports environmental projects that help to restore some of the most threatened habitats as well as create new outdoor environments for the public to enjoy. Since its launch in 2013, Northumbrian Water has invested over £500,000 in the Fund, enabling over £10,000,000 to be invested in 138 projects restoring local biodiversity through top-up government grant funding.

Northumbrian Water's Water Rangers Community Programme works with volunteers across communities to help clear and protect 56 of the region's waterways more prone to pollution. A total of 74km have been protected through 8500 patrols since beginning the programme in 2014.

Learn more about the Water Rangers.

Cyber security

The Group seeks to protect its critical assets and data from cyber-attacks and ensures that there are adequate and effective cyber security defences to protect corporate information assets and critical infrastructure. While a Group-wide priority, that is guided by Group-wide policies, each business has its own tailored programmes and resources.

To illustrate with a business case, at UKPN:

- UKPN's Cyber Security Operations team monitors the Security Operations Centre and Security Information Event Management system 24/7 for alerts that indicate areas for further investigation.
- It has established the High Impact Low Probability programme to ensure it has an enhanced programme in place to effectively respond to large scale high impact events.
- It took part in a national cyber security exercise to test its current processes and identify further opportunities for improvements to ensure there is sufficient protection and a robust response in place for a cyber-attack. To minimise the impact of a crisis on the delivery of service to customers, a central team coordinates the response at either a strategic or tactical level. UKPN also has a holistic Business Continuity Management System that builds a framework for resilience by identifying potential threats to the business and the impacts on the business operations these might cause.
- UKPN conducts vulnerability scanning on core systems including the smart meter system. The vulnerability scans include simulated hacker attacks and vulnerability management is subject to a weekly review meeting. Information Security for the Smart Meter system is aligned to ISO27001 as part of the Smart Energy Code (a multi-party agreement which defines the rights and obligations for smart metering) and is managed by a security sub-committee which appoints an external auditor for an annual audit.
- UKPN operates a company-wide Security Matters branded campaign to raise awareness across multiple channels, such as intranet, email, Yammer and digital noticeboards.
- An online cyber security training course, which was updated in 2020, is mandatory for all employees, and to accommodate field staff, educational content is now available on their mobile and touchpad devices.