

Environment

Our low-carbon transition plan demonstrates our commitment in achieving net zero emissions by 2050 through adopting clean energy and implementing energy efficiency initiatives. We also look beyond the climate by also focusing on biodiversity, nature, and water-related risks.



Silver Fern is a symbol of resistance and enduring power. It is also recognised as a symbol of New Zealand in Oceania.

Combating Climate Change and Reducing Carbon Footprint

The Group acknowledges the imperative to confront climate change and manages the environmental impact of each of our business operations. As experts in the energy field, we are aware that our operations can both contribute to and reduce global GHG emissions, influencing the shift towards a sustainable, low-carbon economy. Since 2021, we have been openly disclosing our commitment to phase out coal-fired generation by 2035 and extending our best efforts to support local communities across all our markets of operation to affect an energy transition and attain our decarbonisation goals. The Group remains vigilant in tracking regulatory developments and is eager to bolster government efforts toward decarbonisation.

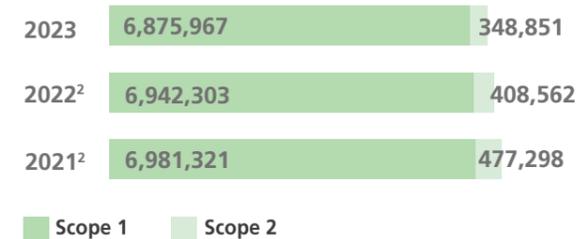
According to the IEA, today, the global average surface temperature has already risen by approximately 1.2°C compared to pre-industrial levels. This increase has intensified typhoons, heat waves and other extreme weather events. At the same time, GHG emissions have yet to peak, signalling that far-reaching and permanent structural changes across society are pressing and paramount. To meet the Paris Agreement's goals of limiting the increase in the global average temperature to 1.5°C above pre-industrial levels, the energy sector, which accounts for about two-thirds of anthropogenic GHG emissions, must be significantly transformed and decarbonised.

Furthermore, the Oil & Gas Decarbonisation Charter (OGDC), launched at COP28, marked a unified commitments from the oil and gas industry to combat climate change by striving for industry best practices in emission reductions. The OGDC's commitments to achieve net zero operations by 2050, eliminate routine flaring by 2030, and reduce methane emissions to near-zero by 2030 align with our objectives. In step with these commitments, we aim to reduce our Scope 1 and 2 emissions by 67% by 2035 from our 2020 levels, setting us on course towards net zero operations by 2050. Additionally, we recognise that the transition towards a decarbonised energy sector is not solely a climate issue but also a public health imperative. We also pay attention to the emissions associated with our network losses. In 2023, our electricity transmission and distribution losses were recorded to be 1.2% and 5.57% respectively, while our gas leakage rate was 0.79%¹. We are continuously improving our system losses and increasing the system reliability with technical advancement. As highlighted in COP28, the health benefits of climate action are substantial, and by reducing our carbon footprint, we are contributing to cleaner air and promoting climate-resilient development.

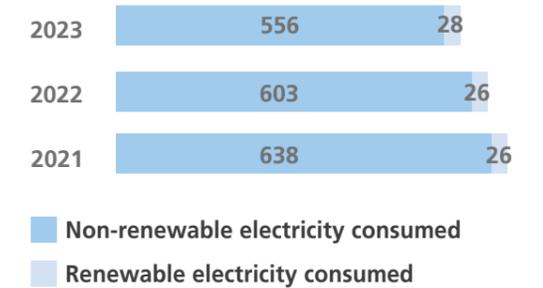


1 Included leaks of vent, fugitive, pneumatic and unburnt.

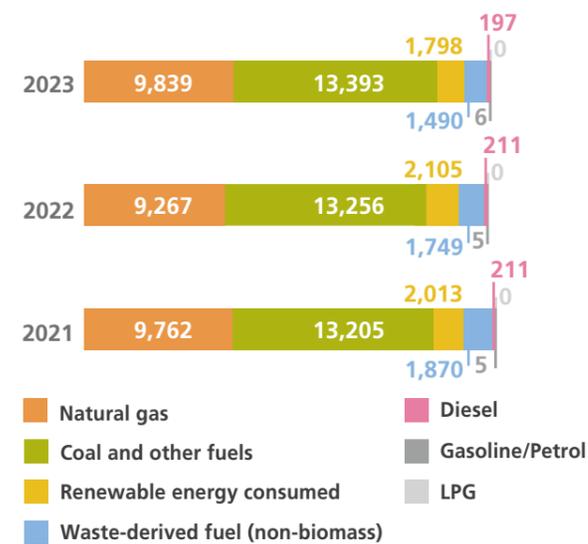
GHG Scope 1 and 2 emissions (tCO₂e)



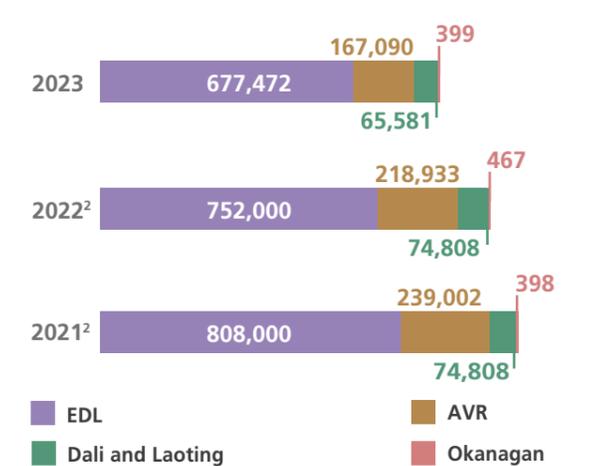
Purchased electricity for own consumption ('000 MWh)



Non-renewable and renewable energy consumption ('000 MWh)



Carbon avoidance (tCO₂e)³

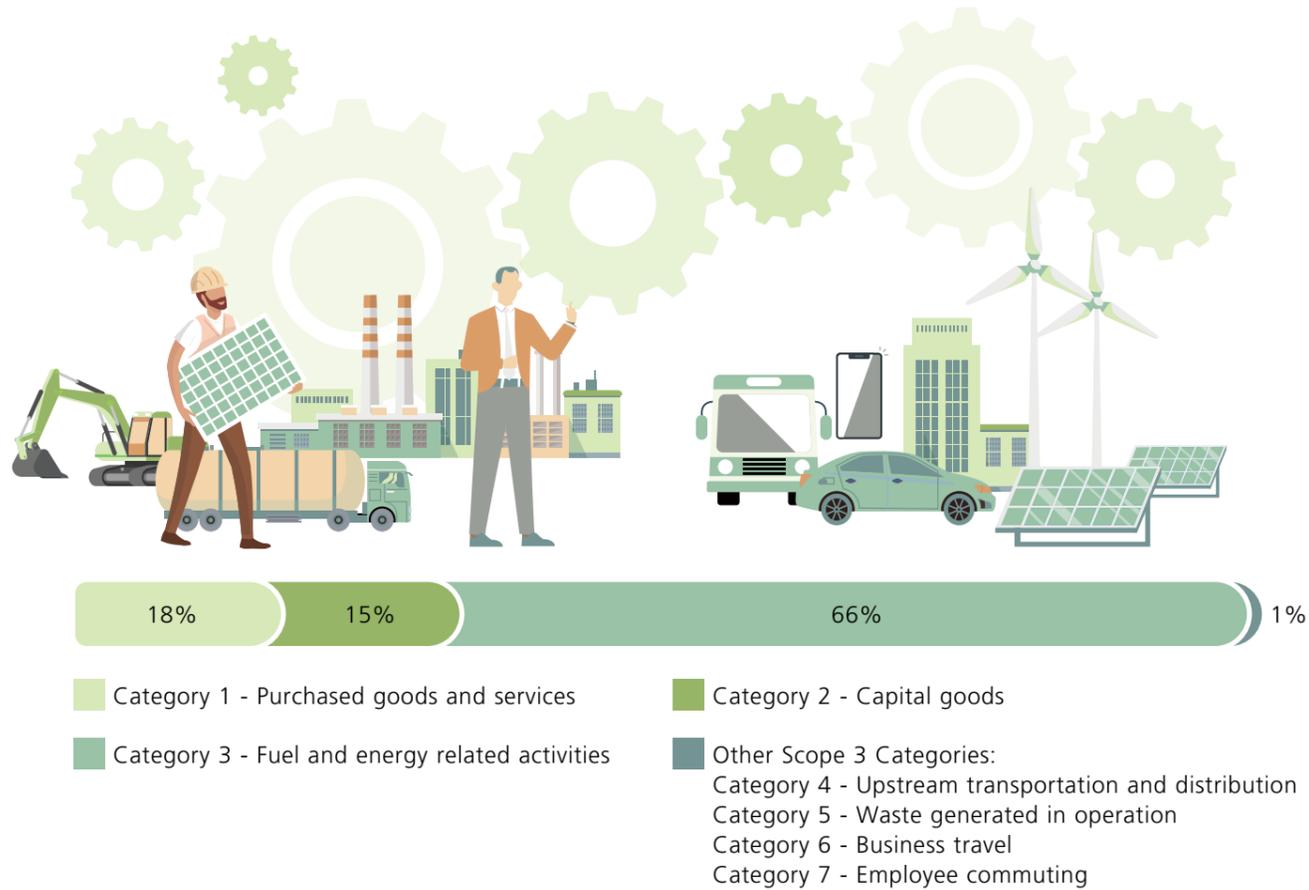


In our ongoing journey toward sustainability, the Group is also sharpening its focus on Scope 3 emissions, which are indirect emissions within our value chain. Given the nature of our energy and utility-related businesses, majority of our Scope 3 emissions result from upstream activities, particularly from fuel and energy related activities relating to the production process of the fuels and electricity we consume. Following the momentum

for meeting the ambitious goals set out in the Paris Agreement, many of our business units are addressing emissions across their value chain and endeavouring to achieve Scope 3 targets. In 2023, we have improved our report on Scope 3 emissions. Our estimated Scope 3 emissions from the Group's business operations, which cover a total of 83% of our attributable revenue, were 705,633 tCO₂e.

2 The 2021 and 2022 data figures have been restated to align with the updated approach to allow for meaningful comparison of data over time.
3 Grid emission factors decrease as renewable energy sources increasingly feed into the grid. Consequently, the carbon avoidance achieved by displacing electricity generated from fossil fuel decreases over the years, reflecting a cleaner energy mix of the grid.

Scope 3 Emissions by Categories



Key Initiatives and Targets by Our Business Units

SAPN

- Achieve net zero Scope 3 (value chain) greenhouse emissions by 2050 On track

UKPN

- Work with suppliers to reduce supply chain carbon emissions (Scope 3) by 25% by 2028, compared to a 2018/19 baseline On track

NGN

- Achieve carbon negative business operations and net zero Scope 3 emissions by 2050 On track

Recognising the immateriality and the limited control we have over the downstream activities of the energy products we sell, which includes electricity and gas, our present efforts concentrate mainly on upstream activities, such as purchased goods and services, capital goods, and fuel and energy related activities, where we can exercise greater influence. As we improve our data collection and expand our reporting, we aim to progressively cover a wider array of Scope 3 emissions. This will not only enhance the transparency and accountability of our reporting but also guide our efforts in driving down emissions throughout our entire value chain, thereby contributing to the global effort to mitigate climate change.

Commitments and Actions

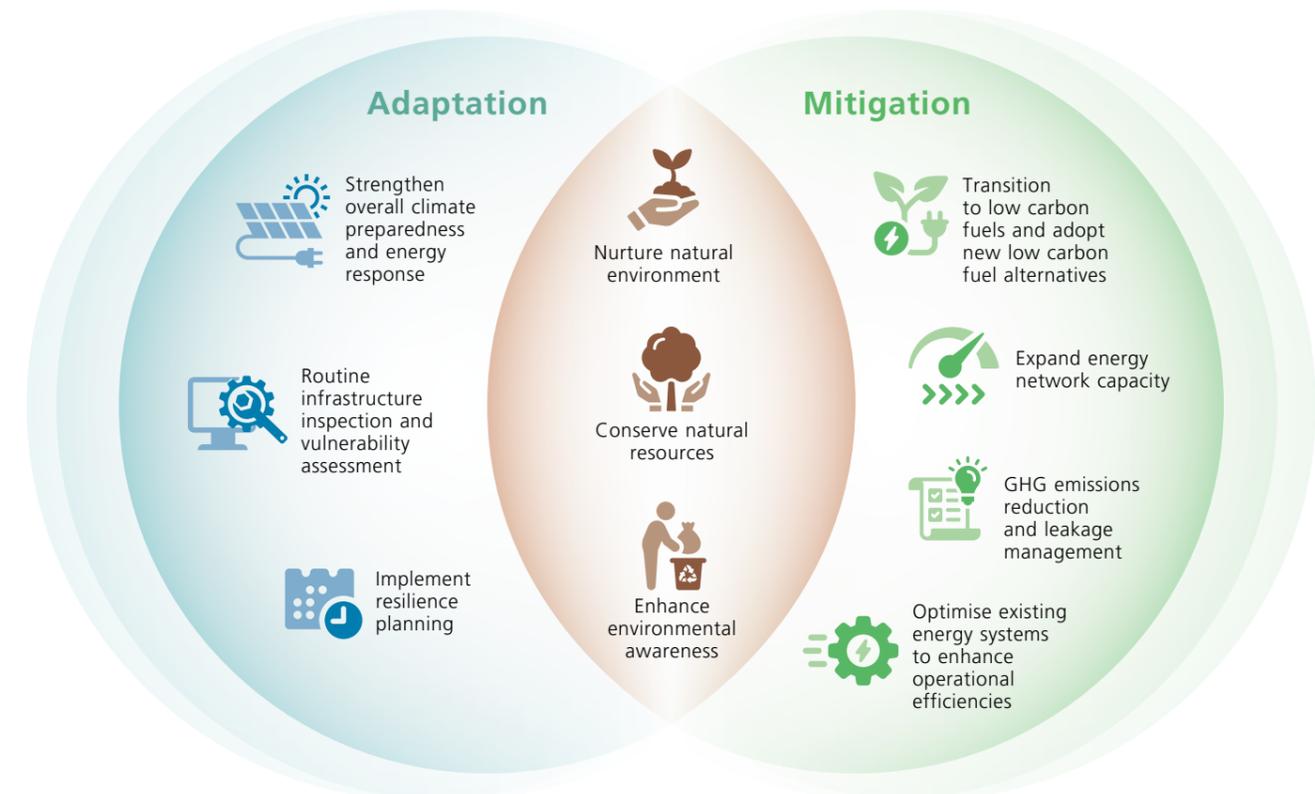
The Group understands the extent to which climate change threatens the well-being of people and the environment. We firmly believe that a resilient environment and vibrant communities are foundational to business success.

Our mitigation strategies include decarbonising our energy generation portfolio, advancing methane reduction and recovery, and optimising operational efficiency. Moreover, we are committed to expanding our business segments that are crucial to our core objectives, such as deploying smart energy solutions, increasing our renewable energy capacity, and exploring hydrogen as an energy source.

Complementing these efforts, we actively pursue carbon avoidance initiatives, including renewable and energy-from-waste projects, that displace electricity typically generated from fossil fuels, as well as projects that harness by-product gases such as landfill and waste coal mine gas, which would otherwise be released to the atmosphere or flared. In 2023, these activities enabled the Group to avoid 910,542 tCO₂e of emissions.

Adaptation efforts are also integral to our strategy, focusing on strengthening overall climate preparedness and enhancing our energy systems' response to climatic shifts. This involves routine infrastructure inspections, vulnerability assessments, and robust resilience planning to anticipate and withstand climate-related impacts. Furthermore, strategies such as implementing biodiversity management plans, improving water use efficiency, and minimising waste footprint emerge as intertwined areas between adaptation and mitigation.

By enhancing our climate resilience, we not only safeguard our operations against climate-induced disruptions but also ensure the continuity and adaptability of our business model. Integrating resilience into our strategy enables us to maintain operational integrity and fulfil our environmental commitments amidst a changing climate landscape.



Enhancing Climate Resilience

As the frequency and intensity of climate-related events increase, it is imperative for the Group to develop strategic approaches that enhance resilience and ensure continuity of operations. By proactively integrating adaptive strategies across our business units, we are committed to safeguarding our assets, infrastructure, and more importantly, human

capital against the unpredictable impacts of climate change. We have demonstrated our ability to operate a sound and reliable electricity transmission and distribution system with the System Average Interruption Duration Index (SAIDI) of 0.05 and 0.71 in 2023 for transmission and distribution respectively.

OCEANIA

VPN – Implementing Proactive Flood Response

In response to the severe flash flooding around Melbourne’s Maribyrnong River and extending regions, VPN took decisive action to protect its energy infrastructure and maintain service to customers. The company’s emergency measures included building of levees and temporary barriers, real time water level monitoring and de-energisation triggers to prevent widespread damage. These interventions, combined with the swift deployment of mobile generators and network reconfiguration, were effective in minimising disruptions.

Recognising the importance of community support during such crises, VPN also deployed its Mobile Engagement and Response Vehicle (MERV) to provide direct assistance and communication to those in evacuation centres. In the aftermath, VPN has also invested in the construction of permanent levees capable of withstanding 1:200 year flood levels at vulnerable substations, demonstrating a commitment to strengthening infrastructure resilience. This strategic approach emphasises not only immediate response but also long-term adaptation to protect against future climate-related challenges.



MERV at the Bendigo relief centre where evacuees from the Rochester flooding were provided with customer support and comfort.



SAPN – Management of Bushfire

Bushfires pose a critical threat to lives, property and ecological communities in South Australia. SAPN strives to minimise the risk and severity of fire events through conducting regular inspections and pre-bushfire patrols. The company has completed all inspections in the 2022/23 cycle to pre-emptively identify asset defects with a high probability of failure and fire-starting. It has also completed all pre-bushfire patrols, totalling 49,800 km of network, before bushfire seasons in all operating regions.

The last three years of La Nina weather conditions resulted in significant vegetation growth, and SAPN’s vegetation management programme was required to trim vegetation on 70,911 spans of powerline across South Australian before the commencement of the bushfire danger season.

Bushfire represents such a significant safety and reliability risk to our workers, communities and infrastructure, the SAPN undertakes an extremely comprehensive range of bushfire risk preparation, mitigation, response and adaptation activities.

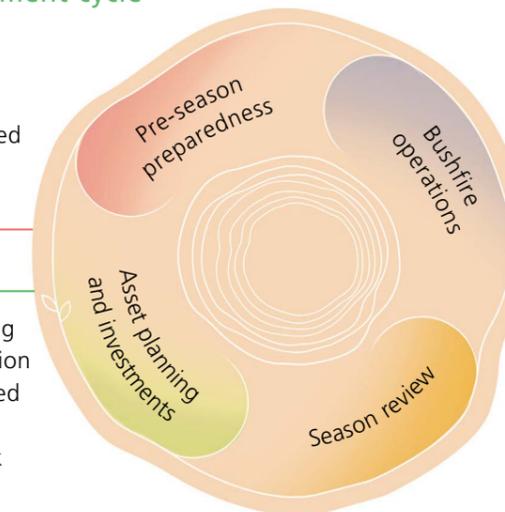


SAPN plans ahead to reduce bushfire risk and ensure the safety and reliability of the network for the community.

Bushfire risk management cycle

- Pre-Summer asset patrols
- Vegetation clearance
- Fire start defects remediated
- Desk-top exercises
- Mandatory training

- Sophisticated risk modelling
- Design and material selection
- Deployment of higher-speed protection
- Replacement of higher risk assets



- Weather monitoring
- Collaboration with emergency services
- Fire danger protection settings
- Customer communications
- Public safety power shut-off

- Key learnings
- Improvement actions
- Refinement of processes and prioritisation of investments

Governance: Bushfire Risk Management Committee

Collaboration and communication: energy industry, emergency services, government, universities and customers

OCEANIA

AGIG – Building Resilience through Adaption and Mitigation

Erosion management is vital in preventing and controlling erosion to land that covers and protects their underground assets. AGIG’s Aerial Surveillance Lands team are tasked with monitoring the land cover of their assets and reporting any potential risks, areas of erosion or repairs required. Any identified erosion is remediated by the mainline civil crew, following engagement with key stakeholders to ensure all needs are considered.

During 2023, AGN completed a 20-year programme to replace old cast iron mains in the Victoria network with modern high performance materials. This improved the reliability of gas delivery, reduced emissions (via the leakage of gas) and ensures that the network is hydrogen-ready to adapt and mitigate climate risk. In total, approximately 1,500 km of mains have been replaced from the old cast iron material to a more reliable polyethylene material since 2003.



AGN’s Mains Replacement Programme has the added benefit of achieving emissions reductions in the near term and ensures our network is ready for hydrogen in the future.

ASIA

HK Electric – Implementing Anti-Flooding to Tackle Flooding Risk

Following the Typhoon Mangkhut incident in 2018 and the record-breaking rainfall in 2023, HK Electric has undertaken a rigorous analysis of wave overtopping risks at 17 strategic locations housing our power generation and transmission assets, including Lamma Power Station and its Extension, shoreline areas near transmission and distribution substations, and key transmission cable structures. With technical findings from the study, HK Electric has been implementing enhancement measures to prevent asset damage due to flooding, such as revising Design Guidelines for New Generation and Transmission Facilities, conducting regular drills with employees, contractors and customers, installing anti-flooding systems and enhancing flood walls.

In the coming years, HK Electric plans to retrofit substations within the areas of potential storm surge impacts identified by the Civil Engineering and Development Department (CEDD) of the HKSAR Government with flooding alarms and bund walls in 2 phases that spans from 2024 to 2026.

EUROPE

UKPN – Protecting Against Floods as Climate Resilience Strategy

UKPN has been working with members of the Energy Networks Association (ENA) to assess the impact of climate change projections on the electricity network. Through a series of workshops with the Met Office, the national meteorological service for the UK, and other ENA members, they have identified and prioritised the weather and climate related hazards which need consideration both now and into the future. The detailed impact of these hazards on our networks and information as to the prevalence of the hazard in the current climate and the future RCP8.5 climate have been described as an output of this work.

Eight climate change hazards have been prioritised from this work. The principal work from these studies has been flood prevention work. The principal action arising as a result of these studies is flood prevention work. UKPN have installed permanent flood protection at 78 sites over the RIIO-ED1 business plan period and plans a similar number over RIIO-ED2. In addition, temporary flood protection equipment is available to deploy in emergencies. Current wood pole overhead line designs have been reviewed following Storm Arwen happened in 2021, which are considered adequate for future climate conditions.



Permanent flood barriers protect the site against the prospect of a 1-in-1,000 year flood of the River Wandle.

NGN – Safeguarding Pipeline Integrity Against Climate Change

In a proactive move to safeguard critical infrastructure against the escalating threats of climate change, NGN conducted a routine inspection of a high-pressure pipeline traversing Black Burn in Cumbria. The inspection revealed that riverbed erosion had uncovered a section of the pipeline, posing a significant risk to its structural integrity. Understanding the risks associated with this exposure, NGN promptly commissioned a specialist assessment and installed a ramped rock weir composed of boulders and cobbles over the pipeline. In addition to providing durable protection against further erosion, the installation of rock weir had also taken into consideration of the local ecology to minimise disruption to the natural river flow and maintaining the aesthetic quality of the environment.



NGN engineers carry out gas mains replacement work to reinforce resilience.

Driving Energy Transition Through the Shift to Clean Energy

The Group is steadfast in its commitment to combat climate change, driving renewable energy and green hydrogen initiatives across all business units. By investing resources and fostering innovation, we are reducing our reliance on fossil fuels and advancing a sustainable energy future. In South Australia, we are currently blending 10% of green hydrogen into the existing natural gas network to actively reduce

carbon emissions. While in UK, NGN has an active portfolio of innovation projects to support the net zero transition, including trialling the blending of hydrogen (up to 20% by volume) with natural gas to 670 customers in their region (HyDeploy22) and establishing the safety case for the use of 100% hydrogen as an affordable and sustainable alternative to natural gas (H21).

ASIA

HK Electric – Shifting Towards a Low Carbon Fuel Mix

HK Electric is switching from coal to gas. Four coal-fired units, L1, L2, L3 and L4 were decommissioned between 2017 and January 2024, resulting to an increase of 56% gas-fired power of HK Electric’s total power output in 2023. Following the commissioning of two new gas-fired units, L11 and L12 in 2022 and early 2024 respectively, the gas-fired generation ratio is expected to increase further to around 70%.

In 2022, HK Electric updated the company’s carbon reduction target and committed to reducing Scope 1 GHG emissions by 68.4% per kWh of electricity generated by 2035, as compared with that of 2019. This mid-term carbon intensity target has been validated and approved by the Science Based Targets initiative (SBTi).



HK Electric, in partnership with the other power company in Hong Kong, commissioned Hong Kong’s first Offshore LNG Terminal in July 2023.



HK Electric actively pursues a decarbonised electricity supply by incentivising the local production of renewable energy. Through the Feed-in Tariff (FiT) Scheme, the company offers private sector customers at premium rates for their renewable energy contributions to the grid, with about 10.8 MW connected since the programme’s inception. Meanwhile, over 29 GWh of zero-carbon electricity generated was subscribed through the purchase of Renewable Energy Certificates (“REC”) since its launch.

In parallel, HK Electric is enhancing its own renewable capacity. Additional solar power system were installed at Lamma Power Station and on other premises of the company, boosting its solar generation capacity to 2.4 MW. Together with the company’s 0.8-MW wind turbine unit on Lamma Island, the total installed capacity of renewable power increased to 3.2 MW as at the end of 2023. Furthermore, a green mobile electricity supply system has been launched, offering a clean and reliable energy source for emergency power relief and as an alternative to diesel generators at major events. The whole system is expected to save around 1,800 tonnes of carbon dioxide emissions in 10 years’ service, equivalent to approximately the carbon dioxide intake of 8,000 trees.

Moreover, HK Electric, in partnership with another power company in Hong Kong, commissioned the territory’s first offshore LNG terminal. The terminal received its first LNG shipment in 2023, which is the world’s largest FSRU vessel with an LNG storage capacity of 263,000 m³. This terminal is crucial to securing the city’s green energy future, including strengthening fuel security and cost competitiveness of fuel supply by creating a new channel to receive natural gas from diverse international markets.



Over 580,000 customers will be involved in the deployment of Smart Meters, allowing them to further optimise their energy use more effectively.

OCEANIA



VPN – Enabling More Large-scale Renewable Connections

VPN has set a target to increase total installed capacity of renewable energy generation on its networks to 4 GW by 2026. They had already increased to 2.6 GW of renewable energy directly connected to the networks as of end 2023, including 988 MW of residential rooftop solar across 23,792 installations.



VPN launches new battery to support more solar in Melbourne's western suburbs

Between March 2022 and April 2023, Beon Energy Solution was engaged to design, construct, and commission the 240 MW Avonlie Solar Farm in southern New South Wales to support the growth of renewable energy. By enabling greater penetration of residential rooftop solar, VPN has unveiled the first neighbourhood battery to be installed on Powercor's distribution network in February, which is located in the rooftop solar hot spot of Tarneit in Melbourne's western suburbs. The 120 kW/360 kWh battery will soak up surplus solar from households during the day and supply approximately 170 homes for up to three hours during peak electricity demand periods, helping Victorians to "be part of the renewable energy revolution".

AGIG – Introducing Renewable Hydrogen Gas into Australia Network

In support of the Australian state and territory ambitions of being net zero carbon by 2050, AGIG is committed to delivering at least 10% renewable gas across its distribution networks by 2030, with a vision of 100% renewable gas by no later than 2050. During the year, AGIG has proactively partnered with governments and industry to deliver renewable hydrogen projects across the country and the value chain.

It has expanded the supply of blended renewable hydrogen in South Australia, increasing from 700 homes to nearly 4,000 homes and businesses in Mitchell Park, Clovelly Park and parts of Marion. This expansion is a significant endorsement of the success of this pioneering project, as it marks two years since it began delivering blended renewable hydrogen to homes in the southern part of Mitchell Park in May 2021, demonstrating the ability of the existing gas network to transport renewable gas to homes and its compatibility with existing gas appliances.



AGIG's HyHome is Australian-first initiative showcasing 100% hydrogen gas appliances.

It received development approval for the Hydrogen Park ("HyP") Gladstone project, which puts Gladstone in progress to become the first gas network in Australia where the entire gas distribution network will supply homes, businesses and industries with a blend of up to 10% (by volume) of renewable gas. The project is now under construction and is expected to blend into the Gladstone gas distribution network in early 2024.



AGIG's HyHome, located at the Dennis Family Homes display centre in Wollert demonstrating future energy use where natural gas is replaced entirely by carbon-free hydrogen.

It has unveiled Australia's first 100% hydrogen-powered home, HyHome, providing a window into future low-carbon energy solutions for Australia. HyHome, with many of its appliances running off hydrogen, demonstrates the future energy use where natural gas is replaced entirely by carbon-free hydrogen. The showcase reflects a critical step in providing customer choice in the energy transition.

It signed an arrangement to power a South Australian government two-year hydrogen bus trial. Commenced in August 2023, the trial's hydrogen fuel cell buses are powered by green hydrogen generated at AGIG's HyP South Australia. The bus trial will carry out over 80,000 customer journeys within the first 12 months and save approximately 90 tonnes of CO₂ emissions per year, at a minimum. CO₂ emissions per year, at a minimum.



The AGIG team attended Central Queensland's largest annual environmental awareness event: EcoFest, sponsored by the Gladstone Regional Council showcasing the featured 3D model of HyP Gladstone, hydrogen production demonstration kit and model hydrogen-fuelled race car.

OCEANIA

Wellington Electricity – Evaluating Electrification Capacity

As the New Zealand Government has pledged through the Zero Carbon Act to reach net zero emissions by 2050, Wellington Electricity is taking steps to support decarbonisation. For instance, it has evaluated the available capacity of the residential low-voltage network. The evaluation helps determine whether the network is ready for the EV uptake and the transitioning of residential water heating from gas to electricity. Meanwhile, Wellington Electricity conducted for its business customers an electrification assessment by engaging with companies that use gas or coal to understand the scale and timing of their future electrification projects. Results showed that an estimated 30 MW of future electric load needs to be installed over the next ten years to fulfil electricity demands.

EUROPE

UKPN – Supporting of Low-carbon Heating at Households

To help UK customers transition away from fossil fuels as fast as possible, UKPN kicked off the NeatHeat project to trial new boiler systems, Zero Emission Boiler (“ZEB”), offering a low emissions solutions for 28 homes across London, the South East and the East of England which may be unable to install a heat pump.

Using the heating systems already present in many UK households, the ZEB charges up when electricity is cheaper or greener, rather than using carbon-intensive solutions such as gas or oil. With a high-density storage core, the ZEB charges up overnight during off-peak, efficiently storing this energy and releasing it whenever the thermostat calls for heat or hot water. Its software will also create a unique heating plan and a charging schedule to enable the most cost-efficient heating for the home.

Customers participating in the trial are anticipated to cut their emissions by 2.5 to 3 tonnes of CO₂ per year. The trial will allow UKPN to understand the charging pattern of the smart boiler and test optimisation mechanisms that will provide flexibility to the local electricity network and use existing infrastructure more smartly.



In NeatHeat, UKPN aims to look into an alternative clean heating solution that ensures no one is left behind in this sustainable transition.

EUROPE

WWU – Enabling Low-carbon Hydrogen Production and Network Development

WWU is investing £400m between 2021 and 2026 in the gas network to support its journey to net zero. By 2035, WWU aims to deliver a net zero ready network to the areas most likely to convert to hydrogen, and to transform its entire network by 2040.

High volumes of low-carbon hydrogen in the gas network are essential to delivering the net zero system for customers. In order to reduce the cost and impact of green hydrogen production, WWU is partnering with a global hydrogen company to produce innovative electrolyser prototypes. The prototypes will allow less pure water, such as rainwater, storm overflow and industrial process wastewater, to be used as feedstock, reducing input costs and widening the potential locations for green hydrogen production.

WWU is developing strategic plans for hydrogen clusters and rollout across the areas it serves. For the South Wales Industrial Cluster, the company’s flagship Hyline Cymru project is seeking to develop a new dedicated hydrogen pipeline which will support decarbonisation of major industry, and open the potential for repurposing the existing gas network for other customers. A feasibility project for the pipeline was undertaken through 2023.

Additionally, WWU has announced a feasibility study to evaluate the capability of existing North Wales infrastructure to transport hydrogen as part of its future network planning strategy. The study will provide a detailed assessment of the infrastructure needed to advance opportunities for hydrogen in Wrexham and Deeside. The project will also explore supply and demand scenarios to understand the extent of hydrogen rollout required in the low-carbon future. It will also develop options for changes to the current method for implementing industrial cost-sharing schemes, which allows customers to share the cost of adopting a hydrogen network and could reduce the cost of rolling out hydrogen for industry.



WWU’s Hyline Cymru could allow industrial customers to move to hydrogen as early as 2030, offering a path for decarbonisation and stimulating the hydrogen economy, in turn both protecting and creating new jobs.

Enhancing Climate Mitigation through Methane Management and Carbon Capture

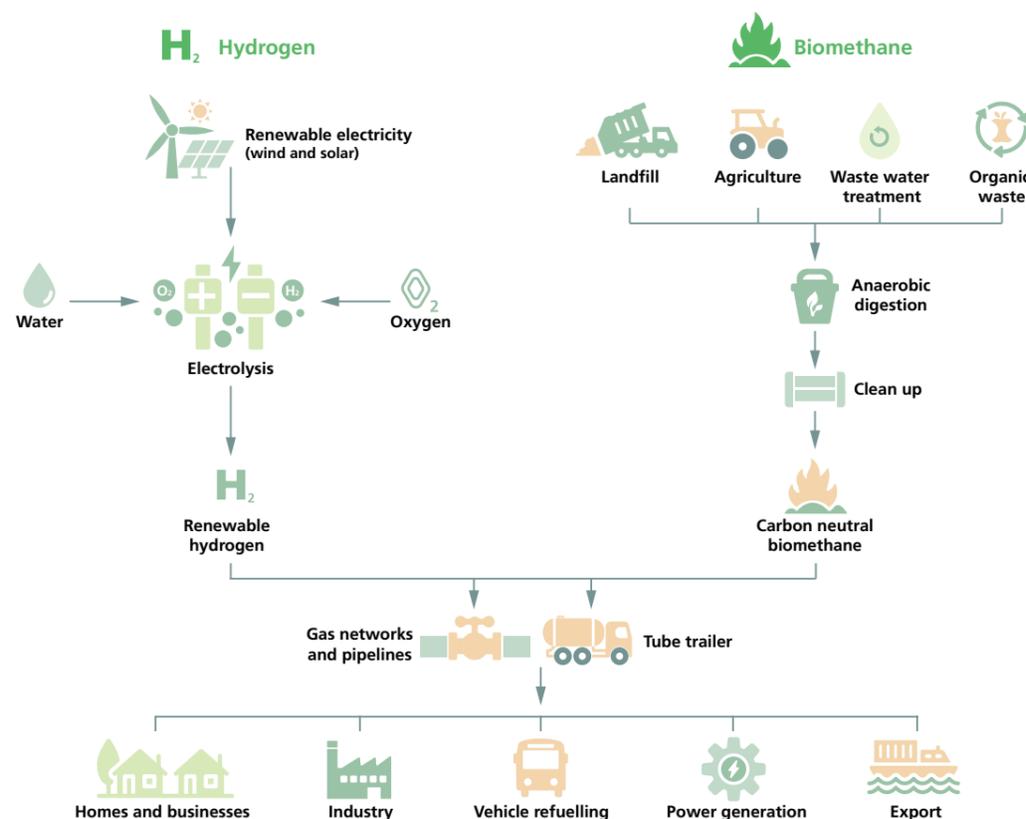
The Group is acutely aware of the immediate impact of methane emissions on climate change and is actively engaged in methane management, aligning with global efforts such as the Global Methane Pledge. Our gas transmission and distribution businesses are at the forefront, implementing detection, leak repair, and infrastructure

enhancement to reduce emissions. Complementing our methane initiatives, we are also advancing carbon capture and storage strategies across various business units, reinforcing our comprehensive commitment to mitigating GHG emissions.

OCEANIA

AGIG – Signatory to the Methane Guiding Principles Partnership

During 2023, AGIG became a signatory to the Methane Guiding Principles (MGP) partnership. The MGP partnership is a global multi-stakeholder partnership that promotes a best practice approach for reducing methane emissions in the natural gas supply chain by sharing learnings and increasing transparency replacing methane reduction.



EDL – Establishing Waste Coal Mine Gas (“WCMG”)-powered Stations and ‘Green Credit’ Revenue

EDL owns and operates a large portfolio of WCMG-powered stations in Australia. WCMG is produced during coal mining as methane gas trapped in coal seams is released. As this product can be a safety hazard and a challenge to mining operations, it is extracted by mine ventilation and coal seam drainage. Historically a waste product that is vented or flared, EDL uses the extracted methane as a power generation fuel to deliver reliable, sustainable, and affordable energy and significantly reduce GHG emissions.

EDL also produces ‘green credits’ – carbon offsets – through operation of a large portfolio of landfill gas, WCMG, renewable energy power stations and renewable natural gas plants in Australia, the UK, and North America. These green credits are traded through local and national carbon markets, monetising EDL’s ability to abate carbon. This activity not only underpins EDL’s commitment to environmentally sound practices but also demonstrates the tangible financial value of sustainable operations.



EDL owns and operates the 64 MW WCMG Moranbah North Power Station, which captures and combusts WCMG and converts it to electricity for the national electricity market.

EUROPE



NGN – Enabling Biomethane and Cutting Methane Leakage

Methane is a predominant component of natural gas and a potent GHG. Its leakage from the network makes up approximately 90% of NGN’s GHG emissions. As custodians of a precious natural resource, NGN continues to carry out its leakage reduction programme to reduce the amount of gas lost, including installing resilient plastic pipes, adopting sophisticated pressure management technology and adding chemicals to the gas to help prevent gas leakage. The company is in progress to meet its target of reducing gas leakage by 24% between 2021 and 2026. By 2023, a 11% gas leakage reduction is recorded compared to the baseline year.

NGN is also committed to enabling low-carbon gas connections, such as biomethane, to its network to support the transition to a flexible, sustainable energy system and facilitate net zero emissions by 2050. This biomethane displaced the requirement for methane-rich natural gas. To deliver on its commitment, NGN provided network capacity assessments to assist developers with project planning and managing the network connection process. As of March 2023, NGN connected 20 biomethane production sites to its network with a maximum production capacity of 17,610 standard cubic metres of gas per hour, equivalent to 1.2% of network gas throughput, enough to heat over 61,000 typical UK homes.

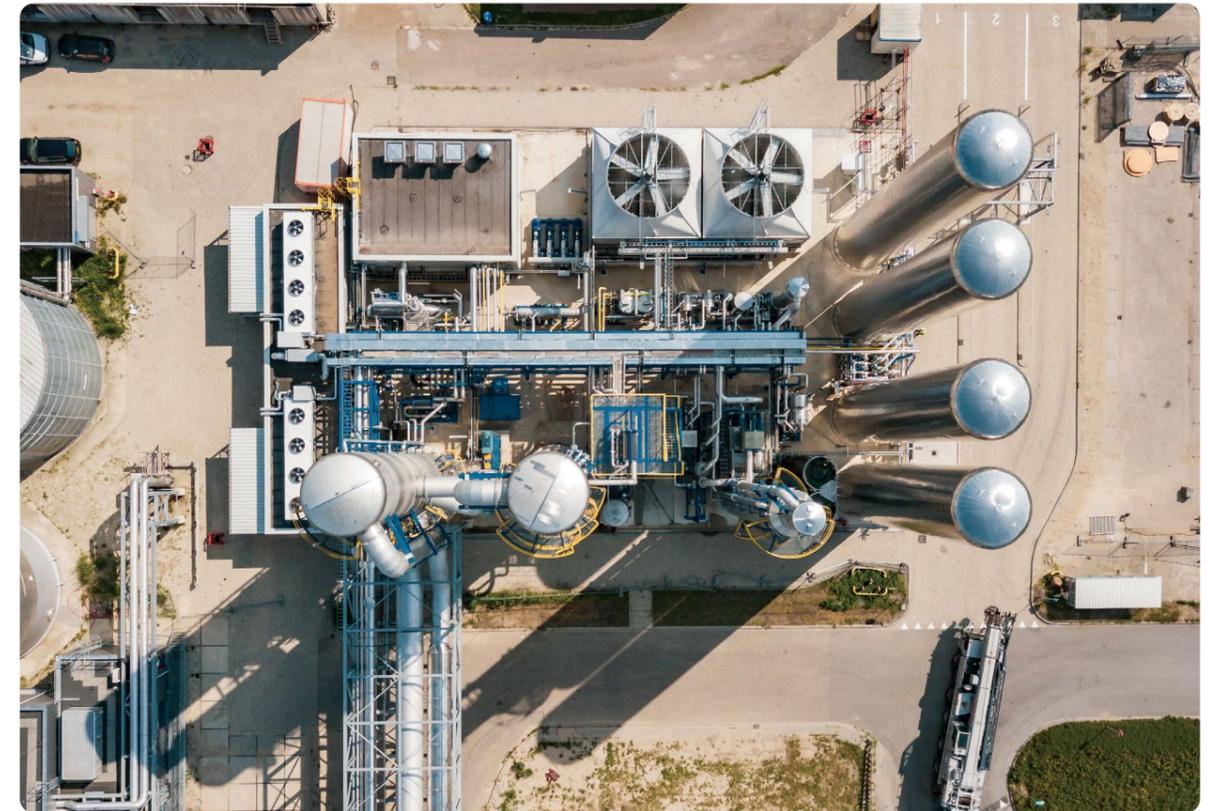


NGN helps biomethane producers get their gas into our grid, through a comprehensive support service.

AVR – Installing New Carbon Capture Facility

AVR is dedicated to maximising the value from waste, including the capture of carbon emissions from the incineration of residual waste. Since August 2019, AVR’s facility in Duiven has utilised an innovative carbon capture system that extracts carbon dioxide (CO₂) from the flue gases of its Waste-to-Energy plant. This captured CO₂ is then supplied to greenhouse growers and various industrial sectors for productive use.

In 2022, AVR secured the stimulation of sustainable energy production and climate transition (SDE++) subsidy from the national government. The subsidy supports the construction of a second CO₂ capture facility at the Duiven site, making the supply of captured CO₂ to greenhouse growers financially viable for 15 years following the project’s completion in 2028, with the new facility’s projected annual capture capacity of 60,000 tonnes of CO₂ to be supplied to the greenhouse horticultural sector from 2028.



AVR captures CO₂ from their processes, which then supply to the greenhouse horticultural sector.

NORTH AMERICA

EDL – Upgrading Landfill Gas-to-Electricity Power Plants into RNG Facilities

EDL is currently commissioning two new RNG facilities in Ohio, USA. These facilities use captured methane – a potent GHG – from landfill waste and convert it into RNG. In 2023, avoided GHG emissions from the RNG produced by EDL’s five RNG plants in the USA was equivalent to the emissions of over 10,000 cars. The RNG produced can be utilised as a clean fuel for vehicles, for residential heating, or to generate electricity. Committed to a carbon-neutral future, EDL supports customers in achieving their decarbonisation goals by boosting the supply of RNG.



EDL converts methane to RNG at the Limestone facility near Youngstown, Ohio, USA.

Building Resilient Energy Systems and Modernising Electricity Network

Transitioning to a cleaner and more sustainable energy future is a strategic imperative for the Group, necessitating an intensified focus on innovation and digitalisation to maximise the utilisation of energy resources. At the business units level, strategic investments in innovative

technologies and processes are prioritised to enhance operational efficiency. This includes the integration of digital solutions, the adoption of best practices in energy use, and equipment upgrades. The cumulative effect leads to resilient energy systems, offering enhanced service quality and sustainability for all stakeholders involved.

ASIA

Jinwan – Battery Energy Storage Project

The project which consists of 16 MW/8 MWh battery and 4 MW/0.67 MWh supercapacitor has been put into commercial operation since 1 Nov 2023. Supercapacitors are a type of an electrochemical energy storage systems which have great power density and specific capacitance. These systems have the ability to efficiently release energy with a high density over a relatively short time. The project assists the main generation unit (600 MW) in load-following response to power grid frequency modulation. The combination of “battery + supercapacitor” has greatly increased the response speed which enables grid to maintain the operation frequency at 50 Hz.



The Battery energy storage project plays a key role in maintaining a stable, reliable and good quality grid power.

OCEANIA

VPN – Energy Efficiency Installation at Brooklyn Depot

VPN completed the large-scale 1.25 MW solar panel system installation at its depot in Brooklyn in 2023 to significantly reduce electricity consumption and GHG emissions at the new location. The depot is fitted with energy-efficient fixtures, including LED lighting, battery storage connecting to the solar installations and future-proofing for EV charging facilities for anticipated growth in EV fleet requirements.



VPN’s installation of solar panel system to enhance energy efficiency.

OCEANIA

SAPN – Developing a New Dynamic Operating Envelope (DOE)

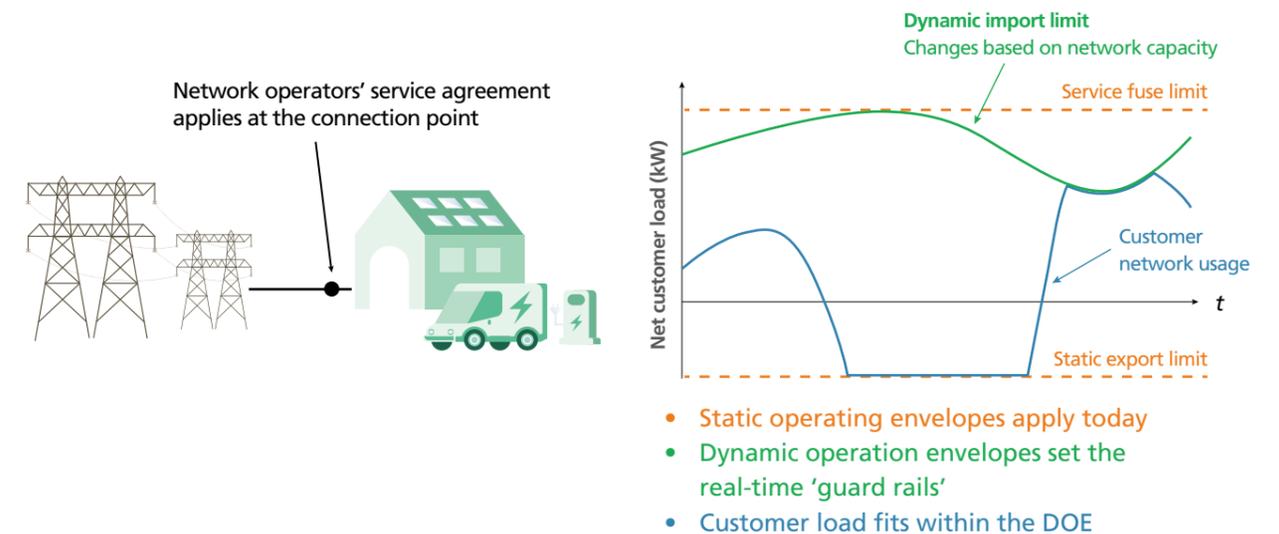
SAPN has released its Draft Regulatory Proposal for the 2025-2030 period, detailing plans to complete the transformation of its network into a ‘two-way’ system, aiding South Australia’s transition to 100% renewable energy. A key aspect of this proposal is the establishment of new systems to enable demand-side flexibility, progressing from existing work focusing on enabling more exports from rooftop solar systems.

With forecasts indicating continued growth in rooftop solar installations, the company expects reverse power flows to surpass the capacity of its network assets at certain times of the year, especially within the low-voltage network. To reduce the need to curtail exports from customer solar systems and ensure a secure electricity supply for all customers, the company intends to introduce ‘flexible connection’ services for both residential and commercial customers.

The proposal outlines the development of new systems and services to accommodate increased connections of customer loads and generation to the distribution network, such as solar systems, batteries and EVs. These advancements will enable more dynamic balancing of energy import and export, aligning times of peak solar generation with flexible loads such as EVs and hot-water systems. New value for customers will be realised as they utilise low-cost, renewable generation during the day, and respond to market price and network constraints during times of peak demand.



Dynamic Operating Envelopes



In early 2023, Enerven, a subsidiary of SAPN, completed the 1000th install for phase 3 of Tesla’s Virtual Power Plant (VPP) project. As part of the project, Housing SA residents across South Australia have had a Tesla Powerwall and a solar system installed, creating a system that works together to create a single power plant. As a result, the SA VPP provides Housing SA tenants the lowest electricity rate in the State, while also creating higher energy security and grid reliability for the entire community.

What are Virtual Power Plants?

A virtual power plant (VPP) is a network of distributed energy resources – such as homes with solar and battery systems – all working together as a single power plant.

The VPP operator uses WiFi technology and sophisticated software to charge or discharge energy from the batteries within the VPP and trade it on the National Energy Market (NEM).

With many systems working together, small amounts of energy stored in individual home batteries can become large amounts of energy to help support the grid in times of need. VPP aims to reduce prices, enhances grid stability, offers outage protection, improves customers’ visibility of their energy usage, and promotes renewable energy transition.

What are Dynamic Operating Envelopes?

Operating envelopes are the limits that an electricity customer can import and export to the electricity grid. These limits are agreed between networks, customers and the Australian Energy Regulator as part of the customer connection or regulatory process.

Currently, in most cases, operating envelopes are fixed at conservative levels regardless of the network capacity because they are static and need to account for ‘worst-case scenario’ conditions.

Dynamic operating envelopes are where import and export limits can vary over time and location based on local network conditions. Flexible Exports is the first example of a DOE in practice, where customers can get access to a dynamic export limit.



SAPN is going to develop a new ‘dynamic operating envelope’ flexible load connection capabilities for residential and business customers.

EUROPE



UKPN – Supporting Electricity Flexibility as DSO

In May 2023, UKPN launched the nation’s first-ever independent Distribution System Operator (“DSO”) to ensure sufficient electricity capacity across its network and to enable cost-effective adoption of low-carbon technologies like EVs, heat pumps, and renewable energy generation. With electricity demand projected to double by 2050, UKPN recognises the critical need for flexible electrical capacity to help the country meet its net zero targets. Flexible capacity is provided by customers already connected on the network and comes primarily from low carbon sources. The development and support of flexibility markets are expected to save customers more than £400 million in 2023 – 2028 by using demand management to meet new capacity needs instead of constructing new infrastructure.

As part of the DSO, UKPN has launched a series of initiatives to support cost – effective decarbonisation of communities it serves and support national objectives:

- Launched new flexibility products that enable domestic customers to provide flexibility. The product launched jointly with Octopus Energy “Octopus Power Ups” enabled 30,000 households in the UKPN region to provide flexibility to UKPN.
- Focused on supporting the 133 Local Authorities in its region with their local climate ambitions and local energy plans. Over 80% of the local authorities in the UKPN region have declared climate emergencies and UKPN has responded with a new service to ensure the infrastructure is available in a timely manner to meet the local needs.
- Enhanced customer service provision for the fleet of generators and batteries that are connected in UKPN’s network. There are 10 GW of generation now connected on UKPN’s network that supply local and national demand. UKPN has enhanced its Control Room capability to provide services that maximise available network access for generation customers and minimise constraints.

Working closely the National Transmission and System Operator companies, UKPN has been able to develop digital solutions that enable customers that impacted by upstream issues on Transmission networks to connect faster on the network.



UKPN is leading the way as the first Distribution System Operator to respond to industry demands by publishing comprehensive data on curtailment history across its network.

NGN – Boosting Energy Efficiency of Offices, Depots, and Fleets

Since 2015, NGN has been upgrading its offices and depots, relocating or consolidating facilities to decrease the total number of buildings. The refurbishment programme includes energy efficiency enhancements, such as installing energy-efficient lighting with sensors and providing low-energy electrical appliances like monitors and refrigerators. For instance, the redesign of NGN’s main office in Thorpe Park, Leeds, is projected to cut the building’s energy use by 28%.

As part of its aim to have renewable energy systems at all locations by 2026, NGN has evaluated its properties and prepared designs and structural plans for rooftop solar PV installations, with installation bids requested in late 2023.

NGN now procures 100% renewable electricity and is considering switching to 100% green gas for its buildings’ energy needs. From 2018 to 2022/23, carbon emissions from gas and electricity in offices and depots have dropped by 86%.

In terms of transportation, NGN is reducing emissions from its roughly 600 commercial vehicles, all equipped with telematics for monitoring driving patterns to encourage efficient driving. Drivers also receive efficiency training. NGN is testing alternative fuel vehicles, including hydrogen and electric models, to evaluate their suitability. Additionally, the company plans to install EV charging points at all sites by 2026, supporting a transition to 50% of its car and commercial vehicle fleet being ultra-low emission or hybrid vehicles. Carbon emissions from vehicles and business travel have decreased by 12% in 2023 since 2018.



NGN is constantly investing in our workforce and trialling new technology and processes, to keep moving forward.

Enabling the Acceleration of Green Transportations

The global transition to EVs is well underway. In UK, it has committed in law to achieving net zero carbon emissions by 2050 and to banning the sale of new petrol and diesel cars and vans from 2030. In South Australia, we can expect to see 100% of car sales being electric by as early as 2040

according to the South Australian government's Green Paper on the Energy Transition. The Group is working in progress and in plan for the future to support the transition while serving our diverse range of customers, and at the same time to tackle GHG emissions and contribute to cleaner transport.

ASIA

HK Electric – Introducing Green Mobile Emergency Power Supply

HK Electric has introduced a green mobile electricity supply system in replacing the traditional diesel-fuelled generators, to provide customers with reliable and emission-free energy during emergencies. The system, comprising an Energy Storage Truck (EST) and a Power Changeover Truck (PCT), will provide temporary relief when normal power supply is not available. It could also serve as a clean backup power source for large-scale and major events. The system is the first of its kind that combines the usage of power changeover and energy storage to achieve uninterrupted power supply during emergency situations, and also to avoid air and noise pollution during operations, minimising environmental impacts on the surroundings.



The green mobile electricity supply system, comprising an energy storage truck (right) and a power changeover truck (left), provides uninterrupted temporary relief when normal power is not available.

OCEANIA

SAPN – Enabling the EV Transition

With the observed exponential curve in new EV purchases and rapid increase in the installation of public EV charges in South Australia, SAPN began looking to partner with local councils to pursue a trial investigating the viability of Stobie (power) pole charging stations for EVs in 2023. SAPN is continuing to work with the Electric Vehicle Council and through regular Networks and partners to investigate ways to integrate EVs with renewable energy generation and storage, via on-the-ground demonstrations



SAPN's first and new network of rapid EV charger is up and running in the Barossa.

VPN – Implementing a Green Fleet Policy

The Green Fleet Policy, published in 2023, has been a driving force in the company's efforts to reduce GHG emissions while ensuring vehicles are suitable for the business. As part of this policy, VPN plans to update its fleet by replacing diesel vehicles with fully electric and hybrid vehicles. This transition is anticipated to result in an annual emission reduction of 15.6 tCO₂e.

EUROPE



UKPN – Facilitating the EV Transition to Get to Net Zero

UKPN has published their Electric Vehicle Strategy 2023 to keep pace with the growth of EV and ensure all customers can participate in the EV journey.

For on-the-ground work, UKPN is delivering a flexible resourcing model that supports the scaling up of delivery as and when demanded by EVs and other low carbon technologies (LCTs). One of the focuses in RIIO-ED2 will be on increasing visibility of the low voltage (LV) network in particular, where EVs and LCTs primarily connect. This will ensure that UKPN has the capacity and skills to continue to deliver for their customers as demand for LCTs grow.

UKPN is also involved in an innovation project – Shift 2.0, to trial market led flexibility solutions for smart charging. UKPN has been exploring and testing the use of dynamic and location pricing to address secondary peaks, herding behaviour and constraints in respond to the increasing LCT load profiles and conflicting market signals, to develop flexibility procurement that allows customers to shift their charging time according to DNO price signals.

Another flagship innovation project that UKPN has done is Optimise Prime, the world’s largest trial of commercial EVs, aiming to understand and minimise the impact that electrification of commercial vehicles will have on distribution networks. UKPN unites with technology providers, fleet and transport companies to test and implement the best approaches to plan for and promote the EV revolution, while saving cost for network customers.

In parallel, for its light commercial vehicles, UKPN is piloting EVs, with intentions to deploy up to 30 EVs and potentially scaling up to 100 EVs. For the suitable heavy-duty vehicles in their fleet, UKPN is evaluating the use of renewable hydrotreated vegetable oil (HVO) fuel, which could significantly reduce particulate emissions.



UKPN is delivering a network suitable for the EV transition.

NGN – Reducing Emissions with Sustainable Transportations

NGN is reducing emissions from its roughly 600 commercial vehicles, all equipped with telematics for monitoring driving patterns to encourage efficient driving. Drivers also receive efficiency training. NGN is testing alternative fuel vehicles, including hydrogen and electric models, to evaluate their suitability. Additionally, the company plans to install EV charging points at all sites by 2026, supporting a transition to 50% of its car and commercial vehicle fleet being ultra-low emission or hybrid vehicles. Carbon emissions from vehicles and business travel have decreased by 12% in 2023 since 2018.



The transport sector is now starting to embrace hydrogen fuel cells and Northern Gas Networks’ is proud to be one of the first adopters of a Toyota Mirai hydrogen-powered car.

Managing Environmental Impacts and Conserving Resources

Climate change is one of the biggest drivers of biodiversity loss today. At the same time, biodiversity is the greatest natural defence against climate change. According to the United Nations, conserving and restoring natural spaces hold the potential to deliver an estimated one-third of the climate mitigation needed in the next decade. Taking nature for granted may result in a systemic market failure, as the Global Risks Report 2023 highlighted nature loss and the decline in global biodiversity as two of the top ten risks that pose economic risks that can affect businesses.

As highlighted by COP28's Nature, Land Use and Ocean Day where significant financial pledges exceeding HK\$186 million were made to support

climate action with a focus on protecting and restoring natural ecosystems, sustainably managing natural resources and the environment is an indispensable responsibility of all corporations. The COP28 Joint Statement on Climate, Nature and People also signalled a new commitment for countries to coordinate and simultaneously implement their nature and climate plans.

As a global energy investor, we are actively planning to integrate nature-based solutions and channel investments into conservation efforts that contribute to climate mitigation, reflecting the Group's vision for a sustainable and resilient energy future that places a high priority on valuing and preserving biodiversity and natural resources.

2023 Performance Highlights

- Over **78%** of our attributable revenue were covered by ISO 14001 or other EMS certificates 
- **9%** and **20%** reduction in total hazardous and non-hazardous waste produced (vs 2022) 

- **4.8%** reduction in water consumption/waste generation (vs 2022) 

Commitments and Actions

The Group is committed to protecting the environment and biodiversity and supporting sustainable development by conducting our business in an environmentally responsible manner.

We aim to minimise the impact of our operations on the environment while addressing global concern about climate change. We comply fully with all applicable laws and regulations and endeavour to integrate environmental considerations into all aspects of our business operations. We seek to minimise and mitigate the impact of our developments before we begin a project, and continuously monitor the potential impact of operating projects on biodiversity.

As a player in an essential utility sector in numerous markets around the world, we are also committed to supporting local governments in achieving the goals set by the United Nations Framework Convention on Climate Change.

Environmental Management

Power Assets is implementing an Environmental Management System ("EMS") with the aim of contributing to the 'environmental pillar' of the company's sustainability development. This EMS ensures continual environmental improvement, monitors compliance with relevant laws and regulations, fulfils supply-chain requirements, promotes staff environmental awareness, and increases financial savings resulting from resource saving and cost reduction.

	% of Group's Attributable Revenues ¹ Certified with ISO14001 or Other EMS Certificates	% of Group's Attributable Revenues ¹ that Conducted External Environmental Energy Audits
Total	78%	93%

¹ Percentage of attributable revenue represents the revenue of each business multiplied by the effective interests owned by the Group on see-through basis, divided by the summation of the attributable revenue. This is an illustration of the scale of each business to the Group, and the figures do not represent the consolidated revenue for the Group.

Regulatory Compliance

Compliance with laws and regulations is our utmost priority. We are fully aware that environmental regulatory engagement not only protect our business but also central to assisting the Group in realising our corporate net zero goals in the coming future.

During the reporting period, we were not aware of any non-compliance with laws and regulations having a significant impact on the Group relating to air and GHG emissions, discharge into water and land, and generation of hazardous and non-hazardous wastes.

The Group ensures operations in all business units fully comply with applicable laws and regulations, for instance the European Climate Law in Europe and the Climate Change Act 2022 in Australia. We have implemented policies and mechanisms to hold individuals accountable. Our management is dedicated to staying updated on the most recent regulatory changes and providing comprehensive training to relevant staff members. Additionally, we invest significant resources into monitoring and detecting any potential non-compliance to ensure adherence to regulations.



Protecting Biodiversity

The Group firmly commits to biodiversity and habitat protection throughout the lifecycle of our assets. Management oversight of environmental management strategy, including biodiversity issues, land closure and rehabilitation projects, is held by all business units. Most of the managers or committees are responsible for assessing and managing the relevant risks and opportunities. The Group strives to avoid and mitigate adverse impacts on the surrounding environment as we integrate biodiversity into planning considerations. On top of regular environmental impact assessment, we have been engaging with external experts to tailor management plans for high-ecological risk sites. Adopting the net positive impact concept, we endeavour to achieve net gains for biodiversity from our business project outcomes.

To fulfil our commitment to giving back more than what we take from the environment, we require all operations and suppliers to avoid conducting operational activities near sites of globally or nationally-recognised key biodiversity conservation areas, including but not limited to World Heritage areas and International Union for Conservation of Nature (IUCN) Category I-IV protected areas. If any operation site is close to critical biodiversity, we apply the mitigation hierarchy of ‘avoidance, minimisation, restoration and offsetting’ to reduce biodiversity impacts. The Group is also committed to land restoration after site closure and has set aside sufficient funds to support relevant impact mitigation and rehabilitation work.

Key Initiatives and Targets by Our Business Units

HK Electric	
<ul style="list-style-type: none"> Plant at least one more species of native trees or shrubs at Lamma Power Station in 2023 to support biodiversity 	Achieved ●●●●
SAPN	
<ul style="list-style-type: none"> Develop an action plan for Nature and Biodiversity Implement a programme to cover up electrical infrastructure that has high risk of impacting native fauna 	On track ●●●●
AGIG	
<ul style="list-style-type: none"> Set biodiversity targets by end of 2025 	On track ●●●●
EDL	
<ul style="list-style-type: none"> Plant of 50,000 additional trees at the UK’s sites undergoing gas field infrastructure modification 	Achieved ●●●●
UKPN	
<ul style="list-style-type: none"> Identify and assess an additional 100 sites for biodiversity enhancement by 2028 	On track ●●●●
NGN	
<ul style="list-style-type: none"> Complete natural capital assessment of up to 50 of its sites by 2025 Create ‘Homes for Nature’ on 250 of its sites by 2026 	On track ●●●●
WWU	
<ul style="list-style-type: none"> Commit to ‘no net loss’ on designated projects and achieving ‘biodiversity net gain’ on impacting work from 2026 	On track ●●●●

ASIA

HK Electric – Coral Survey at Lamma Power Station

In August 2023, an onsite survey was conducted to assess coral species and health in the vicinity of the Lamma Power Station. This initiative forms part of HK Electric’s commitment to environmental sustainability and monitoring the impact of its operations on local ecosystems. The survey, which covered four locations, successfully identified 11 hard coral species and 3 octocoral species. The findings were promising, showing that the coral colonies were in generally good health, with no signs of bleaching or partial mortality. The presence of several moderately sized colonies also suggested positive coral recolonisation and recovery subsequent to the Lamma Extension project. These findings underscore HK Electric’s dedication to environmental conservation demonstrate the company’s commitment to preserving marine biodiversity within its operational footprint.



HK Electric carried out coral survey at Lamma Power Station and found positive coral recolonisation and recovery.



OCEANIA



AGIG – Increasing Focus on Nature and Biodiversity

In 2023, AGIG participated in a pilot programme with the Australian Government’s Department of Climate Change Energy, Environment and Water (DCCEEW) that sought to assist organisations with understanding and implementing the requirements of the Taskforce on Nature-related Financial Disclosures (TNFD). The learnings from this programme will assist AGIG in setting biodiversity targets by the end of 2025.



AGIG reviews their environmental footprint with a view to setting biodiversity targets by 2025 to protect wildlife species.

United Energy – Harmonising Infrastructure Development with the Conservation of Wildlife

Upon discovering a colony of bats residing in the old control building at its Hastings Zone substation, United Energy promptly took action to comply with wildlife protection laws before proceeding with demolition. Recognising the importance of these nocturnal creatures to the ecosystem, United Energy temporarily halted all work to allow for the gentle relocation of the bats to a safe new habitat.

With the bats now securely rehomed and thriving in their new environment, demolition activities at the substation resumed, diligently following all regulatory guidelines to ensure the continued safety of the bat colony and the preservation of the local bat population. This responsible action underscores United Energy’s commitment to environmental stewardship and its dedication to harmonising infrastructure development with the conservation of wildlife.

SAPN – Action Plan for Nature and Biodiversity

In 2023, SAPN sought consultancy support to begin the development of an Action Plan for Nature and Biodiversity. Calculating nature loss is complex and measuring the impacts of activities and solutions is still maturing, so the journey will be a gradual and staged one. A key step in the development process was gaining an understanding of the SAPN business footprint, impacts, dependencies, risks and opportunities with respect to nature. This programme underscores the company’s dedication to biodiversity management and showcases the company’s proactive approach to reducing environmental impact through strategic infrastructure modifications.

EDL – Conservation Partnership

EDL, the Northern Territory Government and Parks Australia have partnered with the Djurrubu Rangers on the ‘Karnabarradj’ Project. This is a new conservation partnership in the environmentally sensitive Jabiru region and the site of the EDL Jabiru Hybrid Renewable Power Station.

The partnership involves critical work to protect 1,000 hectares of endangered black-footed tree-rat habitat through the implementation of a conservation zone management plan and monitoring programme, which includes feral animal and weed control, fine-scale fire management and fauna surveying. It also provides further opportunity to consolidate key threatened species management skills for the Djurrubu Rangers through experience and collaboration with Parks Australia staff.



Members of EDL team explored the ecosystem of Jabiru region surrounding EDL’s Jabiru Hybrid Renewable Power Station in the Northern Territory, Australia with local rangers.

EUROPE



UKPN – Biodiversity Improvement and Management



UKPN has maintained its partnership with nine Wildlife Trusts, informing its Environmental Action Plan to bolster biodiversity in its service areas. The company has assessed the biodiversity of 100 substations, with the goal of improving their scores by 30% through focused enhancements.

Throughout 2022/23, UKPN actively supported conservation efforts, involving the restoration of hedgerows and ponds, the installation of nest boxes, meadow improvements, and the eradication of invasive species at select locations.

In its 2023-2028 business plan, UKPN pledges to evaluate an additional 100 sites for biodiversity enhancements. So far, 70 potential sites have been identified, with 25 undergoing ecological reviews. These assessments, which establish baseline biodiversity scores using DEFRA’s metric, will inform improvement strategies and forecast the expected biodiversity scores after recommendations are implemented.

UKPN has reiterated its commitment to key biodiversity initiatives, including increasing biodiversity potential in new major substation projects, improving biodiversity at existing facilities, and embedding ‘Biodiversity Net Gain’ into its operational practices.



UKPN has committed to identifying a further 100 of their sites for biodiversity enhancement between 2023 and 2028.

NGN – Launching Series of Biodiversity Management Programmes

Homes of Nature

NGN carefully manages the vegetation on its asset sites to ensure it does not pose significant fire risks or hinder safe site access and exit. To help promote biodiversity on site, NGN commits to creating ‘homes for nature’ on 250 of its asset sites by 2026. This can involve installing new habitats or changing vegetation management practices to promote biodiversity. Since 2017, NGN has installed Homes for Nature at 84 sites. Examples include fitting bat and bird boxes, leaving felled timber on site as a shelter where animals may hibernate during the winter months, and not cutting the grass during May to enable the growth of wildflowers to aid pollinators.

Natural Capital Valuation and Ecosystem Services Assessment

In collaboration with a third-party consultant, NGN has conducted an ecosystem services screening assessment for its sites. The ecosystem services have been incorporated into a bespoke natural capital evaluation tool which provides a technical and financial evaluation for services such as biodiversity and aesthetic appreciation of landscapes as well as carbon sequestration, air pollutants removal, and temperature regulation. NGN completed baseline natural capital surveys at 30 of its sites in 2021, with repeat surveys completed at the same sites in 2023 and further surveys scheduled for the same sites in 2025.

Land Remediation and Tree Planting Programme

With approximately 150 sites on the legacy footprint of former coal gas production works, NGN is proactively addressing the challenge of potential ground contamination. The company dedicates £0.5 to £1 million annually to investigate and monitor these sites, ensuring that any significant environmental or human health risks are identified and rectified. When necessary, targeted remediation works are performed to bring the sites up to rigorous environmental compliance standards. This diligent land management practice, with clear annual targets for site assessments and remediations, is transparently communicated in NGN’s Annual Environment Report and to the regulator.

In tandem with these efforts, since 2021 NGN has successfully funded the planting of 23,000 trees in urban areas within its service region, contributing to the air quality, aesthetic and ecological enhancement of urban spaces. The programme is set to gain further momentum with a goal of planting an additional 17,000 trees by 2026. The tree planting programme is a strategic effort to foster sustainable development, improve air quality, and make cities greener and more liveable.



NGN colleagues team up with Durham Wildlife Trust in September 2023, to create a pond for local wildlife at our National Energy Research Village (NERV) site in Gateshead.

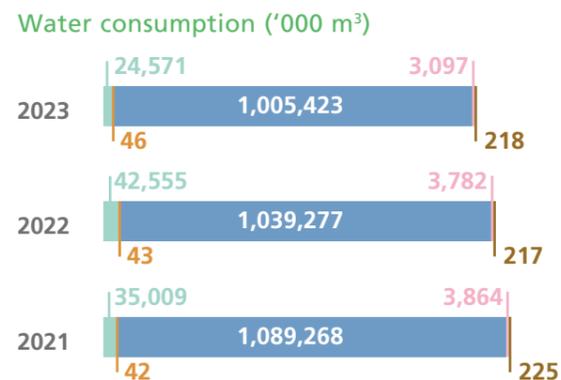
Water Management

Water scarcity is a pressing global issue, with demand for this essential resource increasing on every continent. The Group is dedicated to water stewardship and security, taking a responsible approach to managing this finite resource and identifying associated risks. To ensure a coordinated response, management-level oversight of environmental concerns, including water use, is in place across all business units.

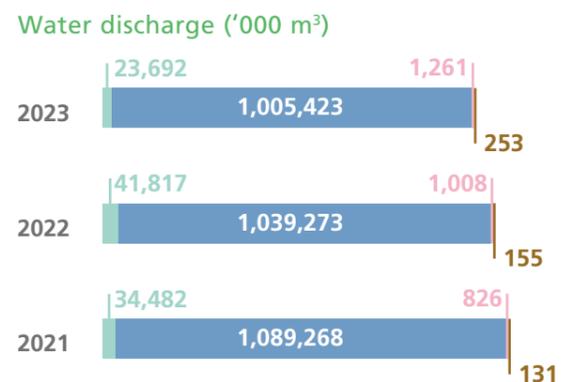
According to the latest Aqueduct tool, a water risk data platform launched by the World Resources Institute (WRI) in August 2023, 25% of the global population faces extremely high water stress each year. While our operations are not currently in water-stressed regions from the relevant Global Water Risk Indicators, we recognise the importance of water stress to our power generation and distribution businesses, including those focusing on green hydrogen projects where a reliable and sustainable water supply is critical.

Commitment and Actions

To proactively manage and address water-related risks such as water availability, water sensitivity and water stress mapping, water scarcity is incorporated as a regular part of our risk assessments and business strategy to enable the development of water conservation plans. We have installed water-efficient fixtures and encourage water-saving practices in our offices to minimise water discharge. Additionally, we actively promote the collection, recycling, and reuse of wastewater and rainwater as a means to reduce freshwater consumption in our operations.



■ Surface water ■ Groundwater ■ Seawater
■ Third-party water ■ Other sources



■ Surface water ■ Seawater
■ Third-party water ■ Other sources

Key Initiatives and Targets by Our Business Units

HK Electric	
<ul style="list-style-type: none"> Reduce total water consumption at its key office premises by 1% in 2025 as compared to 2020 	On track
UKPN	
<ul style="list-style-type: none"> Reduce 10-15% water consumption at top 6 depots by 2023 as compared to 2018/19 Reduce 10% water consumption during the next price control period 2023-2028 	On track

ASIA

HK Electric – Reviewing of Water Stress Risk for Lamma Power Station

In 2023, HK Electric conducted a water resources management study for the Lamma Power Station. This study aimed to cast a critical eye over the current water resources management practices and benchmark against industry peers.

The study provides insights and actionable recommendations for HK Electric, and to refine and enhance the company's existing water resource management practices. Complementing this effort, HK Electric will continue to participate in the CDP water security survey, demonstrating its commitment to transparency and improvement in water-related disclosures.

Additionally, as part of its ongoing water resources management practices, HK Electric collected and reused more than 109,000 m³ of plant processing water and rainwater at Lamma Power Station in 2023. It also retrofitted a Brine Recovery Reverse Osmosis system to further enhance wastewater recovery at the power station.

EUROPE

UKPN – Assessing Water Risk Management Strategies

UKPN ensures water reduction technology and water-saving devices, such as push taps, sensor taps, and instant hot water taps, standard items implanted at offices and depots when refurbished. Automated meter readers have been installed at top sites to improve the regularity and accuracy of meter readings.

To ensure thorough oversight, UKPN has also installed Automated Meter Readers at key sites, which enhance the accuracy and frequency of water usage reports. Regular monitoring coupled with these water reduction technologies allows for quick detection and repair of leaks. Additionally, UKPN collaborates with the appropriate water providers to receive constant flow reports, aiding in the prompt identification and resolution of any irregular water usage.



UKPN installs new Automatic Meter Readers to monitor water consumption.

Effluent and Waste Commitment and Action

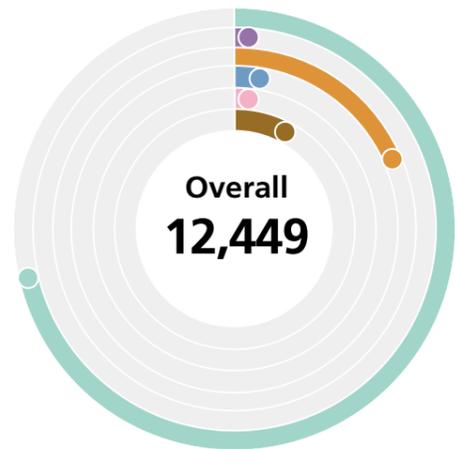
The sound management of effluent and waste is essential to our business operations. We endeavour to minimise waste generation and effluent disposal throughout our operations. To demonstrate our commitment to minimising waste footprint, we set waste reduction and recycling targets wherever feasible and have implemented a waste management plan with responsible and efficient waste handling guidelines.

We also proactively explore potential areas of improvement in existing procedures and processes

by engaging external parties, such as conducting waste mapping exercises to identify waste streams and facilities. Our business units are also adopting principles that emphasise waste reduction, resource reuse, and recycling, with current focus on improving circularity of industrial economy.

As we progress, we will consistently monitor our waste generation and management practices, seeking continuous improvement and exploring innovative solutions to further lessen our impact on the environment.

Total hazardous waste produced (tonne)



- 71%** Other waste management methods
- 1%** Reuse
- 18%** Recycling
- 2%** Incineration (including energy recovery)
- 1%** Incineration (without energy recovery)
- 7%** Landfilling

Total non-hazardous waste produced (tonne)



- 1%** Other waste management methods
- 2%** Reuse
- 96%** Recycling
- 1%** Landfilling

Key Initiatives and Targets by Our Business Units

HK Electric

- Reduce production of ash and gypsum at Lamma Power Station by 37% in 2024 as compared to the baseline figures in 2019 On track
- Reduce total waste generation at its office premises by 10% in 2025 as compared to 2020 On track

SAPN

- Embed circular principles across our activities and our value chain with the goal of becoming a net zero waste organisation by 2050 On track
- 2023 target of 82% of our generated waste diverted from landfill Achieved

AGIG

- Improve monitoring and measurement of waste minimisation, recycle and re-use by end of 2024 On track

UKPN

- Recycle 80% of office, depot, and network waste by 2025 On track
- 99.5% of street works material, with no recoverable waste to landfill by 2028 On track

NGN

- Send less than 0.1% of excavation spoil by mass to landfill annually by 2026 On track
- Reduce amount of office and depot waste created by 20% between 2018 and 2026 On track
- Use no more than 2.5% virgin aggregate annually by 2026 On track

WWU

- Minimise office waste diverted to landfill to 25% by Q2 2024 On track
- Send a maximum of 20% waste to landfill by 2026 compared to 2019 On track

AVR

- Send less than 0.1% of excavation spoil by mass to landfill annually by 2026 On track
- Reduce amount of office and depot waste created by 20% between 2018 and 2026 On track
- Use no more than 2.5% virgin aggregate annually by 2026 On track

OCEANIA

SAPN – Advancing Waste and Recycling Management

SAPN has improved its waste management efforts, achieving a new milestone by increasing its landfill diversion rate from 80% to 88%, meaning that most of the waste generated by the business is recovered, repurposed and recycled. For a business of such scale and complexity, this achievement is not just a reflection of the company’s commitment to environmental stewardship but also a testament to its strategic and effective waste management practices.

VPN – Recycling of Damaged Solar Panels

The task of recycling bi-facial solar panels presents substantial challenges due to their dual layers of glass, considerable size, significant weight, and specialised chemical composition. To address these challenges, VPN engaged with an Australian-based company that specialises in solar panel recycling, ensuring efficient processing, high material recovery rates, and uncontaminated output streams. Over the past two years, approximately 4,500 damaged solar panels from the Avonlie and Sebastopol Solar Farms in New South Wales have been diverted from landfill and processed by this recycling company for proper material recovery and recycling.



VPN recycles damaged solar panels to promote circular economy.

OCEANIA

Wellington Electricity – Waste Education

Wellington Electricity conducted a comprehensive waste minimisation workshop for all employees, detailing strategies to reduce, reuse, and recycle both in the workplace and at home. The session, held in collaboration with Lower Hutt City Council at its Wellington office in July 2023, successfully engaged staff on the environmental benefits of diligent recycling and waste reduction practices.



In addition, the company showcased a segment from the ‘Wasted New Zealand’ series that focuses on recycling, landfill issues, food waste, and wastewater management during the CEO’s presentation in May 2023. Subsequent instalments from the series will be featured in monthly CEO updates to reinforce the waste management education efforts.

Wellington Electricity organises waste minimisation sharing session for all employees.

NORTH AMERICA

EDL – Conducting a Waste-mapping Exercise

In March 2023, EDL launched a waste reduction campaign to minimise the amount of waste sent to landfills globally and reduce carbon footprint. The campaign encourages all EDL personnel to brainstorm waste reduction initiative ideas and then implement them in projects, sites, or offices. Sharing these initiatives also contributes to the cross-pollination of waste reduction ideas across EDL. The campaign includes supporting materials on waste reduction concepts, showcases waste reduction activities across EDL, and encourages participation in the campaign. Initiatives to date have included global PPE recycling, coolant re-usage and non-disposable safety glasses.



EDL has also rolled out a new waste tracking tool across its North American operations, enabling more accurate accounting of waste figures. This tool establishes ways for the North American Environmental Compliance Team to capture waste data that was previously untracked, reflecting its proactive approach to environmental responsibility.

EDL launches a Waste Reduction Campaign to reduce waste disposal to landfills.

EUROPE

UKPN – Waste Mapping Exercise

UKPN undertook a waste mapping exercise to identify various waste streams, the responsible facilities, and the associated waste contractors. This exercise also brought to light potential enhancements to the current waste management practices.

In 2022/23, UKPN generated around 4,000 tonnes of office and depot waste, which has reduced by over 100 tonnes compared to the previous year. Of this, 11.5% of non-recoverable waste ended up in landfills. The remaining (88.5%) were diverted from landfills and were either recycled or used for energy recovery, significantly ahead of its annual waste diversion commitment.



UKPN uses cable ducts made from recycled material to eliminate waste, pollution and drive down carbon emissions.

Air Emissions Control and Reduction Commitment and Action

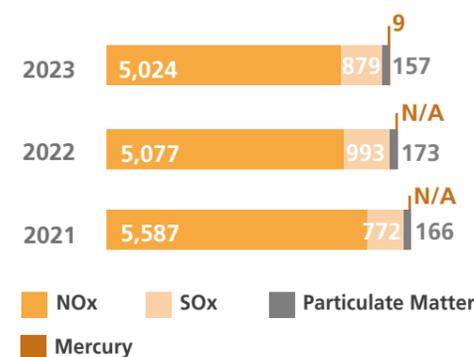
The Group’s management approach to air emissions control and reduction is characterised by a commitment to progressive strategies across its diverse business units. In January 2024, the European Parliament reached a legislative agreement to introduce two new regulations to phase down and limit the use of fluorinated GHG (F-gases, including SF₆) and other substances that cause global warming and deplete the ozone layer.

With a clear focus on minimising environmental impact from air emissions, the Group is actively supporting its business units in implementing emission reduction technologies and transitioning to cleaner energy sources. By setting specific air emission reduction targets and investing in advanced emissions control systems, the Group is actively contributing to a healthier environment.

Key Initiatives and Targets by Our Business Units

- | | | |
|--------------------|--|-----------------|
| HK Electric | <ul style="list-style-type: none"> Commission new gas-fired unit L12 in early 2024, which features advanced emissions control technology for reducing nitrogen oxides emissions | <p>On track</p> |
| UKPN | <ul style="list-style-type: none"> Reduce 33% of NOx emissions between 2023/24 and 2028/29 15% decrease of fluid filled cable leak by 2028 compared to beginning of the period of RIIO-ED2 | <p>On track</p> |

Air emissions (tonnes)



OCEANIA

SAPN – Greenhouse Gas Emissions Reduction

SAPN is tackling GHG emissions by transitioning its passenger and light commercial vehicle fleet to EVs, a move that will decrease emissions and contribute to cleaner transport. In addition, SAPN is developing an SF₆ life-cycle management plan with the goal of accelerating the phase-out of SF₆ insulated assets across its network.

VPN – Replacing SF₆ Equipment in Plan

VPN is proactively addressing the challenges associated with the use of SF₆. They are actively in the process of identifying and technically evaluating non-SF₆ alternatives. This ensures that they possess technologically suitable options ready for procurement in the future, aiming to minimise the use of SF₆ on the network and SF₆ alternatives, where appropriate, aligns with the evolving regulatory landscape in the future.

EUROPE

UKPN – Minimising Air Pollution by Equipment Upgrade and Fleet Transition

UKPN is charting a course towards a more sustainable electric grid with the introduction of its first ‘clean air’ Gas Insulated Switchgear (GIS) operating at 132,000 volts. Different from conventional GIS systems that rely on SF₆, UKPN’s new GIS is SF₆-free. The system utilises a blend of dehumidified air, consisting of oxygen and nitrogen, which has zero global warming potential. This project is a critical step in UKPN’s ambitious plan to reduce the use of SF₆ in new switchgear, extending across all voltage ranges where market alternatives are available. This initiative is also in line with the UK’s net zero carbon emissions targets, ensuring that environmental considerations are balanced with the need for maintaining reliable power supplies.

Furthermore, UKPN is actively engaged in minimising the environmental impact of its operations, particularly in regard to emissions from its power generators. The primary sources of NOx and particulate matter within the fleet are vehicles and temporary generators, through the combustion of diesel. Throughout the year, UKPN has initiated trials with hybrid diesel-battery generators, which are capable of substantially reducing emissions when compared to conventional diesel generators.