White paper

An Introduction to Independent Distribution Network Operators (IDNO)

VATTENFALL

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Historically all new residential, commercial and industrial developments were connected to the electricity supply network through one of the 14 Distribution Network Operators (DNO), which each cover a specific geographic region of the UK.

Since 2000, Ofgem has licenced Independent Distribution Network Operators (IDNO). The aim was to increase competition in the market and prevent inevitable geographic monopolies by allowing IDNOs and Independent Connection Providers (ICP) to compete with the DNOs to complete some connection activities as well as manage new sections of the network.

The new framework, in which IDNOs and DNOs can connect developments to the electricity grid, means that developers now have a choice of network provider. They can select one of the 14 licenced IDNOs or the DNO that covers the local area.

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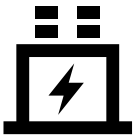


What is the difference between a DNO and IDNO?

The key difference between a DNO and an IDNO is that DNOs are focussed on maintaining the stability and integrity of their whole networks, so prioritising new connections can be a challenge. IDNOs on the other hand can focus on working with the customer to achieve the best possible connection solution.

When a new development is built it must be connected to the electricity supply network. At this point developers have the choice of who will design and build and then adopt and manage the network assets.

While there are many differences between DNOs and IDNOs, there are also several important similarities:

- **Network Quality** - Whether the network is to be adopted by a DNO or IDNO, it will be designed and built to meet the same high standards of safety and quality.
- **Management and response** - IDNOs must operate and maintain the network to the same standard as a DNO and offer the same 24/7 emergency response to faults.
- **Price** - The amount IDNOs can charge customers for using the network is regulated by Ofgem through a 'Relative Price Control' and the pricing level is maintained in line with the equivalent DNO charges.
- **Consumer choice** - DNOs and IDNOs do not 'supply' electricity to consumers. This means whether the network is adopted by a DNO or IDNO, the consumer will still have a choice of electricity supplier.

However, there are also key differences between DNOs and IDNOs.

- **Operational area** - In contrast to DNOs, which are geographically based, IDNOs can adopt and operate networks anywhere in the UK. Therefore, developers can work with any one of the 14 licenced IDNOs or the relevant DNO for their region.
- **Size** - IDNOs are generally smaller and newer organisations compared with DNOs and as such often have more flexibility and modern processes to meet developer's requirements.
- **Asset Adoption Value** - Unlike DNOs, IDNOs can offer an Asset Adoption Value payment – an amount paid to the ICP or developer on energisation of the local network.
- **Contestable and non-contestable work** - Some elements of the connection process can only be carried out by the DNO, such as the final connection to the existing transmission network and other grid reinforcement work. This is referred to as non-contestable work. All other elements of the network's design and build (the contestable work) can be completed by the incumbent DNO or a National Electricity Registration Scheme (NERS) accredited ICP contractor. The IDNO is then able to adopt all assets that fall under the scope of contestable work provided the DNO has not already agreed to do so.
- **High voltage networks** - IDNOs cannot take on projects with voltages over 132 kilovolts (kV).

Elements adopted by IDNOs

IDNOs will usually adopt all elements from the point of connection down to point of supply. The IDNO will adopt anything below and inclusive of a 132kV substation to Low Voltage (LV) circuits (400V) and meter points. The IDNO cannot adopt transmission scale equipment, which is the responsibility of National Grid.

What are the benefits of partnering with an IDNO?

Asset Adoption Value Payment

One of the key advantages of partnering with an IDNO is the 'asset adoption value' (AAV) also known as the 'capital installation costs discount' payment. To promote competition in the connections market Ofgem allows IDNO's to use future network revenues to help subsidise the initial costs of the new projects. The payment varies from development to development but can be very attractive to developers to help off-set the total capital cost of designing and building a new electrical network. DNOs are not permitted to offer this type of payment to discount capital expenditure.

The revenues that the AAV is drawn from are generated by the Distribution Use of System (DUoS) charges as well as the efficiency gains that the generally more agile IDNO businesses are able to achieve managing and operating the network.

The level of AAV payment offered for a development will depend on project specific factors including the customer consumption rates relative to the assets installed on site. See the 'Understanding Asset Adoption Value Payments' section of this document for more information.

Streamlined processes

The unique position of IDNOs means they can help to simplify the connection process. Being typically smaller organisations, IDNOs can be more focused on the needs of each individual customer and as a result can often accelerate the process. Typically, the IDNO will liaise with DNOs on behalf of the developer with regard to the non-contestable elements of the connection. This removes much of the burden from the developer, and the IDNOs specialist knowledge and experience as well as their status as a licenced operator means greater efficiency can be achieved.

Faster response

The greater focus and organisational agility of many IDNOs means they are often able to respond more quickly to issues and faults with the network. This means that power can be restored to customers' homes and businesses faster and with minimal disruption.

Capacity reservation

The IDNO works with the developer to minimise the grid reinforcement costs by optimising the design and is able to reserve extra capacity from the DNO at no cost to the client. Capacity reservation can be especially important in areas of high demand, such as inner-city locations, and for larger projects the cost savings can be significant.

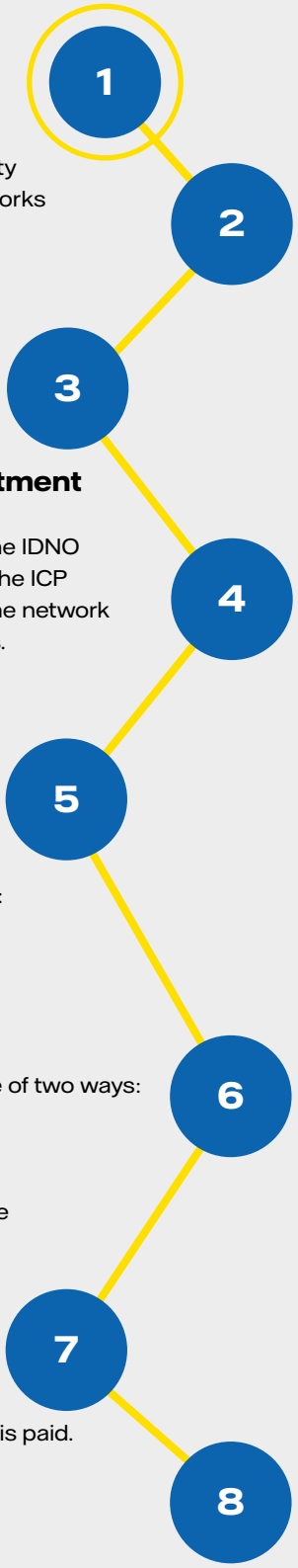
Collaboration on project aims

Compared to DNOs, IDNOs are more able to operate in partnership with developers to help them achieve their objectives on each project. For some this might be to lower the environmental impact of a development through the integration of low carbon technology. For other customers, the location or nature of the development may require an innovative approach to deliver the most resilient, future-proofed solution.

The process - Step by Step

Step 1 - Initial contact

The customer, or ICP if one has been appointed, approaches the IDNO with estimates of energy usage, site capacity and project requirements. The IDNO works with the developer or ICP to obtain a connection offer from the DNO, which outlines the contestable and non-contestable work elements.



Step 2 - Connection offer

The DNO provides a connection offer that outlines the network design, which includes details such as the expected tariffs, grid reinforcement costs and the reserved capacity.

Step 3 - Independent Connection Provider appointment

If an ICP has not yet been appointed, the IDNO can work with the developer to select the ICP that will carry out the construction of the network assets and other contestable elements.

Step 4 - Network valuation

The IDNO works with the ICP to create a detailed design of the network and establish the Asset Adoption offer, which includes an Asset Adoption Value to be paid to the customer or developer.

Step 5 - Contracts

The IDNO creates the following documents for review and acceptance:

- Commercial agreement
- Adoption agreement
- Connection agreement

The contracts can be structured in one of two ways:

1. The ICP signs the agreements on behalf of the client.
2. A tripartite agreement between the IDNO, end client and ICP.

Step 6 - Build

The IDNO projects team oversees the construction of the network by the appointed ICP. The IDNO team will carry out inspections and witness the installation work to ensure it has been completed in line with the agreed design and the required technical standards.

Step 7 - Energisation and payment

The network is energised and the AAV is paid.

Step 8 - Operation and management

The IDNO owns and operates the network assets including all maintenance requirements and fault fixing.

Understand asset adoption value payments

DNOs and IDNOs generate revenue from the Distribution Use of System (DUoS) charges, which are paid by the consumer through their chosen energy supplier. DUoS is paid regardless of who adopts the network and is already a part of the final £/kWh price that the consumer pays. IDNOs are permitted to use some of this projected future revenue to provide a payment on energisation to developers to help subsidise the cost of building the new network and assets. This is referred to as the Asset Adoption Value (AAV).

The AAV is calculated on a case by case basis and there are many factors that must be included beyond the total level of consumption. Due to operational cost differences, a larger demand will not necessarily mean a larger payment can be offered as this must be considered in relation to the network's equipment. For example, a development with a 1 megavolt amperes (MVA) transformer and a 0.7 MVA load may be offered a larger payment than a development with a 2 MVA transformer and a load of 1.1 MVA.

The charging methodology also has a significant impact on the AAV payment that may be offered. For networks up to 33 kV the Common Distribution Charging Methodology (CDCM) or Extra High Voltage Distribution Charging Methodology (EDCM) can be applied. For networks over 33kV the EDCM approach is always used.

CDCM

Under this charging model the maximum tariffs are set by Ofgem and therefore there is limited scope for adjustment of the payment levels. Here the AAV is based on the usage, DNO area, and network factors of the development. Also, IDNOs can be more competitive on the operation and maintenance costs and therefore are able to include this saving in the calculation of the AAV. This methodology differs between different DNO areas, which results in different tariffs.

EDCM

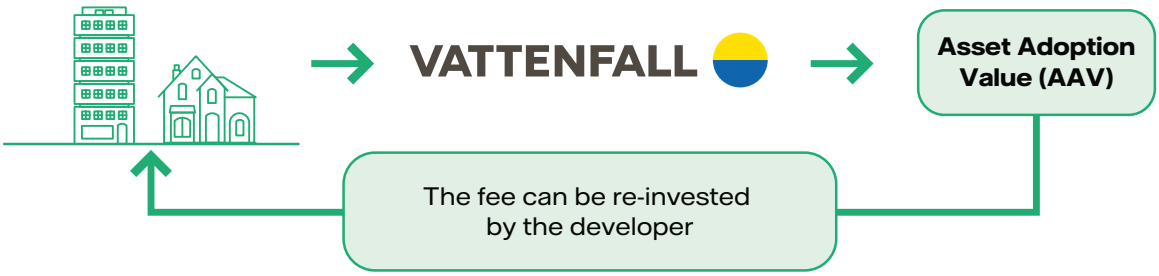
In this model the charges are not set by Ofgem and instead a calculation based on capital contributions (CAPEX) and operational expenditure (OPEX) is used. This allows the IDNO more scope to formulate the offer based on the requirements of the developer. For example, a larger AAV can be agreed based on a marginally higher tariff or a smaller initial contribution can allow for lower on-going charges.

An accurate AAV estimate can only be calculated using full project details. To receive a detailed proposal, developers should contact their chosen IDNO.

1. A developer builds a new project, using qualified contractors, such as ICP's for the connection.

2. Vattenfall IDNO adopts the network paying a fee to the developer/owner.

3. The fee is based on the future revenue of the network and is known as the Asset Adoption Value.



Capacity reservation & flexible ramping rates

Capacity reservation

Capacity reservation allows businesses to secure a large amount of power in advance, drawing it down incrementally as needed. This is particularly beneficial for developments that expand in phases until they are fully complete, at which point they utilise the full amount of power they reserved.

The approach is both wise and economically beneficial. To illustrate, Vattenfall's Business Developer, Tanara Motta De Castro, shares an example from the field:

"As an IDNO, if we connect a 250MVA data centre in the southeast of the UK they could achieve annual savings of between £2 million and £3.5 million by operating at 50% capacity at the outset and ramping up power as required."

Capacity reservation offers significant benefits for developers, primarily by ensuring that projects have guaranteed access to the necessary power. But also by eliminating the costs of paying for power capacity before it's needed, a crucial factor in maintaining project efficiency.

As competition for limited grid capacity heats up, capacity reservation will become an important technique to ensure sufficient power, which is likely to become more commonplace. When combined with flexible ramping rates, which enable developers to increase their power capacity in line with demand as a development expands, the savings can be significant.

Flexible ramping rates

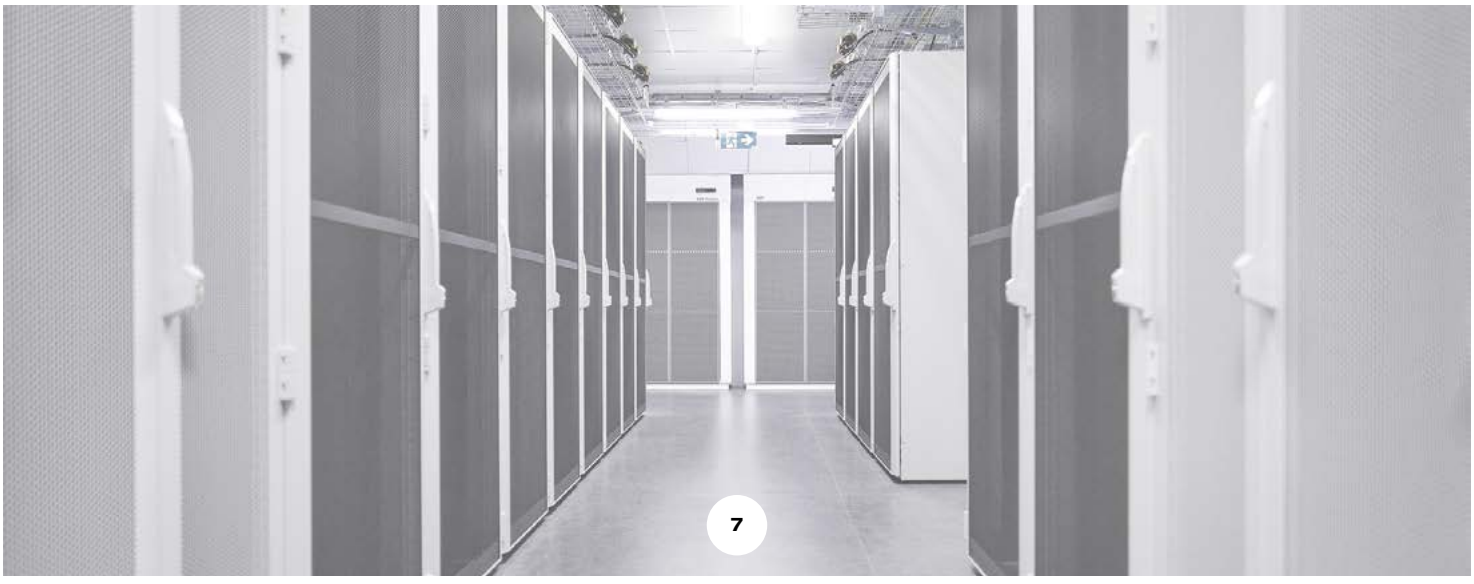
New developments, and businesses which are switching to electrical power in favour of fossil fuels, often require less power at the start of a project than they will once the development is complete. Flexible ramping rates offer a solution to this problem, which can save developers significant sums.

All electric developments can have high power demands, especially energy hungry industries such as data centres which rely on constant server operation and security. To put it into perspective, a 100MVA data centre has the same energy demand as 50,000 flats.

Vattenfall IDNO offers an innovative approach to this challenge that allows developers to gradually increase their electrical capacity in-line with the projects required power demands. Via Vattenfall's ramping rates model clients only pay for used capacity while reserving any additional capacity for future expansion at no extra cost. This approach can save up to 70% on capacity charges, significantly reducing operating expenses

Vattenfall collaborates with developers to provide flexible ramping rates for projects across the UK. Plans consider the next decade's growth, highlighting the flexibility and long-term vision of Vattenfall's services.

Bilgin Oralerkaya, Business Developer at Vattenfall, summarizes: "Our goal is to empower developers to master their energy use, turning a fixed cost into a variable one that aligns with their growth trajectory."



Introducing Vattenfall

Experience

Vattenfall is one of Europe's largest producers and retailers of electricity and heat and operates primarily in Sweden, Germany, the Netherlands, Denmark, and the UK. The Vattenfall Group has approximately 20,000 employees world-wide.

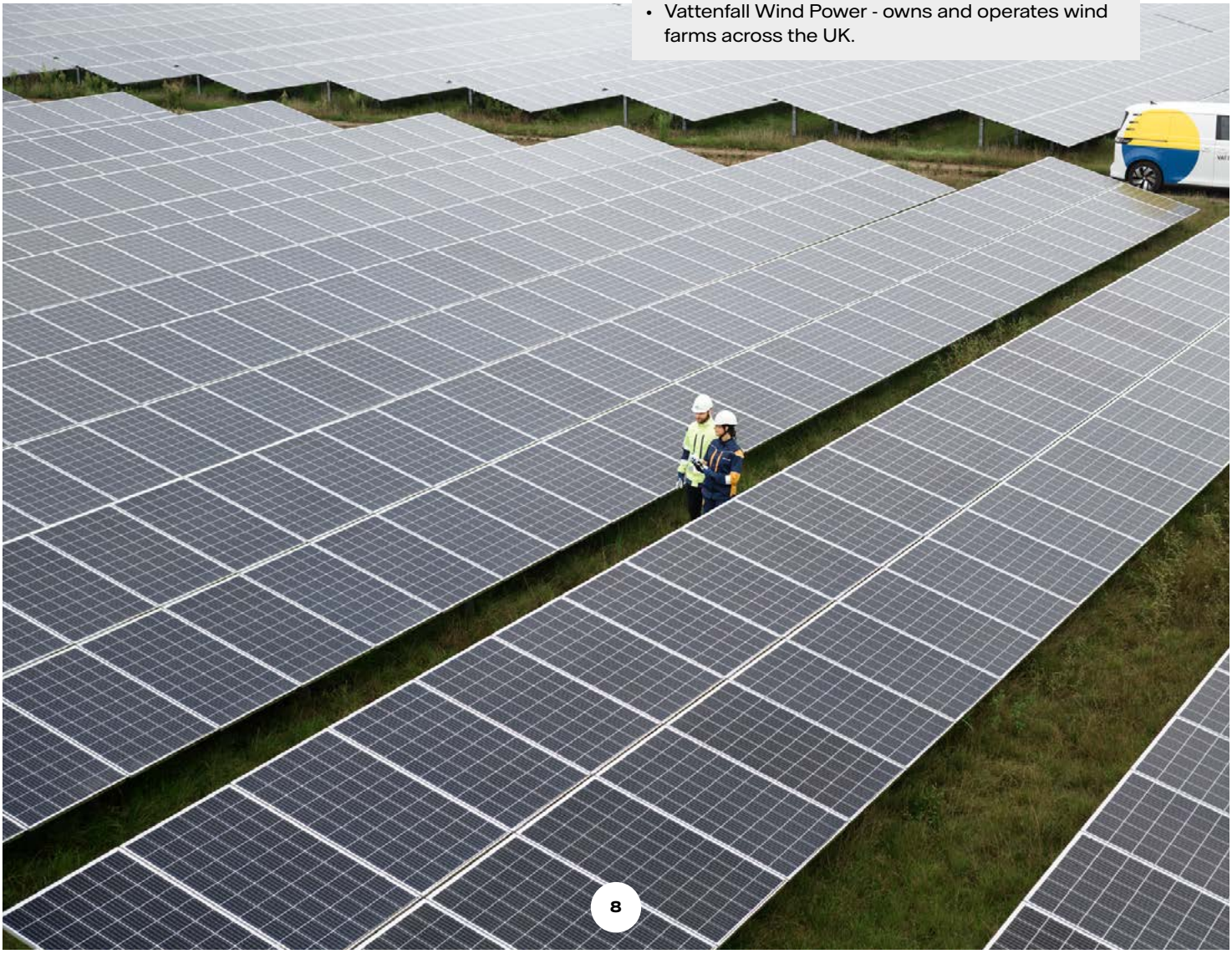
Vattenfall Group has a history that goes back more than 100 years to the founding of what is now Vattenfall AB – a Swedish state owned power company. When working with Vattenfall, customers benefit from the knowledge and experience gained on our generation and distribution projects across Europe. Vattenfall is focused on one goal: to enable fossil free living within one generation.

Vattenfall in the UK

Vattenfall has invested heavily in the UK market, bringing the knowledge and experience from across Europe to benefit customers here. It has spent billions of pounds developing renewable and low carbon energy solutions, alongside the significant investment required to become a licenced IDNO.

Vattenfall has several businesses in the UK:

- Vattenfall IDNO – one of the 14 licenced IDNOs.
- Vattenfall Heat UK - works with developers to create innovative district heating solutions.
- Vattenfall UK Sales - supplies renewable energy to high-demand business customers.
- Vattenfall Wind Power - owns and operates wind farms across the UK.



Introducing Vattenfall IDNO

Financial stability

Vattenfall IDNO has the full backing of the Vattenfall Group but as an independent division has the agility and flexibility to meet the needs of customers on each and every project. With profits in excess of £764m (10.3 billion kr) in 2023 the Vattenfall Group's strong financial position means you can be assured of long-term dependability.

Research and development

Vattenfall has a team of 120 people dedicated to research and development. The business consistently invests millions of pounds into research every year and runs multiple innovation projects with key partners throughout several industry sectors. One of the key aims of the research is finding new ways to enable fossil fuel free living within one generation.

True partnership

Vattenfall believes in building strong relationships with customers and aims to assist at every step to ensure the network is completed quickly and efficiently and operated to the highest standards. This includes everything from overseeing construction and working with the DNO on the developer's behalf, to delivering the fastest possible response time to issues once the network has been adopted. As it is not affiliated with any single ICP, Vattenfall can work flexibly with a range of licenced providers to match project needs.

A commitment to sustainability

Vattenfall has the aim of enabling fossil fuel free living within a generation and has made significant progress to reduce emissions. Vattenfall partners with businesses in a range of industries that share that dedication, such as Vattenfall Group's backing of the HYBRIT zero carbon steel project in Sweden. Here in the UK, Vattenfall is proud to be one of the very few IDNOs who will work with developers who are investing in low carbon technologies such as EV charging points, heat pumps, solar generation, battery storage or smart grids. Vattenfall IDNO is willing to adopt these complex and relatively new types of asset to help developers meet their carbon reduction goals.

Sector specific benefits

Vattenfall IDNO offers specific benefits for different types of project:

- **Generation** - As part of the Vattenfall Group, power generation is in the DNA of the business and therefore Vattenfall IDNO has a true understanding of what is important for developers in this sector. As a result of its unique background, it is one of the few IDNOs who will work on generation as well as demand projects. Read more about generation connections.

- **Commercial developments** - Vast experience across Europe from retail and offices to manufacturing and warehouses means Vattenfall IDNO can deliver cost effective and streamlined services tailored to your development. We offer commercial developers an improved route for securing grid capacity for both new and upgraded electrical grid connections. These services come with additional benefits such as Asset Adoption Value payments, value-engineered designs, and support for capacity roll-out.
  Read more about commercial connections.

- **Data centres** - Vattenfall IDNO provides UK Data Centres with strong commercial offers for new grid connections, optimised for future power demands. Partnering with Vattenfall IDNO provides Data Centres with multiple benefits including capacity reservation and flexible ramping rates, as well as class-leading remote monitoring and control technology and complete project support from early-stage design through to delivery and adoption. Read more about data centre connections.

- **Hydrogen projects** - Vattenfall has significant hydrogen experience across the sector and is focused on the production and distribution of green hydrogen. We are working in collaboration with steel producer SSAB and mining company LKAB on a major hydrogen project, HYBRIT in order to reduce the negative climate effects of steel production. The project has also demonstrated that effective hydrogen storage can reduce costs by up to 40%. Read more about hydrogen project connections.

Grid Connections Consultancy

Our consultancy service provides support to accelerate connections to the UK grid. Our dedicated team of experts removes the pain of securing grid connections by providing bespoke consultancy, or managing the entire process on your behalf.

Our consultancy service provides:

Customer focus and single point of contact
Grid connections require coordinating landowners, ICPs, DNOs, National Grid, multiple legal teams and other contractors and suppliers. Obtaining the details you need from DNOs can be difficult at the best of times. Vattenfall's Grid Connections Consultancy removes this complexity by providing a single point of contact who will manage all parties on your behalf.

Feasibility studies and grid capacity insights
A large part of any new development involves navigating UK grid availability to determine how much power is available where, at what cost. Vattenfall has developed a platform for analysing grid capacity anywhere in the UK, which can provide developers with key insights into the best locations for their projects.

Expert oversight for cost-effective connections
Grid connection projects can often be delivered in a number of different ways. Before you accept an offer from your DNO, or a quote from an ICP, we will review every detail to ensure you're getting the best deal.

Pre-offer, pre-acceptance, post-acceptance, pre-construction and construction phase support
Every grid connection project is different and can get stuck at any phase of the process. Whether you are just starting out, or part-way through a project and have hit roadblocks, Vattenfall's Grid Connections team can step in to support your goals.

Management of connections at HV and EHV levels
From primary substations connected at EHV through to simpler HV connections we have significant experience of navigating complex projects throughout the UK.

Compliance audits and management
Grid connection requirements are constantly evolving, and it can be hard to keep up with the latest changes. Our dedicated team will advise whether your application is required to meet regulatory and compliance requirements such as G5/5, G98, G99, G100, P28, P29 and the Grid Code, to avoid your project being delayed.

Capacity reservation and flexible ramp rates

IDNOs can reserve grid capacity on behalf of clients and release power capacity over extended periods to align with building and development project time-frames. Our Grid Connections team can explain the options and design your connection agreement to fit with your development plans and avoid locking up investment capital until it is required.

How Vattenfall IDNO supports projects:

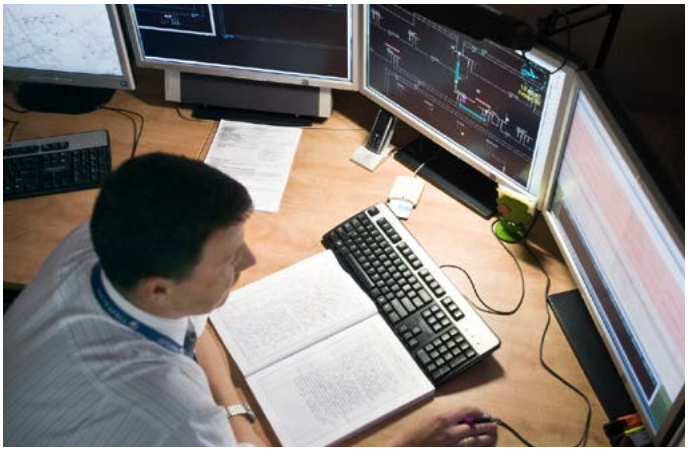
1. Power capacity assessments
Find out how much power is available in a particular location and initiate the process of applying for power. We will present you with the best available options to secure the power you need for your development.

2. Apply for a grid connection
We will apply for an 'indicative' or 'firm' quote for your grid connection, on your behalf and present you with the available options. Firm quotes can incur extra cost, depending on the size of your required connection (LV/HV/EHV). We will provide you with clear pricing based on the scale of your project.

3. Developing your grid connection
We will secure your grid connection and value engineer your connection design to ensure you receive the best possible value for money, and manage the development process with the DNO.

4. Overseeing the on-site works
We can recommend an Independent Connection Provider (ICP), or work with your existing contractors, and liaise with them, and the DNO, on your behalf to ensure your connection is delivered on time.

Whatever stage you are at with your project and grid connection requirements, Vattenfall's Grid Connections Consultancy team can help accelerate the process.



Case Studies

Edinburgh Park - Parabola

Developed by Parabola, the innovative new Edinburgh Park Southern Phase will be one of the UK's biggest all-electric property developments. It will include nearly 1800 residential units and 1 million sq ft of commercial office space, as well as restaurants, a health centre, bicycle hub, nursery and EV charging points.

Vattenfall IDNO was awarded a multi-million-pound contract by Parabola to deliver and operate the electrical infrastructure, which will enable the new area to operate without producing carbon emissions. This is a vital part of Parabola's commitment to sustainable development and in line with Edinburgh's ambition to become a net zero city by 2030.

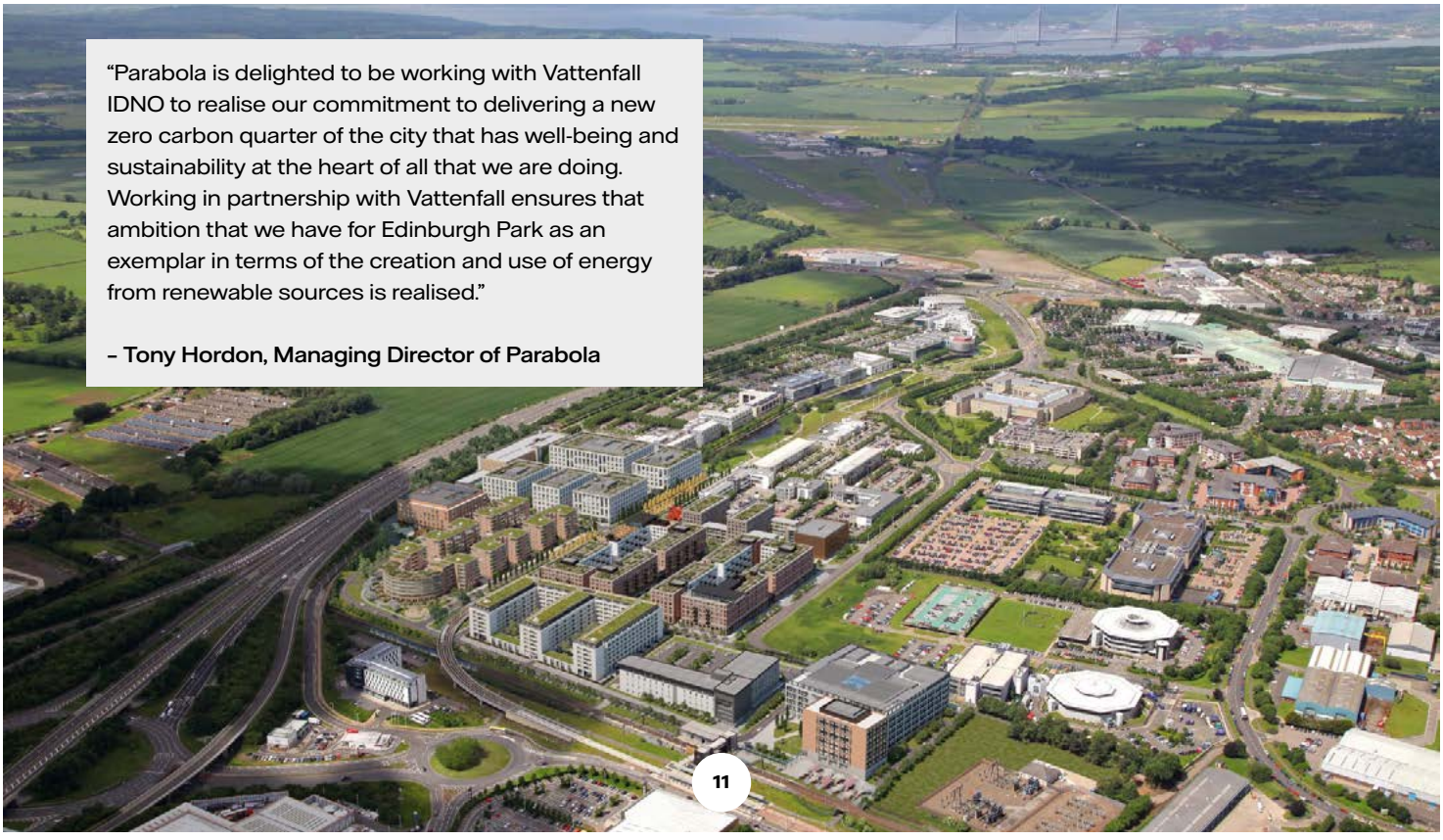
For such a pioneering project, collaboration with an IDNO that could support the aims of the development was essential. Vattenfall's experience and ethos were key factors in winning the contract.

An ICP is building the substations and associated infrastructure, and once complete Vattenfall IDNO will take ownership of the new electrical network and will continue to provide the operation and maintenance of the development.

Mannington Battery Depot

Vattenfall IDNO provided a new 33 kV connection, new substation and 3km of cable for Still Waters Green Technology battery depot in Swindon. Vattenfall supported the client with a strong commercial offer, design Improvements which lowered the clients' CAPEX requirements, and flexibility on lease terms to accommodate a short lease period. The project was built by the ICP Greenfrog Connect and the connection is now owned and operated by Vattenfall IDNO.

The project will deliver balancing services for National Grid, to help enable the growing proportion of renewable generation in the UK, making a significant contribution to the future flexibility of the UK's energy system and helping reduce costs for consumers.



"Parabola is delighted to be working with Vattenfall IDNO to realise our commitment to delivering a new zero carbon quarter of the city that has well-being and sustainability at the heart of all that we are doing. Working in partnership with Vattenfall ensures that ambition that we have for Edinburgh Park as an exemplar in terms of the creation and use of energy from renewable sources is realised."

– Tony Hordon, Managing Director of Parabola

Case Studies

Food Enterprise Park

Vattenfall IDNO supported a new food park in Norfolk with an upgraded grid connection and a new 132kV substation to provide 30MW of import capacity and 50MW of export.

Food Enterprise Park (FEP) is a 46 acre consented development site in Greater Norwich Food Enterprise Zone which provides real estate and facilities for food and drink businesses.

Working alongside the ICP, East Solutions, Vattenfall IDNO helped deliver the required power for the site. East were responsible for design, engineering, and installation, and will be the site's O&M provider for Vattenfall on an ongoing basis.

The development aims to support the co-location of food businesses, enabling them to add value to local produce before onwards distribution. Unfortunately there was not sufficient capacity in the local electricity grid to meet FEP's demand. They quickly absorbed the 3.7MW that was available and started planning how to secure more power. They commissioned a new 132kV substation to provide 30MW of import capacity and 50MW of export.

The substation will transform the power down to 11kV and feed a switch room housing the import and export meters. Food Enterprise Park's connection is via a single MPAN (Meter Point Administration Number), so their on-site electricity infrastructure is managed as a private wire network meaning that FEP meters the on-site electricity distribution and invoices their tenants.

Clarke Willis, from Food Enterprise Park, explains:

"Working with an IDNO is excellent because we can start by releasing just some of the capacity we have secured to the businesses at FEP. We don't need all of the 30MW immediately, so we'll only be taking 5MW to start with and then we can build out and release the additional power in stages."

Reserving capacity in this way is not possible through a DNO, so working with an IDNO provided FEP a significant advantage. "The Food Enterprise Park development will cost around £4.5M, so the Asset Adoption Value payment from Vattenfall was very useful." explains Clarke.

Vattenfall are keen to support developments with net zero ambitions and FEP is blazing a trail for sustainable farming by planting 1 million trees around the site.

"It makes a big difference to know you will get the same person on the phone. We worked out the adoption agreement and financials with Vattenfall through one-to-one phone calls over a few weeks and the relationship, way of working and can-do attitude worked extremely well - it's the way we like to work."

Summary

Licenced IDNOs give developers a choice for the design, construction and ongoing operation of new networks. IDNOs can offer greater efficiency and flexibility in the connection process as well as financial advantages in the form of Asset Adoption Value payments.

A long history and strong position in the European energy sector means developers can rely on Vattenfall to help them achieve their objectives. Its commitment to sustainability means Vattenfall is the ideal partner for generation or demand projects where low carbon technology is a central element.

To find out more, visit: idno.vattenfall.co.uk

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