

Vysiion and Critical National Infrastructure

Solutions for Utilities and Renewables

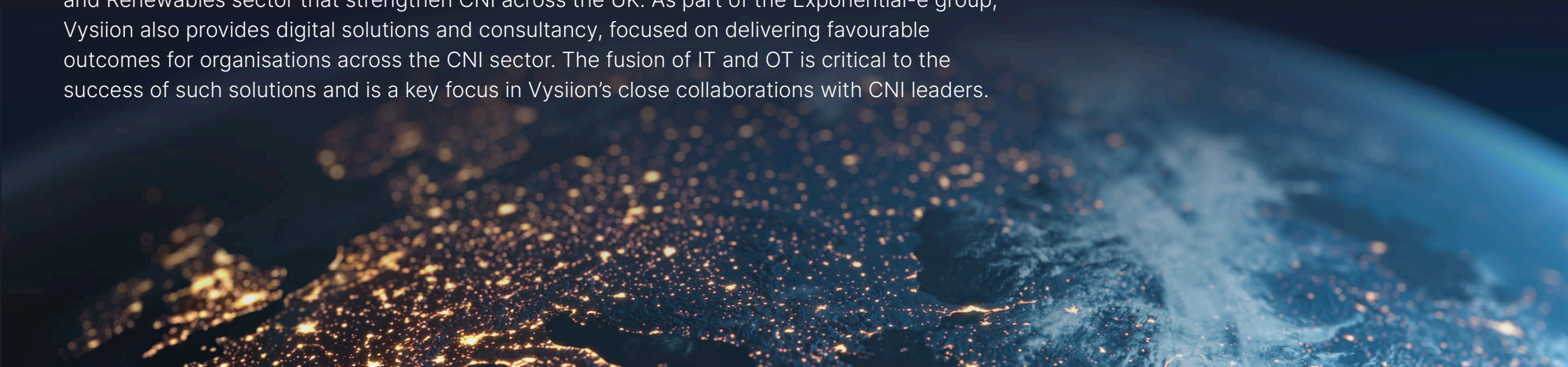
Utilities and Renewables



Critical National Infrastructure (CNI) is the backbone of a country, providing the facilities, systems, sites, information, people, networks and processes upon which daily life depends. With the Utilities and Renewables sector providing essential energy and water services, maintaining availability to citizens and business is paramount.

On top of the increased pressures from regulations and compliance, plus the growing requirement to move towards sustainable generation methods, Utilities and Renewables are also faced with keeping up with the pace of technology and the implications of converging IT and OT (operational technology) networks.

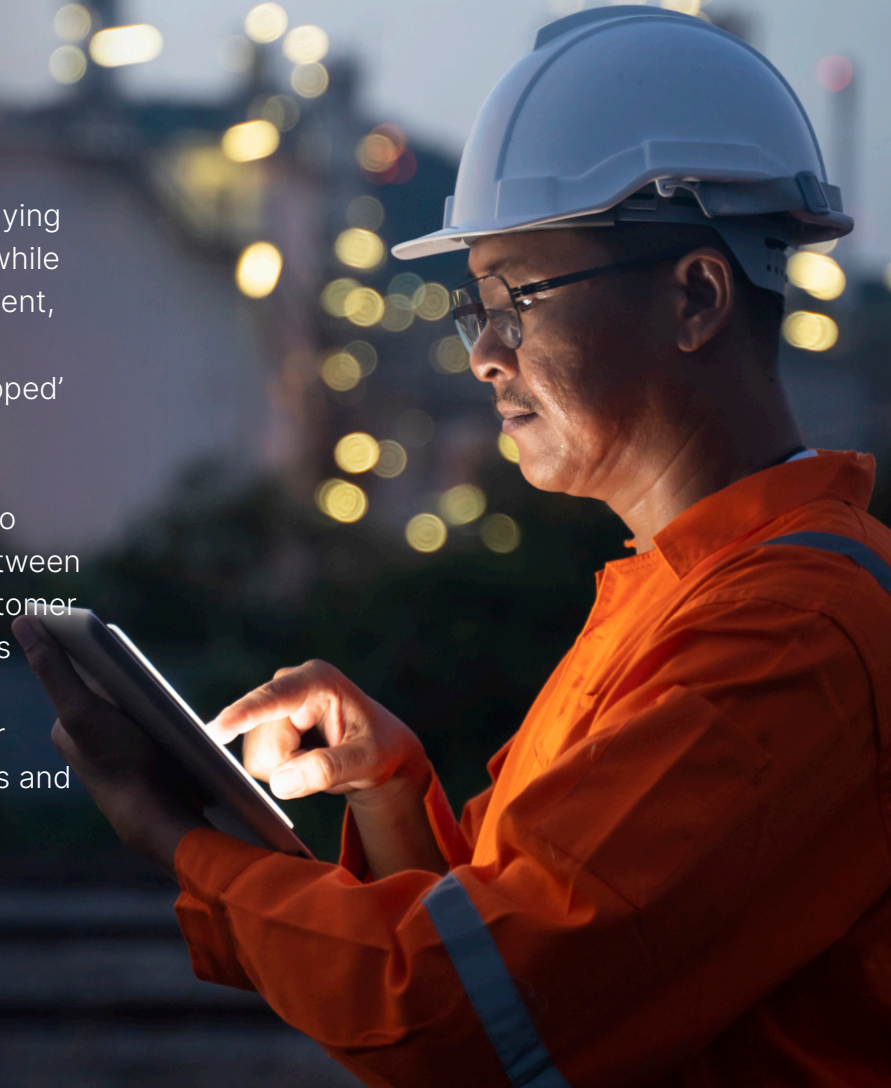
Vysiion's extensive experience in delivering mission-critical projects in both IT and OT gives us a unique perspective on these challenges, allowing us to offer innovative solutions to the Utilities and Renewables sector that strengthen CNI across the UK. As part of the Exponential-e group, Vysiion also provides digital solutions and consultancy, focused on delivering favourable outcomes for organisations across the CNI sector. The fusion of IT and OT is critical to the success of such solutions and is a key focus in Vysiion's close collaborations with CNI leaders.



Creating the right foundation for CNI's unique connectivity requirements

Historically, IT and OT networks have operated independently of one another, with CNI relying on IT to automate business functions, such as billing, customer service, and accounting, while OT has primarily been focused on controlling critical infrastructure and systems management, e.g. power generation and distribution. Pre-2010, there was little awareness of critical infrastructure vulnerabilities and rarely dedicated resource for OT security – these 'air-gapped' systems were seen as secure.

In today's world of connectivity and real-time data, OT and IT networks are now merging to provide monitoring, maintenance and remote control to CNI systems. Bridging the gap between IT and OT systems creates new opportunities to improve operational efficiency, meet customer demands, and keep pace with digital transformation. As a trusted partner for organisations across the CNI sector, we see this trend continuing until there is a fully integrated IT-OT environment, allowing the sector to mitigate risk and more effectively achieve disaster recovery and service continuity processes, and continue working closely with our partners and customers to make this a reality.



From Smart Grid to Smart Cities

The digital transformation of the power and energy sector started well over a decade ago, but the true power and potential of big data and IIoT technologies is still to be realised. The modernisation of the power grid goes beyond the smart metering of households and businesses, and focuses more on distributed generation, the integration of renewable and microgeneration, and the growth in eco-initiatives, such as electric vehicle charging.

With 65% of electricity companies purported to be investing in digital technologies and platforms by 2023, the Smart Revolution is here.



The Challenges





We are acutely aware of the pressures that the CNI sector faces, driven by macro and micro environment factors as you look to meet customer demands, keep pace with digital transformation and deliver on green objectives.

Our extensive experience in delivering mission critical projects in the CNI sector means we can help you streamline processes and provide innovative solutions to future-proof your operations, meeting those challenges head-on.



Infrastructure:

As the population grows, legacy infrastructures require updating to future-proof services through the adoption of digital services. An example of this is the upgrade of BT 21CN analogue service switch off and migration to MPLS and 4G/5G connectivity.

How we help:

- Vysiion are experts in critical network connectivity. Our solutions enable centralised control and secure linking of intelligent data, creating optimal conditions for the ongoing digitalisation of operations.
- Vysiion can supply evolving mobile (4G and 5G), leased line, and SD-WAN services.



Sustainability:

With investment being ploughed into green energy to meet UK climate targets, IIoT and IoT will play an increased role in developing new solutions to help cut emissions by 2030.

How we help:

- Vysiion supports the delivery of critical network infrastructure for renewable energy and other large-scale CNI projects, providing edge-to-core solutions throughout the UK and internationally.
- Vysiion has been involved with almost all UK offshore windfarm projects, providing solutions to the most complex issues.



Preventing threats from cyberattacks:

The threat of cyberattacks increases with the reliance on new technology that can compromise critical services. NIS Regulations provide legal measures to boost overall physical and cyber security – which organisations must adhere to.

How we help:

- With our in-house, UK Cyber Security Operation Centre (CSOC), Vysiion delivers 24×7, real-time security monitoring and alerting service, reducing the risk of cybercrime, and increasing organisations' cyber resilience, expertly managed by our cyber security professionals.
- Vysiion delivers peace of mind when it comes to physical security and surveillance by designing and delivering CCTV, access control and fence line detection systems, creating a robust security ecosystem.



Regulations:

With greater scrutiny placed on organisations to adhere to consumer regulations, data protection becomes imperative to ensure you stay compliant and maintain the protection of your customers' digital footprint.

How we help:

- Vysiion provides the infrastructure and security required to traverse between OT and IT networks, protecting transfer data to improve service delivery optimisation, drive operational efficiencies, meet evolving customer demands and plan to secure disaster recovery and business continuity measures.
- Vysiion provides cost-effective, secure, and resilient hosting for our customers' infrastructure within Ark's Tier 3, energy-efficient data centres, while our support services proactively monitor and manage mission-critical IT infrastructure, services, applications, connections, sites and processes, 24×7×365.

Industry Trends



We have seen trends emerging through our work with many organisations in the CNI sector to keep pace with technological advancements to help meet the challenges they face.

Innovation:

Organisations are driving innovative solutions to develop programmes support technology refresh projects that help:

- Upgrade legacy infrastructure
- Harness data to analyse and act upon, at speed
- Generate new revenue streams





Real-time Data Availability:

Collecting and controlling data in real-time is of paramount importance when it comes to making informed decisions and establishing future planning requirements:

- Improve network planning and engineering processes
- Transfer of data between IT and OT to improve quality assurance to customers
- Guarantee uptime of IIOT applications, particularly SaaS applications
 - especially in remote locations



Service Continuity:

Maintaining critical services to citizens and local communities in the event of a disruption:

- Contingency planning, where systems and services can be accessed from anywhere, avoiding a single point of failure
- Mitigating any loss of service when planning large-scale infrastructure change
- Proactively looking towards digitization and decentralised structures, supported by end-to-end telecommunication networks



Cyber Resilience:

Securing critical networks and information systems to keep businesses, citizens and public services protected from cyber threats.

- Protecting and securing the safe passage of data moving across networks
- Avoiding DDoS attacks, designed to overwhelm networks with bogus traffic leading to disruption
- Securing on-site engineers from unprotected laptops where unknown viruses can quickly pass into the network



Physical Security:

Protection of physical infrastructure and sites:

- Modifications to defective access control systems and supplement protection with biometric capabilities
- Upgrading CCTV systems with infrared/thermal imaging and video analytic capabilities
- Combining perimeter protection with additional security measures to have a more comprehensive view of potential threats

Compliance:

Ensuring compliance with industry regulations (NIS Directive/ GDPR) through emerging standards and protocols through connected edge devices:

- Full review of end-to-end cyber security infrastructure
- Ensuring that processes are in place to avoid a malicious attack
- Ensuring protocols are in place to react appropriately by implementing robust disaster recovery plans

compliance

Our Solutions

From Edge to Core, we design, deliver and support resilient infrastructure to control critical applications and systems.

Smart Solutions (Edge Technology)

Edge technologies that sense, inform, and often control an output, are the core component of “Smart” solutions. These enabling technologies include simple signage, to more complex SCADA systems, and are used across all sectors – utility, transport, manufacturing, and cities. As an integrator Vysiion can design, install, and then once in service, monitor and maintain these assets on a 24×7 basis.

- Intelligent Signage
- Weather monitoring
- BMS/EMS systems
- M2M Factory Automation
- IoT/IIoT



Physical Security and Surveillance (Edge Technology)

The threat landscape is complicated and continuously evolving. Threats to physical sites can cause extensive damage to critical networks, resulting in loss of service to businesses and communities. Vysiion delivers peace of mind when it comes to physical security and surveillance, monitored by our 24/7 Network Operations Centre.

- Intrusion Detection System
- Access Control
- CCTV
- ANPR
- PA Systems
- Fence Line Detection

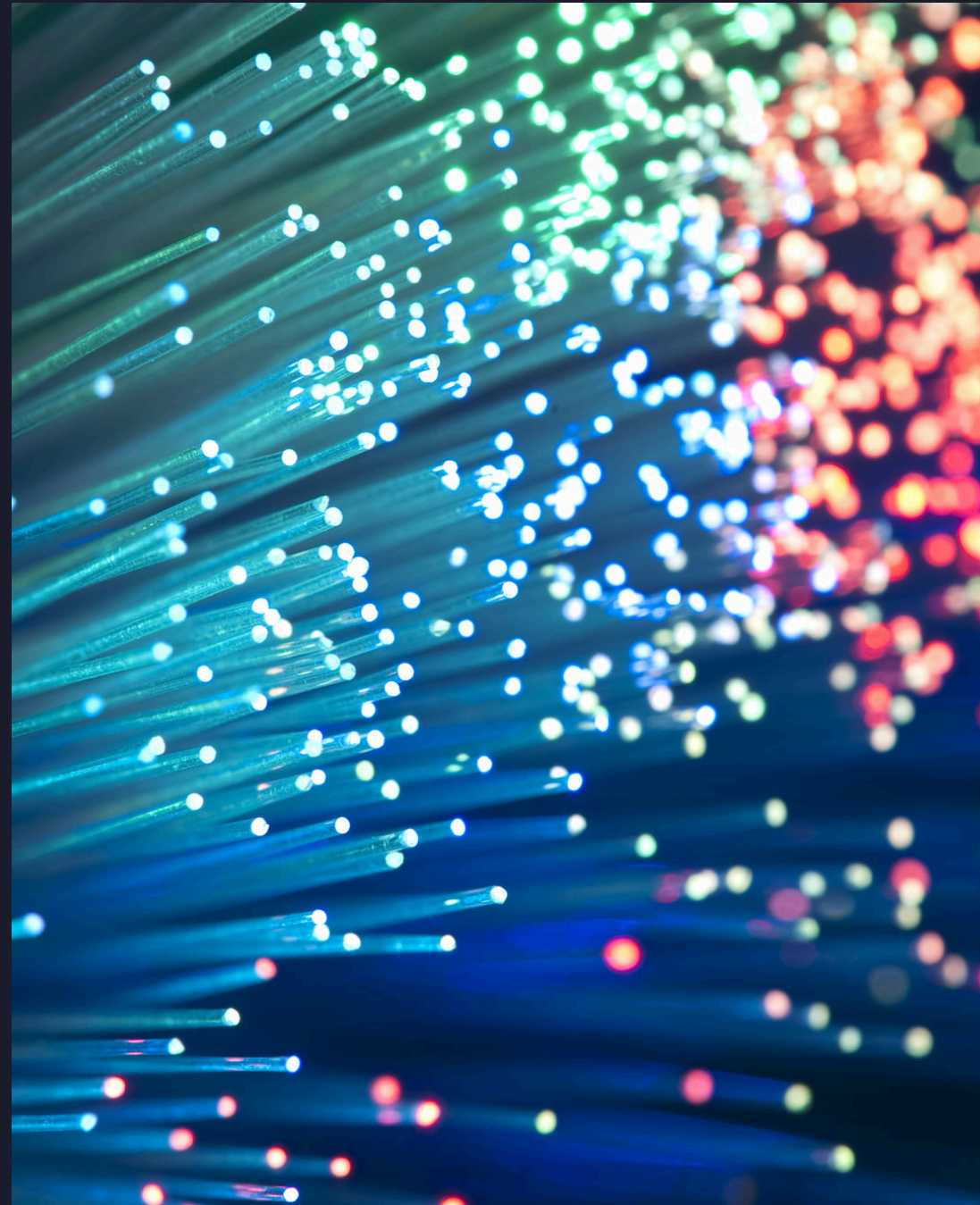


Critical Network Connectivity

The powerful networking of all system components, in compliance with international standards, is a critical foundation for secure and reliable CNI infrastructure. Our solutions enable centralised control and secure linking of intelligent data, to create optimal conditions for the ongoing digitalisation of operations.

Our flexible delivery approach allows us to design, build and test in our in-house workshops, pre-deployment, or complete on-site, to ensure smooth roll-out and continuity of service.

- Fibre/Copper
- Microwave
- WAN/SD-WAN
- Managed LAN & WiFi
- Point-to-point Line of Sight Radio
- SDH (Deterministic Network)
- 3G/4G/5G Comms
- MPLS
- Business Internet
- SD-HOME



Cyber Security

Critical infrastructure must be fully protected from cyberattacks. The comprehensive and practice-oriented security concepts from Vysiion lay the groundwork for the secure operation of data flow in both OT or IT environments, underpinned by our 24×7×365, UK-based Cyber Security Operation Centre.

- CSOC
- Ransomware protection
- DDoS Mitigation Service
- Dedicated Firewall
- Managed Centralised Firewall
- SSL VPN
- Penetration Testing
- Vulnerability Scan
- Intrusion Detection System
- Intrusion Prevention Service



Data Centre Services (Core)

Designing and deploying data centre-hosted or private cloud solutions, especially for customers with demanding security and compliance requirements, including connectivity to secure private networks. We provide cost-effective, secure and resilient hosting for our customers' infrastructure within Ark's Tier 3 energy-efficient data centres. Our support services are proactively monitoring and managing mission critical IT infrastructure, services, applications, connections, sites and processes, 24×7×365.

- Connectivity
- Migration
- Structured Cabling
- Co-Location
- Smart Hands
- NOC
- Break Fix



Project and Solutions Engineering

Vysiion employ a skilled project team, able to provide a consultancy and design service, through to build and commissioning of complex edge to core solutions. Working across sectors, the team are trained and experienced in current and emerging IT and OT LAN/WAN, Cyber, edge technology and mission critical applications. Current projects include fixed and wireless network builds, security and access control, and on premise/cloud solutions and applications

- Innovative, robust, edge to core delivery
- Agile project management, compliance, reporting, and controls
- Documented solutions and auditable process
- Factory build, stage/test, and logistics
- Field commissioning, QA and SAT
- QHSE/SHEQ, ISO, CDM



Field Service Engineering

Vysiion employ a team of adept field engineers. Capabilities include installation and support of Edge technologies, through passive and active network infrastructure. As a team, they have experience across multiple market sectors, supporting critical infrastructure for utilities, transport, renewables, defence, public and private sector clients. Vysiion offer a nationwide field force expert in installing, commissioning and integrating multiple technologies in a diverse range of environments

- Feasibility Studies, Audits and Site Surveys
- Installation
- Civils
- National Roll-outs



Network Operation Centre (NOC)

Our NOC is there proactively monitoring and managing mission critical IT infrastructure, services, applications, connections, sites and processes 24 hours a day, 7 days a week, all year round. A key element within our managed service offering is the focal point for proactive and reactive network activities such as monitoring, performance tuning, software distribution and updating, router and domain name management, and coordination with affiliated networks.

ALERT

- Using advanced event detection to proactively monitor infrastructures 24/7/365
- Raise alerts when predefined thresholds are met.
- Configured to each customers' requirements.

INFORM

- Provide information on capacity and performance
- Real-time data monitoring
- track progress of ticket status

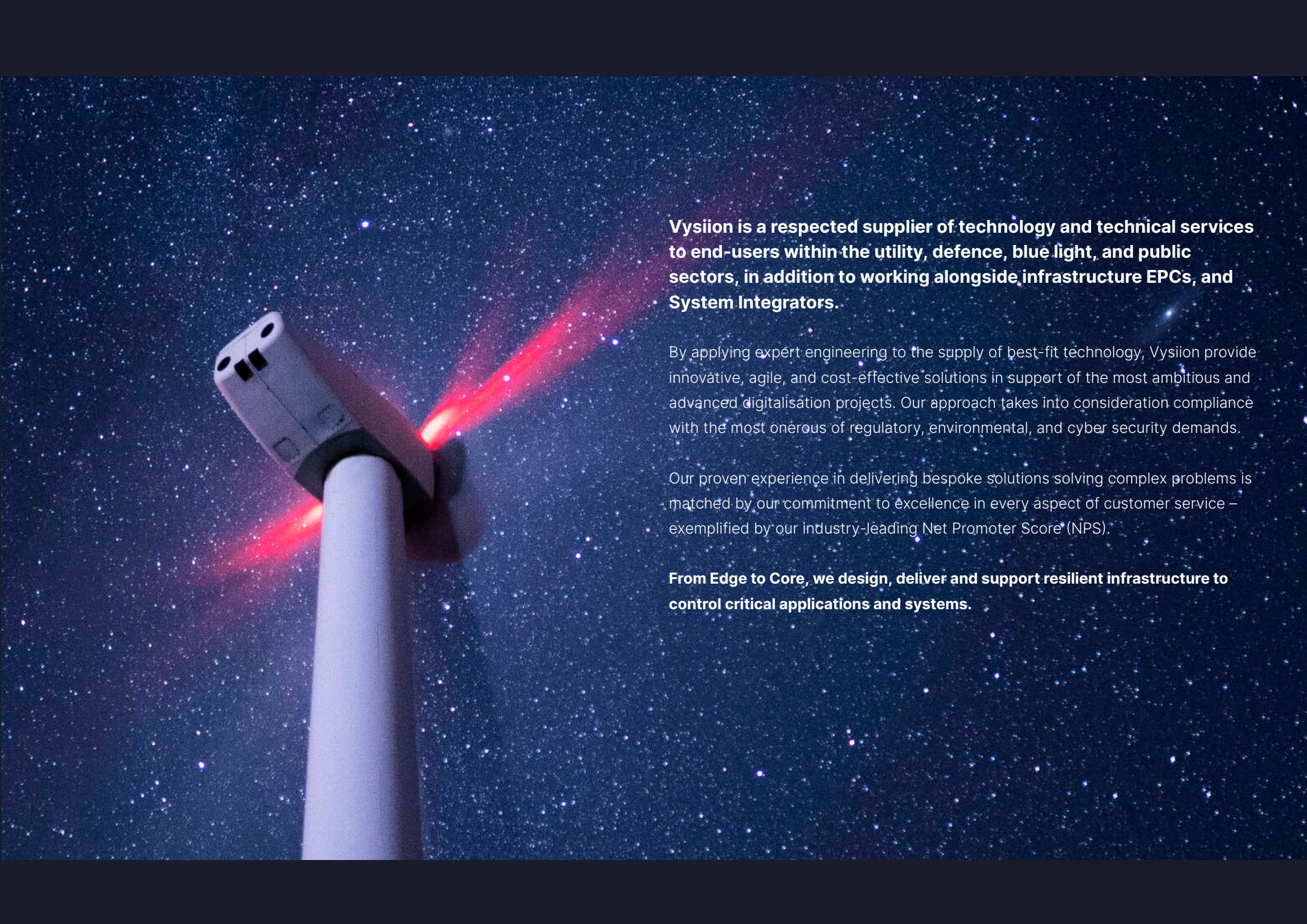
RESOLVE

- Resolve / escalate incidents in line with customer requirements
- Manage the Incident until resolved



About Vysiion



A white antenna is mounted on a white pole. Two bright red laser beams are emitted from the antenna, one pointing upwards and to the right, and the other pointing downwards and to the left. The background is a dark blue night sky filled with numerous small, bright stars.

Vysiion is a respected supplier of technology and technical services to end-users within the utility, defence, blue light, and public sectors, in addition to working alongside infrastructure EPCs, and System Integrators.

By applying expert engineering to the supply of best-fit technology, Vysiion provide innovative, agile, and cost-effective solutions in support of the most ambitious and advanced digitalisation projects. Our approach takes into consideration compliance with the most onerous of regulatory, environmental, and cyber security demands.

Our proven experience in delivering bespoke solutions solving complex problems is matched by our commitment to excellence in every aspect of customer service – exemplified by our industry-leading Net Promoter Score (NPS).

From Edge to Core, we design, deliver and support resilient infrastructure to control critical applications and systems.

The Vysiion Difference

Vysiion is a technology services company with a difference: our people and our approach. As a team, we have the in-house capabilities to design, supply, integrate, deliver and support complex and demanding bespoke digital transformational projects.

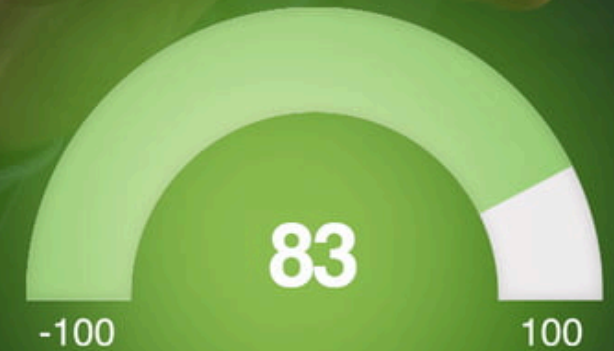
From design to deployment, our qualified and experienced solution architects are vendor-agnostic so free to choose the best-of-breed approach to suit your project requirements. Our UK-based NOC and CSOC provide 24×7×365 monitoring and support and our field-based resolver teams keep your networks functioning through reactive, proactive and preventative maintenance.



The systems and processes adopted by Vysiion align with best practice and relevant legislation, and are continually reviewed and tested. Qualifications and accreditations include:

- BESC (Electrical Safety Competence relevant to substation and overhead line working)
- BOSIET Trained for offshore working
- SAFE Contractor
- UVDB B2 subcontractor assessment
- IEE 18th Edition electrical installation
- Scottish Power W11, W12 & SR4

Our teams have all the relevant work-related competency certificates to deliver services into the most demanding sectors. Our experience and competency is exemplified by our industry leading Net Promoter Score.



Our Customers

Vysiion is a trusted partner of the CNI sector

UKPN – Communications Network

Key Deliverables

- Design of network integrating many communications media
- Supply multiplexor equipment
- Delivery and commissioning of network equipment

The Challenge

UK Power Networks own and maintain electricity cables and lines across London, the South East and East of England. To mitigate the effect of the BT 21CN migration to IP communications, they needed a communications network between all of the UKPN Grid and Primary substations. Vysiion was tasked with supporting the critical communication infrastructure (inc. design, project management, supply, installation, configuration, testing and onsite commissioning) for this project utilising multiple vendors to provide interfaces from X21 and V35 through to C37.94 IP and IEC61850-3.

The Solution

- A resilient Synchronous Digital Hierarchy (SDH) transmission backbone across the entire network.
- Combination of various WAN connectivity methods including, Private and Dark Fibres, Radio Networks, BT EAD circuits supplied by Exponential-e and copper connectivity.
- A full installation of the network with our substation-authorized communication engineers.
- Full project management for the rollout programme, in order to meet the deadlines and be ready for circuit migration.

Result

Vysiion provided a resilient highly reliable network connecting all primary substation and using our knowledge of protection application, in collaboration with Exponential-e, we have this entire network reporting into two operating centres.

Moray East Offshore Wind Farm

Key Deliverables

- Supply of critical communications infrastructure.
- Supply of passive fibre and structured cabling solution.
- Installation of Wi-Fi network and telephony systems.
- Diverse communication bearers supplied by Exponential-e.
- Highly secure 2FA DMZ for remote connectivity.
- Security CCTV – Perimeter Protection System.

The Challenge

Moray East is a highly competitive offshore wind project and provides the equivalent of 40% of Scotland's electricity requirement. To reduce unexpected downtime, a myriad of agencies require access to critical data to assist in preventative maintenance. This requires resilient high bandwidth services into remote locations as well as a critical communication infrastructure for the offshore and onshore substation at New Deer and remote Marine Operations Centre at Fraserburgh.

Solution

We developed a secure CISCO-based DMZ allowing multiple authorised agencies to obtain their relevant data whilst maintaining the security of data owned by others. This was achieved using cloud based two factor authentication services.

Working with Exponential-e, we have been able to provide multi-vendor resilient network over 1Gig bearers, with additional 4G back-up solution to both the substation and the operating base some miles away in Fraserburgh.

Vysiion, utilising its tried and tested methodology, delivered secure and resilient SCADA networks telephony and physical security systems.

Results

The communications subsystems and associated infrastructure to support the SCADA, CCTV, Intruder Detection and Telephony services.

The passive fibre and structured cabling infrastructure both onshore and on the Offshore Substation Platform.

Securely authenticate and control connectivity for several 3rd party systems via the network Secure DMZ and communication bearers.

Caithness Moray Project

Key Deliverables

- Supply of critical communications infrastructure.
- Detailed design, supply, installation, testing and commissioning of the Plant Telecommunications.
- Operational voice communications at Spittal and Blackhillock Converter stations.
- Connectivity to PSTN network, plus telephony system back-up.

The Challenge

The Caithness Moray Projects, led by Scottish Hydro Electric Transmission ('SHE Transmission') and contracted to ABB, provides a HVDC link between Spittal in Caithness and Blackhillock in Moray, utilising a subsea cable for power and communications. Vysiion needed to provide resilient telephony to support communications across very remote locations.

Solution

The Caithness Moray project included redundant IP telephony, IP-based public address, including speakers and infrastructure cabling, hand-held radio and satellite phone systems at both Spittal and Blackhillock Converter Stations.

The telecommunications systems facilitates operational voice communications at both sites (predominantly within the Control Building and associated DC, Valve and Reactor Halls) and also out to other locations via trunk circuits as well as connectivity to the public switched telephone network (PSTN) network.

The satellite phone system provides backup to the telephony in the event of system failure.

Results

It was a difficult delivery due to the challenges of the supply chain, but the trust and agility in our capabilities meant the prime contractor wanted to work directly with us on future projects.

ElecLink (Eurotunnel)

Key Deliverables

- Active Network infrastructure.
- Passive network Infrastructure including CAT6a and Fibre.
- Security Panels.
- UPS and associated power cabling .
- Closed Circuit TV (CCTV) with recording.
- Intercom – main gate only (interface to Eurotunnel PABX is at MISS UK).
- Access Control System (ACS).
- Perimeter Intruder Detection System (PIDS) – fenceline, including gates.
- Interface with Building Intruder System (IDS).
- Security Lighting – at both gates.

The Challenge

The ElecLink project provides a power interconnector through the channel tunnel with a capacity of 1000MW between the UK and France, to provide cost effective generating capacity with low environmental impact and carbon reduction of circa 6.1 million tonnes. Working for Siemens Vysiion were requested to provide full security packages including CCTV, Access control and intruder detection systems. An additional challenge to this project was to integrate the systems with the existing Eurotunnel infrastructure.

Solution

Vysiion provided active and passive infrastructure, real-time physical monitoring with CCTV, access control, perimeter intrusion detection systems, and security lighting.

Due to the nature of the site, the systems were fully redundant, including a 12-hour UPS. Full integration of all systems was completed, providing the user with a single interface for management of threats as well as integration into Eurotunnel's management systems.

Results

We have supplied all of the systems required and in turn upgraded the Eurotunnel management system so that it is able to integrate into the MISS system. A secondary result from this engagement was that Vysiion was able to be seen by the operational telecoms team and this, in part, led to a further opportunity directly with Eurotunnel and another with ElecLink.

Who we serve



Thank you for reading

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Want to know more? Fill in the form and one of our CNI experts will be in touch.