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Infratech:
Instrumental for the Green Agenda

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Minimising the impact of climate change has (rightly) become a key focus for governments and organisations globally as part of their ESG agendas, with ambitious targets set and progress closely scrutinised.

In 2019, the UK became the first major economy to commit to reach net zero emissions by 2050, and the UK government has pledged millions of pounds to fuel 'green recovery post-pandemic. With infrastructure being a key contributor to carbon emissions, finding ways to make infrastructure assets more efficient is essential to meeting these targets. Although the UK government has recognised the huge potential that smart energy systems can bring to their net zero strategy, there are many other opportunities presented by the adoption of Infratech.

What is Infratech?

Infratech is the integration of digital technologies and data into the infrastructure lifecycle. With a better understanding of the value and use of data and a shift in government priorities towards innovation, Infratech can offer improvements in efficiency. This, in turn, makes infrastructure more sustainable.

What opportunities does Infratech present?

Around the world, the potential of Infratech has been demonstrated beyond doubt. We have listed some examples below:

Smart Grids: These are one of the highest profile Infratech use cases right now. Embracing renewable energy is a key factor for lowering carbon impact, but this energy has to be distributed intelligently. Smart Grids employ two-way communication between the energy provider and customers in combination with advanced data analytics, Internet of Things (IoT) technology, and AI. They assess supply and demand, adjust outputs to divert power to where it is needed, prevent outages, and optimise usage when demand is low. The UK has invested

in Smart Grid technology (see Ofgem's roadmap for Smart Grid implementation).

Vehicles: Copenhagen is aiming to become carbon-neutral by 2025 and is creating smart cities using Infratech solutions to reduce pollution. A digital traffic management system uses a network of sensors together with CCTV to monitor traffic conditions and use this information to adjust traffic signals, optimise public transport, and update road users. Vehicles spend less time idling meaning less emissions. By developing smart traffic management, the UK could move towards meeting its air quality targets under the Environment Act 2021.

Water supply: It's been reported that 24% of the water supplied by Thames Water (for example) is lost through leakage, and technology can be deployed to detect leaks and assist with predictive maintenance. As droughts are forecast to become increasingly regular, the careful management of water becomes essential.

Waste management: Infratech can reduce waste and encourage the 'circular economy'. Dutch start-up Excess Materials Exchange has created an innovative digital marketplace to facilitate the re-use and recycling of excess materials and waste products. Waste materials are given 'digital passports', enabled by blockchain technology, so companies can list their waste materials on the platform which other companies can then browse to find needed materials. Waste, from leftover construction materials to manufacturing by-products, becomes a valuable resource.

Waste collection can also be optimised through Infratech. Cascais, in Portugal, has embraced SmartBin technology by installing smart waste monitored recycling bins, the data from which can be analysed and used to optimise waste collector routes. Rubbish collections are expected to be reduced by up to 50% meaning that CO2 emissions are reduced and local government saves money.

Digital twins: One of the most significant technological developments in the fight to improve sustainability is the use of digital twins. By creating virtual models that accurately reflect physical infrastructures, organisations can test new processes to improve efficiency, analyse potentially negative environmental outcomes and use fewer resources than physical test environments. BT embraces digital twins to simulate energy demand across the network. Initially used to understand energy use and identify opportunities to save energy, further developments have allowed BT to assess the impact of
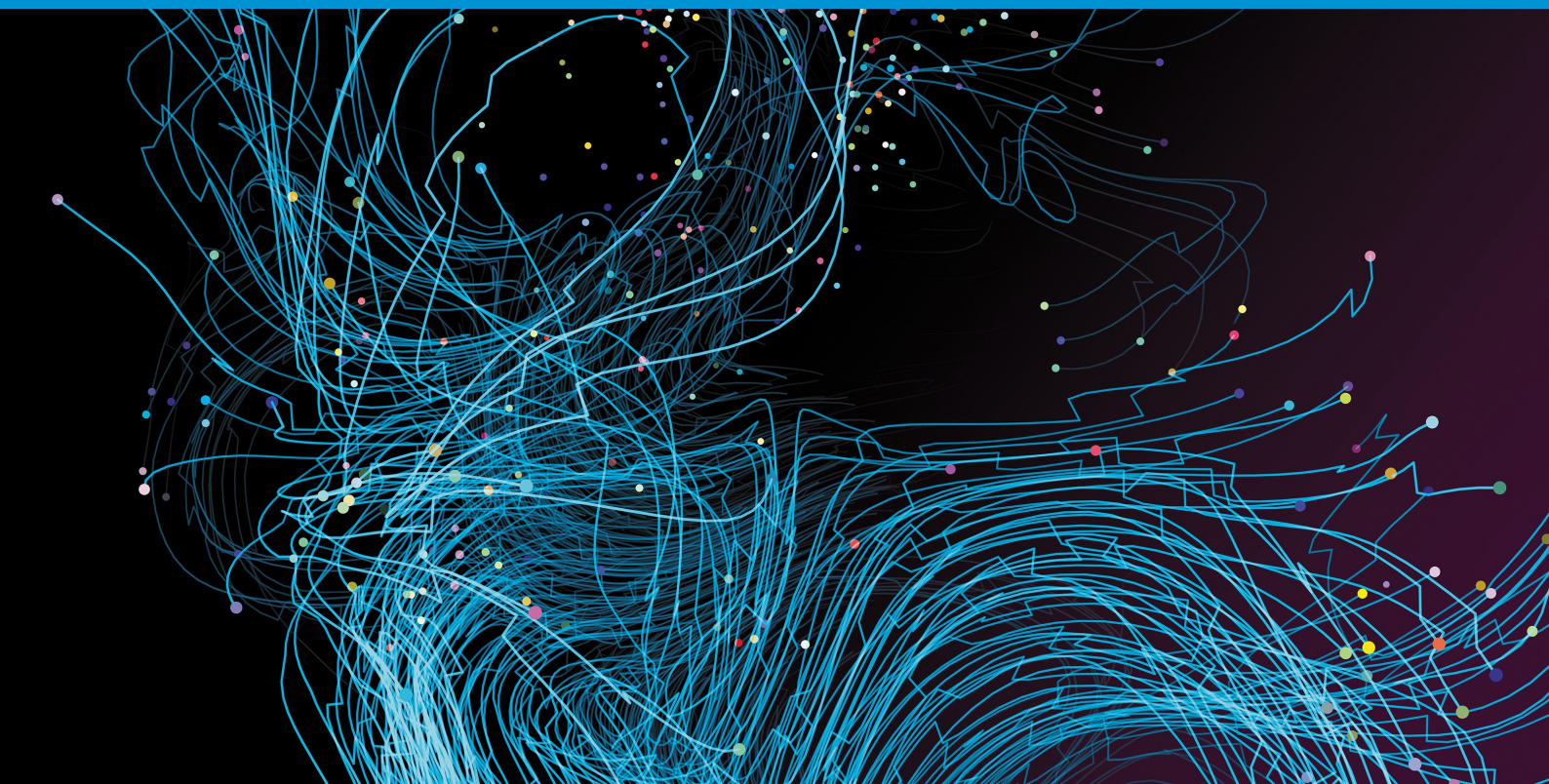
network changes. This feedback empowers BT to effectively manage the energy infrastructure, predict future energy use and make more efficient decisions. This delivered benefits worth £40 million in 2020, primarily from energy savings.

Reputation: Adopting Infratech solutions can have significant reputational benefits. Ørsted, the Danish power company, was ranked as the world's most sustainable company in the Corporate Knights 2023 Global 100 index for its dramatic transformation from a fossil fuel-intensive utility to a global leader in renewable energy. With a focus on off-shore wind power, Ørsted uses Infratech to optimise its assets showing how committed it is to positive change.

How does UK Government view Infratech?

The government has long recognised the potential of IoT technology, an example of an Infratech use case, with David Cameron [stating back in 2014](#) that the IoT is "*a huge transformative development - a way of [...] making transport more efficient, reducing energy needs, tackling climate change*".

More recently, the UK government has emphasised energy systems in its Net Zero Strategy, interconnecting the deployment of smart technologies in traditional infrastructure to save money—up to £10 billion a year by 2050—and reduce the amount of energy generation needed to decarbonise. Their report entitled "[Digitalising our energy system for net zero](#)" focused on the need to combine energy system data to make it more valuable. Funding has been targeted at the [Energy Digitalisation Taskforce](#) and [Energy Data Visibility Project](#) to enable use of Infratech to reach their green targets. Smart City projects are underway across the UK, such as Glasgow's status as the UK's 'Future City Demonstrator'.

As an alternative to government funding, Infratech attracts more private capital into infrastructure. The use of data and analytics means more informed decisions can be made which reduces risks and quantifies future costs, making it more attractive to private capital. Whilst this reduces the reliance on public sector budgets, government support remains essential to attract this funding.

What are the challenges?

The opportunities described above are tantalising, but there are challenges to address.

Infratech projects can become tangled in red-tape, struggling to balance technical system requirements, stakeholder concerns, and sector-specific regulation. In response, the UK has established the Linear Infrastructure Planning Panel to engage key public interest stakeholders. It aims to encourage good practice resulting in the robust, collaborative and adaptive use of Infratech and to decrease the bottleneck of infrastructure development. It will be interesting to follow its progress. The Global Infrastructure Hub, a G20 initiative, is working to drive investment in Infratech and reduce the barriers to Infratech such as a lack of common approach for data collection, format, governance and purpose. They have set an InfraChallenge to encourage innovation in Infratech.

The huge number of network connections that underpin Infratech solutions present a dramatically increased attack surface for cyber-attacks. Infrastructure has been the subject of politically motivated cyber-attacks directed at a Ukrainian state nuclear power company and a DDoS attack on a Lithuanian energy company. In August 2022, South Staffordshire Water was attacked by a cybercriminal ransomware group who threated to tamper with water supplied by the company. This attack led to a significant data breach. The reputational benefits gained from employing Infratech can easily be negated through inadequate cyber security.

Governments now recognise these threats and have responded with increased legislation to regulate cybersecurity across industries incorporating technology-empowered infrastructure.

- The Product Security and Telecommunications Infrastructure Act 2022 is applicable across the entire IoT industry, meaning much of Infratech falls under its remit. It adds different requirements (such as a better reporting system for vulnerabilities) to all new devices entering the UK market with the potential for huge fines of up to £10 million or 4% of worldwide turnover for non-compliance.

- The Network and Information Security (NIS) Regulations applies to operators of essential services and relevant digital service providers which catches much of those using Infratech, such as utilities and

transport. This legislation addresses threats to network and information systems by requiring operators and providers to manage risks and notify relevant authorities of any serious incidents. The scope is being increased to include Managed Service providers and increase the notification requirements.

- The Cyber Resilience Act and NIS 2 Directive impact those with a presence in the EU, aiming to increase the security of IoT products and protect critical infrastructure. The NIS 2 Directive sets direct obligations on management and requires cyber risk management measures to be put in place.

- As Infratech is underpinned by the collection and effective use of huge amounts of data, GDPR is applicable and brings further complexity, particularly concerning the allocation of Controller and Processor roles through the interconnected structures.

Infratech users face the challenge of trying to navigate the complex legislative landscape whilst supporting new technological developments. This puts a strain on company resources, requiring them to allocate time and resources to legal investigation and expert advice.

Another key challenge is the computing power required by Infratech. This computing power is usually supplied by the data centre industry, which is facing increased pressure to become more sustainable and energy efficient—it's estimated the industry contributes around 2% of global greenhouse emissions. But Infratech can help to solve this problem itself. EcoDataCenter, a Swedish data centre provider, employs innovative cooling technologies (such as utilising the cold Nordic climate) and uses 100% renewable energy to become the world's first climate-positive data centre. Closer to home, Exmouth Leisure Centre uses a washing-machine-sized data centre to heat a public swimming pool. The waste heat raises the temperature of surrounding oil which is then pumped into a heat exchanger that warms the pool water. This innovative solution empowers public facilities whilst reducing emissions and energy requirements, technology, and infrastructure working hand in hand to provide benefits for all.

A loaded solution

Now is the time to act and embrace Infratech. It offers huge potential to help reach green targets by minimising carbon footprints, using energy and resources more efficiently, and reducing pollution and unnecessary waste. But these benefits don't come without a catch—environmental costs, cyber-security risks, and ever-changing legislative requirements mean it is a complex landscape to navigate.

There is no Planet B and we owe it to ourselves to encourage the solutions that can safely reduce our carbon impact.

Infratech at Fieldfisher

At Fieldfisher, technology and infrastructure are in our DNA. We regularly bring together market-leading experts from a range of disciplines to support Europe's most important infrastructure projects.

Our industry focused teams deliver cutting-edge advice in sectors such as transport, energy, communications and construction, advising across the entire infrastructure value chain.

Wherever you are on your infrastructure journey, Fieldfisher is here to help. If you would like to talk to us about an Infratech project you are working on, or if you just have any questions and want to learn more, please contact Chris Eastham or Nikhil Shah. We particularly encourage those at an early stage in the project-lifecycle to get in touch, so that we can help to develop strategies for minimising legal risk and optimising project outcomes before pen is put to paper on the contract.

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