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Power the future, sustainably

The foundational strategy to help energy and utility organizations drive sustainable innovation, grow resilience, and exceed customer expectations

Fueling everyday life

Energy and utility organizations provide the fuel of our society. From enabling simple moments of everyday family life to powering the most complex of business innovation initiatives, it's a relationship that revolves around reliability, transparency, and trust.

But today the sector faces unprecedented challenges: from the geopolitical events that disrupt supply and pricing and the sustainability challenges that call for transformative action, to the rapidly evolving demands of customers, the increasing use of bi-directional grids, growing cybersecurity threats to critical infrastructure, and so much more besides.

All these pressures demand that energy and utility businesses – across sectors from fossil fuels, to renewables, to nuclear power – are more efficient, agile, sustainable, and transparent than ever before. Technology is pivotal in gaining these capabilities, but companies with aging infrastructure and multiple levels of resource constraints find it difficult to drive change cost-effectively at speed – especially in an ever-changing and increasingly complex industry.

VMware and Intel have deep experience of partnering with energy and utility organizations worldwide, helping them overcome these complex technology challenges and achieve their business goals.

Our virtualization and automation technologies, and future-ready edge-infrastructure, enable energy and utility businesses to rapidly modernize IT and OT in support of more innovative, flexible, efficient, sustainable, and secure data-driven operations.

Our virtualization and automation technologies, and future-ready edge-infrastructure, enable energy and utility businesses to rapidly modernize and simplify IT and OT, in support of more sustainable, secure, flexible, efficient and innovative operations. Our technologies will also standardize your operations, helping you scale your business more easily and adapt to market changes faster.

With our support you can accelerate the deployment of new solutions and services that will exceed customer expectations and fuel a more sustainable future for all.

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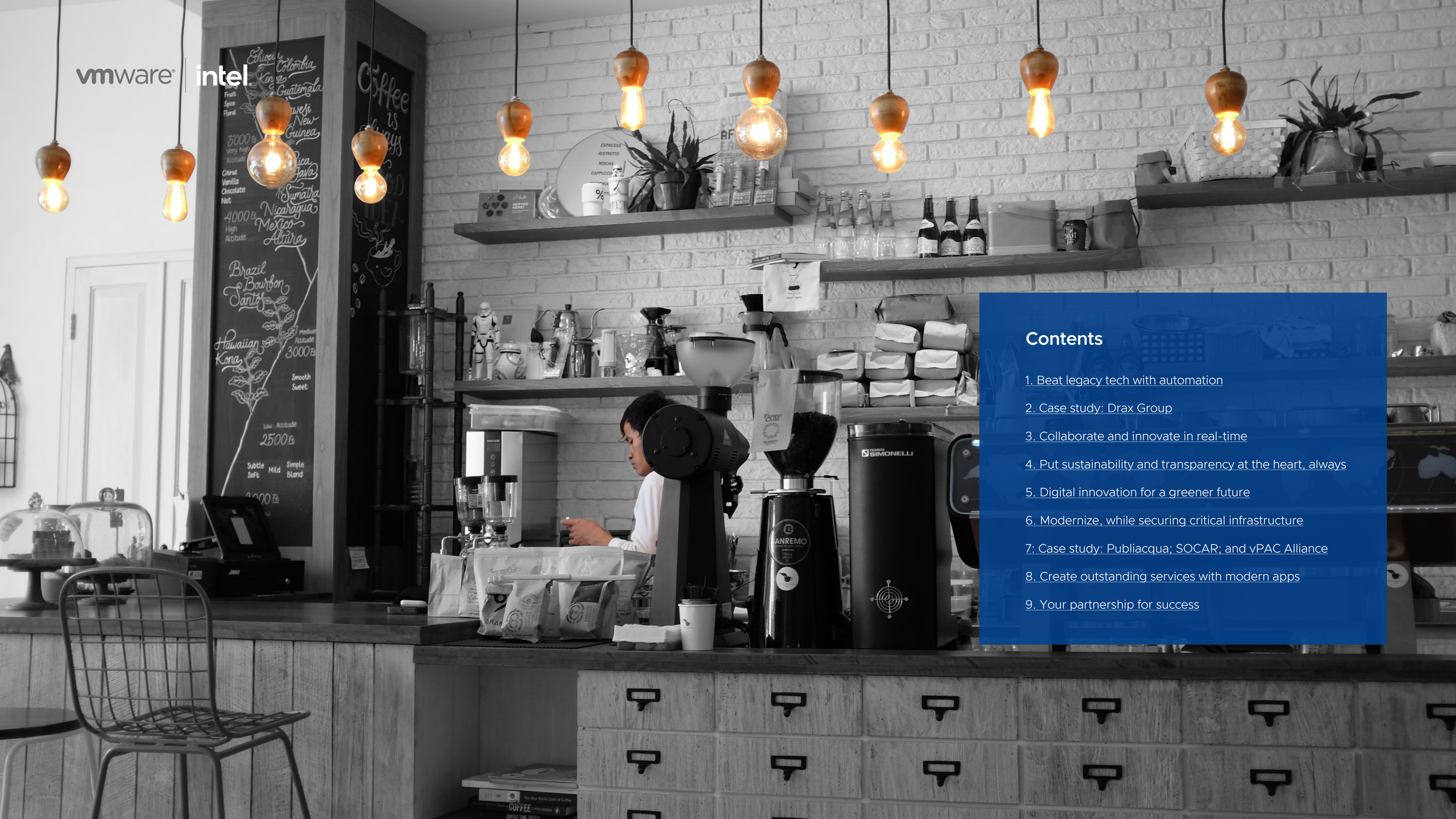

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Beat legacy tech with automation

The opportunity

To overcome today's challenges and advance toward sustainability goals, energy and utility organizations must adapt – moving with increasing speed and efficiency.

But legacy infrastructures and applications are a considerable barrier to progress: slowing collaboration, innovation, and time-to-market, and increasing operational risk. The complexity and inconsistency of an aging technology landscape can prevent a business from quickly identifying areas in which processes can be improved: such as through the reduction in maintenance costs and downtime, which can otherwise sap resources.

Ultimately, this outdated landscape will have a negative impact on the services and prices that a company can offer to its customers, with implications for future brand perception and customer satisfaction.

Organizations that overcome this challenge, however, have the opportunity to bring simplified, consistent, future-ready capabilities across both IT and OT environments: enabling a pre-emptive and proactive posture from which to consistently improve processes, innovation, and competitiveness.

Power sustainable growth with VMware and Intel

VMware and Intel can help standardize and consolidate the digital foundation across IT and OT environments – helping energy and utility businesses to overcome legacy infrastructure challenges and connect modern capabilities to critical energy systems. Furthermore, our technologies will work seamlessly in your existing network with legacy devices, so you can transition at your own pace.

A consistent, software-defined infrastructure – including a software-defined data center from VMware, for example – is the foundation upon which you can leverage VMware and Intel solutions to accelerate process automation across distributed environments.

Machine-learning modules will then be able to take real-time information from sensors and run it alongside historical data to predict failure and schedule maintenance: which can all be controlled from a single pane of glass.

Intel's continued innovation in predictive maintenance is leading to exciting opportunities that empower energy and utility companies to reduce downtime, forecast maintenance needs with far greater precision, and keep people and assets safe.

This automation strategy will also have intrinsic sustainability benefits – enabling organizations to continually identify key areas in which operational efficiencies will reduce resource usage and emissions.

Case study: Drax Group

Accelerating toward a carbon-negative future

The opportunity

Drax Group is a UK-based energy company that operates across renewable electricity generation, electricity sales to business customers, and compressed wood pellet production and supply to third parties.

In 2019, Drax announced an ambitious goal to be carbon negative by 2030. The company needed to adapt its strategy and operations to pursue this zero-carbon vision. That meant building a more flexible infrastructure that could respond faster to changing business needs and consolidating disparate data sources to make better informed decisions.

The solution

The business developed Drax Target Architecture, a modernization initiative designed to shed the limitations of existing systems, streamline access to data sources, and help the IT team develop new functionalities faster.

The Drax Target Architecture features three interlinked technology pillars, or Hubs. The Integration Hub connects dozens of on-premises and cloud apps, then funnels data from multiple sources to the Data Hub.

The Microservices Hub, built together with VMware, helps the IT team develop new applications faster, using a micro-services-based architecture built on Kubernetes technology.

Built on VMware Tanzu® Mission Control™, the Microservices Hub is an orchestration application that centralizes and simplifies Kubernetes cluster management, ensuring the operations team can apply consistent security and governance guardrails while giving developers self-service and quick access to clusters.

The results

9 months
to return-on-investment

“We’re increasing productivity, enhancing our skills and doing a lot more with less effort, to higher quality, and we have the inherent benefit of reuse.”

Mark Leonard, Director of Global Business Development at Drax Group

The VMware Tanzu product and services portfolio met the company’s requirements for a simple, out-of-the-box solution that could get up and running fast.

The Drax team has transformed its approach to app development, now able to deliver discrete, reusable blocks of capabilities that can be refreshed easily and built out to deliver scalable, future-proof applications.

The Drax Target Architecture has supported the delivery of new, growth-enabling services. For example, its solution built on VMware Tanzu technology has enabled the company to launch an industry-leading digital service that provides business customers with greater visibility and management of energy consumption in their electric vehicle fleets.

With faster application development, better use of business-critical data, and improved decisions, Drax is moving closer to its carbon-negative ambitions.

Read more here

Collaborate and innovate in real-time

The opportunity

Today's leading energy and utility companies understand that, by themselves, they cannot shape a future of reliable, future-ready, sustainable energy management.

Some are pursuing mergers and acquisitions to bring more sustainable energy solutions into their organizations. Some are also playing a more active role in leading change across wider sustainable ecosystems – such as the way that an electricity supplier might collaborate with smart-city leaders and vehicle OEMs to enable electric vehicle charging infrastructure. And others may even be looking to take this infrastructure a step further by leveraging vehicle-to-grid (V2G) to create a virtual power plant (VPP) marketplace, providing even greater resilience to future natural disasters.

But for these integrations and collaborations to be successful, it must be possible to rapidly share, analyze, and act upon data in real-time – out to the most remote edge locations – while confidently ensuring data security, sovereignty, and compliance at all times.

The challenge for many energy and utility companies is rooted in inflexible legacy applications, siloed initiatives, and insufficiently flexible infrastructure to take advantage of real-time data insights and modern technologies.

Organizations realize that private cloud is a vital part of the answer. But in a cloud-only approach, latency is a challenge to real-time data sharing; and hidden cloud costs – such as those faced when moving data and workloads – can be a concern.

The answer? A hybrid approach from edge to private cloud for managing real-time and non-real-time applications, and data sharing supported by zero-trust security, has been shown to be the most successful way forward in supporting agile, data-driven collaboration.

Power sustainable growth with VMware and Intel

With solutions and support from VMware and Intel, energy and utility companies can migrate to any private cloud and between private clouds without recoding their apps; modernize their infrastructure; and operate consistently across data center, edge, and any private cloud environment through a single platform.

Leveraging the same compute, network, storage, and Kubernetes stack not only offers operational efficiencies but also reduces complexity and drives cost transparency and savings – money that can be reinvested in further innovation.

With this seamless connection from the edge to the cloud, energy and utility organizations get the flexibility to ensure faster, more agile data analysis and operations, as well as faster and more effective AI/ML model training and feedback loops – driving better customer experiences and greater business value.

Together, VMware and Intel deliver solutions that enable the IT organizations within energy and utility organizations to confidently integrate edge and cloud: delivering real-time data analytics and providing the necessary technology foundation for collaboration, supportedby AI and ML.

Put sustainability and transparency at the heart, always

The opportunity

Organizations in the energy and utility sectors find themselves at the center of converging demands for a more sustainable future.

On the one hand, many customers are now voting with their feet and moving to suppliers who can provide more sustainable energy solutions, along with the transparency to continually prove they are operating responsibly.

On the other, there are growing macro political forces. For example, in late 2022, the European Green Deal – which is pursuing a deep transformation of the energy system – presented an Action Plan to highlight how "new technologies can help improve the efficient use of energy resources, facilitate the integration of renewables into the grid, and save costs for EU consumers and energy companies."

Energy and utility organizations are at the epicenter of this change, with a greater ability and responsibility to make an impact on carbon footprints than most other industries. This presents a unique challenge: one in which they must eliminate inefficient processes and reduce carbon footprint across a complex ecosystem that encompasses multiple sites, infrastructure, devices, vendors, technologies, compliance demands, and processes.

But, for those that get their sustainability strategy right, there is a huge opportunity to meet customer expectations and increase advantage over their competitors.

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“[VMware Cloud] will build our ability to respond to new needs and deliver new services in terms of compliance, sustainability, and the green economy.”

Mauro Cacciafani, Architecture, Risk and Security Manager, Publiacqua

Power sustainable growth with VMware and Intel

At VMware, we see virtualization technology as an accelerator for sustainable operations – and one that comes with significant business benefits

Our technology portfolio, including our multi-cloud offering, helps energy and utility companies to reduce the environmental impact of data centers, infrastructure operations, and data management – by bringing increased visibility into IT/OT operations and offering ways to enhance productivity across IT and the wider organization. After all, you can’t manage what you can’t see. VMware makes container and host energy visible, enabling benchmarks you can act on.

VMware Edge Stack helps energy and utility companies to reduce their infrastructure footprint to the minimum with a single platform that covers software-defined connectivity, real-time and non-real-time application management, virtualized infrastructure and device management, and security governance all-in-one.

Edge Stack is being used in the energy/utility sector today to modernize and digitize grid infrastructure – for example by virtualizing primary and secondary substation workloads. VMware is also working on developing open standards for secondary substations by contributing to the Edge for Smart Secondary Substation (E4S) Alliance, and working with leaders in the industry to drive a shift from hardware-based to digitized operations.

Intel is also helping energy and utility businesses forge a path to sustainability, by providing sustainable solutions that enable them to capture and analyze operational data in near real-time – driving visibility and oversight.

Leveraging more data with edge intelligence gives businesses the flexible controls and deeper perspectives they need to solve unique challenges and become sustainable leaders of energy ecosystems.

Digital innovation for a greener future

Focus on:
Grid modernization

The EU plans to revolutionize its power grid in order to meet future green energy demands and achieve its goal of reducing emissions 55% by 2030.

As such, it recently published its “Digitalizing the Energy System-EU Action Plan” which has goals including the installation of solar photovoltaic panels on the roofs of all commercial buildings by 2027 and all new residential buildings by 2029.

Electricity grid modernization will involve an investment of around €584 billion between now and 2030, with about €170 billion focused on digitalization measures including smart IoT devices and meters, 5G and 6G connectivity, and a pan-European energy data space powered by cloud-edge computing services.

With a third of European grids being over 40 years old, the addition of this layer of digital technologies is absolutely vital in preparing them for the distributed and intermittent generation from renewable sources, the increasing demand, and for ensuring energy efficiency at all levels.

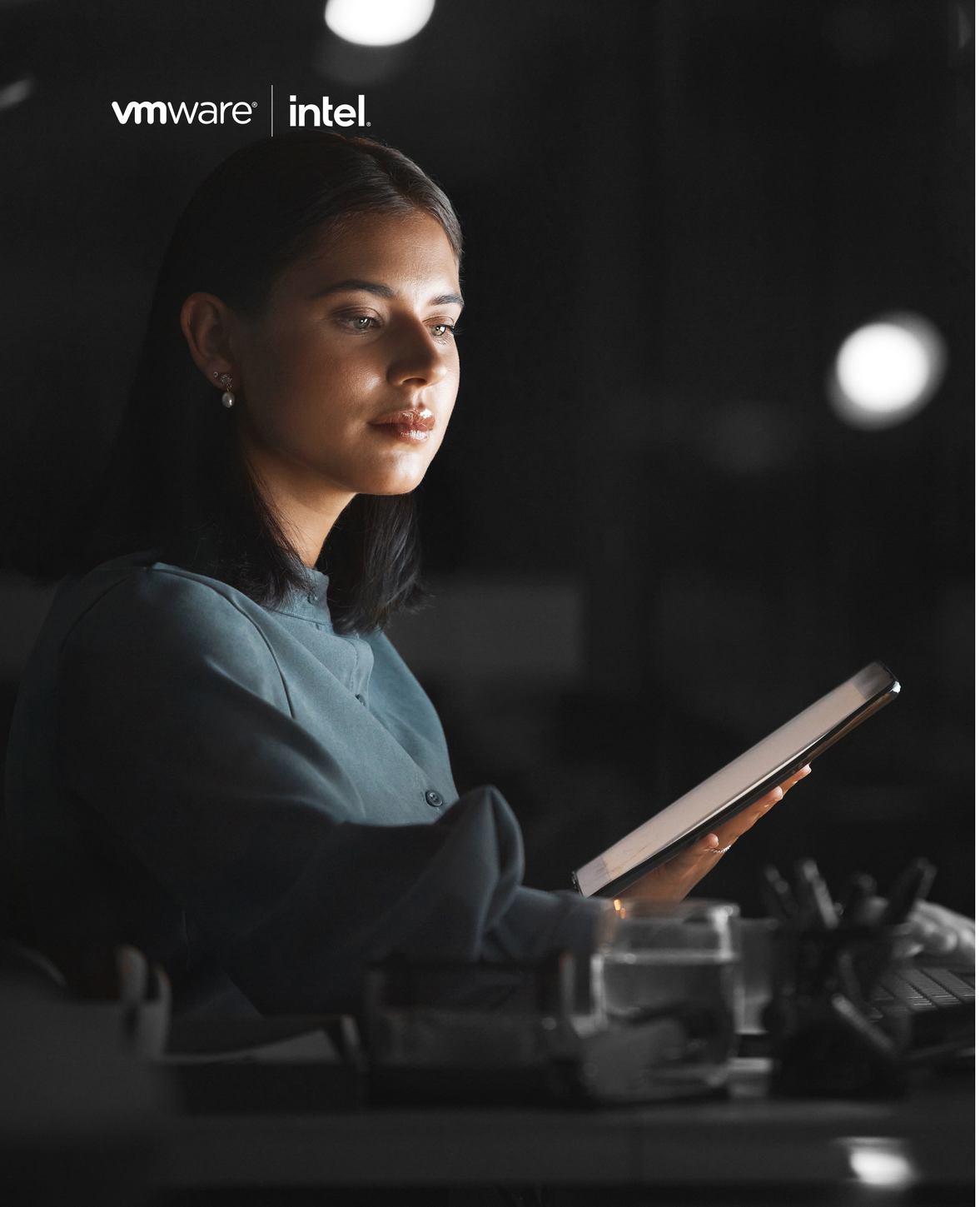
Case study: Iberdrola

Iberdrola is a multinational electric utility company based in Bilbao, Spain. In collaboration with a group of industry partners and technological companies – including Intel – it is driving the development of a new digital platform for secondary substations (SSP).

Based on edge computing, the platform will allow the company to continue leading the digital transformation of its network business. This technology allows the distribution of advanced computing capabilities onto different nodes of the grid – in this case, secondary substations.

It represents a significant step in the digitalization of the distribution grid and the ability to meet the new requirements of customers – integrating new distributed resources, and supporting the increasing electrification of the economy.

Read the full story here



Modernize, while securing critical infrastructure

The opportunity

As energy and utility companies connect more of their critical infrastructure with edge and IoT technologies, the potential for groundbreaking innovation increases, but so does the threat of cyberattack.

Providers of critical national infrastructure are being increasingly targeted by cyber criminals, and yet almost four in every five critical-infrastructure organizations do not adopt zero-trust security strategies, with the average cost of a breach rising to $5.4 million in 2022.

Energy and utility organizations have an imperative to protect their data, whether that data is at rest (for example, in the cloud or data center), in transit between core and edge, or in use. Organizations therefore need the ability to monitor all those environments in real-time, which can be a big challenge across vast networks of IoT systems and devices that leverage connectivity such as 5G.

Many energy and utility organizations still run legacy technology, and suffer from vulnerabilities in the gaps between their IT and OT systems. Different security solutions have often been bolted onto individual apps, creating silos that prevent the sharing of critical knowledge.

But, as many businesses have already realized, both reducing complexity and increasing insight are crucial: simplification is key to improving your security posture. Moving to a single-platform, zero-trust approach across IT and OT will give energy and utility companies the means to secure their entire enterprise – assets, devices, and data – from edge to cloud.

Power sustainable growth with VMware and Intel

VMware and Intel transform security by providing comprehensive measures in both software and hardware, across application infrastructure and endpoints. It is an approach that maximizes visibility, context, and control, and secures the interactions between users, applications, and data.

Intrinsic security from VMware, for example, uses threat intelligence and infrastructure to protect apps and data across endpoints, workloads, networks, workspaces, and clouds while providing IT/OT with visibility and control over policies that protect the business.

VMware Carbon Black cloud-based protection technology analyzes endpoint activity, identifies threats, and automates your response to block cyberattacks in real time.

VMware SASE Platform™ provides secure, reliable, and optimized access to traditional and new applications for mobile clients, branches, and campuses with a single, holistic solution.

VMware SD-WAN is a software-defined WAN overlay that ensures high-quality application performance and availability for end-users while lowering networking costs.

Intel ® AES-NI is an encryption standard used across software ecosystems to protect network traffic, personal data, and corporate IT/OT infrastructures.

Intel ® Secure Key (DRNG) is an innovative hardware approach to high-quality, high-performance entropy and random-number generation.

Such a strategy reduces exposure to cyberattack via a zero-trust system based on full visibility and control. This is how you can proactively manage cyber risk, strengthen the security of your and your customers' data, apps, and devices, and achieve full regulatory compliance.

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Case studies

vPAC Alliance: driving substation digitalization

VMware and Intel have teamed up with industry leaders to drive open, interoperable, and secure software-defined architecture to host protection, automation, and control solutions for power-system substations.

Together with companies like ABB, Dell Technologies, and Edison International, our mission is to develop a standard, flexible, and manageable platform for the next-generation smart grid.

Read more

Publiacqua: a secure flow of IT services in the cloud

Publiacqua has created a disaster recovery service using VMware Cloud on AWS, building a platform not previously available through more traditional technologies while also delivering security, reliability, and system integration.

“The possibility of integrating VMware Cloud on AWS allowed us to tackle the project with tools and technologies we knew.”

Mauro Caccifani, Architecture, Risk and Security Manager at Publiacqua

Read more

SOCAR: strengthening |its agile structure

SOCAR Turkey partnered with VMware to gain full visibility of its network and manage three data centers with a disaster recovery strategy from a single location without any data loss. With a more agile structure, it can now use software-based firewalls, routing, and switching technologies as needed.

“VMware NSX is the right platform and solution for us. It provides greatw flexibility and competence in IT continuity.”

Akin Börekçi, IT Infrastructure and Service Management Group Coordinator, SOCAR Turkey

Read more

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Create outstanding services with **modern apps**

The opportunity

In a disrupted world, customers are seeking ever more choice, control, and visibility over their energy usage and costs. Energy and utility organizations that are able to seamlessly provide more personalized customer services and experiences have the opportunity to elevate their brand reputation.

The ability to rapidly develop and launch intuitive and engaging modern apps is therefore growing in significance as a competitive differentiator between businesses.

But legacy technology infrastructure and outdated apps – or internal operational software – are limiting the ability of many companies to bring new cloud-native apps and features to market at speed, leading to missed opportunities.

A lack of in-house skills in the required fields of software and app development can exacerbate this problem. But there is now a chance to leverage the support of experienced technology partners to overcome these challenges and gain a competitive edge through enhanced customer offerings.

Power sustainable growth with VMware and Intel

VMware and Intel are dedicated to helping our energy and utility customers unlock their full potential via a transformative multi-cloud strategy: enabling the seamless delivery of new services and apps to customers, and supporting secure data-exchange.

VMware offers world-class expertise to help you implement and scale a production app platform that delivers enduring value for your business, as well as a great developer experience, by leveraging our Tanzu Application Platform and Tanzu Labs services. Our capabilities will enable energy and utility organizations to:

Take an agile approach to operations. Adopting lean methodologies will enable companies to get new services to customers faster – with the ability to scale up quickly during periods of increased demand.

Increase innovation. By freeing resources that would have previously been deployed to maintain outdated systems, energy and utility businesses can focus on the people, processes, and technology needed to take innovation to the next level.

Your **partnership** for success

VMware and Intel solutions have been built to work alongside one another. No matter where you are on your digital transformation journey, we can assist you: from building up your infrastructure to helping you assess your application portfolio; prioritizing migration or transformation plans; and providing expert resources to accelerate the progress you are making.

Integrating VMware into your tech stack does not mean having to start from scratch. Our systems integrate seamlessly with many public-cloud providers and deliver seamless platform capability to enable software-defined operations.

Together with Intel, VMware empowers IT/OT organizations at energy and utility organizations to realize a digital transformation and deliver IT infrastructure and application services with speed and agility – supporting business growth while optimizing TCO and improving resource utilization.

In this way we'll help you innovate and deliver trusted and reliable energy and utility services to customers, fueling a more secure and sustainable future for everyone.

Let's talk
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