

Building a resilient future for the energy & utilities sector

From quick fixes to longer-term
strategic changes



The environmental storm threatening to upend modern life as we know it

The huge power outage across Spain, Portugal, and parts of France, upended modern life as we know it—no trains, no planes, no internet, and more. The energy and utilities (E&U) sector is now at the epicentre of a battle with unpredictable environmental and energy challenges. While events such as hurricanes, wildfires, and floods are not new, the scale and impact of these incidents have evolved into major incidents that bring more wide-reaching consequences—a shift utilities can no longer afford to ignore.

Throughout 2024 and the start of 2025, several European countries have been affected by severe floods caused by prolonged heavy rains. Damage has been widespread, with overflowing river basins and landslides causing catastrophic damage. Weather events in locations such as Canada, Spain, and wider Europe, that we once called one-in-100 or one-in-1,000-year events, are now happening

every year, sometimes multiple times a year. In North America, hurricanes and wildfires have dominated headlines—resulting in outages to key resources across large areas.

With an outdated, vastly distributed network, the damaging effect of changing weather conditions, and a need to reduce emissions, E&U companies are in the middle of a perfect storm. **E&U organizations need to be more strategic; this means assessing critical assets before and after a storm, investing where it matters, and planning for better resilience and restoration.**

It's no longer about how to play the defence game against climate change, it's how to build a reliable future.

Infrastructure will only keep getting older – a recipe for disaster

Currently, much of the UK's energy grid is outdated. With the average electrical transformer now **63 years old**, many of today's infrastructure is near the end of typical lifecycles.

Despite being outdated, these assets are still operating. They are under immense pressure and struggling to match supply with demand. Extreme weather conditions are only causing aging assets to fail more frequently. These assets are not designed to operate in extreme conditions and frequent outages are having huge impacts on reliability. Beyond the UK, Spain and Portugal recently suffered one of the largest blackouts in history,

a blackout authorities say will require **'trillions of dollars' of infrastructure** investment into an ageing power grid and lack of energy storage capacity to avoid again.

When it comes to the renewables sector, **over one-third of the UK's offshore wind farms** will reach the end of originally anticipated operational design life by 2035 and will have to be decommissioned should lifetime extension not be pursued.

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[Find out more](#)

First, some low hanging fruit to pick!

Prevention to the point of zero risk is financially impossible for E&U companies. But the cost of doing nothing is now higher than the cost of mitigation. The cost is now in human life, material damage, service supply, reputation, and the ability to secure insurance. There are steps companies can take immediately, but it's a balancing act.

Elevating critical infrastructure will help to avoid flood damage—it's what they've always done to housing in the Caribbean and SE Asia, and managing vegetation under power lines will reduce wildfire risks. In North America, utilities are starting to build underground to reduce the risk of downed lines and wildfires, yet this makes them more susceptible to flooding.

Utilities need to break this down by regions, assess common weather events, and consider what mitigation risks can be put in place to reduce risk—whether that's putting infrastructure on platforms, underground, or sectioning the grid to de-energise sections during an event.



Time to exploit the **predictive power** of meteorological data

Traditionally, utilities have implemented solutions like undergrounding lines in hurricane-prone areas, but with storms now veering into previously unaffected regions and lingering longer over land, even these mitigations are being outpaced. Hurricanes are changing their paths. They're bringing floods to areas that never used to flood.

Previous mitigation strategies need to step up to a new plate, one filled with meteorological data and trends. The E&U industry needs to work much more closely with the meteorologists to uncover what are the forecasts, and what these new trends are and will bring.



Now it's down to businesses with **infrastructure and asset mitigation** strategies

While energy generation facilities, especially centralised ones such as nuclear plants—are generally well-protected, the transmission and distribution (T&D) networks remain highly vulnerable.

As energy generation becomes more distributed with the likes of solar and wind, the threat landscape is becoming even more complex.

While a transition to renewables is necessary, energy companies must consider grid reliability and cost. Saving the planet is often tertiary because overall, people do support green initiatives, but their primary motivations are about saving money and avoiding inconvenience.

1
Grid
reliability

2
Reduced
costs

3
Green
initiatives

As the grid becomes the weakest link, renewables & carbon capture step up

For the E&U sector, reducing emissions has been placed at the forefront, and doing so through renewables is an established strategic goal. While distributed generation doesn't prevent natural disasters, with careful planning and design, it does offer greater flexibility and resiliency.

Wildfires in 2024 alone emitted more carbon than was reduced by all industries' decarbonisation efforts. We need carbon capture initiatives, not just footprint reduction, and this carbon capture must complement emission reduction to address climate change in a timely and holistic manner.



Industrial AI: Predicting with certainty

Technology, particularly AI, is now playing a pivotal role in helping utilities adapt. From asset investment planning to predictive maintenance, Industrial AI solutions are allowing operators to better allocate resources, effectively oversee workforces, and manage risks proactively.

To support **the UK's ambitions for clean power**, policy attention has so far focused on building new offshore wind farms. However, with an originally anticipated average lifespan of 20-25 years, the UK's earliest offshore wind farms are currently entering the final lifespan stage. Maintaining these assets has always been critical, but now the focus is on extending the lifespan of these costly assets to get the highest return on investment possible. Energy companies are increasingly turning to predictive asset maintenance to extend the lifecycle of existing assets, keep optimization full, and ensure reliability in an extremely asset-intensive and relied-upon sector. With global reliance on

water supply, sanitation, banking, communications, transport, and more, power outages very quickly cause chaos, and force operations to grind to a halt.

Predictive maintenance can target when and where to extend the asset lifecycle and increase reliability. For example, 80% of the lost energy from wind turbines is due to poor maintenance of the blades.

In today's climate, utilities can't rely on "business as usual" and hope the problem will resolve itself. To better manage their assets and operations, new developments in risk-based AI-predictive asset maintenance are increasing the reliability of assets and the supply of renewable energy.



Emergency Management – is the sky blue, grey, or are the black clouds gathering?

The use of "Black Sky" planning helps energy companies prepare for large-scale outages and it's now starting to become standard practice. Unlike "Blue Sky" daily operations or "Grey Sky" seasonal spikes, Black Sky scenarios involve total grid restarts (cold starts) after major disasters.

EDF Renewables UK and Ireland, the leading renewable energy company specialising in wind, solar, and battery technology, has chosen **IFS Cloud** to deliver Enterprise Asset Management (EAM) to support its ambitious growth plans to increase total green energy output produced by their onshore and offshore operations.

Using a single data model supported by key value drivers such as Asset Performance Management, IoT, mobile work execution, live dashboards, and KPIs, EDF Renewables will benefit from end-to-end visibility across multiple organizational structures and business units.

Pre- and post-event restoration



The use of Industrial AI can aid strategic investment planning with tools such as **Copperleaf AIP**, combined with IFS Cloud's Project Portfolio Management, Supply Chain Management, Asset Management, Scheduling and Mobility solutions. Together, these offer full asset lifecycle management. Underpinned by Industrial AI, it enables asset-intensive customers to strategically monitor optimal asset performance.

This identifies critical assets and their risks, and supports predictive maintenance instead of routine scheduling. Copperleaf customers have reduced planning times by up to **50%** with improved asset sustainment and 30% reduced risk. Copperleaf helps incorporate **ESG metrics into everyday decision making**, and supports the modelling of embodied and operational Green House Gas (GHG)

emissions and integrates this into an organization's asset investment, planning, and management system. These emissions can be modelled at an asset level to consider whole lifecycle GHG emissions and create a baseline emissions profile for the organization.

In addition, the coordination of complex restoration of activities after major disruptive events, emphasises the need for different scheduling strategies. Here's where powerful Planning & Scheduling Optimization (PSO) solutions ensure restoration can be managed alongside normal daily operations.

The AI-enhanced toolkit is ready

Aging infrastructure, changing weather-related threats, and the urgency to decarbonise makes it clear: business-as-usual is no longer an option. Mitigation strategies must go beyond outdated traditional practices, and instead leverage technology where AI has a key role to play in predictive analytics, risk analysis, and fast-acting PSO strategies to adapt to a challenging energy future. Want to learn more?

[Find out more](#)

Read IFS Spotlight Paper, developed in collaboration with Accenture: **Strategies for Grid Flexibility and Resiliency** to gain more insights on how IFS is supporting utilities in their grid modernization initiatives.

[Read IFS Spotlight Paper](#)

IFS Spotlight for Utilities

Powering the Future: **Strategies for Grid Flexibility and Resiliency**

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About IFS

IFS is the world's leading provider of Industrial AI and enterprise software for hardcore businesses that service, power and protect our planet. Our technology enables businesses which manufacture goods, maintain complex assets, and manage service-focused operations to unlock the transformative power of Industrial AI™ to enhance productivity, efficiency, and sustainability.

IFS Cloud is a fully composable AI-powered platform, designed for ultimate flexibility and adaptability to our customers' specific requirements and business evolution. It spans the needs of Enterprise Resource Planning (ERP), Enterprise Asset Management (EAM), Supply Chain Management (SCM), and Field Service Management (FSM). IFS technology leverages AI, machine learning, real-time data and analytics to empower our customers to make informed strategic decisions and excel at their Moment of Service™.

IFS was founded in 1983 by five university friends who pitched a tent outside our first customer's site to ensure they would be available 24/7 and the needs of the customer would come first. Since then, IFS has grown into a global leader with over 7,000 employees in 80 countries. Driven by those foundational values of agility, customer-centricity, and trust, IFS is recognized worldwide for delivering value and supporting strategic transformations. We are the most recommended supplier in our sector.

