

Ways to Plan, Manage and Optimize Operations in Renewable Energy

IFS White Paper



Anthesis

The renewables energy sector is undergoing a global transformation. By 2040, global demand for energy will have risen by **25-30%**, fueling unprecedented investment in renewable generation infrastructure to meet net zero. Facing new and challenging business models, increased demand, infrastructure complexity, ambitious sustainability targets, climate change and more, power generators and new energy providers and vendors working in the related value chain must find new ways to better plan, manage and optimize their operations.

This white paper unpacks some of the challenges facing renewables, examines the role of technology, and highlights how renewable companies can succeed with a proven, cloud-based solution that connects people, projects and assets in one platform.

Renewable Energy: Key Challenges

Asset diversification and complexity

Over the last two decades the move towards renewable energy has seen a vast diversification in the number and type of assets held. Turbines, solar arrays, battery arrays, hydrogen storage facilities, electrolysis plants and more are now all connected to the grid and the transmission infrastructure, requiring enterprise asset management systems that have the flexibility to handle a broader portfolio that must be monitored, operated, managed and maintained. This diversification also extends to asset ownership, creating a need to efficiently manage multiple transmission and distribution interconnection requests from different parties.

Ensuring a reliable and sustainable supply

With geographically dispersed assets such as wind turbines and solar arrays feeding into the grid, it becomes increasingly important to be able to predict failure to maximize reliability and uptime. Intelligent connected assets and artificial intelligence are playing a major role in optimizing maintenance. Using data from sensors, scanners, and customer demand reports, asset performance monitoring coupled with AI-based predictive analytics allows informed, data-driven planning. In addition, utilities managing the grid interconnections now also have an opportunity to offer service contracts to asset owners, with the potential to create profitable new revenue streams, while also protecting the safety and integrity of the grid.

Complex projects and lack of visibility

Projects in the energy sector are complex, typically involving multiple stakeholders, supply chains, and various budgetary and scheduling constraints. Good visibility and transparency are essential for subcontractors, regulators and local government agencies, but utilities also need to develop plans that are operationally efficient and executable. There's a growing need for energy companies to have access to integrated enterprise asset management software that can provide the capability to plan, design and deliver complex asset projects into asset operations and maintenance.

Rising customer expectations and demands on supply

The recent trend towards hybrid and home working has meant that demand for energy is ubiquitous and harder to predict: it no longer peaks geographically in defined business center enclaves. As we transition towards electrification, adopting electric vehicles and HVAC systems, planning capacity to meet demand becomes increasingly complex. Consumers expect the lights to come on wherever a switch is pressed, yet they also want to transition to greener energy sources.

These dynamics create significant challenges for utilities: they need to innovate and invest without affecting affordability yet introduce more renewables without impacting reliability of the grid.



New more complex operating models

As the cost of consuming energy has increased, so domestic, commercial and industrial consumers are looking to become self-sufficient, embracing wind and solar microgeneration and expecting to sell excess energy back to the grid. The rise of these Distributed Energy Resources and microgrids threatens to leave utilities providing the grid infrastructure and backbone, but with limited consumption revenues from fewer subscribers.

Distributed Energy Resource Management Systems, or DERMS, will need to be integrated with enterprise platforms to track and monitor power from power plants and transmission lines and from aggregated networks of customers who are using API-enabled sensors, microgrids and “behind-the-meter” batteries to manage electricity generation from edge devices. Managing revenue sharing also requires new capabilities.

Utilities must consider adopting connection and operation fees to generate revenue to cover the cost of maintaining supply to those left behind in the race to renewables and occasional use customers. Here in particular, technology can help utilities exploit new installation, service, and maintenance opportunities and interconnection fees, managing behind-the-meter private microgrid assets such as solar panels with utility-specific mobile workforce management.

Skills shortage: a ‘Grey Tsunami’

As experienced utility workers retire, the progressive loss of valuable, time-served ‘operate and maintain’ knowledge is becoming acutely felt. The sector faces significant challenges attracting and retaining new employees. To attract new talent, companies must provide tools and technologies (mobile, digital, virtual) that appeal to the next-generation workforce.

Technology, in the form co-pilots and AI agents, can both automate some of operational tasks, and provide a valuable knowledge base to support training. Leading EAM vendors are already developing knowledge capture to pre-train industrial AI models.

Achieving net zero goals

Amidst increasing environmental scrutiny and media claims of ‘Greenwashing’, governments, regulators and consumers alike all want a standard set of metrics and measurements that clearly prove and show how progress is being made. Adopting Enterprise Asset Management software with dedicated ESG reporting capabilities ensures both accurate reporting and, crucially, the asset performance management data needed to make further ESG improvements.

Echoing new European reporting regulations, IFS Cloud, for example, already tracks Scope 1 and Scope 2 emissions in an auditable format, with capability for Scope 3 emissions reporting to follow in the next release.



Ways to drive operational performance in the renewable energy sector

In a regulated sector, environmental issues and a focus on resilience make it more important than ever to extract the most value from the resources available. This means efficiently managing new projects, optimizing usage of field engineers, and ensuring the supply network can meet demand.

Utilities can't operate in an island: effective logistics management demands tools that don't operate in silos. IFS Cloud is the leading single platform for organizations whose business revolves around a *combination* of service, projects and assets. By eliminating silos, IFS Cloud provides holistic visibility and control across this complete lifecycle delivering lower operational costs, improved customer satisfaction and supporting sustainability and growth through emissions tracking and different business models. IFS Cloud can integrate seamlessly with any existing ERP solution or provide an enterprise-wide solution to support a digital transformation strategy.

Seamlessly manage service, projects and assets

The need to manage new investment projects, complex and linear assets, a distributed field workforce and increasing customer expectations poses many challenges for the energy and utilities ecosystem. By applying holistic, composable, seamless software capabilities across assets, projects and field service, IFS Cloud removes business silos to create united, smart and agile organizations. IFS Cloud confers three key capabilities for renewable operations...

1. Optimize project efficiency: control and complete projects faster

Projects in the utilities industry are complex, involving multiple stakeholder divisions such as sub-contractor workforces, regulators, government agencies, and more. Typically, this means using separate software products across different

stages of the project such as tendering, commercial, estimating, engineering, procurement, manufacturing & fabrication, planning, cost control, construction, installation, service and de-commissioning. In contrast, IFS supports the management of complex project lifecycles, and joint ventures with seamless, fully integrated project management software. Capabilities include:

- Project Gantt functionality – multiple operations
- Definitive view of entire project lifecycle
- Bid to Contract Management
- BIM, CAD and Product Lifecycle Management



2. Workforce management: create an agile response capability

Optimizing the productivity of your field workforce while delivering a great experience for your customers is ever more challenging in today's on-demand economy. IFS's world-class real-time scheduling and optimization tool uses AI and advanced algorithms to deliver the optimum workforce schedule, increasing satisfaction, building loyalty, and growing revenue. IFS provides the capability to instantly understand the skills and supply chain requirements needed for tasks, and dynamically redistribute the workforce as priorities change.

Capabilities include:

- Dynamic scheduling optimization - multiple dependencies
- Dispatch and mobility applications
- Integrated GIS
- Remote assistance - augmented reality
- 'What-if' planning
- Real-time visibility using any device

3. Optimize asset maintenance and

performance: ensure 'cradle to grave'

visibility

Renewable assets are, compared to traditional generation infrastructure, relatively new, calling for real-time monitoring to understand both current performance and also potential asset longevity. IFS includes embedded AI capabilities to collect and analyze information from intelligent assets, applying advanced pattern matching and anomaly detection to inform operational improvements across performance, reliability and maintenance. IFS can forecast windows for potential failure events windows before they happen, leveraging advanced, AI-driven Planning, Scheduling and Optimization capabilities to bundle maintenance projects and maximize use of any resources deployed. The solution can schedule cost-effective condition-based predictive maintenance programs, informed with real-time visibility of all spare or replacement parts available in inventory.

IFS Enterprise Asset Management offers seamless 'cradle to grave' asset management including mapping and GIS integration, asset design management and mobile optimization. The future-proof solution supports your business as you move forward to Industry 4.0, including machine learning, augmented reality, and digital twins. Capabilities include:

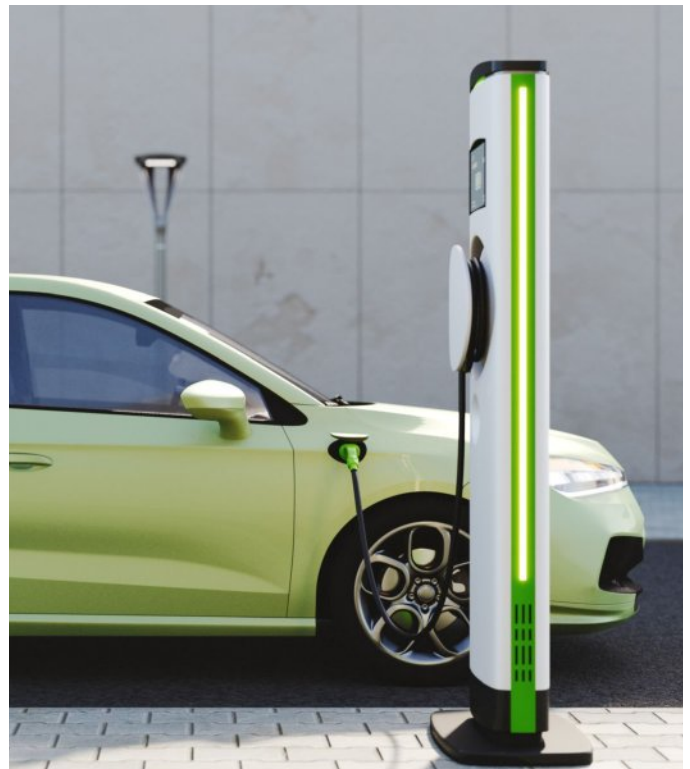
- Asset planning and operations
- Asset operations and maintenance
- Asset performance management

IFS Cloud in Renewables: RES

Using IFS Cloud, Renewable Energy Systems Ltd (RES), the world's largest independent renewable energy company, is transforming data sharing and capabilities across service, project and asset management. Join industry experts from IFS and RES discussing industry predictions for AI and Automation, Operational and Maintenance Services, and Simplified Cloud-based business systems.

res

Watch the webinar



IFS Cloud in Renewables: EDF

Leading renewable energy company, EDF Renewables UK and Ireland, has chosen the IFS Cloud platform to deliver Enterprise Asset Management (EAM) to support ambitious growth plans. Specialising in wind, solar and battery technology, IFS will provide Enterprise Asset Management, including Operation & Maintenance, Work Order Management, Contract Management and Mobile Workforce Management.



Delivering IFS Cloud forms a key part of our future growth strategy. The new platform will allow us to scale our business more efficiently and consistently, whilst also capturing the richer management information needed to drive continuous improvement and inform key decision-making.”

Piero Maggio, Director of Asset Operations
EDF Renewables UK & Ireland



[Learn more](#)



Transformation for Renewables.

What to look for in an enterprise software.

We've highlighted some key factors to consider when selecting a software vendor for your digital transformation journey:

1. Distributed energy resources will mean new customers, new services and new market opportunities. Best-in-class vendors should offer user-friendly customer support interfaces that streamline new customer enrolment and provide equitable and intuitive compensation mechanisms.
2. Enterprise resource planning platforms will need to be interoperable with GIS platforms to represent infrastructure assets spread across vast geographies. Electric fleets will require new substations and feeders, as well as behind-the-meter infrastructure, to monitor usage. These assets need to be faithfully represented, both spatially and temporally, in cloud-based desktop and mobile applications.
3. Enterprise solutions should be expansive enough to cover multiple business functions: workforce management, asset management, accounting, energy acquisition and control, vendor management and data metering.
4. Edge and distributed intelligence, microservices and central support services (data collection, automation, AI/ML) will need to be tracked on the grid and built into composable software systems that can be adapted over time.
5. Software packages will need the predictive power to forecast weather-related shortages and outages and the real-time responsiveness to inventory damage to infrastructure assets from wildfires and hurricanes and quantify their effects on customers' power service.
6. Engineering teams, grid operators, and data science and analytics teams used to operate in silos. As these groups come together to plan strategic road maps and technology solutions in agile, they will need enterprise software with real-time visibility and graphic user interfaces that can be understood by all parties.
7. Grid operators are used to operating their own resource data and being in complete control of it. Now, working with thousands or millions of customer-owned devices, they need to be more comfortable with collaboration and, to some degree, uncertainty. Companies will need online messaging tools, both live and automated, to forge strategic partnerships between customer organizations and vendors.

To learn more about the ways IFS Cloud can help your renewables business drive efficiencies with connected assets, remote monitoring, effective planning, predictive maintenance and more, visit ifs.com.



About IFS

IFS develops and delivers cloud enterprise software for companies around the world who manufacture and distribute goods, build and maintain assets, and manage service-focused operations.

Within our single platform, our industry specific products are innately connected to a single data model and use embedded digital innovation so that our customers can be their best when it really matters to their customers – at the Moment of Service™.

The industry expertise of our people and of our growing ecosystem, together with a commitment to deliver value at every single step, has made IFS a recognized leader and the most recommended supplier in our sector. Our global team of over 5,500 employees every day live our values of agility, trustworthiness and collaboration in how we support thousands of customers.

Learn more about how our enterprise software solutions can help your business **today** at [ifs.com](https://www.ifs.com).