Diversification within the Power Generation Industry

New business opportunities from renewables, decentralization and decarbonization

IFS



Contents

Energy security. A growing imperative across the power generation sector 03

A changing generation landscape. Opportunity spotlight: green hydrogen storage 05

A changing generation landscape. Opportunity spotlight: carbon capture 06

Diversifying into a new business model 08

Taking on renewable energy challenges 09

IFS meets the challenges of renewable energy generation 10

IFS brings value to your industry 11

IFS for the Power Generation Industry 12

About IFS 13

Energy security

A growing imperative across the power generation sector

As we accelerate our move towards renewable energy, new challenges highlight the growing need to understand and plan for energy security.

Recent geopolitical conflict has seen physical access to several sources of natural gas and oil withdrawn, alongside online cyber threats to the security of the grid. In tandem, as energy providers strive to maintain reliable supplies, the desire to source clean energy places further pressure on renewable energy models.

A volatile marketplace

Global dependency and demand for energy – for our homes, electric vehicles, businesses and economies – has never been higher. Yet, as both coal and nuclear plants are decommissioned to try and meet carbon reduction targets, this shift to clean energy has seen availability fall. As providers compete to secure natural gas or clean energy from the market, supply issues have seen prices reach new heights. Balancing supply and demand (including during this transition) is the sector's biggest challenge.

From coal, to gas, to renewables. But how?

In Australia, renewable energy accounted for 35.9 per cent of Australia's total electricity generation in 2022, with wind and solar generation to the grid more than doubling since 2017 [1]. But with 8.3GW of coal fired generation to be retired from 2023 and 2029, and gas fired generation now more costly, the Australian Energy Market Operator (AEMO) reports only 7.3 GW of new projects in the pipeline to replace the lost capacity, threatening electricity shortages.[2]



[1] Clean energy council

[2] Reuters



Rising temperatures. A global supply concern.

In September 2022, an unprecedented heatwave in California saw the state's Independent System Operator calling on residents to conserve their energy use (especially air - conditioning) in the later afternoon and evening to conserve reserves and prevent rolling power cuts. In addition, cloud cover and smoke from wildfires threatened to reduce generation from solar supplies. Predictions from the U.S. Energy Information Administration also suggested that in a prolonged drought California's hydroelectric generation level could halve.

Bridging the gap

As fossil fuel sources are decommissioned, it falls to technology (including the ability to store power from renewables), more energy efficient assets and more cost-effective operations to fill the gap.

Buying natural gas to subsidize coal generation leaves power companies no choice but to pay the current premium market rate. To maintain profitability, that deficit must be filled. The choices are stark: if the costs can be passed on to consumers, it creates an affordability crisis. If a rate cap prevents this, cutting other costs elsewhere is the only way to recoup losses.

A changing generation landscape

Opportunity spotlight: green hydrogen storage

One of the major challenges for energy companies developing renewable energy generation is energy storage.

In peak generation periods (when conditions are sunny or windy) the electricity supplied by renewables will often exceed demand on the grid. If it is not to go to waste, this excess electricity must be stored.

As an alternative to using costly, immovable, large-scale battery arrays, electricity from renewables can instead be used to create hydrogen gas from water using electrolysis. In contrast to production by fossil fuel reforming, 'green' hydrogen offers an attractive, stored energy source from clean wind, solar and hydro power which can also help to decarbonize other industrial processes.

Greener. Cleaner.

Hydrogen can be used in a fuel cell reaction with air to liberate electric current, or combusted to generate thermal energy. In both cases the only emissions are water vapor and warm air. In contrast to using battery arrays to store electricity, hydrogen energy can be stored in tanks, transported and distributed – either as compressed gas or as a liquefied organic oil.

Increasingly, natural gas companies are starting to explore blending green hydrogen into natural gas to reduce their carbon footprint.

Fueling hydrogen investment: Inflation Reduction Act

In the US, the Inflation Reduction Act 2022 will see some $369 billion directed to energy security and climate change over the next decade. The aim is to transition the entire economy to renewable sources, stabilize pricing and promote greener, circular business operations. For green hydrogen producers, this could equate to subsidies worth 2.6 cents per kWh and up to $3 per kg of hydrogen until 2032.

Just as the cost of solar technology has plummeted in the last five years, as global green hydrogen investment grows, so the cost of production also will fall. Fortescue Metals Group (FMG), the world's fourth largest iron-ore producer owned by Australian billionaire Andrew Forrest, has already set aside US $1bn of unallocated capital for its green hydrogen subsidiary Fortescue Future Industries (FFI) to fund five renewable H2 projects.



A changing generation landscape

Opportunity spotlight: carbon capture



Despite growing public demand for governments to act swiftly and decisively to prevent global warming, the fact remains that the vocal support often reduces when people are personally inconvenienced.

While we can try and engender changes in behavior, and appeal to moderate demand as renewable capacity grows, citizens expect the lights to come on whenever and wherever required.

To keep global warming to 1.5°C, emissions must reduce by 45% by 2030, reaching net zero by 2050.

Already experts are predicting our current efforts will not be enough. A recent International Energy Agency (IEA) report advises that the path to net zero is narrowing, requiring greater ambition and implementation, with stronger international cooperation to turn things around.

↓45%

Carbon capture.
Mitigating our actions today.

Scientists are proposing that removing, storing and recycling will be essential to stabilize the climate and prevent catastrophic, irreversible climate change. Carbon capture and storage (CSS) solutions offer ways to remove and store carbon dioxide (CO2) emissions today from high CO2 producing industrial processes, such as steel and cement production, or from burning fossil fuels in power generation. The carbon is transported from the point of production (via ship or pipeline) and stored deep underground in geological formations to prevent it from returning to the ground surface or seabed.

For example, in the US Occidental Petroleum (OXY) and Carbon Engineering (CE) are constructing the world's largest direct air carbon capture (DAC), capable of absorbing up to 500,000 metric tons of CO2 each year. In another US project, an ethanol plant is successfully recycling CO2 to produce algae, processing it into livestock feed, biofuels, and food and nutritional supplements, with plans to add the CSS to a further nine refineries.

Other diversification opportunities

Microgrids

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Gas generation: supporting renewables transition

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Microgrids

"Behind-the-Meter" self-generation will see consumers using, and selling back, their own renewable energy. Utilities can embrace this shift with new demand response models and variable remuneration tariffs.

Diversifying into a new business model

Diversification drives three significant changes to business structure:

Joint Ventures

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Decentralization

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Operational Asset Management

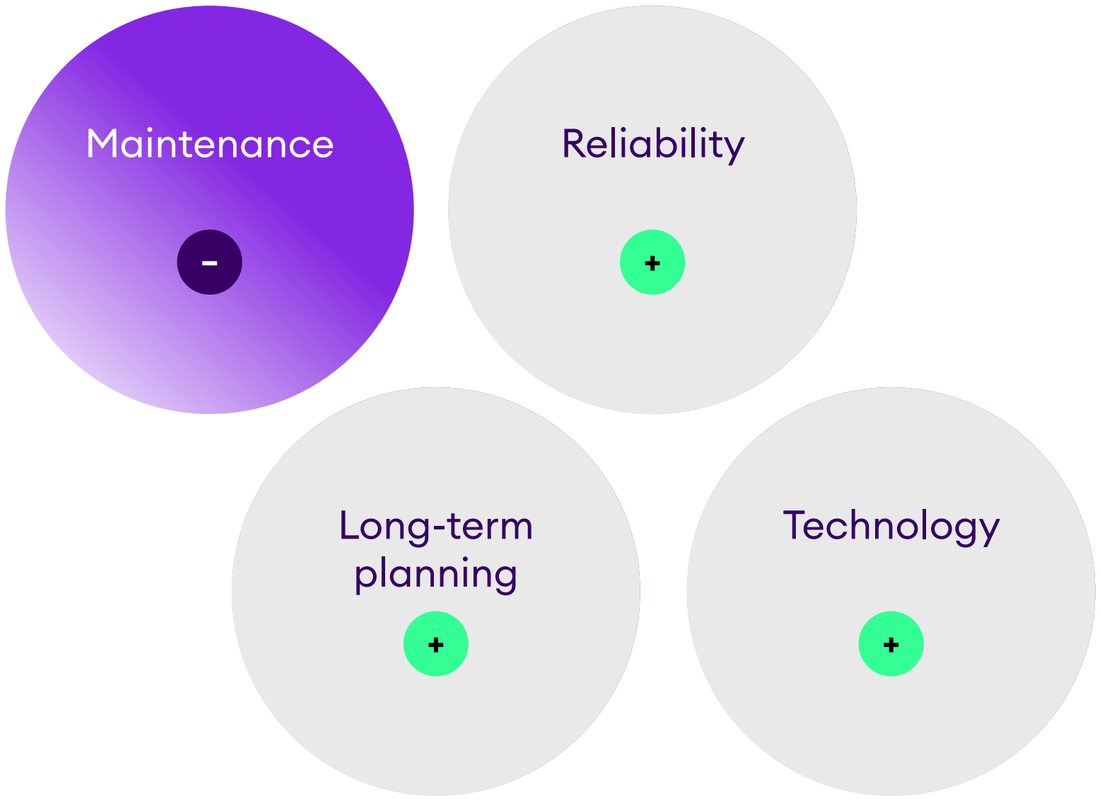
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Joint Ventures

As power generation companies look to expand capabilities, acquisitions and Joint Ventures are becoming more common.

Taking on renewable energy challenges

Switching to renewable energy sources presents specific challenges to power generation companies.



Maintenance

Renewable energy assets have different maintenance schedules to traditional power sources. They are also geographically dispersed across multiple locations. Remote sensing technology provides real-time stream data to predict and prevent failure, maximizing uptime and supporting cost-effective maintenance.



IFS meets the challenges of renewable energy generation

IFS solutions support your diversification into renewable energy.

AI-powered innovative solutions

IFS Cloud provides an agile, composable platform where innovation is embedded. Powerful AI-driven capabilities like Asset Performance Management can help resolve complex questions like ‘do we have the right inventory in the right locations to meet predicted demands?’ And ‘Can we execute strategic just-in-time procurement, securing the best possible price in a competitive market?’

Business and asset management in one solution

Track your new ventures and their impact in one system. IFS gives you the big picture of your enterprise and ESG goals with core business processes and Enterprise Asset Management in one place. Easily combine ERP and Service Management capabilities like project and financial management, supply chain, field service, and optimized maintenance scheduling.

A clear roadmap

To keep your IFS Cloud environment secure and help you innovate more easily, we release new features and updates twice a year, along with monthly service updates containing fixes and security patches. You have continual access to the latest technology and evergreen software, but with complete control.

Flexible architecture

IFS enables a composable enterprise platform: modular applications that that are highly configurable, interoperable, and flexible to adapt to modern technology. Open APIs ensure immediate connectivity to existing systems and solutions that work ‘out of the box’. With the choice of cloud or remote deployment., flexibility is unparalleled.

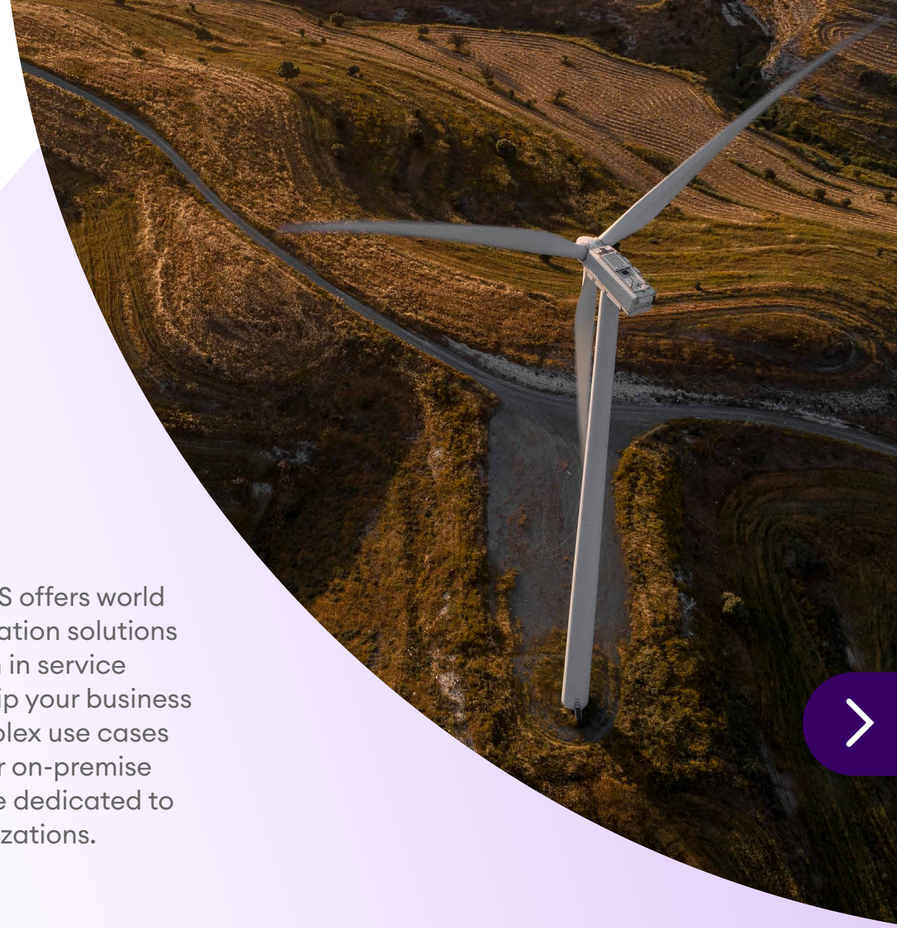
IFS brings value to your industry

There are many benefits associated with leveraging the integrated capabilities of IFS Cloud for renewable energy companies. Examples include:

- Improvements in user productivity
- Reduced time to report operational activity
- Improved process efficiencies with a modern ERP
- Optimized asset maintenance and scheduling
- Improved regulatory compliance productivity
- The business agility to swiftly respond to new market opportunities and changes



IFS for the Power Generation Industry



IFS software is built for your industry. So, it's ready to support your new business challenges without the need for extensive customization.

IFS Cloud combines a composable, AI-enabled native enterprise asset management (EAM), field service management (FSM), mobile workforce management (MWM) and enterprise resource planning (ERP) solution tailored to the needs of the power generation sector.

Enterprise resource planning (ERP)

Agile, modular and evergreen technology that helps you take advantage of the changing power generation industry. Add functionality as your business model changes: start with capital assets and then manage component repair, or add Field Service Management. You can also extend software into core areas of your business to manage finances, human capital management, reporting and analytics. Find out more.

Enterprise asset management (EAM)

A powerful AI-enabled, composable platform solution that embeds innovation across the complete asset management lifecycle. IFS EAM software optimizes asset lifecycle management from managing asset maintenance to monitoring asset performance, improving asset availability, reliability and revenue. Importantly, you can enhance your EAM system to support project execution, project financial control, HR, purchasing, risk management and document management. Find out more.

Field Service Management

Positioned in the Leaders Category in the IDC MarketScape for Worldwide Service Life-Cycle Management Platforms 2023 - 2024 Vendor Assessment, IFS offers world class scheduling and optimization solutions along with unrivalled breadth in service management capability. Equip your business to tackle even the most complex use cases and choose between cloud or on-premise deployment with our software dedicated to helping service-based organizations. Find out more.

Land management

Land Management is becoming increasingly important for power generators. IFS software helps operators manage land acquisition close to population sites, manage leasing agreements, and administer and share agreed percentages of generation revenues with farmer landowners who rent land to host solar PV arrays and wind turbines. Find out more.

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.

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