NTT DATA

The data advantage: Transforming energy management into a strategic power move

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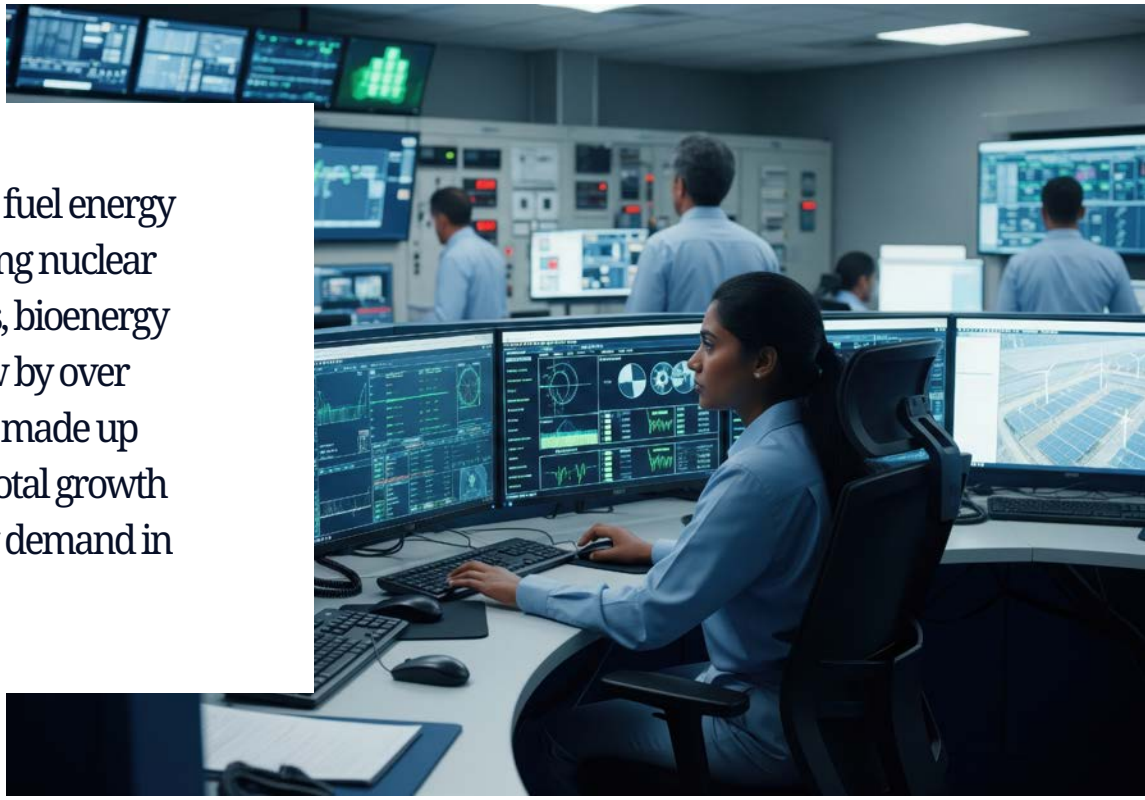
What's happening in the energy sector and how it's affecting your enterprise

If you're working in energy, you'll know efficient energy management and reducing deviations are the priorities for every company in this sector. But in today's market, that's no mean feat. With a mature power system gaining complexity, energy procurement and portfolio management have more moving parts — making them more difficult to optimize.

With the rise of renewable energy, distributed generation, battery energy storage systems (BESS) and flexible loads, there are now more assets and investments to be analyzed.

> "Other non-fossil fuel energy sources (including nuclear and renewables, bioenergy and waste) grew by over 5% in 2024, and made up nearly half the total growth in global energy demand in the year." [1]



The flexibility of the system is no longer on the generation side. There are more participants to work with, including industrial consumers, energy communities and virtual power plants (VPPs). And demand-side solutions will become more relevant due to the lack of investment and planification on the grids.

The UK is a clear example, taking that path some years ago:

[1] *International Energy Agency (IEA). **Global Energy Review 2025.** 2025.*

> "Last year, electricity networks in Great Britain secured a record high of 9GW of flexibility. In turn, a total of 22GWh of flexibility was harnessed, enough to power almost 7,000 average UK households for a full year." [2]

Participating in the wholesale market is no longer an option, but a must.
An accurate strategy needs to take into consideration not only day-ahead but also intraday, cross-border and ancillary services markets. This can be done on your own or through a third-party representative. It depends on the size of your portfolio, your aversion to risk and your appetite for benefits.

One study on ancillary services in Portugal and Spain found that

> "participating in the secondary service market resulted in an approximate 11% increase in EUR/MWh earned." [3]

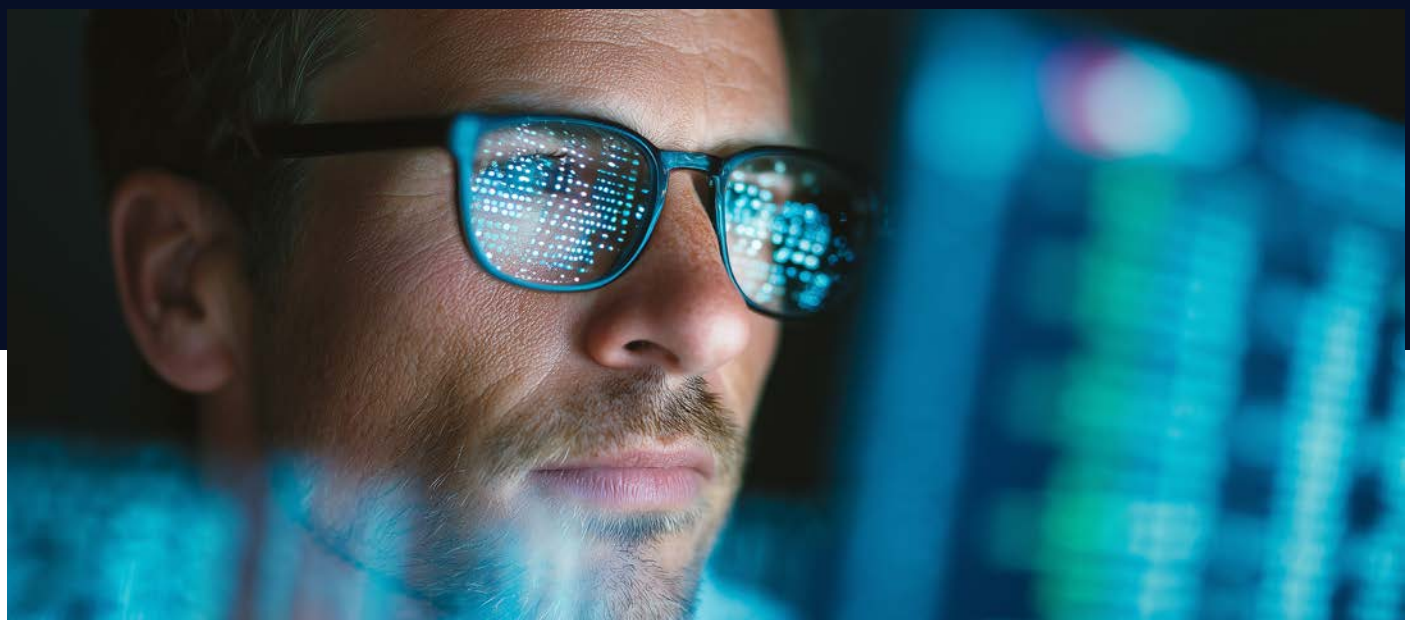
This is a clear statement: You need to evolve from a passive actor into an active energy manager.
This requires taking control of your portfolio and defining how to squeeze your assets to optimize both your production costs and productivity, your energy production and consumption, and your operations and maintenance (O&M).

Herein lies both challenge and opportunity for energy producers and consumers.

What will swing it is the technology behind them — specifically, the data technology.

[2] *Energy Networks Association.* ***GB cements status as world leader in energy flexibility with estimated £300m savings for billpayers.*** *June 26, 2025.*
[3] *Synergetics.* ***Extra revenues with ancillary services in Portugal and Spain.*** *June 13, 2024*

Data is the fuel of growth in the energy sector



Data is everything in the energy sector. Knowledge is power. Real-time knowledge of prices, volumes, markets, and so on gives you the power to get your own insights and make the right decisions at the right times.

A strong data repository is vital *to* keeping up with all the moving parts in the energy sector and taking opportunities for gains as and when they come. And it will be the key cornerstone for evolving into digital operations and AI-led organizations.

But a strong data repository is not *every* and *any* data you collect. Storing bad-quality data that you will never use isn't going to help.

3 key components of a valuable data repository

External data	Internal data
What analysts tend to call "fundamental data"	This is your production/consumption, the variables that affect it, and acceptable ranges for each variable.
Used to forecast power prices for short, mid and long term, so you have a clear picture of market dynamics.	Measures how you work

Systems
Allow you to quickly access and utilize data to make a meaningful impact
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The last point is where a lot of companies get caught short. They're relying on clunky spreadsheets that don't give them any useful insights despite the hours they spend updating them.

Stop working *for* your data and start working *on* your data.
Use the technology available today to *get* relevant, high-quality data *just* in *time* and *use* it to *drive* your business forward.

4 ways to turn data into a driver of business growth

Having access to data is only the beginning. The real gains come from how it's used in the business and integrated into everyday operations to make every decision and every second count.

Create a solid infrastructure for data optimization

To manage and *make use of* large volumes of incoming data, we need the proper foundations. Building a data warehouse or data lake is the very first step:

- **Define your core business information**
  Identify the key pieces of information in your core business entities that need to be tracked and captured over time to support your daily operations. This information includes forecasts, actuals, prices, transactions and so on.
- **Make your *data-ingestion* process flexible**
  Information will come from hundreds of sources. It is subject to instant, uncontrolled changes, and these changes will need to be applied to your extract–transform–load (ETL) templates.
- **Determine how you will assess data quality**
  How will you identify misleading information, typos or other sources of errors? You will need measures in place, from simple controls (such as double input reconciliation) to more sophisticated ones (such as outlier detection and confidence level analysis).
- **Set up a governance model**
  This brand-new ecosystem needs to work on a daily basis. Define roles and responsibilities. If a file is not loading, who will take over that? If a data point is incorrect, who will validate it and provide the right value?

Implement a process-support tool

This gives you the control and transparency you need to view your internal and external data and act accordingly. A good portfolio management tool can be set to work within the parameters of complex procurement contracts and the new 15-minute granularity market.

4 key outcomes

Your process-support tool should have capabilities that allow you to:

1. Get your energy expenditures under control

By maintaining an up-to-date overview of your portfolio, you can accrue your energy costs for the upcoming weeks and months and balance the books ahead of time.

2. Master risk management

With so many moving parts always in flux, risk management in the energy sector requires much more detailed analysis. Your portfolio management tool can provide this, creating standard P&L and mark to market (MTM) analysis, calculating value at risk (VaR) and profit at risk (PaR), and more.

Track the ups and downs of income, costs and the market and see the ultimate impact on your business.

3. Enrich your analysis with real data

Make it make sense for what is under your control, your contracts and your purchases. Use actuals and spot prices to review the performance of your contracts in the past and negotiate renewals with more leverage. Or evaluate different energy sources based on their costs to decide where to get energy from next.

4. Integrate with the dispatch center in real time

Your portfolio management tool acts as the bridge to the market. Use it to contract a go-to-market agent to represent your assets under the agreement, services and strategy you prefer. Or become a market agent and represent your assets directly. In both scenarios, real-time integration allows for full performance monitoring.

With this solution in place, you ease operations and make available the data insights needed for ongoing improvement of business outcomes.

Use AI-driven processes to make decisions with real-time market intelligence

AI is creating a revolution in how we use data. Using AI for managing meeting minutes and invoices was just the start. Integrating AI with your portfolio management tool multiplies the gains.

The revolution of forecasting

You no longer have to play it safe with pay-as-produced power purchase agreements (PPAs) and settle for a low premium and uncertain outcome, especially for renewable energy that is often weather-dependent.

Pay-as-forecast PPA, with its fixed pricing, can be a safe option when you have accurate and granular forecasts for production and consumption. You know what you need and what you can produce with AI-powered forecasting using real-time market intelligence.

> "Recently, ExxonMobil's AI-powered demand forecasting model was reported to have reduced forecast errors by 25% (Kuang, et al., 2021)." [4]

And this isn't just an idea. It's doable today, as AI models have become easier to develop and maintain. They learn every day from previous data and auto-adjust to give constant, accurate reporting. Everyone benefits from knowing what to expect from energy production. This predictability helps consumers manage what they have and close any gaps, and allows producers to explore other options for using their supplies without jeopardizing prior agreements.

[4] International Energy Agency (IEA): ***New report on Energy and AI | BUILD UP***

> “DeepMind’s wind power forecast was found to increase the financial value of wind energy by as much as 20% (Google DeepMind, 2019).” [5]

With contracts and standard energy exchanges being taken care of so efficiently, producers have the freedom to make additional money by squeezing the capabilities of their assets further. How about offering ancillary services like secondary or tertiary reserves? This does require control.

That brings us to the second cast member of the AI revolution

The supervision of assets in real time

Tracking the behavior of assets to see where they can be utilized to support grid stability can be handed over to AI. Beyond that, AI can identify patterns that predict upcoming troubles where ancillary services will be needed, supporting responsiveness.

Such detailed and responsive management of asset behavior through AI will also be beneficial for energy communities and virtual power plants. Each component in the group of assets can be monitored and managed to optimize the sourcing of energy from the grid.

AI brings data to life. You can go deeper into the data, create a clearer picture of your options, and even automate some actions to keep up with changing variables.

[5] International Energy Agency (IEA): ***New report on Energy and AI | BUILD UP***

Prioritize sustainability and put ESG at the core of the business

> “It’s predicted that “almost 90% of global electricity generation in 2050 comes from renewable sources, with solar PV and wind together accounting for nearly 70%.” [6]

Being on top of sustainability-related data will only become more important.
We need transparency, traceability and adaptability to meet ESG targets and prove compliance with regulatory standards. So, ESG is an essential pillar in your data systems.

The ultimate goal for everyone is net zerom and that means reducing scope 1 and 2 emissions. One of the main mechanisms for that is Guarantees of Origin (GoOs). Using this as proof of renewable energy usage allows for the reduction of reported scope 2 emissions.

With the technology in place, you can monitor energy generation and consumption, identify the GoOs that can be issued or redeemed, and ensure you are working within sustainability targets and regulations. Know your allowances and quickly spot excess to find the net zero balance.

There is money to be made here.
The green economy is growing because regulations on balancing energy consumption with renewable energy usage are getting tighter, especially for big consumers. Being able to more closely monitor and forecast renewable energy production will turn a notoriously volatile energy source into a reliable one for producers to sell and consumers to buy.

With the proper systems in place:

- **Producers** can more reliably forecast renewable energy and map the profitability of those contracts and sales.
- **Consumers** can monitor market fluctuations to buy at the most cost-effective time and prove compliance with sustainability targets.

The right tools will make sustainable energy consumption manageable, traceable and profitable.

[6] International Energy Agency (IEA). ***Net Zero by 2050.*** May 18, 2021.

NTT DATA, your partner in technological optimization

The energy market has given us more options than ever before to drive business outcomes, whether that's maximizing profitability as a producer or maximizing cost-effectiveness as a consumer. Both are achieved by optimizing energy management to leverage every contract, asset, service and market participation.

The toolkit of optimization is technology, and NTT DATA has a comprehensive suite of solutions to help you achieve sustainable, profitable energy management.

From governance and planification to effective implementation, we can help you modernize your infrastructure, effectively integrate AI into your processes and operations, build operating excellence, and manage ESG for compliance and commerciality.

Our industry specialists have the experience to support both leading energy providers and heavy-industry power consumers to boost operations through practical and lean digital transformation. Our skilled team will identify and apply the best solution for you, enabling you to implement your business strategy, reach your targets and improve your operations.

When would you like to start enhancing energy management, unlocking operational efficiencies, driving commercial success and contributing to environmental sustainability?

Talk to NTT DATA and find out how you can improve energy management with the right tools and technology.

Visit nttdata.com to learn more.

NTT DATA is a $30+ billion business and technology services leader in AI and digital infrastructure. We accelerate client success and positively impact society through responsible innovation. As a Global Top Employer, we have experts in more than 70 countries. NTT DATA is part of NTT Group.


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