GridBeyond®

GridBeyond Academy Presents

How to enhance your energy strategy with demand side response technology

Introduction

About the Author

Wayne Muncaster *VP North America*

Wayne has over 20 years' experience in the energy sector. Wayne has seen the energy landscape change significantly and is ideally placed to provide advice and education on this complex market. With the influx of renewable energy and with grid operators requiring the help of technologically advanced demand response providers and large energy consumers to ensure grid stability, Wayne's invaluable knowledge and expertise have secured him a spot as one of the industry's authoritative voices on the topic, and a regular contributor to the GridBeyond Academy.

What is the GridBeyond Academy?

GridBeyond believes that education leads to better, more informed business decisions.

We recognize that energy systems are rapidly changing, which is why our academy simplifies complex energy topics to ensure clarity and accessibility for all. The GridBeyond Academy is intrinsically linked to our core values, to empower industries and large energy users to take control of their energy consumption and provide instrumental services to the balancing of the electricity network.

Delve deeper into the topic at our webinar...

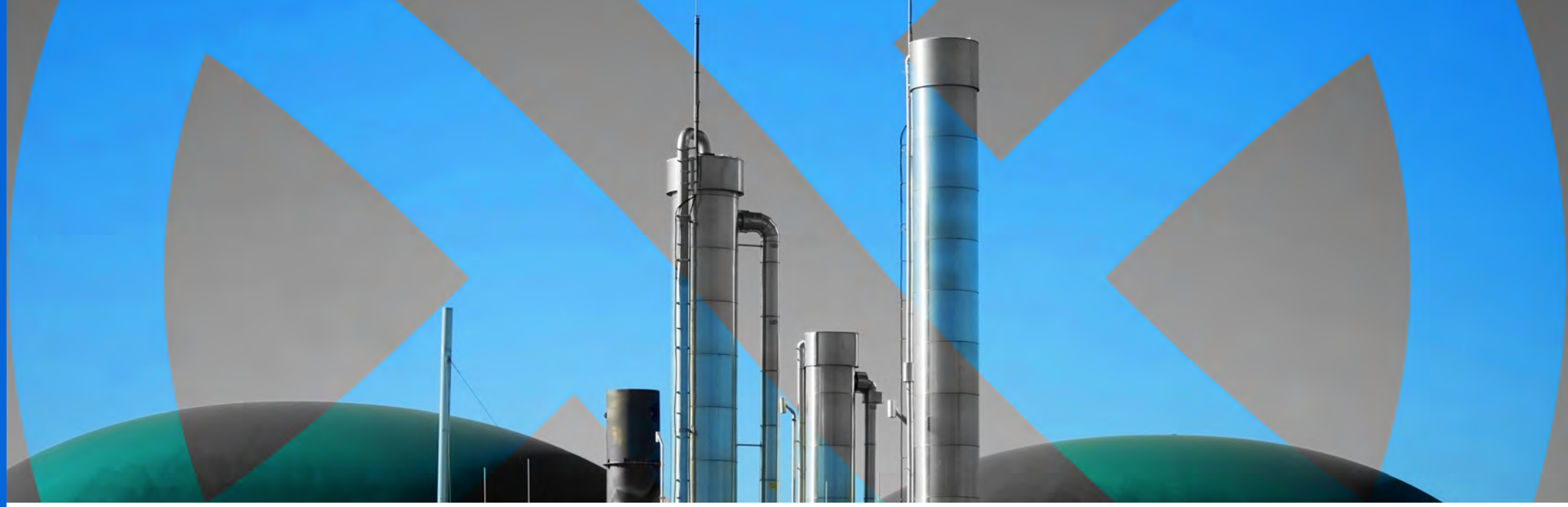
We've covered the topic in more depth in our on-demand webinar. Hosted by Wayne Muncaster, we explore: the ways our clients have already used our technology to enhance their energy strategy, energy lifecycle solutions, how to find energy flexibility, and the steps involved in fully integrating demand side response into your energy strategy.

Take Me to the On-Demand Webinar

This ebook has been created for those with an

Intermediate

knowledge of energy management

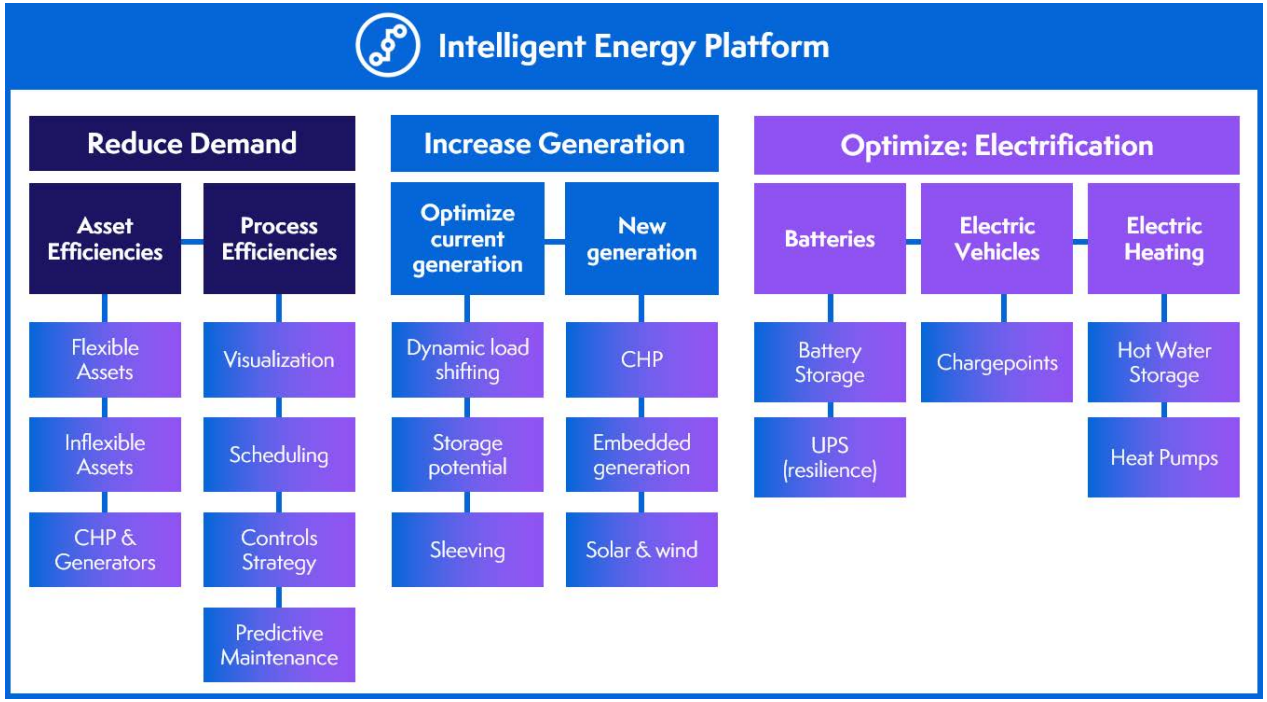


Your Energy Strategy

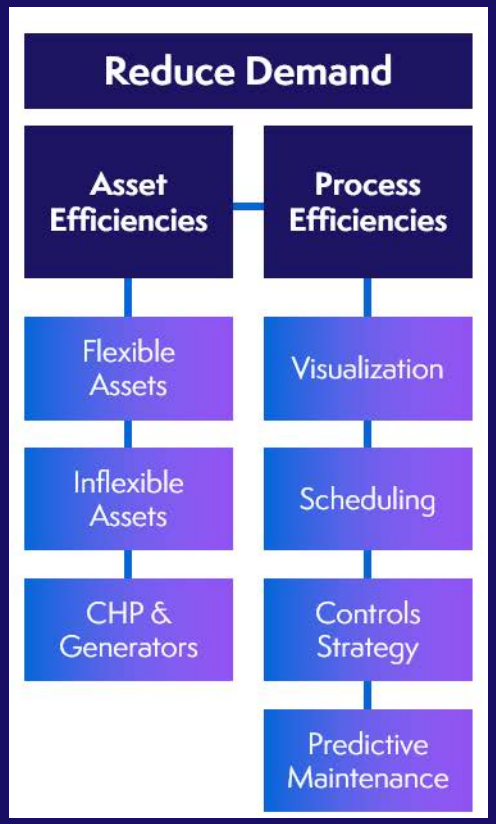
Demand side response (DSR) is sometimes seen as just one element of a larger energy strategy.
Whilst it has independent benefits, it touches on a significant number of areas within your current energy strategy.

When advising on integrating demand side response into an overall energy strategy, we divide the concept into 3 key sections: Reduce demand, increase generation, optimize use. We find that this helps our clients to visualize the implementation better, and get other business stakeholders and team members on board.

This diagram shows you what a 'Whole System' energy strategy might look like when underpinned by an intelligent energy technology platform.



Part 1: Reduce Demand



Reducing demand is probably the most common way businesses tend to focus their energy strategy. As you can see, demand reduction involves both process efficiencies and asset efficiencies.

An intelligent demand side response and energy management platform can help with...

Flexible Assets

When establishing the parameters for demand side response, what we're essentially doing is looking for flexibility. Flexible assets are easy to turn up and down based on DSR requirements, and these same controls can be used to reduce consumption with little or not impact on operations.

Inflexible Assets

The inflexible assets need to be managed differently, using on-site generation or storage to 'create' flexibility, whilst adhering to schedules and process requirements, ensuring no impact on operations.

CHP & Generators

By optimising the use of CHP and embedded generation, such as wind, solar or back-up generation, the energy your equipment requires from the grid can be significantly reduced.

Visualization

Gain full visibility of the operational process, how much energy is used at each stage and how many items are processed for each kW/h of energy used.

Scheduling

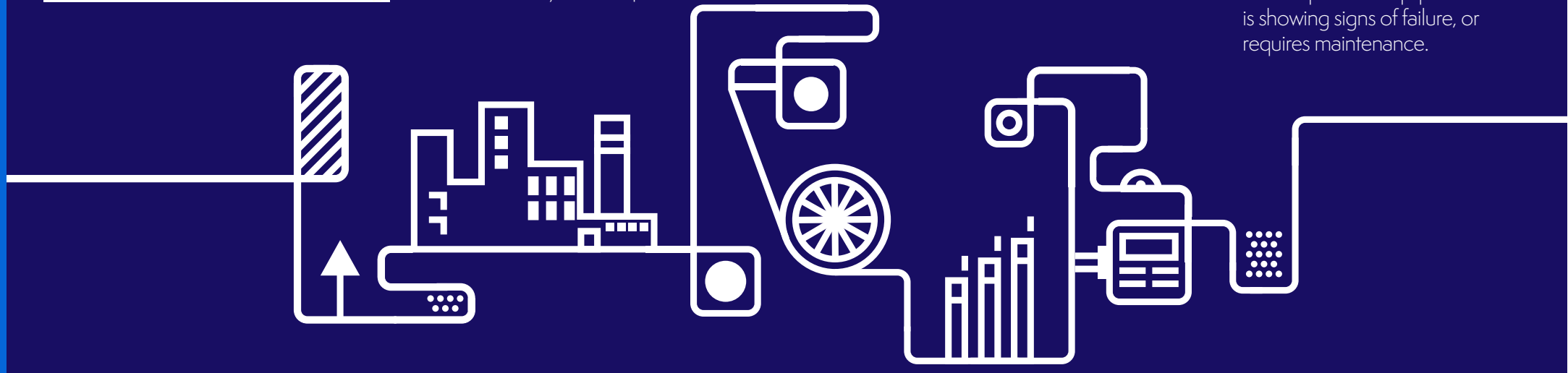
By using energy automation tools, it is possible to schedule processes and prioritise a device queue to enact at times of lower cost energy, and to accommodate any grid events for which you may need to turn down particular energy intensive equipment.

Energy controls strategy

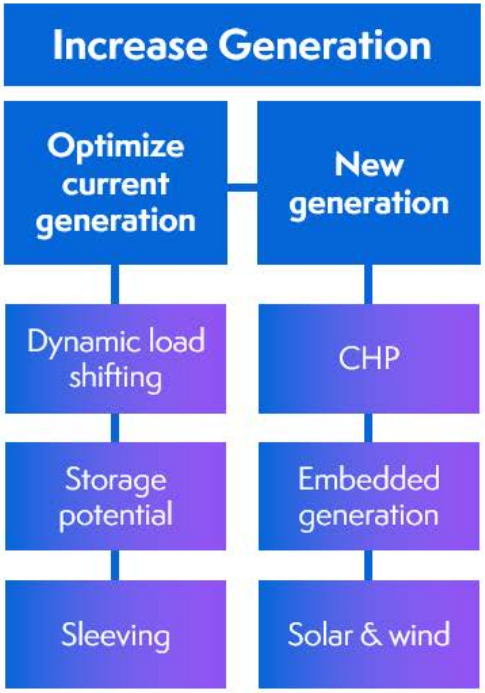
Technology enables seamless integration with a BEMS, meaning demand side response works alongside your current energy controls without impact.

Predictive Maintenance

By establishing the energy usage patterns in processes, intelligent energy technology and machine learning will pick up on any anomalies and determine when a piece of equipment is showing signs of failure, or requires maintenance.



Part 2: Increase Generation



Generation is arguably one of the most difficult areas to fully optimize without automated technology.

When using DSR technology with machine learning capabilities, dynamic load shifting and exports become seamless. The automation in place to manage DSR participation optimizes the use of on-site generation to maximize on-site usage and/or storage at times when market prices are low, and to ensure trades are made at the point of highest value.

Understanding how to optimize generation based on storage capacity, production schedules and market prices for power (export opportunities)
will reduce costs, increase revenues and deliver environmental benefits.

This level of complexity requires a technical solution, particularly where decision making is carried out within a production day.

Monitoring multiple market opportunities, operational parameters, asset status (fuel levels, battery state-of-charge etc) making 'next best action' decisions (often close to real-time) while controlling and metering constraints, requires a sophisticated platform.

A user-friendly client-facing portal, with energy trading dashboards, enables sites to manage storage and trading in order to make the best returns, as well as shift loads to avoid peaks and optimize generation assets.

From simple sleeving arrangements, businesses have the ability to use any excess electricity produced through embedded generation to be consumed on other business sites. Sophisticated virtual power plants, optimized self generation and storage are becoming increasingly important parts of an integrated energy strategy.

Part 3: Optimize Energy Use and Electrification

Optimizing energy use is perhaps best described as the enhanced integration of the previous two elements, creating benefits greater than the sum of its parts.

Whilst the reduction in use and increase in generation can be delivered without technology, integrating these and adding new technologies such as electric vehicles, electric heating and batteries into a coherent energy strategy requires a sophisticated platform.

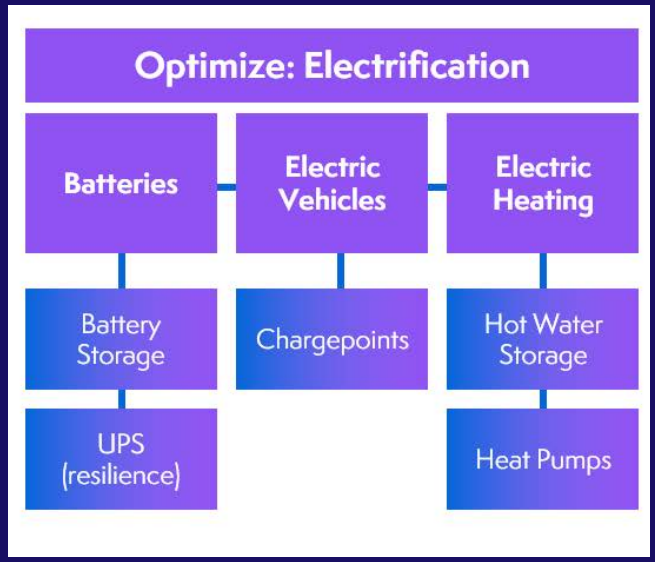
To fully enhance an energy management, sustainability and cost reduction strategy, participation in the demand side response arena is crucial. Access to multiple markets is increasingly important as volatility is driven by change and uncertainty.

The monitoring, controls and automation put in place to enable participation in either of these services is the technology that underpins every other element of the energy strategy chart.

This said, participation in DSR requires a certain level of flexibility. Flexibility can be more difficult to find in industrial sites with strict processes and machinery that may not work effectively if the power fluctuates.

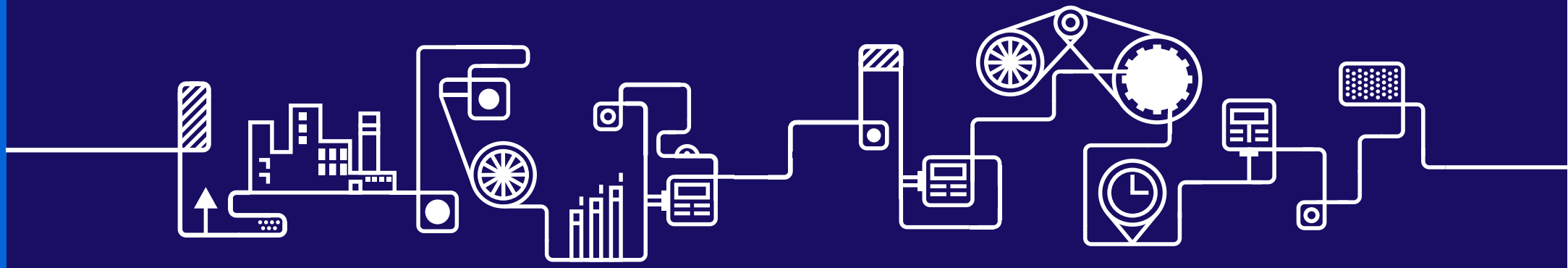
This is why storage plays an important role, both on site and as part of an aggregated portfolio, as it means flexibility can be increased significantly. This in turn enables faster, more dynamic responses, which is more valuable to the grid (and therefore more valuable from a revenue perspective).

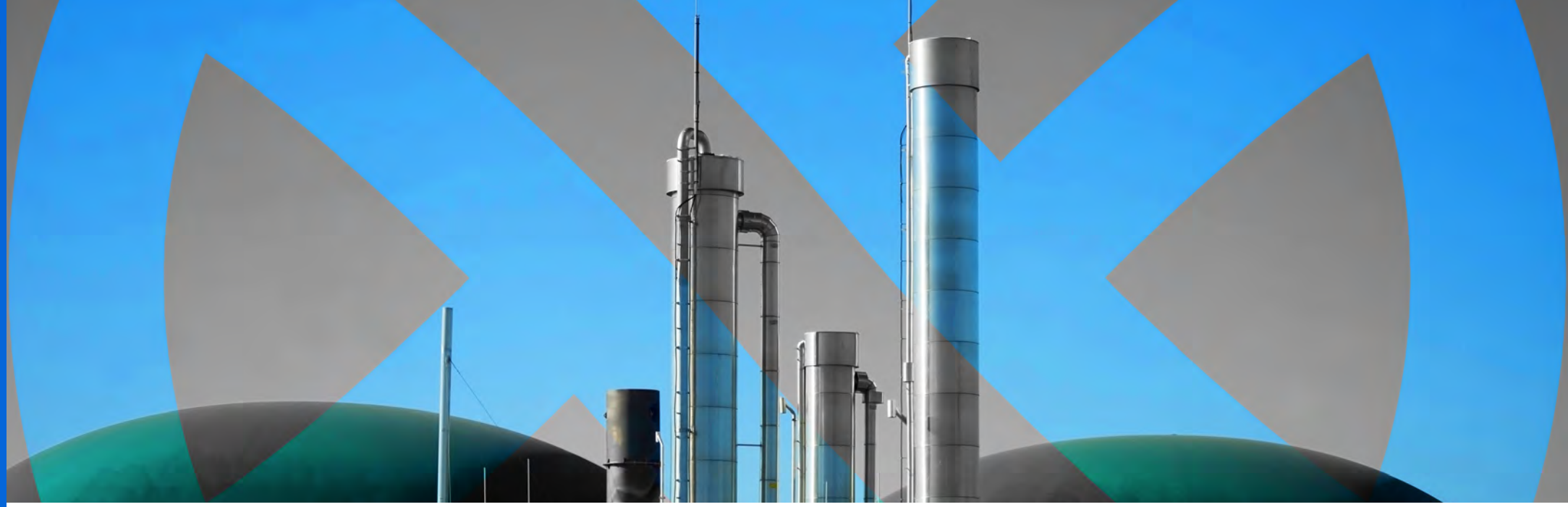
As these areas evolve, we can see a direct correlation between DSR and Storage technology advancements and the convergence of these with the wholesale market.



With access to trading, machine learning technology can be used to take into consideration all the moving parts of electricity supply and demand, including process scheduling to make intelligent choices around purchase, consumption, storage, generation and export. Unlike balancing services, the trading can be an ad-hoc market with highly changeable prices.

In order to take advantage of the opportunities this presents, GridBeyond's main priority is to trade our customer's flexibility for the best possible return, using state-of-the-art technology.





To summarize...

By taking a holistic approach to energy management and combining it with technology designed to optimize participation in DSR , we see a multitude of opportunities open up. The convergence of energy trading with demand side response proves an interesting topic across the energy industry, and an area of expertise for GridBeyond having developed the technology to merge the two opportunities several years ago in the European market.

Businesses are at the heart of this energy revolution, where renewables are commonplace and energy consumption fluctuates with the intermittent generation. But first, businesses need to be able to unravel the jargon and get to the crux of these energy opportunities. That's why we developed this guide, and why we created the GridBeyond Academy.

Watch the on-demand webinar covering the topic in more detail

Watch Now

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