

Q&A

PREPARING FOR THE GRID OF THE FUTURE

Q&A WITH MICHAEL CUNNINGHAM

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THE ELECTRIC UTILITY INDUSTRY IS FACING MAJOR CHALLENGES IN THE NEXT DECADE: THE NEED TO INVEST IN RENEWABLE GENERATION AND LOW CARBON TECHNOLOGIES; MAINTAINING AGING NETWORK ASSETS WITHIN SIGNIFICANT BUDGET CONSTRAINTS; AND AT THE SAME TIME PROVIDING RELIABLE AND AFFORDABLE ENERGY IN THE FACE OF A RAPIDLY CHANGING CONSUMER LANDSCAPE. THESE DEMANDS MEAN THE TRANSITION TO A MORE ROBUST, RESILIENT, FLEXIBLE, DECARBONIZED GRID.

Michael Cunningham, Chief Operating Officer of the Camlin Group is a keen observer of the industry and sees Camlin playing a key role helping utilities.

"Decarbonization and the road to Net Zero underpin everything," he says. "The topology of the network is going to be very different ten years from now, with onboarding of renewable energies and low carbon technologies at every level in the grid, from the consumer with electric vehicles and solar panels right up to high voltage renewable generation and everything in between. That means an electricity grid with multi-directional power flows and a changing demand landscape, making it very difficult to plan and predict the behavior of the grid into the future. Utilities can only see with any reliability a short time into the future, and the grid must withstand that. As it stands right now, this is exceptionally difficult. To meet these challenges successfully, the industry needs to evolve rapidly, which needs new technologies, new methodologies, new partnerships and new ways of thinking."

Michael sees conventional understanding of the industry being severely disrupted: the view that on one side there are network operations focused on timely and efficient energy flow, and on the other side, asset management focused on the management of both risk and capital assets. This is not how the industry is likely to operate in the rapidly approaching future as the rise of renewable power generation turns this industry orthodoxy on its head. Alongside large, centralized power generation plants, sources of renewable generation will proliferate rapidly and lead to much more complex,



decentralized networks where traditional lines between networks and power generation become blurred. The tried and tested approaches established over decades, such as the asset management function of analysis of risk and risk mitigation, which have served utilities for the last thirty to forty years, will need to be updated significantly to manage the new complexities. Central to managing the new paradigm will be data and digital tools.

For forty years, Camlin has been supplying asset monitoring equipment for transformers, generators, and circuit breakers. More recently though, the company's focus has been on bringing together both monitoring and diagnostics, using artificial intelligence and machine learning to provide informed actionable insights for utilities.

Michael says: "The network is experiencing increasing rates of disturbances, such as through fault currents and transient over voltages, and multidirectional power flows. These will likely impact power transformers and as a result they are going to live a very different life in the future. It means that the approach to running a network must change. Many asset management programs are based on models built over the last forty years around empirical evidence of risk. These will almost certainly need to be upgraded significantly to be fit for purpose in the flexible and decarbonized grid of the future because the network is going to be very different.

Many of the large generator units on the grid will also live a different life. Generators that have been designed and installed for baseload generation will be utilized more commonly for backup generation capacity because the baseload will be met, wherever possible, by renewables. So instead of the generator operating constantly, which it was designed and installed for, and on which its maintenance program and entire asset risk profile is based, it's now switching in and out in a way that was completely unplanned. Traditional offline monitoring and diagnostics models are no longer adequate for this situation and a new methodology is needed. This is exactly the type of area where we can help on the journey."

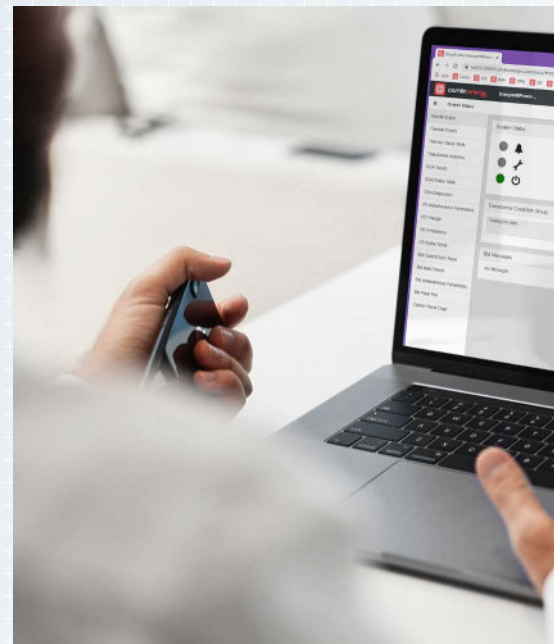
For Camlin, that means working on a "vertical data pipeline", bringing together monitoring, diagnostic software capabilities, artificial intelligence and machine learning, as well as deep domain expertise in assets and networks to provide the actionable insights required for the grid of the future.

Michael says: "As the utility industry evolves over the next decade, although many other companies will start to offer data mining services for utility assets and networks, only a few will be able to match Camlin in terms of translating that diagnostic data into prescriptive actions. Our experience with utilities over the last forty years means that we have an immense bank of knowledge. Many utilities are now facing not only a skills deficit as experienced technical employees retire, but also a whole new set of operating challenges. Our approach means that utilities can fill this breach, make decisions and operate with the benefit of actionable insights developed with the support of Camlin."

At a time when many utilities are seeking to cut costs, there are big financial benefits too. These prescriptive and actionable insights mean fewer visits to sites, fewer repeat visits and much more productive and efficient use of resources. Maintenance is carried out just when it is needed, not at fixed time intervals and asset managers have a much clearer view of the potential lifetime of an asset which helps with budgeting and replacement strategy. Ultimately the utility will be able to drive performance as well as manage risk with increasing reliability.



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Utilities are at different stages in the transition to digital, for a variety of reasons. The task is often huge and daunting and many are grappling with large, customized and complex proprietary systems.

Michael sees utilities which have an interest in renewable generation as often the most forward-thinking when it comes to data and digital tools: "Often these are start-ups and they build data and analytics into their business processes from day one, but we are also seeing more of the larger established utilities taking this path now. Those who get best results break up the task into specific and measurable projects and partner with external providers like Camlin. It becomes a team effort and we work very closely together. These partnerships are a crucial part of the journey ahead."

The challenges facing utilities are huge but the rewards for those which embrace change are significant.

Michael says: "We at Camlin have a part to play. We can help because we can supply the asset monitoring hardware both in the networks and in the assets. We can create and collate the data, we can supply the AI machine learning and our unique breadth of deep domain expertise. We can bring this to bear in partnerships to work with others, delivering the change and progress needed. We can refine and improve existing models and we can create the new insights, models and methodologies that are necessary. At Camlin we see ourselves very much as a trusted partner on the journey to the grid of the future."

