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Smart solutions for a smart nation

Diamond Energy, Singapore's leading demand response aggregator, is changing the electricity game.

By Nur Sabrina Azmi btnews@sph.com.sg



Mr Kay wants to "Uberize the electricity industry", so that customers able to curtail electricity demand temporarily "can act like a virtual power plant". PHOTO: AIDAN LOO

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DIAMOND Energy Merchants, a proponent of smart energy solutions, aims to change the way electricity is consumed in Singapore. "We have to be smart about energy, and Diamond's role in the electricity market is to provide smart energy solutions to our customers," says Diamond Energy's chief executive officer and president Dallan Kay.

Their technology in smart grid solutions aligns perfectly with the smart nation vision that the government has laid out - which is to provide unconventional solutions to conventional problems.

"My time in large utility got me thinking about how to achieve similar results in a more efficient manner, and that's when the idea of a virtual power plant came to mind," said Mr Kay, who previously worked for large US utility company Duke Power before forming Diamond Energy in 2011. He likens Diamond Energy's role in the energy market to that of transportation network company Uber.

"Our vision is to Uberize the electricity industry," said Mr Kay, "so that customers who are able to curtail electricity demand on a temporary basis can act like a virtual power plant."

This means companies that consume electricity can also in turn provide a reliable supply of electricity when there's a disturbance in the grid or a power plant failure. Diamond Energy then comes in as demand response aggregator.

By managing supply and demand through flexible consumption, investments in peaking power plants (power plants that run when there is a peak in demand for electricity) can be deferred at a minimum or even avoided entirely. Diamond Energy therefore hopes to make peaking power plants a thing of the past.

It offers a power-plant-on-demand model, where customers, in exchange for monthly incentives, reduce their consumption on a temporary basis when needed by the grid.

Paid to go green

The model is one where customers earn monthly payments in return for a portion of their non-essential electricity demand available for temporary curtailment. This is akin to paying their customers for going green.

"How customers use the monthly payment is up to them. It can either be used to pursue energy efficiency, reduce their consumption or enhance their profitability," said Mr Kay.

Additionally, Diamond Energy makes the investments for all new technology that its customers require to participate so they can earn benefits from day one.

"A lot of customers like this commitment from Diamond, because we are putting money behind our services," said Mr Kay.

Based on last year's experience, Diamond's customers would typically be required to respond to six curtailment events a year, each lasting about an hour on average. According to Mr Kay, each megawatt could save Diamond approximately S\$100,000. Hence the revenue generated is dependent on the electricity saved, which is then shared between the company and its customers.

Diamond Energy currently has 71.8 MW in the market and is working to expand that base of resource in the electricity market place to double its current size.

It holds 93 per cent of the market share for this service and is the only demand response aggregator that offers all classes of reserve in the National Electricity Market of Singapore (NEMS).

However, its current success didn't come without a price. Mr Kay admits that, while establishing Diamond Energy, he met with a lot of resistance.

"As a small-medium enterprise that is a disruptor to a well-established industry like electricity, credibility was hard to achieve," he said. "We were often discounted as a company that thinks differently and pursues things differently."

Perseverance, commitment and trust in Diamond Energy's solutions were what enabled it to overcome these challenges to build "a strong foundation" that it's on now.

The company also faced some challenges with the heavy regulation imposed. According to Mr Kay, the regulatory framework that applies to a 3,000 MW power utility is the same framework that applies to small electricity companies as well. While Diamond Energy has found a way to overcome these regulations, it may be a barrier to entry for other small companies to follow, said Mr Kay.

Fortunately, since the launch of the Smart Nation initiative in 2014, Diamond Energy has seen some positive signal from the Energy Market Authority (EMA) to pursue smart grid developments such as demand response.

While the progress has taken a long time to gain momentum, it is trending in the right direction, said Mr Kay. He is confident that demand response technology can also support strategic initiatives that are underway in the government such as the Solarnova programme - a programme in Singapore that pursues solar photovoltaic (PV) opportunities in the public and private sector spaces.

According to Mr Kay, demand response can be a solution to address the intermittency that comes from solar supply.

"We can fully embrace solar and exploit it where commercially viable," he said. "Using intelligent demand management, we can work hand in hand to support the clean-energy economy as well."

International opportunities

Diamond Energy is now looking to pursue international opportunities especially in South-east Asia and the Gulf Cooperation Council (GCC) countries in the Middle East.

It has recently won a tender to provide the first demand response services in Vietnam and is also working on a project in the United Arab Emirates (UAE) to pilot demand response.

"The model we have in Singapore will make sense to countries where demand-supply of energy may be tight, and building a new power plant takes a long time," said Mr Kay.

He hopes to improve the awareness of Diamond Energy's demand-response technology and to have it implemented in public sector facilities as well.



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