

# Monetizing Sustainable Electricity Consumption in Singapore

Pioneering Demand Response in Singapore since 2006, Diamond Energy advocates responsible energy consumption with unique benefits to its customers

Home-grown Demand Response Aggregator, Diamond Energy is a top-mover in Singapore's cleantech sector and an advocate for sustainable energy practices. But you won't find the words "environmentally friendly" in its company profile.

Instead, Diamond Energy attracts its customers – building owners, manufacturers, and other large power consumers – with the opportunity to realise the benefits of Demand Response from the National Electricity Market of Singapore (NEMS).

"Our focus is not only about improving energy efficiency or achieving energy savings," explains Mr Dallan Kay, President and CEO of Diamond Energy. "It is about helping electricity customers realize a new stream of revenue from Interruptible Load participation in the NEMS."

Interruptible Load, a form of Demand Response, is the action taken by an electricity consumer to be prepared to reduce a portion of their consumption temporarily by a pre-determined quantity if called upon to do so, in exchange for payments. During times of peak demand or disturbance events in the power grid such as a generator failure, electricity consumers in Diamond Energy's portfolio may be asked to reduce their power usage, taking some load off the grid. Customers are paid based on their availability to reduce their consumption, whether or not they are actually requested to do so.

"Our business model is very transparent," says Mr Kay. "We respond to the real-time requirements of the power grid. Our customers can browse the website of the Energy Market Company, who operates the market, to view the prices at any time."



Diamond Energy's 24hr Demand Response Centre works to ensure a reliable supply of electricity for consumers around the clock.

## AN INNOVATIVE BUSINESS MODEL UNIQUE IN SINGAPORE

Despite the revenue and energy savings potential, Interruptible Load adoption in Singapore has been slow to take off. Widely adopted in the US, few countries in Asia have reaped the benefits. However, Diamond Energy had the foresight to challenge the norm and pioneered the service in 2006.

There are two key reasons for this. Firstly, Singapore's electricity market is more focused on generation than on ancillary services, such as the spinning reserves market where Interruptible Load trades. The spinning reserves market is a fraction of the S\$ 5.11 billion turnover for the NEMS in 2015. Secondly, manufacturing plants and buildings in Singapore are designed and built to be efficient from the start and Interruptible Load participation is not currently part of infrastructural design philosophy.

Diamond Energy's approach is to work with potential customers to perform an on-site evaluation of their facilities free of charge. This evaluation involves identifying suitable non-essential, or discretionary electricity loads, that may be curtailed under the programme. The company then works with the customer to develop a participation model for implementing Interruptible Load that will not compromise the customer's core business operations.



Dallan Kay  
President & CEO  
Diamond Energy

*"Our focus is about helping electricity customers realize a new stream of revenue from Interruptible Load participation"*

*"With Interruptible Load, the reliance on the older and less efficient generators can be reduced over time. This will bring about a cleaner, greener, and more sustainable environment for Singaporeans"*

## CONTRIBUTING GREATER POWER GRID RESILIENCE

Despite a niche business model, Diamond Energy has contributed significantly to the power industry in Singapore. The company was called into action by the power system operator to help stabilize the power grid following disruptions to pipeline natural gas supplies which caused localized blackouts in 2006, just a year after receiving its license from the Energy Market Authority, and more recently in 2011. On both occasions Diamond Energy initiated load reductions from Interruptible Loads, allowing the capacity to be redirected to affected parts of the grid. This paved a way for Diamond Energy's subsequent growth over the last decade.

Today, the company is the largest Interruptible Load player in Singapore and has a portfolio of 71.8 MW. At 93% of the Interruptible Load capacity, this is large enough to support the power grid at a national level. "We have been called into action to support the power grid 89 times since 2006, and we have done so successfully each time," says Mr Kay. "Without the Interruptible Load programme, the other option available to the power system operator is to call older, inefficient generation plants into service, resulting in higher greenhouse gas emissions and pollution."

"With Interruptible Load, the reliance on the older and less efficient generators can be reduced over time. This will bring about a cleaner, greener, and more sustainable environment for all Singaporeans," he added.

To make Interruptible Load participation more attractive, Diamond Energy bears the initial costs of implementing the required technology at the customer's facilities, including the cost to register the designated electricity loads for participation in the NEMS. Once the implementation is complete, Diamond Energy's revenue-sharing arrangement will begin monthly cash payouts to the customer. Diamond Energy earns revenue from the NEMS based on 30-minute spot prices and traded quantities. This revenue is then shared between Diamond Energy and the customers participating in their programme.

Participation in the Interruptible Load programme brings with it a great deal of back-end complexity and stringent regulatory compliance; another reason why Diamond Energy's business model is challenging. The company developed its own in-house proprietary technology platform to grasp these challenges, allowing it to manage an extensive portfolio of resources in the market.

"We are the only company that pays real money to electricity customers" says Mr Kay. "We don't have to make guarantees; we know that they will benefit from what we are doing."

The company's success has also opened doors for international expansion. Diamond Energy worked with the Electricity Regulatory Authority of Vietnam to successfully implement Demand Response Pilot Programs in Vietnam, winning Asian Power's 2015 Smart Grid Project of the Year award. "We have a small team, but we are exporting our unique skills and technology to other markets in Asia and the Middle East where they are needed, and this is providing exciting opportunities for our local workforce," says Mr Kay.

"We want to change the way electricity is consumed everywhere, including raising the awareness of environmental considerations surrounding how energy systems can be optimized with Demand Response."

Among ambitions for the future, however, he is firm that one thing will remain unchanged: Diamond Energy's approach to its customers. "Diamond Energy may be a technology company, but it is driven by people," says Mr Kay. "From addressing customer queries, to personally visiting clients on weekends, we operate a 24/7 business because the electricity market is always open for business."

"We provide our customers with the human touch to the smart grid, and combined with new revenue making potential from Interruptible Load, it makes for a win-win partnership."

## CONTACT US

Diamond Energy Corporation  
enquiries@diamond-energy.com.sg  
www.diamond-energy.com.sg

