

MEDIA RELEASE

24 October 2016

EMA Launches Pilot Programme to Help Consumers Optimise Energy Consumption

The Energy Market Authority (EMA) today signed a Memorandum of Understanding with 16 partners for a pilot programme to optimise energy consumption by managing their demand. This pilot, known as Project OptiWatt, is about demand-side management (DSM). It was announced by Minister for Trade and Industry (Industry) S Iswaran at the Singapore International Energy Week 2016.

2. Through DSM, energy consumption can be shifted from peak to non-peak hours. This reduces the maximum load that the energy system needs to cater to, yielding system-wide benefits. Based on a study by Professor Frank A. Wolak, Director of the Program on Energy and Sustainable Development in Stanford University, every megawatt reduction of peak demand in Singapore could translate to system-wide savings of about \$1.6 million.

3. The objective of Project OptiWatt is to test the viability of DSM initiatives. This includes looking into relevant technologies and business models, as well as understanding consumer behaviour. The project partners comprise Institutes of Higher Learning (IHLs), government agencies, companies, electricity retailers, research institutions and the electricity grid operator. See ANNEX for the list of partners.

4. These partners will explore ways to adjust their energy consumption patterns to reduce the burden on the energy system:

- i) Institutes of Higher Learning
 - Nanyang Polytechnic, Ngee Ann Polytechnic, Temasek Polytechnic and the Institute of Technical Education will explore DSM initiatives to better manage energy consumption on their campuses. The project will also have an educational purpose: the learning points and relevant

research can be incorporated into the education curriculum for the students.

- Energy Research Institute @ Nanyang Technological University (ERI@N) and ENGIE Lab Singapore have developed the PowerZee mobile app to reduce energy use through user engagement and gamification. NTU's eco-campus piloted the app with 1,850 students, who provided feedback on indoor temperatures to enable real-time, data-driven air-conditioning adjustments. Students were also taught "eco-gestures", enabling them to take an active role in direct electricity savings. More of such innovative initiatives will be explored with Project OptiWatt partners.

ii) Government agencies

- The Agency for Science, Technology and Research (A*STAR) and JTC will explore initiatives for shifting their electricity demand from peak to non-peak hours.
- As an initial trial, A*STAR has successfully shifted about 0.3-0.4MW of electricity load without affecting its operations. This was done by adjusting the timing of its washers and sterilisers to operate outside the system peak period (11am to 2pm).

iii) Companies and electricity retailers

- Electricity retailers Diamond Energy Merchants Pte Ltd, Red Dot Power (formerly CPVT Energy Asia) Pte Ltd, and Seraya Energy Pte Ltd will explore DSM initiatives with participating companies and consumers.
- Diamond Energy Merchants Pte Ltd will work with participating companies on Demand Response ¹ and Interruptible Load ² programmes. Air Liquide Singapore Pte Ltd, Applied Materials South East Asia Pte Ltd and Eltek Power Pte Ltd have come on board to explore such opportunities to participate in the energy market.
- Red Dot Power (RDP) eResponse Program is an incentive scheme that pays participating consumers to voluntarily reduce electricity consumption during identified periods. A preliminary trial was conducted at Nanyang Polytechnic (NYP) to explore how consumption can be reduced to respond to real-time system conditions such as high prices or contingency events. The trial found that the electricity load of chillers – amounting to about 7 percent of NYP's total consumption – can be curtailed for up to half an hour with minimal impact on the comfort level of users on the premises.

¹ Consumers can receive a share of the system-wide savings that result from demand response by reducing their electricity consumption during periods of high energy prices.

² Consumers can be paid to be on standby for their load to be shed in response to system contingency events.

iv) Electricity grid operator

- SP PowerAssets Limited, a subsidiary of Singapore Power, will explore how DSM technologies and initiatives can be incorporated into the grid network planning process. Reduction in peak demand can help to better manage the costs to expand the grid network and resource needs such as land.

5. Mr Clarence Ti, Principal of Ngee Ann Polytechnic (NP), shared that this will open up opportunities for IHLs to work with industry experts to develop innovative ways and applications to optimise energy consumption. He said: "It will certainly bring new impetus to NP's ongoing programme to reduce our electricity usage by 15 percent, and boost our efforts in further engaging the campus community in sustainable practices."

6. On the announcement of Project OptiWatt, Mr Ng Wai Choong, Chief Executive of EMA, said: "EMA is pleased to collaborate with our partners to optimise energy consumption by proactively managing their energy demand. I look forward to the success of Project OptiWatt in demonstrating the benefits of energy demand management through consumer engagement."

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Institutes of Higher Learning

1. Institute of Technical Education
2. Nanyang Polytechnic
3. Ngee Ann Polytechnic
4. Temasek Polytechnic

Government Agencies

5. Agency for Science, Technology and Research
6. JTC

Electricity Retailers

7. Diamond Energy Merchants Pte Ltd
8. Red Dot Power Pte Ltd
9. Seraya Energy Pte Ltd

Companies

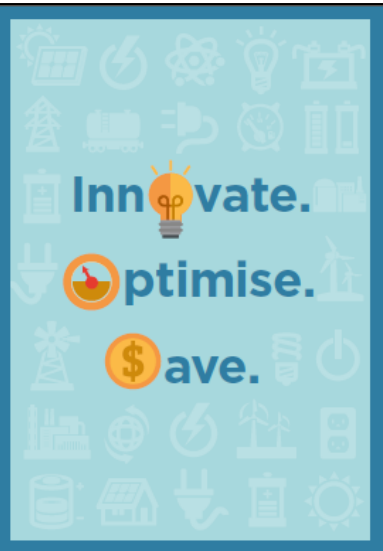
10. Air Liquide Singapore Pte Ltd
11. Applied Materials South East Asia Pte Ltd
12. Eltek Power Pte Ltd

Research Institutions

13. ENGIE Lab Singapore Pte Ltd
14. Nanyang Technological University [Energy Research Institute @ NTU (ERI@N)]
15. Program on Energy and Sustainable Development [Professor Frank A. Wolak from Stanford University]

Electricity Grid Operator

16. SP PowerAssets Limited



Innovate.

Optimise.

Save.

What is demand-side management?

Demand-side management refers to initiatives and technologies that encourage consumers to optimise their energy use.



Electricity is used and balanced in real-time. If many consumers are using electricity at the same time, prices typically go up.

Effective demand-side management begins with consumer engagement.

ERI@N and ENGIE developed the PowerZee mobile app to reduce energy use through interactive user engagement and gamification. NTU's EcoCampus piloted the app with 1,850 students. Students provided feedback on classroom temperatures through the Hot/Cold feature, which led to real-time, data-driven air-conditioning adjustments. Innovative initiatives such as PowerZee can increase awareness on energy use and foster eco-friendly behaviour.

"What we want is for our users to learn about energy efficiency in a fun and engaging way. There is a storytelling element and we have combined it together with social gamification concepts such as an avatar and competition with other players, making the experience of energy conservation and sustainable behaviour both entertaining and social."

Professor Subodh Mhalsalkar,
Director of Energy Research Institute @NTU (ERI@N)

To find out more, visit
www.ema.gov.sg/demand_side_management.aspx
 or contact us at
EMA_Enquiry@ema.gov.sg



Smart Energy. Sustainable Future

Harnessing clean energy from the sun will help Singapore reduce its carbon footprint.

Sunseap is a clean energy provider that offers a zero-cost, one-stop solution from installation to maintenance of the solar system via a Solar Power Purchase Agreement (PPA). Through this arrangement, Cambridge Industrial Trust (CIT) is able to utilise green energy from its 1.5 MWp solar installation at its 3 Pioneer Sector 3 facility without any upfront investment. This means CIT can do its part for sustainability while enjoying competitive energy prices.

"CIT is committed to sustainable business practices to benefit the environment, our unitholders and our tenants who will receive reduced energy costs over the long term. The installation of the solar panels is the latest milestone in our journey towards realising our ambition to be Asia's greenest industrial REIT."

Philip Levinson,
CEO of Cambridge Industrial Trust Management

Improving energy efficiency means consumers can do more with less.

The Seraya Energy Make-Over Programme is a customised programme that identifies potential energy-saving opportunities for consumers. Examples of solutions offered include working with customers to install energy efficient lighting, heat-reducing solar window films and energy-saving photocopyers. The programme helped ibis Singapore on Bencoolen achieve cost savings through a customised solution to upgrade its carpark lighting to more energy efficient models.

"When we found out Seraya Energy has an Energy Make-Over Programme, we were impressed that they uphold the same sustainability principles as we do. Through this programme, we were able to optimise our cost savings."

Jade Stunden,
Executive Assistant Manager,
Ibis Singapore on Bencoolen

Flexible electricity consumption creates valuable opportunities for consumers.

Diamond Energy is a smart energy solutions provider that specialises in demand response services. Since 2014, Air Liquide has been partnering Diamond Energy to offer 2.2 MW of Interruptible Load (IL) in the electricity market. Offering flexible load on standby helps Air Liquide to diversify its revenue streams and to optimise operations through real-time monitoring of electricity consumption and prices.

"Through our unique partnership with Diamond Energy, we have been able to harness value-added services brought forth by Diamond Energy's technology and professionalism in the participation of IL in the electricity market. Diamond's participation incentive provides an appealing value proposition for us as it allows our plant to benefit by being available to respond to an activation event."

Cheong Zhen Siong,
Energy Manager, Air Liquide

Demand management enables new revenue streams for consumers.

Red Dot Power (RDP) is a one-stop service provider that integrates electricity supply and demand management solutions to help consumers better manage their electricity usage. Consumers who buy electricity from RDP are eligible for the RDP eResponse Program, an incentive scheme that pays them to voluntarily reduce electricity consumption during identified periods. RDP will be collaborating with Professor Frank Wolak from Stanford University to measure consumer responsiveness to incentives.

"Singapore's climate, customer mix, and familiarity with advanced communications technologies make it ideally suited to achieve significant economic and environmental benefits from active load management."

Professor Frank A. Wolak,
Director of Program on Energy and Sustainable Development at Stanford University

Opportunities abound in the electricity market for consumers to participate in demand-side management. Consumers can play an active role in optimising their energy consumption.

LEGEND:

 Companies

 Households

 Research Institutes



Project OptiWatt

Project OptiWatt is a pilot programme by EMA, public sector agencies, private sector companies, electricity retailers, research institutes and the electricity grid operator to explore demand-side management initiatives to demonstrate the benefits of optimising energy consumption.



Demand Response (DR) Programme

Be rewarded for reducing your electricity consumption during periods of high energy prices. You can receive a share of the system wide savings that result from demand response.



Energy Storage Systems (ESS)

Be part of the energy future. Since 2015, batteries can participate in the frequency regulation market. While ESS is a nascent area, EMA is working with stakeholders to ensure our policy framework keeps pace with evolving business models.



Interruptible Load (IL) Programme

Diversify your revenue streams by being paid to be on standby in response to system contingency events. Through this, you can also enhance system security and resilience.



Solar Energy

Show your commitment to sustainability by considering renewable energy options. System peak demand can be reduced as solar production typically coincides with system peak demand. Solar leasing lets you enjoy solar energy with no upfront costs. For those without rooftop space, you can also opt for green energy packages through an electricity retailer.



Full Retail Competition (FRC)

Manage your energy cost with more options available. From 2H 2018, all consumers (including households) can choose their electricity retailer to provide electricity price plans for their businesses and homes. Consumers can benefit from retailers offering diverse electricity plans including possibly time-varying pricing and energy management packages.

Typical Ways to Participate in Demand-side Management



Production Equipment

If you have flexible production processes, you can choose to temporarily switch off specific non-critical production equipment.



High Voltage Air Conditioning (HVAC), Chillers & Pumps

For short periods, you can reduce energy consumption of electrical items such as HVAC, compressors, chillers or pumps.



On-site Back-up Generation

You can reduce system demand by running on-site back-up generators for short periods.

Red Dot Power (formerly CPvT Energy Asia) successfully completed a 40 MW virtual power plant pilot project to demonstrate the commercial viability and benefits of demand-side management as part of EMA's Smart Energy Challenge grant.

Participating customers and curtailed loads include NatSteel (arc furnaces), Keppel DHCS (chillers backed up by thermal storage), Tang Plaza (chillers) and Marina Bay Sands (air handling units and cargo lifts). These customers successfully curtailed their loads under the pilot without affecting operations.