

MEDIA RELEASE

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EMA, Shell Launch Singapore's First Smart and Clean Energy-Powered Service Stations, Featuring High-Powered EV Chargers

Singapore's first smart and clean energy-powered service stations have been unveiled today. This project was developed following an innovation grant awarded to Singapore renewable energy solutions company Eigen Energy in March 2021, by the Singapore Energy Market Authority (EMA) and Shell, with support from Enterprise Singapore¹.

2 Three Shell service stations located in Tampines, Pasir Ris, and Lakeview will provide electric vehicle (EV) charging using 100% certified renewable energy, including energy from the solar panels at the rooftops of these stations and other Shell rooftops across Singapore. Consumers can look forward to powering their drives with cleaner energy solutions.

3 The energy harnessed from solar panels at the rooftops of each station helps to power the service stations, which are integrated with a battery energy storage system (BESS). Shell's smart energy management system controls the BESS and monitors the power consumption to enable high-powered EV charging.

4 The three Shell service stations will also offer the fastest electric vehicle (EV) charging available at service stations in Singapore – more than three times faster than the 50kW DC chargers commonly available. Depending on the vehicle model, a typical 30kWh charging session at these three service stations can now be completed in less than 15 minutes.

¹ This initiative is supported under Enterprise Singapore's Open Innovation Initiative, which encourages SMEs and startups to collaborate with industry players to develop commercially viable solutions.

5 Mr Ngiam Shih Chun, Chief Executive of EMA, said: “This project is a key milestone in our efforts to develop a more sustainable energy future for Singapore, particularly in electrifying our vehicle population and scaling up solar adoption. The project demonstrates the importance of partnerships between government, industry leaders like Shell, and SMEs like Eigen Energy in realising a clean energy future. We look forward to more of such collaborations to co-create sustainable energy solutions with the industry.”

6 “We hear from EV drivers that many chose EVs to support sustainability. Now we are glad to better serve our EV community with cleaner charging options using 100% certified renewable energy” said Mr. Doong Shiwen, General Manager of Mobility Singapore at Shell. “Coupled with being the fastest EV chargers in service stations, these three stations embody our vision of the future of mobility and push us forward in our goal of achieving net-zero emissions by 2050. We can learn from this pilot to deploy Shell Recharge at locations facing grid constraints to effectively grow Singapore’s EV-charging infrastructure island-wide.”

7 In line with efforts under the Singapore Green Plan 2030 to increase solar energy deployment, this project is part of a multi-year partnership between EMA and Shell to foster innovation, support local companies, and strengthen capabilities in energy storage and digitalisation. Over the past two years, Eigen Energy, has innovated alongside EMA and Shell as the sustainable infrastructure systems integrator, delivering this project to its success.

8 Please refer to **Annex A** for more details on how Shell’s smart energy management system works.

- End -

ANNEX A: FACTSHEET

Locations of smart and clean energy-powered stations:

- Shell Lakeview
- Shell Pasir Ris
- Shell Tampines

Information on the project awarded the innovation grant in 2021:

Project title	Retail Integrated Smart Energy System (RISES)
Awarded to	Eigen Energy Pte Ltd
Description	<p>The project sought to deploy an integrated smart energy management system at three Shell service stations. This comprised (i) containerised Lithium-ion battery energy storage systems (BESS); (ii) electric vehicle (EV) chargers; and (iii) a smart energy management system to integrate and optimise the various energy resources onsite (i.e. solar PV systems, BESS and EV chargers).</p> <p>The project also sought to improve the fire safety of the battery ESS by developing algorithms and sensor units to enhance early detection of battery cell off-gassing, to react quickly to any potential battery fire.</p> <p>Solar photovoltaic (PV) systems have been installed on the rooftops of these stations to generate clean renewable energy to power the service stations. However, the solar power is intermittent and not available throughout the day. Instead, the stations are integrated with a battery energy storage system (BESS), and Shell's smart energy management system controls the BESS and monitors the power consumption to enable fast EV charging, regardless of the time of the day.</p> <p>Findings from the project can potentially be replicated for future ESS deployments to improve safety, lower compliance cost, and facilitate greater adoption of solar energy in Singapore.</p>

The result and how it works:

Smart: Smart system to overcome solar and grid constraints

At the heart of the EV charging operation is the Shell FlexCharge Manager (FCM), which is a smart on-site controller that utilises the Shell Sky² charge point management system to create a state-of-the-art energy management solution.

This innovative behind-the-meter solution monitors the building's existing grid loads, including solar PV output, and controls the BESS to allocate additional capacity for high-powered charging at the forecourts. As a result, Shell can provide the fastest charging available at service stations in Singapore at its three smart and clean energy-powered stations.

Depending on usage demands and the time of the day, Shell Sky will communicate with the Shell FlexCharge Manager to draw power supply from either the grid, solar PV and/or BESS for the required EV charging load. All power retailed to the EV-charging customer will be 100% certified as renewable energy through the retirement of an equivalent volume of Renewable Energy Certificates (RECs). More information about the RECs can be found in the 'Clean: Clean energy-powered with 100% certified renewable sources' section below.

The scenarios in the table below is an illustration of the use of the Shell FlexCharge Manager on a typical sunny day:

Time of day	Building load	EV Traffic	BESS State-of-Charge	Solar PV output	Shell FlexCharge Manager optimisation decision
9am	High	High	High	Available	EVC is supplied with power from the grid and BESS to ensure optimal EV charging. The BESS is discharged continuously to enable high-powered EV charging.
11am	High	Low	Medium	Available	The BESS may be charged slowly during this period.
6pm	High	High	Medium / Low	Unavailable	The BESS is discharged to enable high-powered charging whenever necessary. If the BESS reaches a low state-of-charge, the EVC will be temporarily

² Shell Sky is an industry-leading software platform to deploy and manage EV charging networks at scale.

					de-rated until the BESS state-of-charge is restored to usable levels.
10pm	Low	Low	Low	Unavailable	The BESS may be charged during this period.

The BESS sizes range from 178kWh (for Lakeview and Pasir Ris) to 389kWh (for Tampines). Using a typical 30kWh charging session as a reference, a fully charged BESS will be able to serve at least 5-12 EV drivers consecutively before it requires recharging.

By integrating the EV chargers with the BESS and renewable energy from the rooftop solar PV system, Shell can alleviate the constraints of the electrical grid, and deploy more high-powered EV charging points to support Singapore’s energy transition. Drivers also enjoy more choices when it comes to smart charging and decarbonisation.

Shell’s smart charging technology, the Shell FlexCharge Manager is hardware-agnostic and can be deployed at more grid-constrained locations without the need for costly and time-consuming grid upgrades. For example, some carparks only have sufficient power capacity to support existing infrastructure such as lights and lifts. Such infrastructure do not always require electricity throughout the day. The smart charging system can monitor the amount of power that is actually available and safely allocate power for EV charging. When the lifts and lights are not in use, the FCM can allocate the spare power capacity to the EV chargers for overnight charging.

Fast: Fastest EV charging at service stations in Singapore

The EV chargers at these stations can offer up to 180 kilowatts (kW) of charging speed, more than three times faster than the 50kW rapid DC chargers commonly available. Depending on the vehicle model, a typical 30kWh charging session can be completed in less than 15 minutes.

Clean: Clean energy-powered with 100% certified renewable sources

Implemented by Shell, all Shell Recharge customers at these three stations will be charging with electricity from 100% certified renewable sources, including the solar panels at the rooftops of these stations and other Shell rooftops across Singapore, through the retirement of RECs.

The sources of this 100% certified renewable energy include the solar PV installed at the rooftops of these stations, and more solar PV installed at other Shell assets in Singapore. There are a total of 37 Shell stations with rooftop PV installed, including

these three stations, and the Shell Tuas Lubricant Plant in Singapore. These sources collectively generate sufficient RECs to ensure that all customers at these three stations will be charging with 100% certified renewable energy.

RECs provide complete transparency to customers about the proportion of electricity in the Singapore grid that is supplied by renewable sources. Every time one megawatt hour (MWh) of renewable electricity is produced, an REC is issued by certified registries in accordance with applicable industry standards. Shell uses these RECs to provide an audit trail that matches the units of energy retailed for the EV-charging services at these three sites with those generated from a renewable energy source. The number of RECs that are available match the exact amount of renewable electricity that is produced from the abovementioned renewable energy sources at Shell's assets in Singapore and is put into the national power grid.