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## Launch of Hybrid Household Energy Storage System Optimized for Energy Self-Sufficiency

Backs Up the Entire House with Large Capacity and High Output

NICHICON CORPORATION

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NICHICON Energy Control System Technology (NECST)

NICHICON CORPORATION has been the leading company in household energy storage systems since it pioneered the technology in 2012, with sales of 60,000 units by September 2019. The company now introduces a new hybrid energy storage system for home solar power consumption. NICHICON will exhibit the system at the 10th International Smart Grid Expo at Tokyo Big Sight from February 26–28, 2020.

### **Overview and Development Background**

According to the Agency for Natural Resources and Energy, the feed-in tariff (FIT) period for solar power systems installed in 560,000 homes will expire in fiscal 2019. The FIT period will expire for approximately 200,000 homes per year. This will cause a shift in where power from household solar systems is directed. Shifting it from selling it to utilities to using it to power the home.

There is also demand for such systems from homeowners who seek protection against power outages that may occur during natural disasters (typhoons, heavy rainfall, and earthquakes). These consumers want to keep the lights on, the refrigerator running, and power TVs, cell phones, air conditioning units, and electric stovetops in case of emergency. The market for household energy storage systems is growing rapidly against this backdrop.

### **Features**

“Back up the entire house with solar-generated power to guarantee your family stability in the event of disaster”

A large-capacity (12kWh) and high-output (5.9kW) hybrid energy storage system optimized for energy self-sufficiency

The ESS-H2L1 system leverages large capacity and high output to supply the entire home with power. When a power outage occurs, the energy storage system will automatically supply the home with power. The system can even supply air conditioning units and electric stovetops rated to 200V. Even if an outage lasts several days, the battery will automatically recharge if connected to a solar power system.

1. High capacity: 12kWh  
Use standard home appliances for up to 23 hours.
2. Charge/discharge power: 5.9kW  
Rated output: 5.9kW, charges/discharges (solar): 5.9kW, independent output: 5.9kW
3. Supplies power to a home's electrical panel during outages; able to provide 200V output enable the use of air conditioner units and electric hot plates. Full load distributor panel provided as an option.
4. Exceptional compatibility with other devices  
Guaranteed compatibility with solar panels of any manufacturer, along with ENE-FARM, and EcoCute products.
5. Outdoor installation guaranteed for 15 years; providing protection against natural disasters for 10 years; installation possible in areas of extreme cold.  
Indoor use guaranteed for five years. Main electrical panel guaranteed for one year.  
Can be installed in areas with temperatures ranging from -30°C to 40°C and can operate in temperatures from -20°C to 40°C.
6. Indoor remote-control touch panel and network control  
Free network monitoring service (error notification, product lifespan confirmation). Able to connect to the internet without a home energy management system (HEMS).  
Long-distance control, etc.
7. Able to receive warnings from the Japan Meteorological Agency (from March 2020)  
Automatically charges the energy storage system to full when the Japan Meteorological Agency issues a warning to the owner's area of residence.

This new large-capacity, high-output hybrid energy storage system, positioned as the industry's flagship model, inherits the functionality of the highly appraised ESS-H1L1 (previous model). Metrics such as solar power generation and the battery's charge can be monitored and controlled from an indoor remote controller, making it easy to use. The system's features enable it to easily accommodate new services expected to make an appearance in the future, such as demand response and virtual power plant technology.

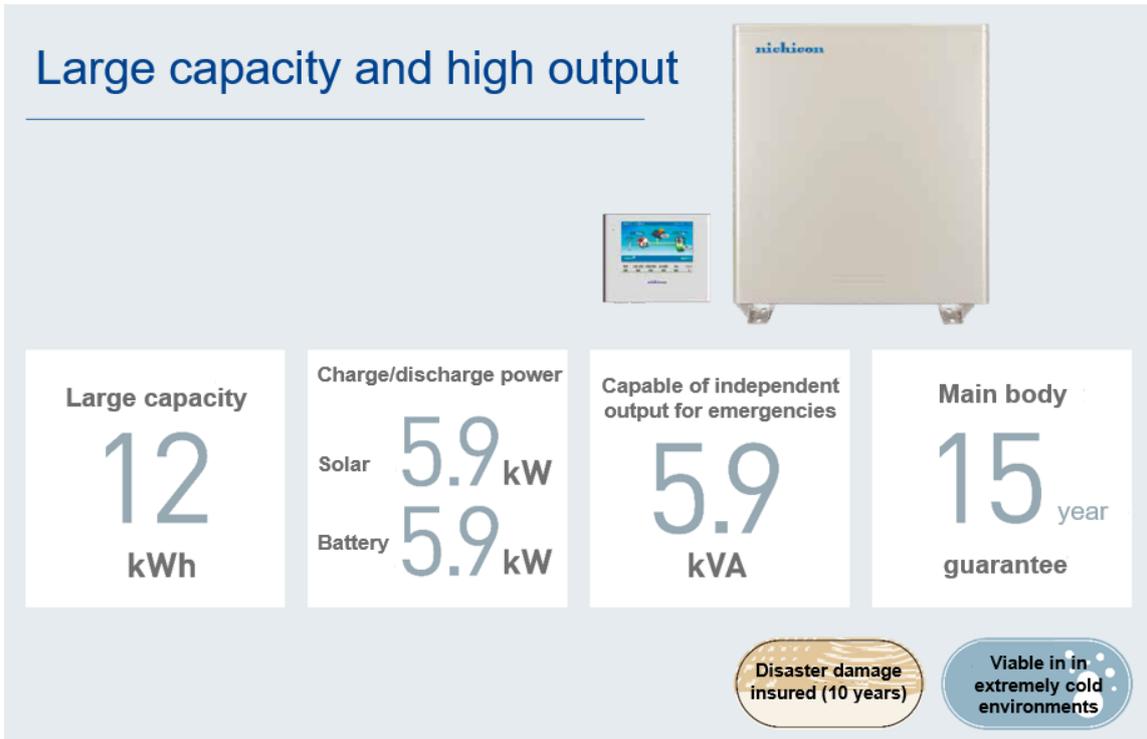
### **Target Customers**

- New construction homes installed with solar power and household energy storage systems as a set
- Households with solar power systems installed whose feed-in tariff (FIT) period is set to

end after November 2019

- Households that have recently installed solar power systems who want to add an energy storage system (for energy savings and as an emergency countermeasure)
- The low-priced model is optimized for use in power purchase agreements (PPAs) and third-party ownership\* (TPO)

\*Third-party ownership (TPO): A model whereby a third party owns a solar power system on a homeowner's property. Also called "roof lending."



The advertisement features a light blue background. At the top left, the text "Large capacity and high output" is written in a dark blue font, underlined. To the right of this text is a photograph of the Nicheon battery system, which includes a small square control panel with a colorful display and a larger, rectangular, tan-colored battery unit with the "nicheon" logo at the top. Below the images are four white rectangular boxes, each containing specific product information. At the bottom right, there are two circular callouts: one with a brown background and white text, and another with a blue background and white text.

## Large capacity and high output

**Large capacity**  
**12**  
kWh

**Charge/discharge power**  
Solar **5.9** kW  
Battery **5.9** kW

**Capable of independent output for emergencies**  
**5.9**  
kVA

**Main body**  
**15** year  
guarantee

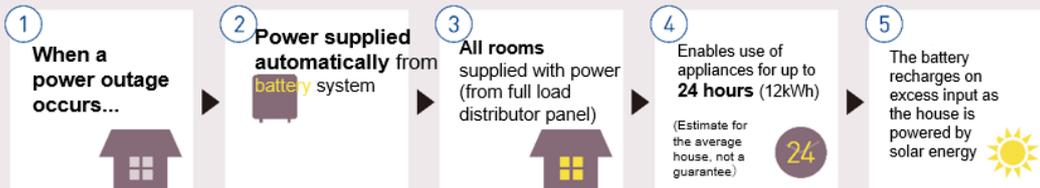
Disaster damage insured (10 years)

Viable in extremely cold environments

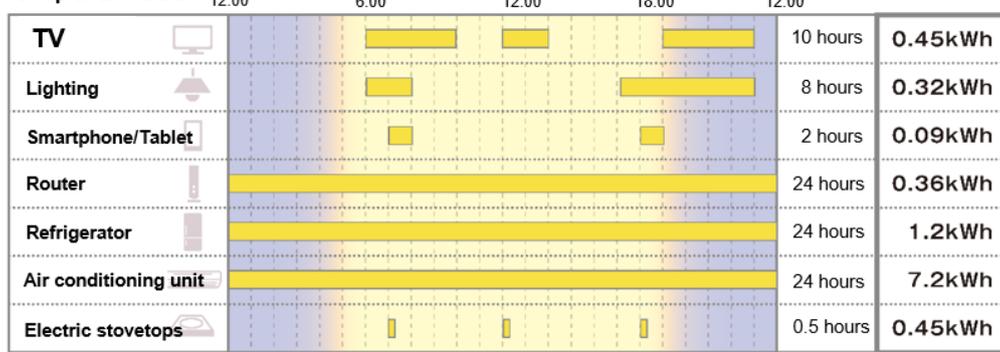
## Stores solar power and automatically supplies the home with power during an outage

Earthquakes are not the only threat—typhoons, heavy rain and snowfall, and other disasters can cause power outages anywhere in Japan. NICHICON's energy storage system relieves anxiety over sudden power outages due to natural disasters to provide families with peace of mind.

### An energy storage system providing peace of mind when disaster strikes



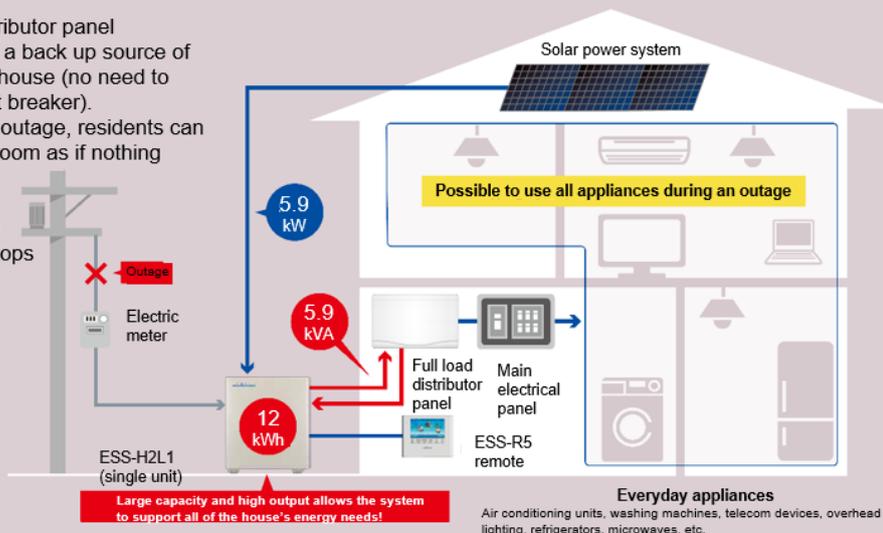
As shown in the chart, standard household appliances continue to be supplied with power for up to 24 hours.



Only roughly **10kWh** even when using all of the above appliances

## Backs up the full load of the house and powers 200V appliances

The full load power distributor panel automatically serves as a back up source of electricity for the entire house (no need to choose a specific circuit breaker). In the event of a power outage, residents can use electricity in every room as if nothing happened. Even 200V appliances such as air conditioning units and electric stovetops can be used.



■ Scheduled launch

March 2020

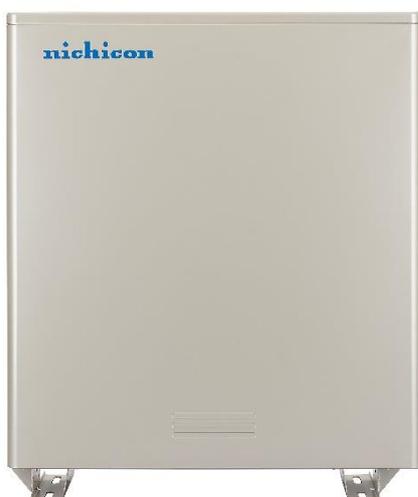
■ Targeted number of sales

10,000 units/year

■ List price

¥4,200,000 (tax exclusive)

Product Images



[ESS-R5 indoor remote]

Specifications

Item		<b>ESS-H2L1 (battery unit)</b>
		<b>ESS-R5 (indoor remote)</b>
Dimensions		W1060 x H1250 x D300 mm (battery unit, not including protruding part)
		W170 x H140 x D23.1 mm (remote)
Weight		254kg (battery unit)
		320g (indoor remote)
Battery	Type	Lithium ion battery
	Rated capacitance	12kWh
	Rated voltage	DC177.64V
	Voltage range (in use)	DC144V to 196.8V
	Battery structure	Six-module series; eight series and one parallel per module
Grid	Power distribution	Single-phase two-wire system

connection output	type	(connection uses a split-phase system)
	Rated output	5.9kW
	Rated output voltage	AC202V
	Output voltage range	AC202V $\pm$ 20V
	Rated frequency	50Hz or 60Hz
	Fundamental power factor	Discharging: 0.95 Charging: 1
	Current distortion factor	Total current distortion factor: 5%; individual current distortion factors: 3% (at rated output)
Independent output	Power distribution type	Split-phase system
	Rated output	2.95kVA/string, 5.9kVA total
	Rated output voltage	AC101V/AC202V
	Maximum output current	29A
	Rated frequency	50Hz or 60Hz
PV input	Connection type	Multistring
	Control type	Maximum power point tracking (MPPT)
	Number of input circuits	4 circuits
	Rated input voltage	DC330V/1 circuit
	Operational input voltage range	DC70V (DC90V on startup) to 450V/1 circuit
	MPPT-controllable voltage range	DC90V to 380V/1 circuit
	Maximum input current	10.5A/1 circuit
	Maximum power input	2.2kW/1 circuit, 6.6kW/4 circuits total
	(PV string) open circuit voltage	DC450V or below/1 circuit
	(PV string) short circuit current	13.5A or below/1 circuit
Inverter	Inversion type	Grid connection: Self-oscillating current control / Independent output: Self-oscillating current control

	Switching type	Sine wave PWM
Rated potential output time		Grid connection: 95 minutes / Independent output: 100 minutes
Isolation type		Unisolated transformerless
Cooling type		Forced-air cooling
Conversion efficiency		Battery: 94% / Solar: 95%
Unnecessary radiation		In conformance with VCCI class B
Noise level		40dB or below
Installation environment	Battery unit	Location: Outdoors (salt-damage resistant) Installable temperature range: -30°C to 40°C Operational temperature range: -20°C to 40°C
	Indoor remote	Location: Indoor / Operational temperature range: 0°C to 40°C
List price (tax exclusive)		4,200,000 yen

## NICHICON CORPORATION

Head office: Karasumadori Oike-agaru, Nakagyo-ku, Kyoto  
 Chairman & CEO: Ippei Takeda  
 Founded: August 1, 1950  
 Capital stock: 14,286 million yen (as of March 31, 2019)  
 Number of employees: 5,169 (as of March 31, 2019 on a consolidated basis)  
 Products: Aluminum electrolytic capacitors, film capacitors, small li-ion rechargeable batteries, Posi-R® positive thermistors, household energy storage systems, V2H systems, EV/PHV rapid chargers, public/industrial-use energy storage systems, switched-mode power supplies, functional modules, accelerator power supplies for medical applications, accelerator power supplies for research applications, backup power supplies for coverage during brownouts/blackouts, etc.  
 Sales: 122,860 million yen (fiscal year ended March 31, 2019 on a consolidated basis)