

Q.HOME⁺ESS HYB-G2

TRAINING & SUPPORT

Q CELLS AUSTRALIA | April 2020

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Q.HOME⁺ESS HYB-G2

Q CELLS



INTRODUCING Q.HOME

STORE TODAY'S SUN TO POWER TOMORROW

There's a new way to harness nature's ultimate asset, that's sustainable, scalable, and renewable. Q.HOME⁺ESS HYB-G2 brings world leading technology to power tomorrow with today's sun.

It's innovation that uses solar to its maximum potential. To give your customers a new level of energy self-sufficiency.

Q.HOME⁺ESS HYB-G2 is Australia's first complete solar plus energy storage solution to come wrapped in A single 10-year product warranty with a single point of contact from one manufacturer.

The future looks bright.

OVERVIEW

WHO WE ARE

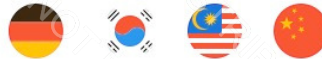
Q CELLS provides affordable and smart energy solutions through technology and innovation to create a sustainable future for the planet.

HEADQUARTERS



In Seoul, South Korea (Global Executive HQ) and Thalheim, Germany (Technology & Innovation HQ)

TECHNOLOGY LEADERSHIP



4 R&D Centres
(Germany, South Korea, Malaysia, and China)

MANUFACTURING FACILITIES



Manufacturing Facilities in 4 countries
(South Korea, Malaysia, China, and USA)

40+ SALES NETWORK



Spanning Europe, North America, Asia, Australia, South America, Africa and the Middle East

PRODUCTION CAPACITY

| | |
|--------|------|
| CELL | 9 GW |
| MODULE | 9 GW |

As of end of 2019,
excluding USA

OUR PRODUCT RANGE



CELLS & MODULES



EPC



SYSTEM SOLUTIONS



ENERGY RETAIL

MANUFACTURING &
CONSTRUCTION,
FINANCE,
SERVICE & LEISURE
MAIN INDUSTRIES

\$63.5B
TOTAL SALES 2019(E)

\$185.7B
TOTAL ASSETS 2019(E)

68 YR
HISTORY

#261

HANWHA GROUP IS A
FORTUNE® GLOBAL
500 COMPANY

76
AFFILIATES

351
GLOBAL NETWORKS

7

HANWHA GROUP IS THE 7TH
LARGEST CONGLOMERATE IN
SOUTH KOREA.

WE ARE BACKED BY A STRONG GROUP

BUSINESS SCALE
EXPERIENCE
GLOBAL NETWORKS

Q CELLS Benefit from Hanwha Group by:

- Gaining bankability and financial stability
- Its enormous business scale and experience
- 76 affiliates in South Korea alone and 351 networks around the world (as of end of 2019)

A large number of Hanwha Group affiliates contribute to the success of Q CELLS by delivering machinery, raw materials, semi-finished goods, and services. The group's enormous global network facilitates our sales activities and provides us with a global market access. Q CELLS also benefits from the huge bankability and financing solutions Hanwha Group offers.

CERTIFICATES AND AWARDS

RECOGNITION IN THE PV INDUSTRY



EUPD RESEARCH TOP BRAND 2012-2020

Q CELLS is one of the most popular and well-known module brands in the photovoltaic industry in Europe, USA and Australia.



VDE QUALITY TESTED

Q CELLS modules, solar power plants, and EPC services have been certified by the strict quality tested program of the VDE certification institute.



PHOTON YIELD MEASUREMENT 2013 & 2014

Our Q.PRO-G2 is the best performing polycrystalline module in the yield measurement Tests of photon magazine 2013 and 2014.

OTHER AWARDS



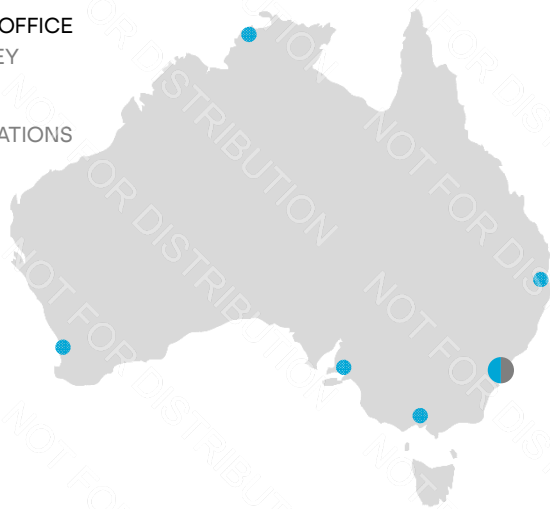
LOCAL SUPPORT

11 YEARS STRONG IN AUSTRALIA

Q CELLS has served the Australian community since 2009 – longer than any other manufacturer currently in the market. With a team based in Sydney and warehouses strategically around the country, we are well positioned to provide in-depth resources to our customers.

● HEAD OFFICE
SYDNEY

● 3 PL
6 LOCATIONS



FLEXIBLE DELIVERY OPTIONS

We have six 3 PLs located throughout Australia, providing convenient and flexible delivery direct to your warehouse or project site.



LOCAL TECHNICAL SUPPORT

Your direct contact at Q CELLS is available and ready to assist you with any issues. In addition, our in-house engineers and support staff members can answer any questions about products and assist with commercial project support.



MARKETING SUPPORT

We will gladly help you market Q CELLS products, for example, by providing individualised marketing materials or supporting you at your customer events.



TRAINING PROGRAM FOR PROFESSIONALS

Participate in our special installer training and earn CPD points while learning all about the advantages of our high quality Q CELLS products and how to win more sales with Q CELLS.

PRODUCT

TOTAL SOLUTIONS

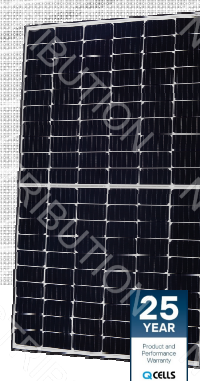
Our world-renowned product brand Q CELLS markets a premium solar module and system portfolio including 25-Year product warranty products, Q.PEAK DUO-G6+ and Q.PEAK DUO-G5+, as well a fully-integrated storage solution, Q.HOME. Q CELLS solar products meet the highest quality standards, are extremely reliable and achieve outstanding energy yields.

Q CELLS NEVER STOPS IMPROVING ITS PRODUCTS:

- All of our premium solar modules are engineered in Germany
- Over 400 scientists and engineers research, develop, and conduct tests in our four R&D centers and in our module test center
- More than 1,300 employees work in our R&D centers and in our manufacturing plants to innovate and improve our technology and quality

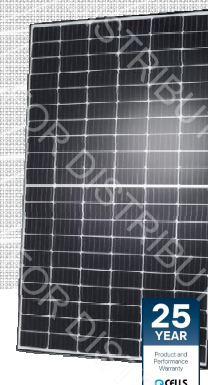
PRODUCT PORTFOLIO

RESIDENTIAL

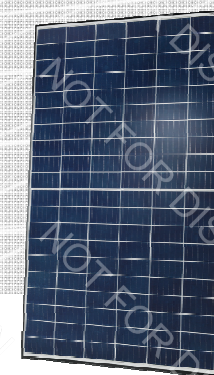


Q.PEAK DUO-G6+
350Wp

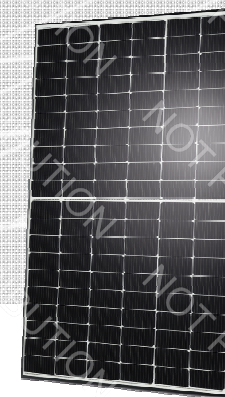
Available 1 May '20



Q.PEAK DUO-G5+
330Wp



Q.PLUS DUO BFR-G5
300Wp



Q.MAXX
330Wp



Q.HOME+ESS-HYB-G2

Available late April '20

OVERVIEW

PRODUCT HISTORY

2016

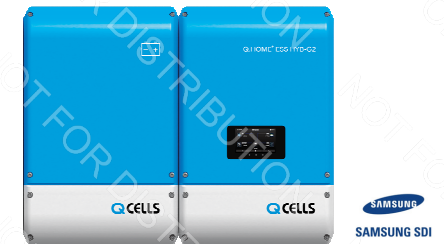
All-in-One Residential ESS launched
by Samsung SDI in EU and AU
Inverter: Hansol
Battery: Samsung SDI



2018

Hanwha Q CELLS GmbH launched
Q.HOME+ ESS-G2 in EU in 2018

Hanwha Q CELLS Australia developed
Q.HOME+ ESS-G2 for AU market from 2018~



2019

Q.HOME+ESS-HYB-G2

Hanwha Q CELLS GmbH launched
Q.HOME+ ESS-G1 in EU in 2017

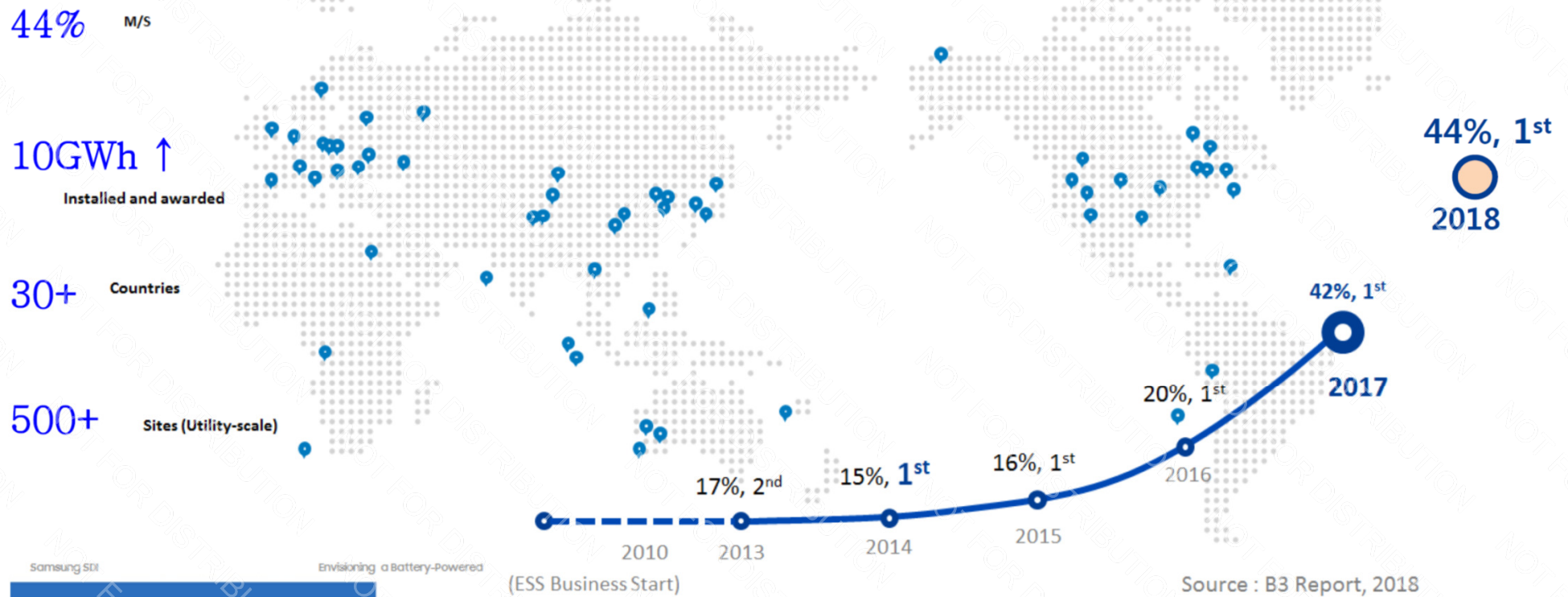
2017



BATTERY

SAMSUNG SDI TRACK RECORD

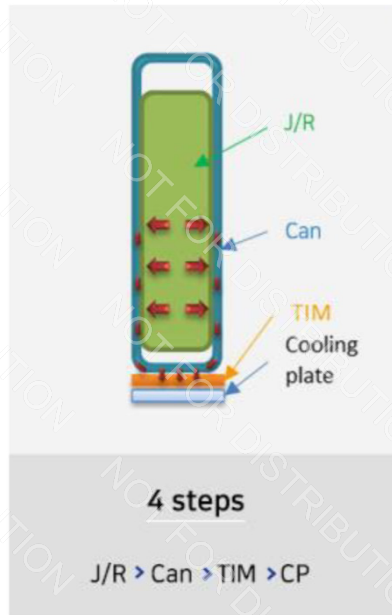
Since 2010, Samsung SDI's batteries have been distributed and operating successfully in 31 countries.



BATTERY

HIGH BATTERY PERFORMANCE & RELIABILITY

CAN VS. POUCH

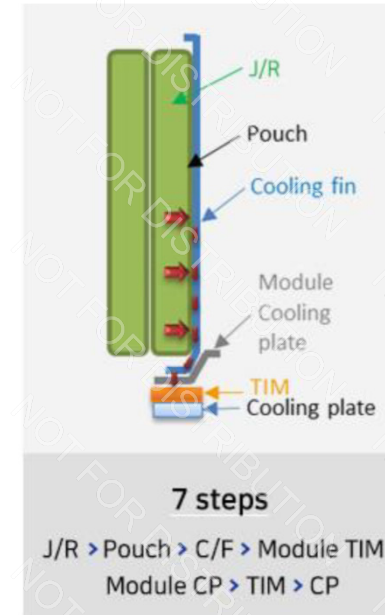


Cooling characteristic of Prismatic and Cylindrical cells is structurally superior to Pouch.

- J/R: Jelly Roll
- TIM: Thermal Interface Material
- CP: Cooling Plate
- Cooling Fin: Part which helps with heat emission

HEAT EMISSION RATE: FAST

Source: Samsung SDI



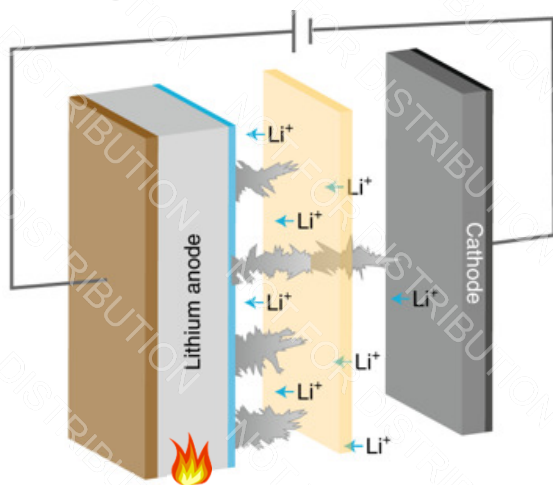
CAN type cell is the most suitable solution for ESS, which have a design life of over 10 years

HEAT EMISSION RATE: SLOW

BATTERY

ENHANCED SAFETY NCM vs. LFP

LFP is known to be safer due to its chemistry, but that doesn't mean NCM is unsafe.
In-fact, NCM shares the same risk as LFP and Samsung SDI has implemented advanced safety protective measures to prevent thermal runaway. Proven through UL9540A test.



**Thermal runaway of both LFP/NCM cells
begins with electrolyte & anode, not
cathode.**

Source: Samsung SDI

| Contents | NCM | LFP |
|--------------------------|---|--|
| Cathode | $\text{LiNi}_{0.8}\text{Co}_{0.1}\text{Mn}_{0.1}\text{O}_2$ | LiFePO_4 |
| Anode | Charged graphite | |
| Electrolyte | Electrolyte | |
| Strengths and weaknesses | High energy density; low material stability | Low energy density; high material stability |

BATTERY

VERSATILE APPLICATIONS

The Samsung SDI cylindrical batteries has no limit for types of applications in the ESS market.

Samsung SDI
Cylindrical Battery



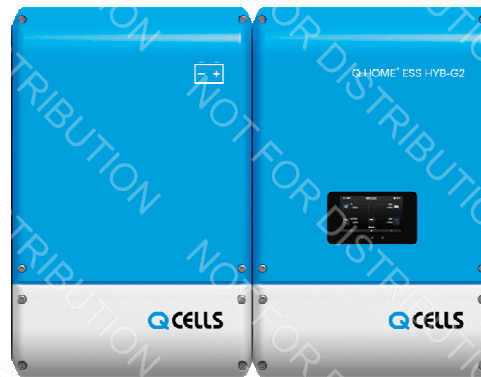
C&I



Q.HOME+ESS-HYB-G2



Residential



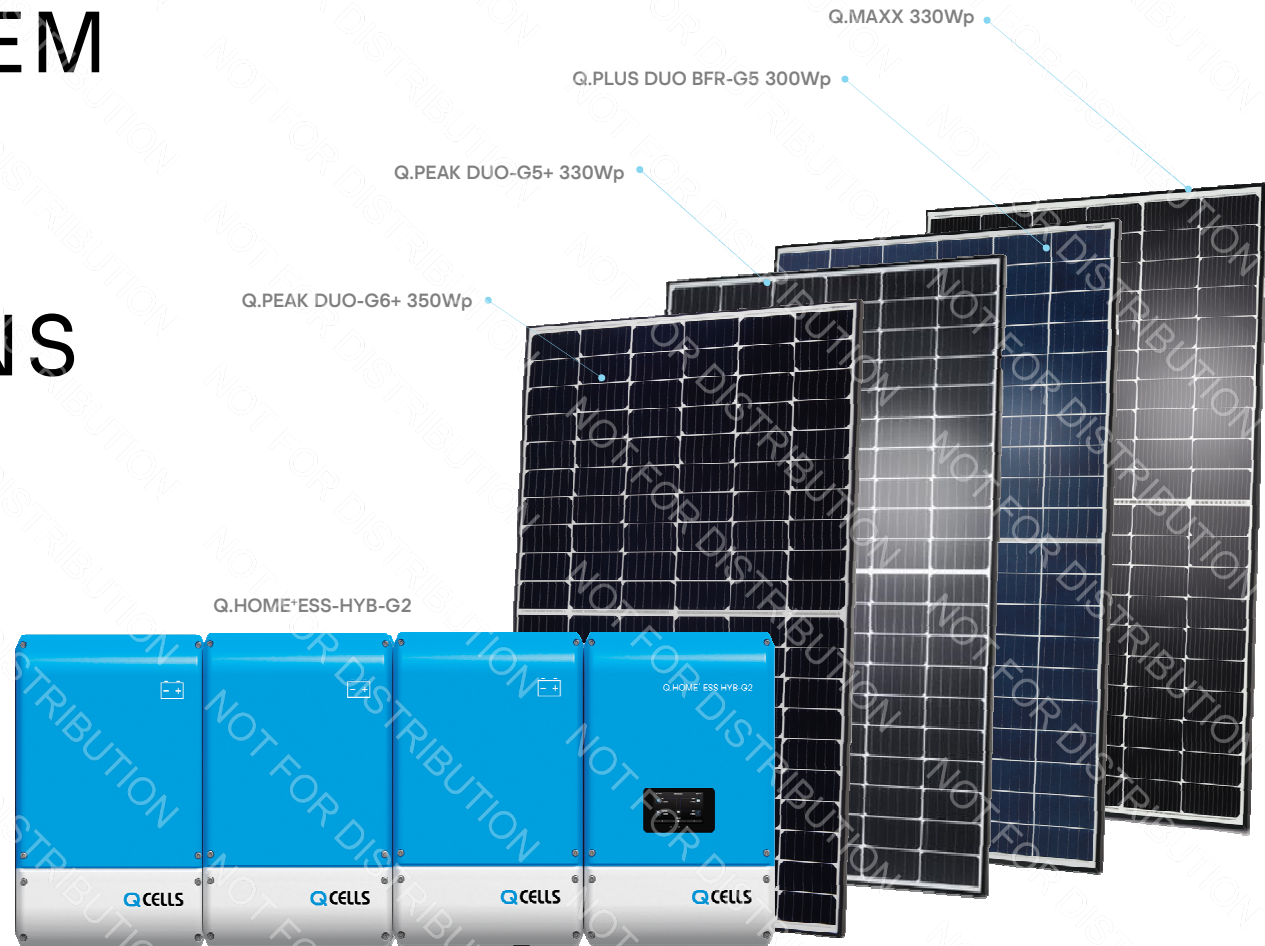
South Australia
100MW/129MWh battery
(Tesla)



PRODUCT SPECIFICATIONS

HYBRID SYSTEM FOR NEW RESIDENTIAL INSTALLATIONS

Q.HOME⁺ESS HYB-G2 is perfectly suited to pair with any Q CELLS solar modules for high reliability and cost-savings.



SCALABILITY

MODULAR & SCALABLE ENERGY STORAGE SOLUTION

Scalable storage capacity from 4kWh up to 12kWh to suit the specific energy production and consumption. Modular design for easy, fast, and flexible installation.



4kWh System



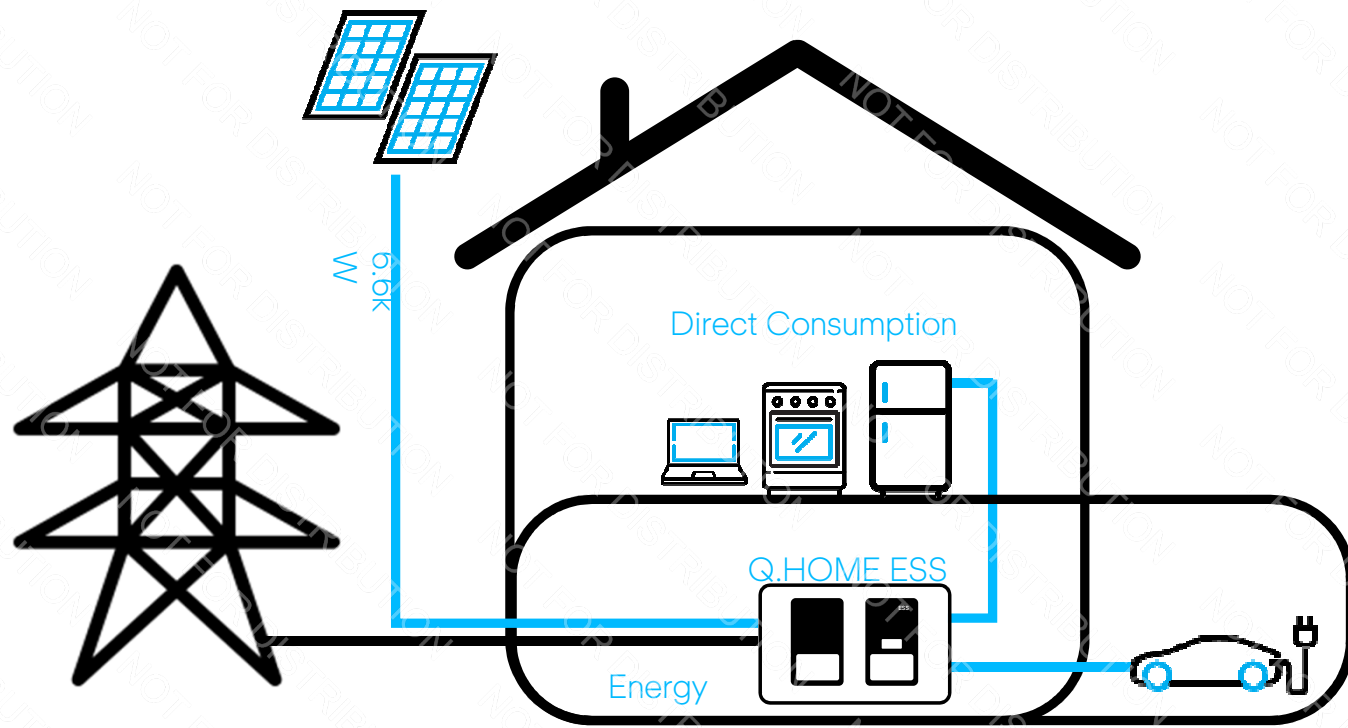
8kWh System



12kWh System

THE EVOLUTION OF ENERGY

Our storage solutions ensure a reliable, long term operation and high output. The Q.HOME*ESS HYB-G2 includes a hybrid inverter, battery, and integrated energy management system and comes with the Australia's very first fully-wrapped 10-year product warranty.



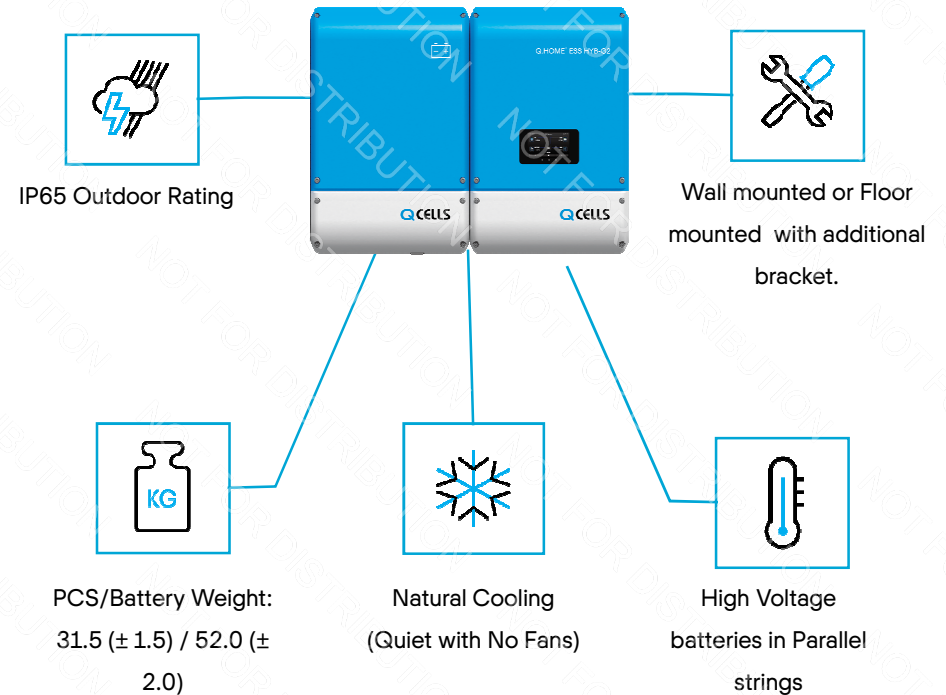
READY TO INSTALL IN REAL AUSTRALIAN CONDITIONS

Q.HOME+ESS HYB-G2 is designed specifically for Australian conditions, including heat and humidity. Thanks to its modular design, making it a breeze to install.

KEY DESIGN & FEATURES

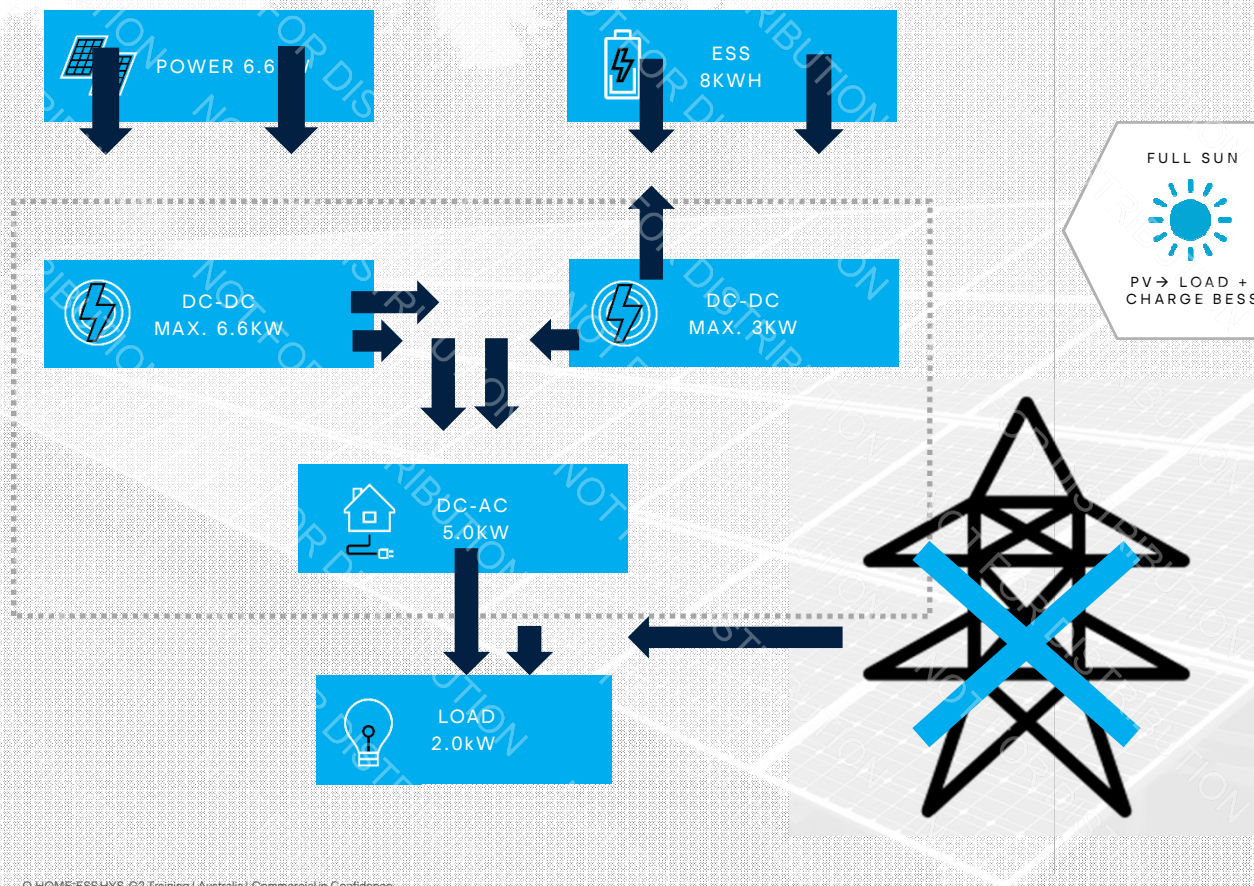
- PV/ESS back-up ☞ Never Go Dark Again
- Floor mounting options available with an add-on accessory for more flexibility
- Compact design and scalable
- Built to last in Australian conditions

Q.HOME+ESS HYB-G2

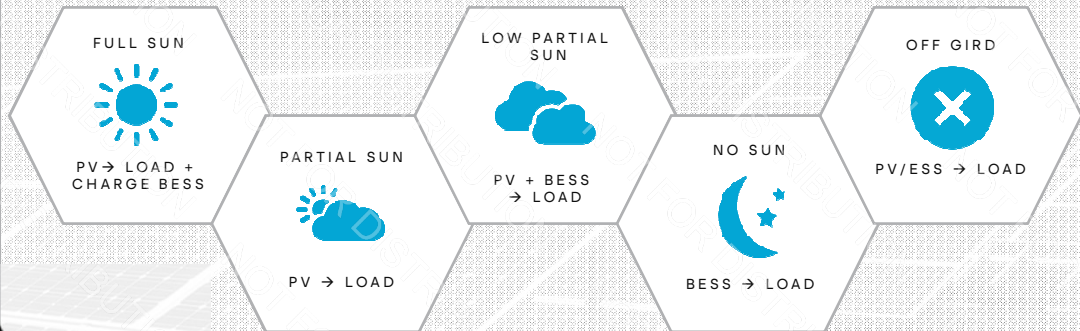


OPERATION

HYBRID INVERTER



OPERATING MODES



BENEFITS

Q CELLS ENERGY STORAGE SOLUTIONS YOUR ADVANTAGES AT A GLANCE



SCALABLE SOLUTION FOR OPTIMISED CONSUMPTION

Scalable storage capacity from 4kWh up to 12kWh to suit the specific energy consumption



10 YEAR FULLY-WRAPPED WARRANTY

High durability with 10 years all-wrapped product warranty



HIGH QUALITY

Premium quality Samsung lithium-ion battery.



SMART DESIGN

Modular design for easy and fast installation, remote control operated systems with lithium-ion battery and battery charger.



REMOTE MAINTENANCE

Easy maintenance of the device due to remote diagnostics, web & mobile monitoring, and a reliable service network



HIGH THROUGHPUT

Exceptionally good energy throughput of 3.2MWh/kWh useable

WARRANTY

AUSTRALIA'S FIRST FULLY-WRAPPED SYSTEM FROM AUSTRALIA'S MOST TRUSTED PV BRAND

As Australia's first fully-wrapped PV+ESS solution, there is only one point of contact should any issues arise. Q.HOME boasts high durability with 10 years product warranty and performance throughput of at least 3.2MWh per kWh battery



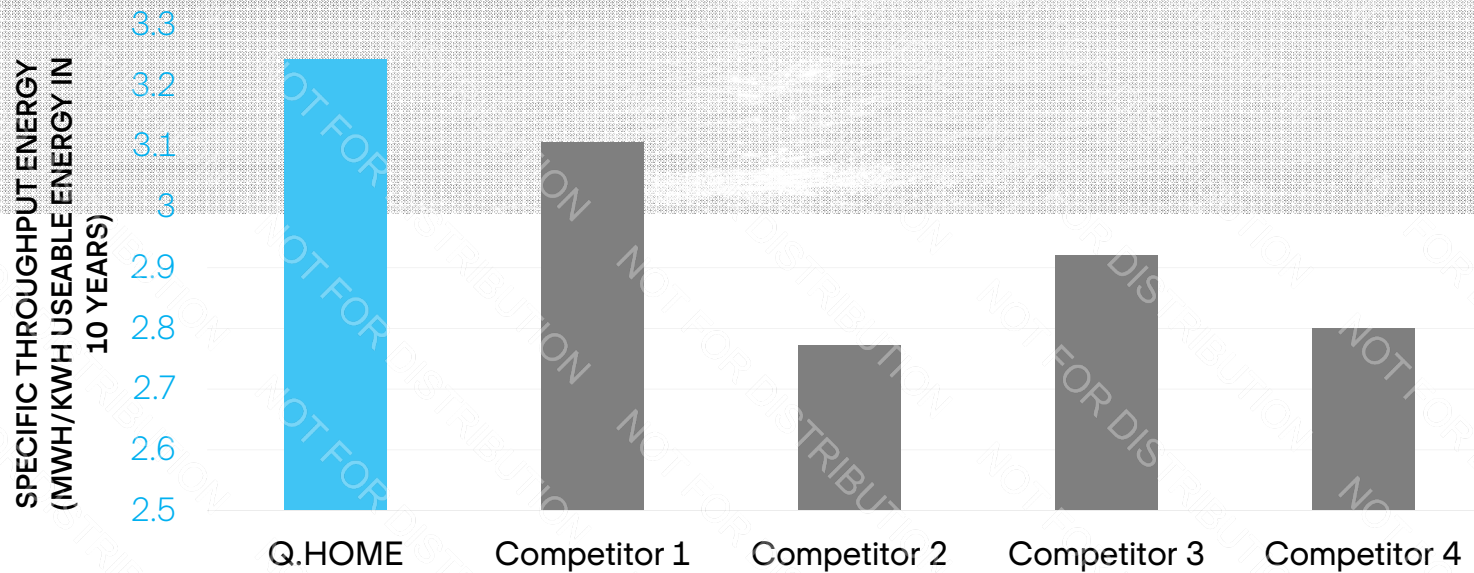
10 YEAR
PRODUCT &
PERFORMANCE
WARRANTY

3.2MWH
GUARANTEED 10 YEAR
THROUGHPUT ENERGY PER
KWH OF BATTERY

20+
LOCAL PRODUCT
SUPPORT STAFF

BATTERY WARRANTY

LONG-LASTING PREMIUM BATTERY WARRANTY



BATTERY FUNCTIONALITY

FLEXIBLE CAPACITY, EXCEPTIONAL QUALITY

| | | | |
|---------------------------|--------|--------|---------|
| Battery Capacity | 4kWh | 8kWh | 12kWh |
| Usable Capacity (DOD 90%) | 3.6kWh | 7.2kWh | 10.8kWh |
| Battery Charge Power | 2kW | 3kW | |
| Battery Discharge Power | 3kW | | |

BACKUP / STANDALONE MODE

NEVER GO DARK AGAIN

Q.HOME's convenient, reliable backup power mode ensure you can keep the essentials running in a blackout.



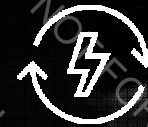
GRID FORMING

Unlike most systems, the grid is not needed for startup.



RELIABLE BACKUP

Max. Power with PV: 4.6kVA (10min)
Continuous Power: 3kVA



POWERFUL

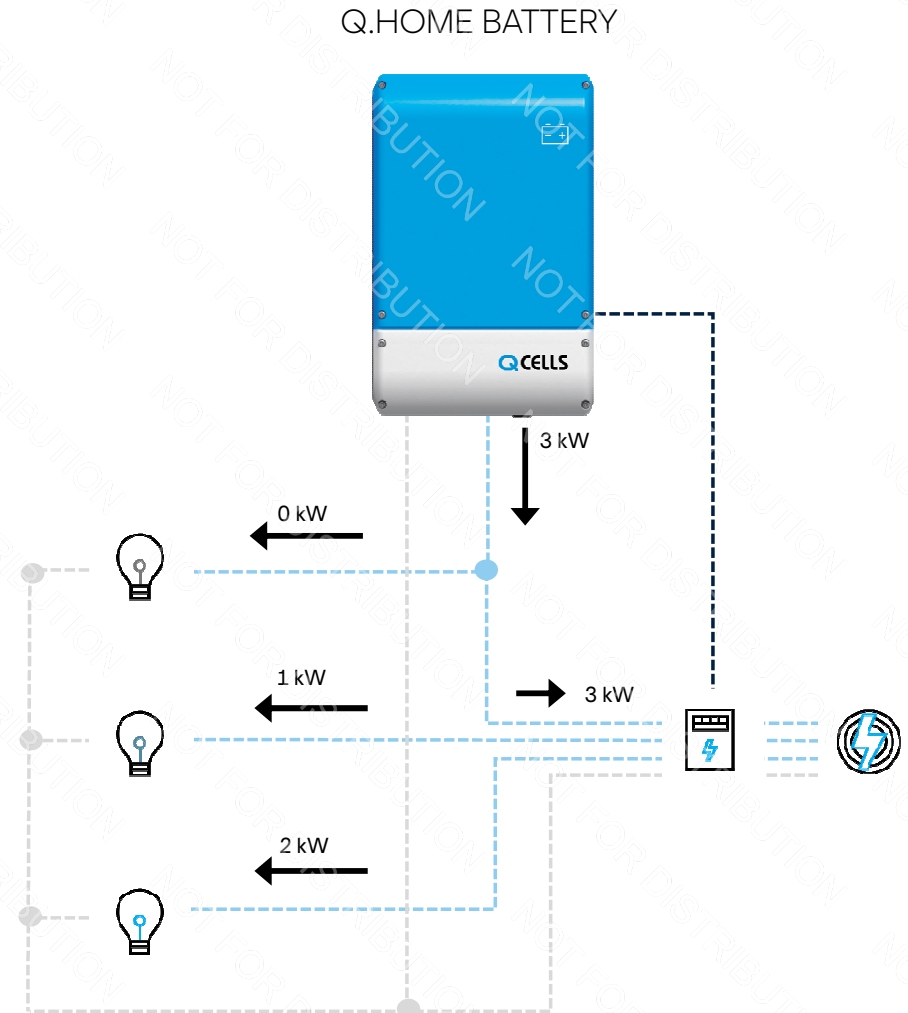
Every kilowatt of the 6.6kW system gets distributed and used for the load or the battery - unlike most inverters which have to choose.

MULTI-PHASE FUNCTIONALITY

MULTI-PHASE MEANS MORE COMPATIBILITY

Q.HOME+ESS HYB-G2 supports both single, and 3-phase functionality – meaning it is well suited for any Australian household.

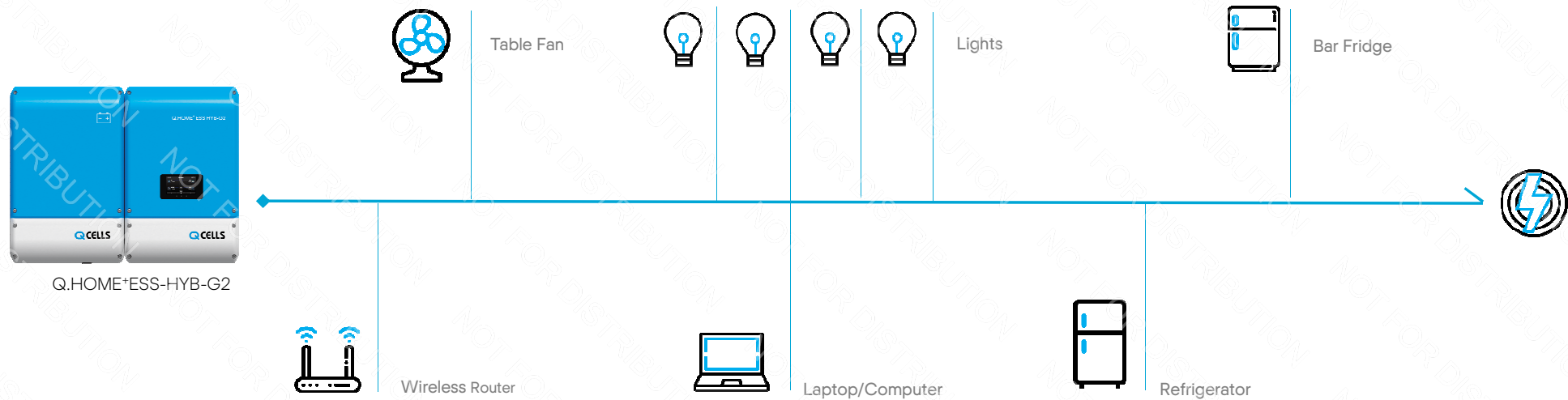
- ⊕ **Max. PV Input: 6.6kW**
- ⊕ **MPPT Range: 125~500V**
- ⊕ **Max Output Current: 25A**
- ⊕ **IP Rating IP65**
- ⊕ **Inverter output rating 5.0kW**



SYSTEM DESIGN

Q.HOME BACK UP CONFIGURATION

Common household appliances that can be connected to the back-up supply of Q.HOME-G2



Combined with Solar, the maximum operating current is 3,000VA/~13A and peak inrush capability of 68.6A (100μs)

MONITORING

Q.HOME MONITORING

In addition to storage, Q.HOME's web monitoring provides installers and homeowners with all the important components for optimum utilisation of the solar system.

Control and monitor the system on Q.HOME's monitoring platform. Easy and direct on the Internet. The platform makes facilitating the service and maintenance of the PV + ESS system easy through key features:

- Cloud Platform
- Custom Installer View
- Custom End-User View
- Web & Mobile Friendly

DATA AT YOUR FINGERTIPS



HOME ENERGY MANAGEMENT SYSTEM

SWITCHDIN: UNLOCKING POTENTIAL

Q.HOME-G2 comes with a free 1-year subscription to SwitchDin.



- Enhanced user friendly data monitoring
- Fleet management
- Optimise Energy Management for additional saving
- PV forecasting
- Historical energy profile
- Clustering capability, e.g. two Q.Home on same house network, or add on to existing system
- 3 second live data for monitoring and diagnostics (fleet managers)
- VPP ready
- Battery control optimisation
- Embedded network ready
- Access to 3G internet option for independent internet network and added security
- Wireless connectivity on top of wired connectivity
- Financial performance analysis
- Easy and flexible installation

Q.HOME-ESSHYS-G2 Training | Australia | Commercial in Confidence



COMING SOON:

- Simplified fault notification for easier diagnostics
- Remote access and commissioning
- Smarter Advanced Energy Management system for optimised energy saving



INTRODUCING SWITCHDIN'S HEMS FEATURE

HOW SWITCHDIN AND Q.HOME WORKS TOGETHER

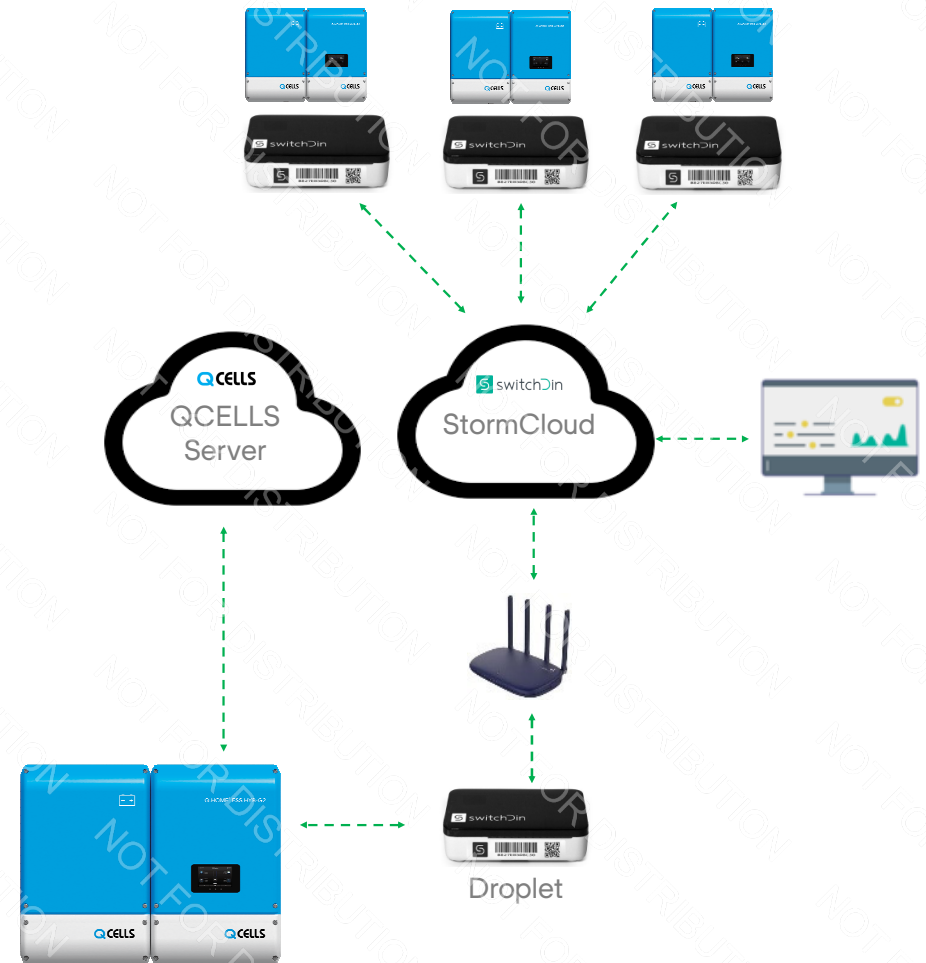
- Each Droplet-equipped Q.HOME can operate autonomously or in coordination with other Droplets via StormCloud, SwitchDin's cloud-based platform.
- Each Droplet is a gateway into StormCloud. Installers, aggregators and manufacturer can use StormCloud to tap into and manage (monitor/control) portfolios of Droplet-enabled Q.HOMEs

Droplet™



SwitchDin's basic residential Droplet controller.

stormcloud™



MONITORING

DATA MONITORING & ANALYSIS

DETAILED SYSTEM PERFORMANCE DATA

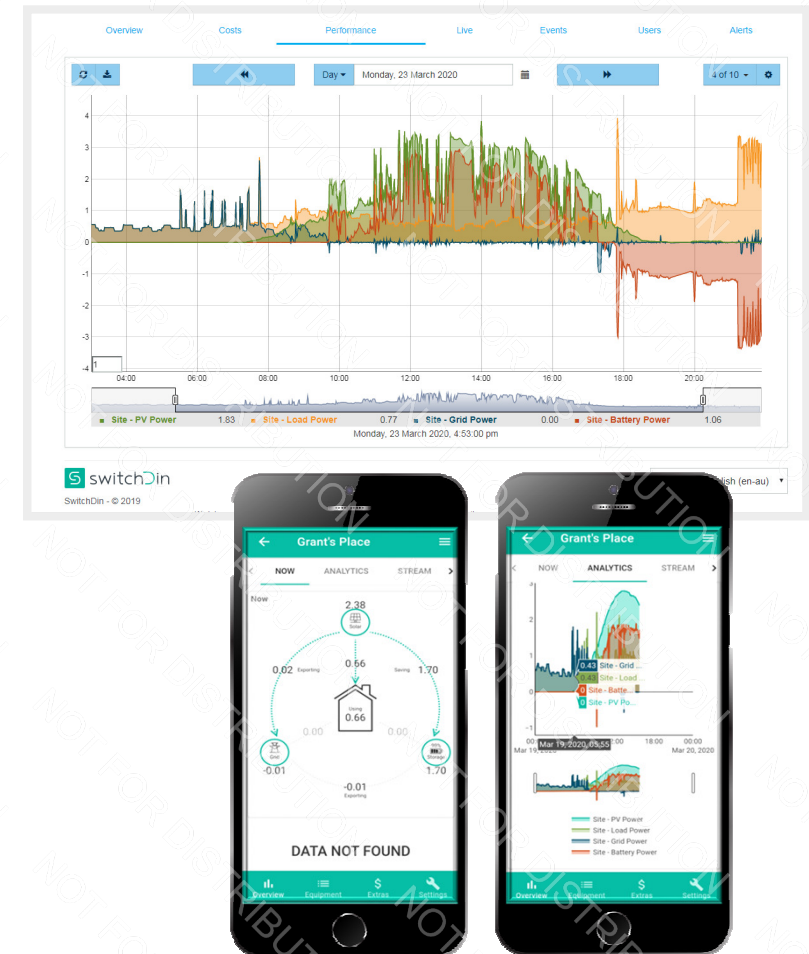
- Droplet will read and report various system performance data including
- 1 minute interval for all historical data is the best available in the market
- Data retained up to 60 months depending on the subscription plan

CUSTOMISABLE MONITORING VIEW

- Offer customised design for monitoring portal
 - Colour, business logo, available data type etc.
- Flexible user permission settings
- Allows users to create and build unique portfolio that suit their needs

MOBILE APP IS COMING SOON

- SwitchDin is currently developing a mobile app (beta version)
- The mobile app provide much simpler view with only the essential information
- This may appeal to major portion of end-users who wish to have a simple and quick way to check their system performance



SYSTEM PERFORMANCE

OPERATIONS & MAINTENANCE

REAL-TIME PERFORMANCE DATA

- The Droplet will read the real-time data of the system every few seconds
- In-depth analytics on historical, real-time, and predictive basis with reporting and data export capability
- Installers can monitor the remotely without needing to visit site for troubleshooting, hence reduced cost of operation and aftersales support



SYSTEM PERFORMANCE

OPERATIONS & MAINTENANCE

CUSTOMISABLE DATA REPORT / CSV EXPORT

- User can download the selected system data from the portal for desired period
- Allow users to be creative with their own analysis

ERROR/FAULT NOTIFICATIONS

- Facilitates fault diagnosis and remote reset to minimise O&M costs
- Customisable alerts and alarms
- Remote inverter configuration support to minimise Installation and commissioning costs

| Overview | Costs | Performance | Live | Events | Users | Alerts |
|-----------------------------|------------------------------------|-------------|------|--------|-------|-----------------------------|
| Device Events | | | | | | |
| Time | Event | | | | | |
| WARNING 2 months ago | Battery SOC Low Warning (OffGrid) | | | | | View Detail |
| WARNING 2 months ago | Grid Fault (OffGrid) | | | | | View Detail |
| INFO 2 years ago | Battery SOC High Cleared (OffGrid) | | | | | View Detail |
| WARNING 2 years ago | Battery SOC Low Warning (OffGrid) | | | | | View Detail |
| WARNING 2 years ago | Grid Fault (OffGrid) | | | | | View Detail |
| INFO 2 years ago | Battery SOC High (OffGrid) | | | | | View Detail |
| WARNING 2 years ago | Grid Fault (OffGrid) | | | | | View Detail |
| INFO 2 years ago | Grid Fault Cleared (OffGrid) | | | | | View Detail |
| WARNING 2 years ago | Grid Fault (OffGrid) | | | | | View Detail |
| INFO 2 years ago | DRM Type 0 (SleepStandby) | | | | | View Detail |
| INFO 2 years ago | DRM Type 0 (SleepStandby) | | | | | View Detail |

Alerts

Definitions

Search...

« 1 »

BATTERY SOC IS BELOW 15%.

3 months ago (ongoing) info

Message: Battery SoC is below 15%.

Device Name: system

Serial Number: 00000000-0000-0000-0000-b827eb8f073d

[View Details](#)

PV POWER > 2.7

2 months ago (ongoing) Warning

Message: PV power > 2.7

Device Name: system

Serial Number: 00000000-0000-0000-0000-b827eb8f073d

[View Details](#)

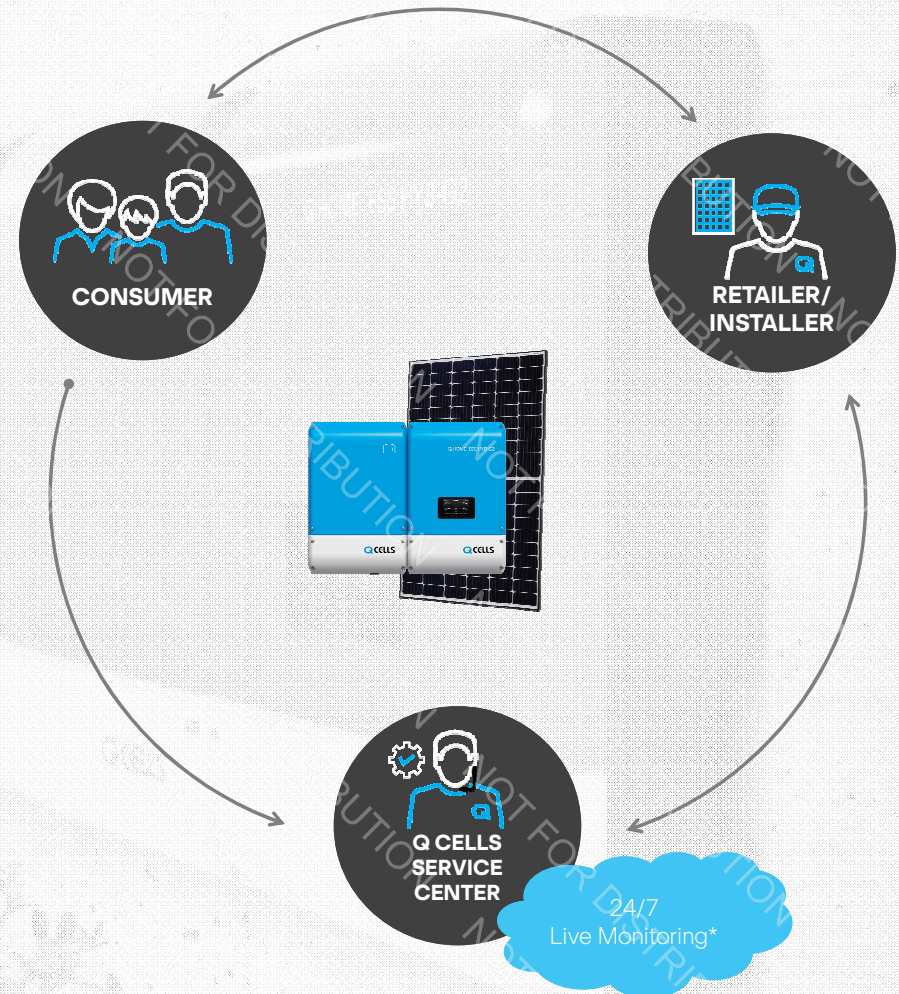
AFTER-SALES SUPPORT

Q.HOME SERVICE CENTRE

- 7 days a week support line
- 48 hours response time
- Active fault alert monitoring (24/7)*
- National network of support technicians

T: 1-800 Q CELLS

E: qhome.au@q-cells.com



*system internet connectivity must be present



"It felt like we were getting something like nothing else in the market."

ROSS BRIERTY, CUSTOMER

CASE STUDY

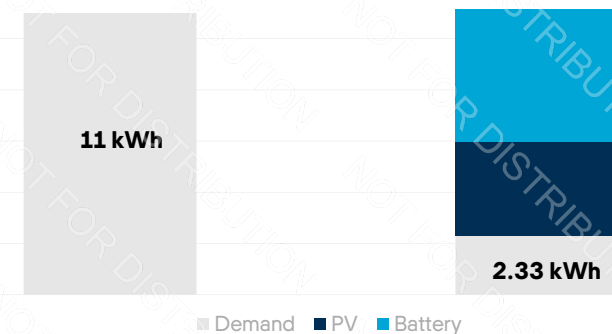
MEET OUR FIRST CUSTOMER

| | |
|--------------|----------------|
| LOCATION | Woodend, VIC |
| SYSTEM SIZE | 6.5 kW |
| INSTALL DATE | 23 August 2019 |

SYSTEM PERFORMANCE

- Home energy demand reduced by 78.9% thanks to Q.HOME, where 47% of these self-sufficiency is directly from the battery
- Early indicators show that the Q.PEAK DUO-G5 is totalling PV production of 28.94 kWh per day
- 33% of total PV production was utilised by the property, either used by load or stored. The rest were exported to grid.

AVERAGE ENERGY SELF-SUFFICIENCY (29/10/2019 - 23/01/2020)



■ Demand ■ PV ■ Battery



We are leading the world's
solar energy industry and
providing our customers with
energy for life.

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NORTH SYDNEY, NSW 2060
AUSTRALIA

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www.q-cells.com/au
<https://q-cells-australia.com/>