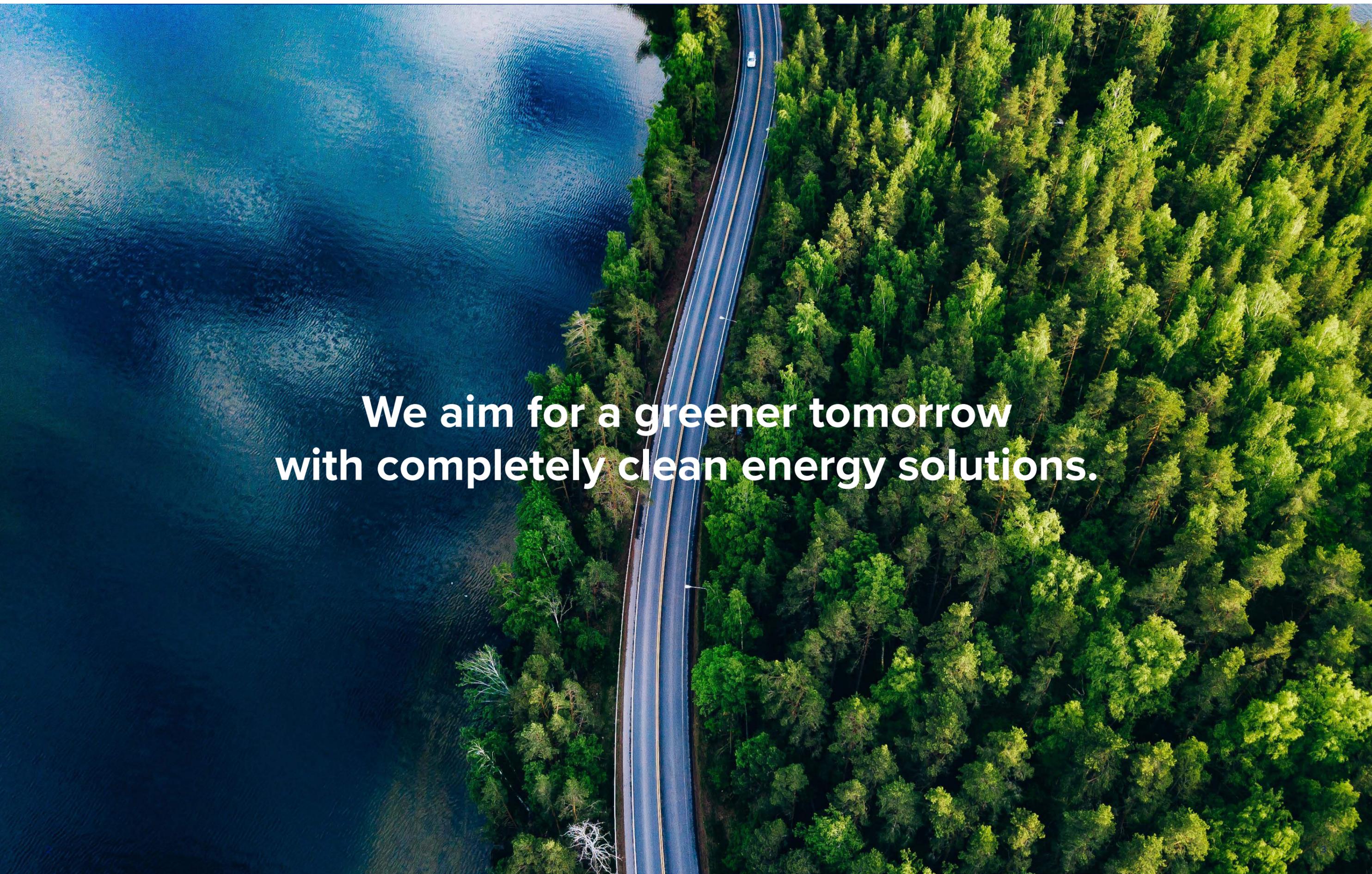


qcells



Q.TRON SMART PACKAGE

So you can always ENJOY the SUN

An aerial photograph showing a two-lane asphalt road that curves through a dense, vibrant green forest. To the left of the road, a large, calm lake with deep blue water reflects the sky. A single white car is visible on the road, moving away from the viewer. The overall scene is peaceful and natural, emphasizing a connection to nature and clean energy.

**We aim for a greener tomorrow
with completely clean energy solutions.**

Dear customers,

Qcells have continuously thrived not just through unstoppable innovation in technology and manufacturing, but by listening to your needs in providing the best product and services. Making you successful is our passion to drive our business.

Part 1. Intro P. 4-9

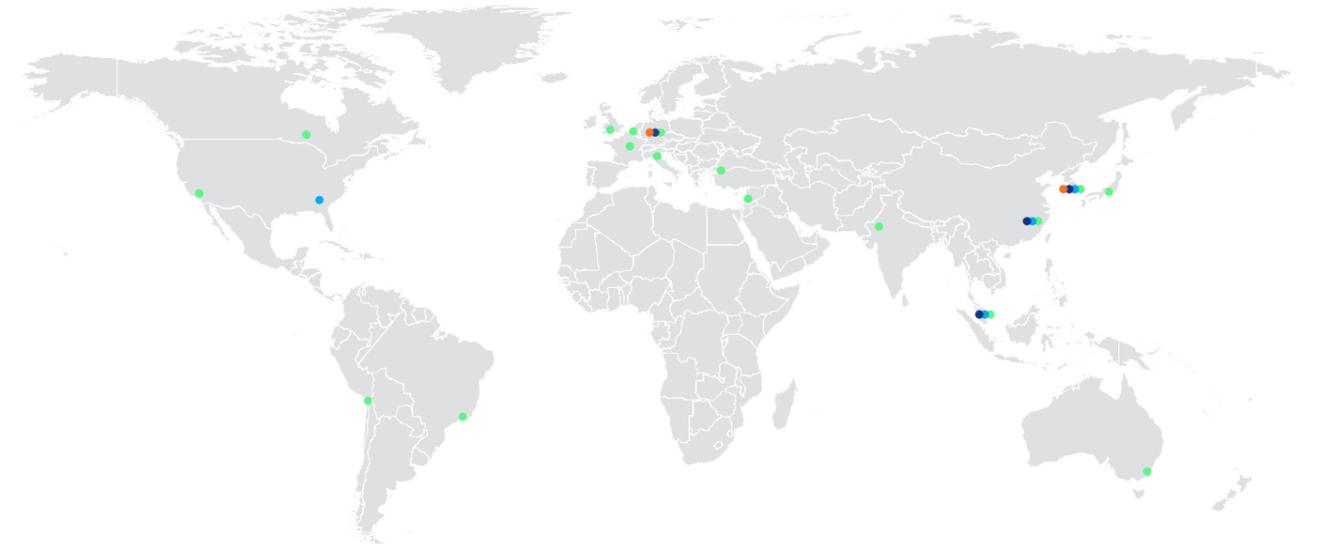
Part 2. Q.TRON SMART P. 10-17

Part 3. Q.OMMAND P. 18-25

Part 4. Q.HOME+ ESS HYB-G3 P. 26-29



World Presence



We Value Long-term Partnership

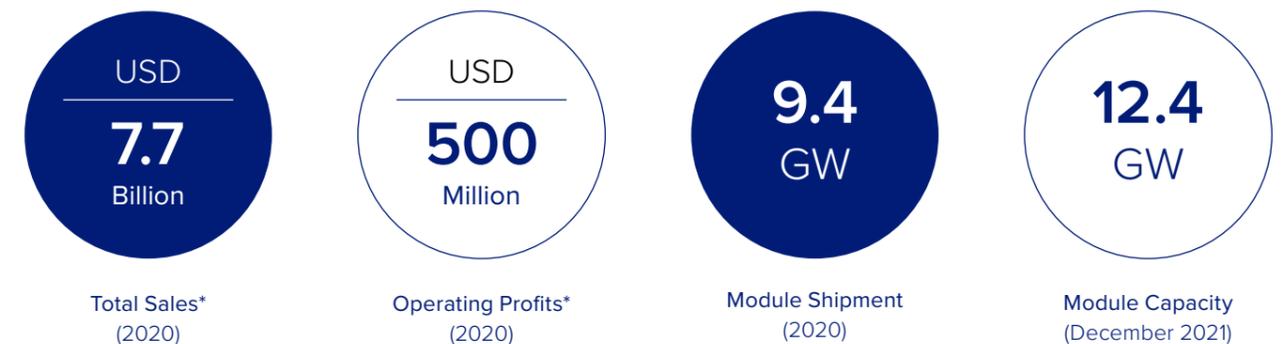
Qcells is a renowned complete energy solutions provider in solar cells and modules, energy storage solutions, downstream project business, and distributed energy solutions business. It is headquartered in Seoul, South Korea and Thalheim, Germany with four global R&D centres and diverse international manufacturing facilities in the U.S., South Korea, Malaysia and China.

Qcells has a strong heritage that dates back to its foundation in Germany in 1999, when it began as a true pioneer of advanced solar cell technology. Since then, Qcells quickly became one of the solar industry's leaders for its technology innovations.

As an affiliate of Hanwha Group, a Fortune Global 500 company and the seventh largest conglomerate in South Korea with total assets over \$197 billion, Qcells is both a trusted and bankable renewable energy partner for our customers worldwide.

In addition to our Tier 1 Bloomberg rating and recognition as a BNEF Top Tier module supplier, our module production capacity of 12.4 GW makes us one of the largest solar solutions providers in the world.

Facts & Figures



*Financial figures of Hanwha Solutions Corporation, the mother company of Qcells
 *Exchange rate: 1 USD = 1,191 KRW

Qcells Complete Energy Solutions

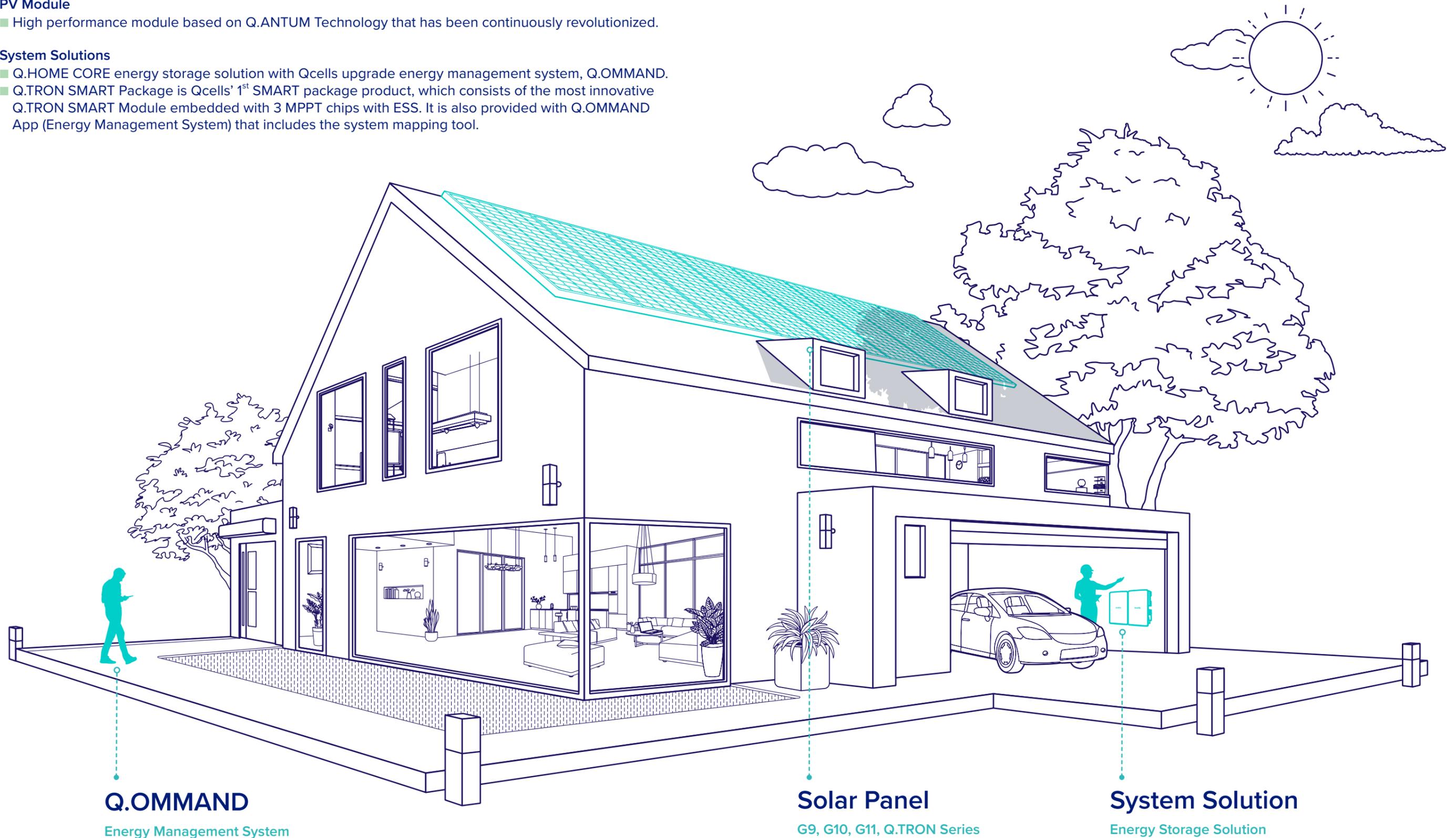
PV Module

■ High performance module based on Q.ANTUM Technology that has been continuously revolutionized.

System Solutions

■ Q.HOME CORE energy storage solution with Qcells upgrade energy management system, Q.OMMAND.

■ Q.TRON SMART Package is Qcells' 1st SMART package product, which consists of the most innovative Q.TRON SMART Module embedded with 3 MPPT chips with ESS. It is also provided with Q.OMMAND App (Energy Management System) that includes the system mapping tool.

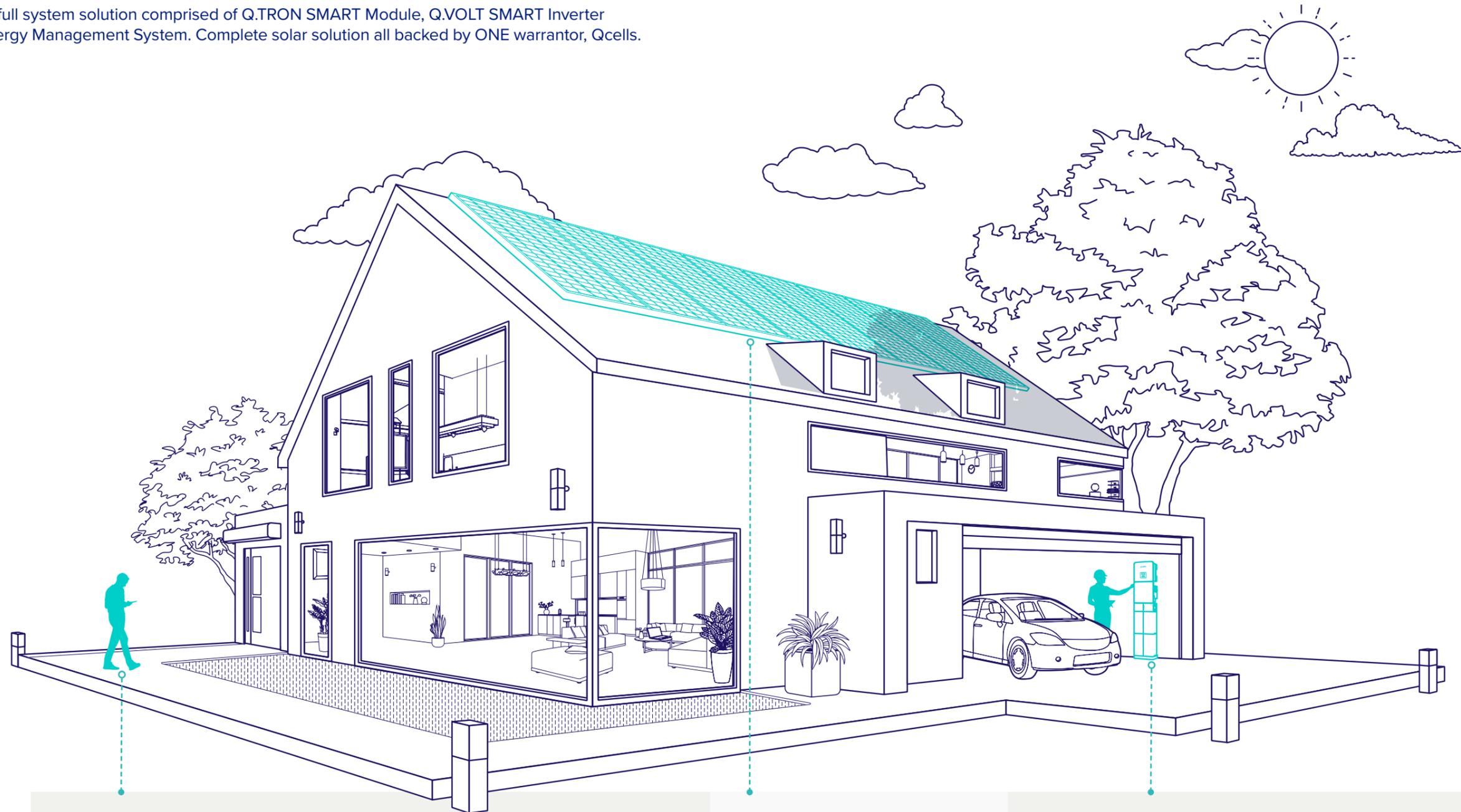


Q.TRON Smart Package

2022 Q.TRON SMART Brochure

One Warrantor Complete System

Qcells introduces 1st full system solution comprised of Q.TRON SMART Module, Q.VOLT SMART Inverter and Q.OMMAND Energy Management System. Complete solar solution all backed by ONE warrantor, Qcells.



Q.OMMAND Energy Management System

1. **Q.OMMAND PRO:** For fast and easy O&M services for installers. Use to register and map the system.
2. **Q.OMMAND HOME:** Real-time module level monitoring and management of the system.
3. **Q.OMMAND GO:** Commissioning energy management system, Q.HOME CORE



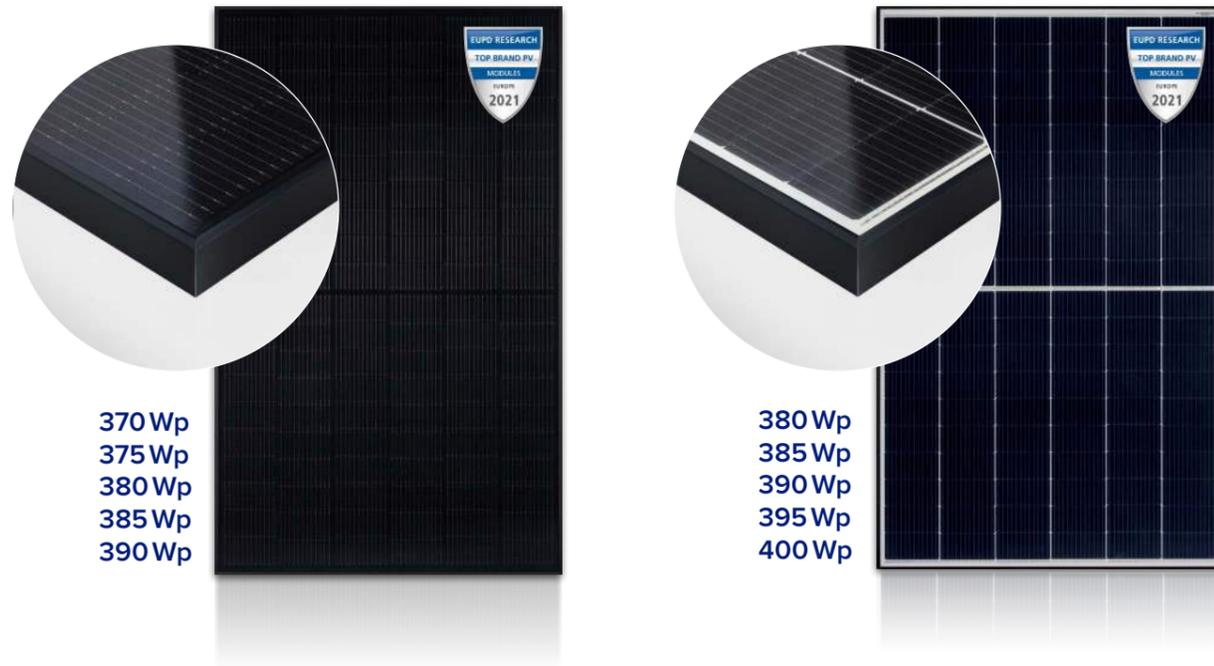
Q.TRON SMART MODULE Home Solar Module

1. Q.ANTUM NEO Technology
2. With 3 built-in MPP trackers
3. Power gain up to 30%
4. Maximum power class 400 WP
5. Module efficiency 22.3%

Q.HOME⁺ ESS HYB-G3 Energy Storage Solution⁺ UPS

1. Scalable storage solution 3.1kWh up to 12.3 kWh
2. Intelligent and modular design for easy and quick installation
3. Remote controllable system with hybrid inverter
4. Lithium-ion battery
5. Backup Power available in the event of a power failure. Consumers can be supplied with a total output of (up to) 15 kW

Specification



3 DC Optimizer Chips for Power Optimization

Q.TRON SMART Module is built-in with 3 solar power optimizers, which will significantly improve power density and efficiency in the event of shading and different orientation. Power optimizers also enables real-time communication and monitoring.

Q.ANTUM NEO N-type Half-cell Technology, Q.ANTUM NEO

Combining N-type technology with Advanced Yield Security and the world's strictest quality testing program QCPV, Q.ANTUM NEO surpasses the performance of conventional N-type products.



25 Year Performance & Product Warranty

With its proven quality, Qcells confidently provides an inclusive 25-year product warranty and 25-year linear performance warranty bringing users peace of mind.

Q.TRON SMART Module based on Ultimate Cell Technology

Q.TRON SMART module power up to 400 Wp is based on Qcells' Zero-Gap Technology and the innovative N-type cell technology called Q.ANTUM NEO. Combining N-type cell technology with Advanced Yield Security and the world's strictest quality testing program QCPV, Q.ANTUM NEO surpasses the performance of conventional N-type products.

This module also contains an integrated DC/DC converter. Voltage limitation will lead to increased output current. The output voltage and current will not exceed its limit respectively.

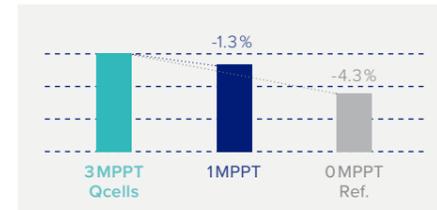
Product Name	Q.TRON SMART BLK-G1+	Q.TRON SMART-G1+
Power Class	370 Wp - 390 Wp	380 Wp - 400 Wp
Efficiency	20.6% - 22%	21.2% - 22.3%
Voltage Limit (VLIM)	35 V	
Current Limit (ILIM)	132.2 A	
Format (including frame)	1717 mm × 1045 mm × 32 mm	
Weight	19.9 kg	
Frame	Black anodized aluminum	
Cell	6 × 20 Q.ANTUM solar half cell	
Junction box IP	Smart junction box: 85-198 mm × 85-102 mm × 22 mm Protection class IP6	
Temperature Coefficient of PMPP	-0.30 %/K	
Snow Load	8100 Pa	
Wind Load	4000 Pa	

*Maximum voltage control by MLPE (installation available up to 27 modules/string)

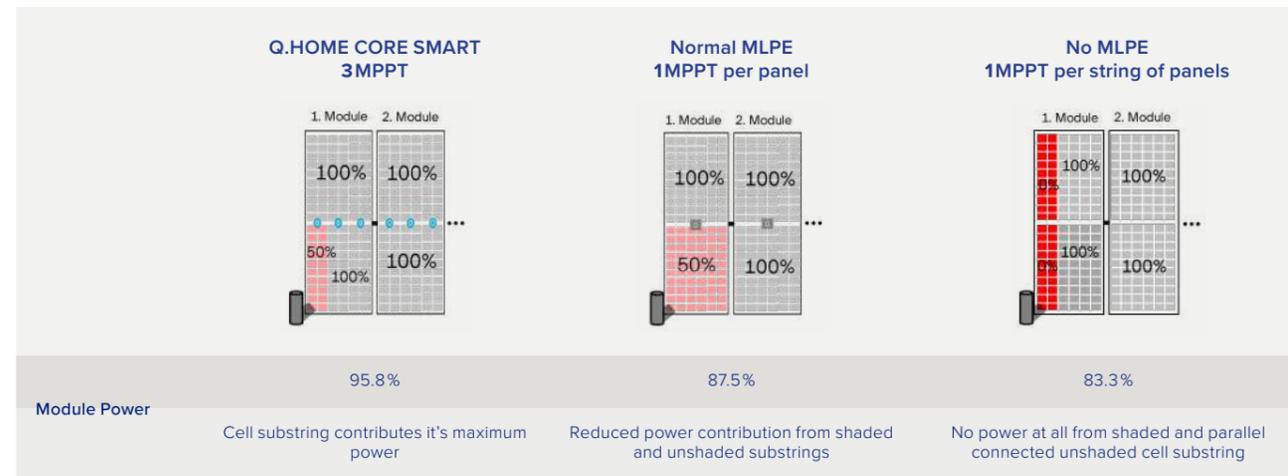


3MPPT - Maximum Power in Shaded Environment

Clouds, leaves, rooftop structure and more can cause shading in solar module. Having not one but 3MPPT provides 5.6% more power output compared to conventional module. It is the perfect choice of module to get most power in shaded environment.



*Shading scenario: One cell substring is shaded by 50%



Single Point of Contact and One Warrantor

To buy and get support for Q.TRON SMART is easy. Contact Qcells to get support for all of the devices of this package. We provide remote diagnostics of installed system and our expertise will visit the site to correct or provide the necessary service.



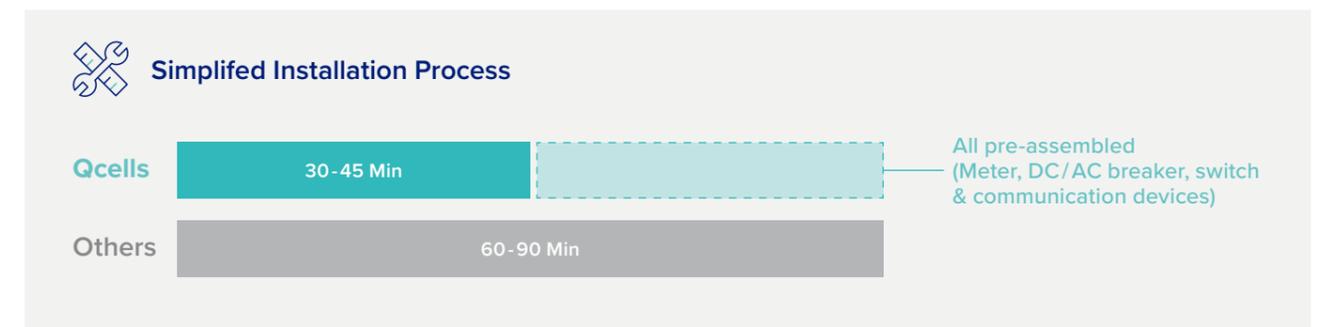
Easy and Flexible Installation

No complex installation and configuration is necessary. Q.TRON SMART is preassembled with 3MPPT and Q.HOME+ ESS HYB-G3 with communication device, so it can be easily installed and put into operation. When using this package, Installers don't have to worry about selecting the type of module model or look for the right type of MLPE. Distributed MPPT also enables flexible roof-top PV design. Simply design and install the system like normal Solar Panel.

Pre-installed MLPE and Communication Device

MLPE embedded in J-Box already, no additional installation process for MLPE

Q.HOME+ ESS HYB-G3 compatible, no additional effort for MLPE



Q.OMMAND

2022 Q.TRON SMART Brochure

Energy Management System

Q.OMMAND is Qcells' Energy Management System that consists of 3 Apps to support installation and module level monitoring. It provides real-time error feedback and performance assessment to keep the system at optimum state.



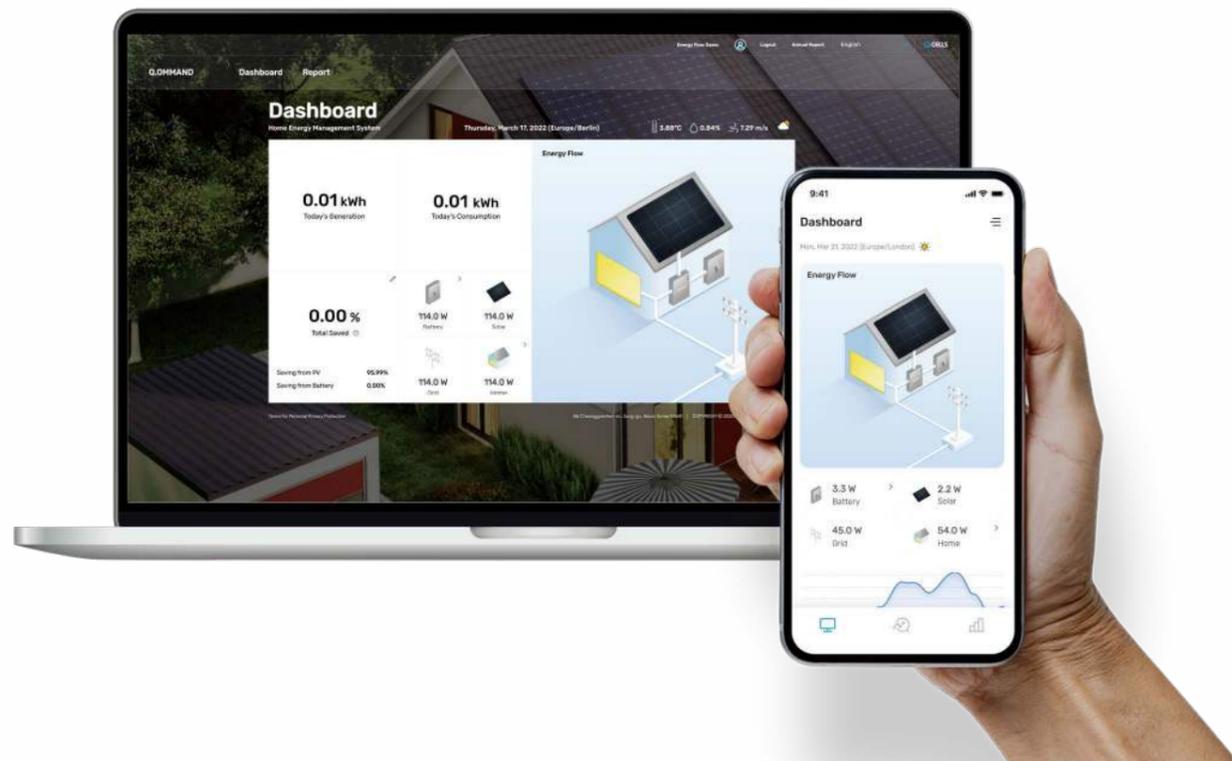
Installers Remote System O&M
Q.OMMAND PRO



Homeowners For your energy management
Q.OMMAND HOME

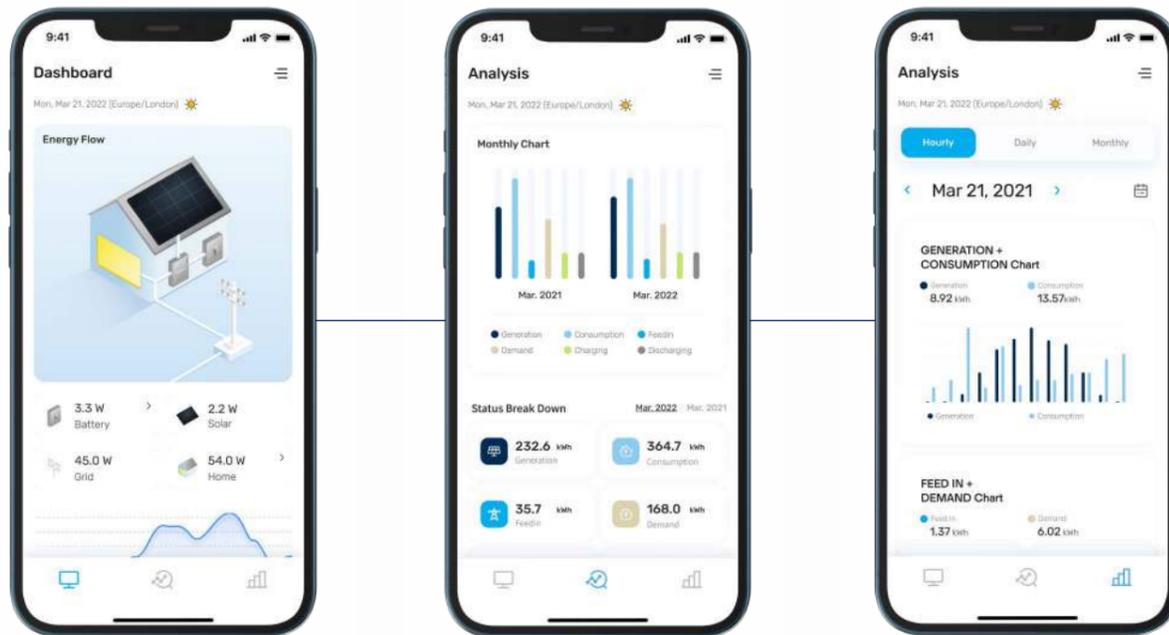


Commissioning For easy & quick installation
Q.OMMAND GO



Q.OMMAND HOME For Homeowners

For monitoring and managing energy generation, storage, and usage anytime, anywhere.



Real-Time Energy Flow

Real-time updated every three seconds.

Regular Report

Monthly, daily, and hourly reporting available.

Notifications

Provide energy overview, battery performance, usage data, and customised alerts and more.

Smart Functions

Q.OMMAND Home provides three smart functions as below.

 **Dynamic Optimiser**
Maximized Energy Yield

Qcells advanced AI algorithm incorporates weather information with real-time data from your solar modules and energy storage system to maximize energy usage and generation.

 **Energy Backup**
Blackout Precaution

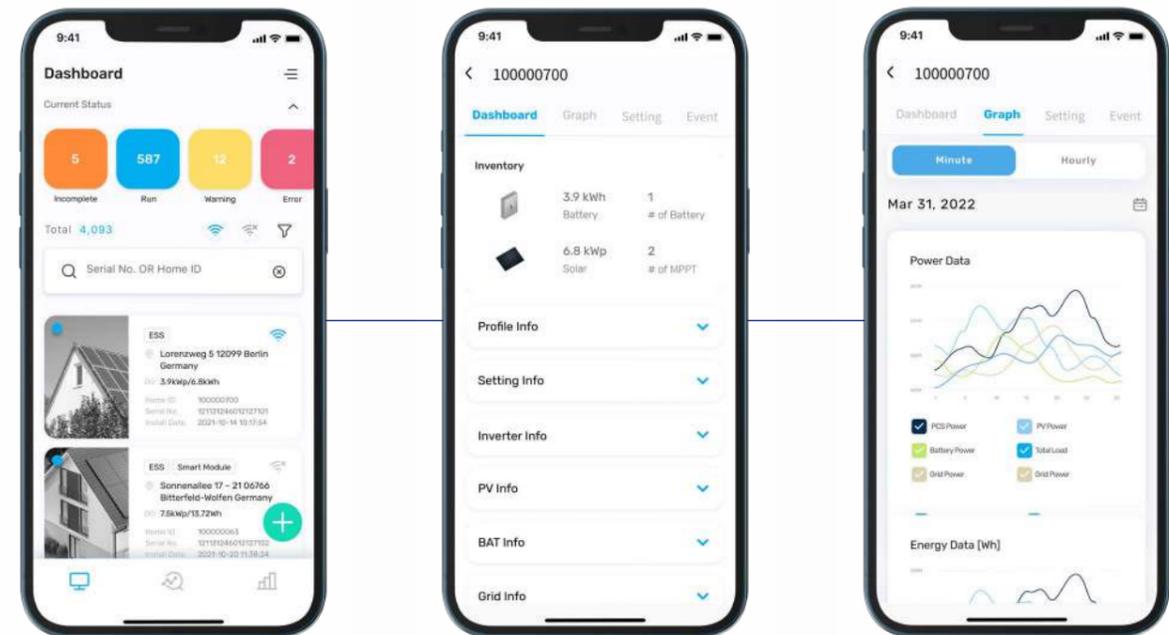
In case of blackout, you can set the amount of energy your Q.HOME CORE will always store.

 **OTA (Over-The-Air)**
Software Updates

Cloud-based software updates continuously adds new monitoring and management features.

Q.OMMAND PRO For Installers

For fast and easy O&M services.



Dashboard

Installers can check the status of multiple sites at a glance and able to find a particular site through search.

Notifications

Immediately notifies when service or maintenance is required.

Tracking History

Installers can track the history of each site including service history, error messages, replacements and others.

Grouping System

Installers can group the sites by region to easily modify grid code, energy policy, and more.

Q.OMMAND GO For Commissioning

For easy installation of Q.HOME CORE.

1 Network Connection

Simple connection to the network within the house.

2 One-click Update

One-click update to the latest version.

3 Date Setting

Save the date and time of the installation.

4 Device Setting

Initial settings of solar modules, batteries, and meters, including grid code, country and time zone.

Energy Management System



Installers Remote System O&M
Q.OMMAND PRO



Homeowners For your energy management
Q.OMMAND HOME For more Q.OMMAND HOME detail, go to page 34.



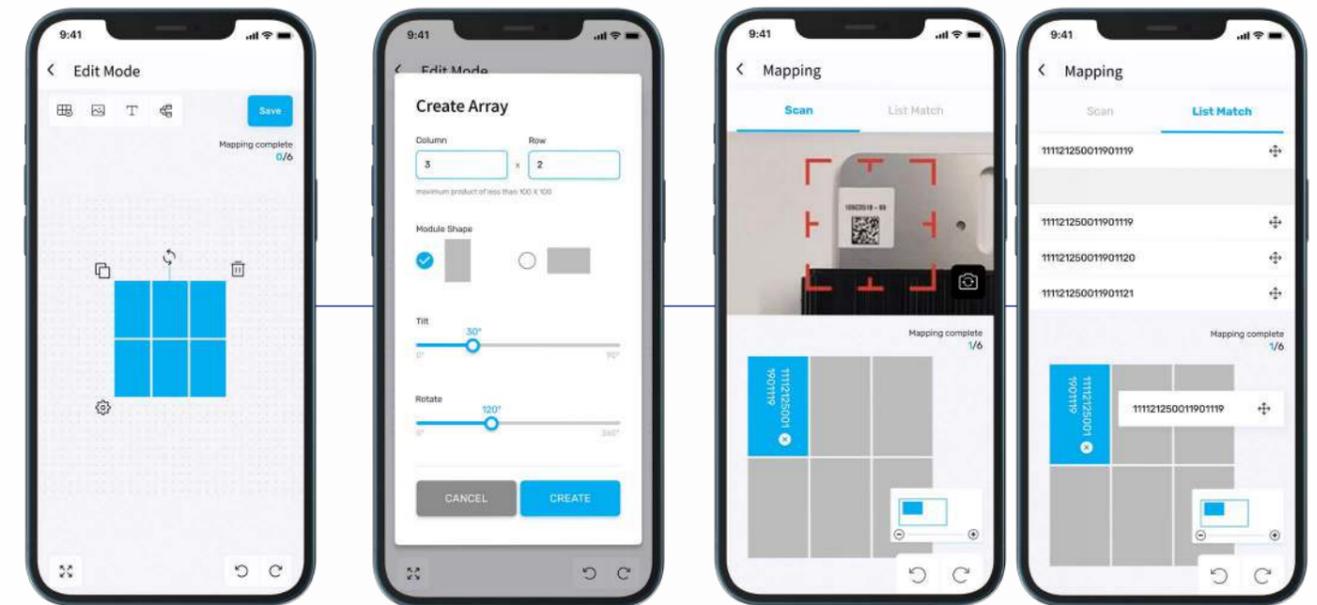
Q.OMMAND PRO For Installers

Start MAPPING the system for Q.TRON SMART modules.

New site registration and system mapping

You can easily register new site and use intuitive mapping application to get a virtual physical layout of the installation for conducting real-time monitoring and diagnostics anywhere at anytime.

For mapping you can scan the QR code or match the module with automatically uploaded serial numbers, creating a complete replica of physical layout.



Dashboard

Installers can check the status of multiple sites at a glance and able to find a particular site through search.

Notifications

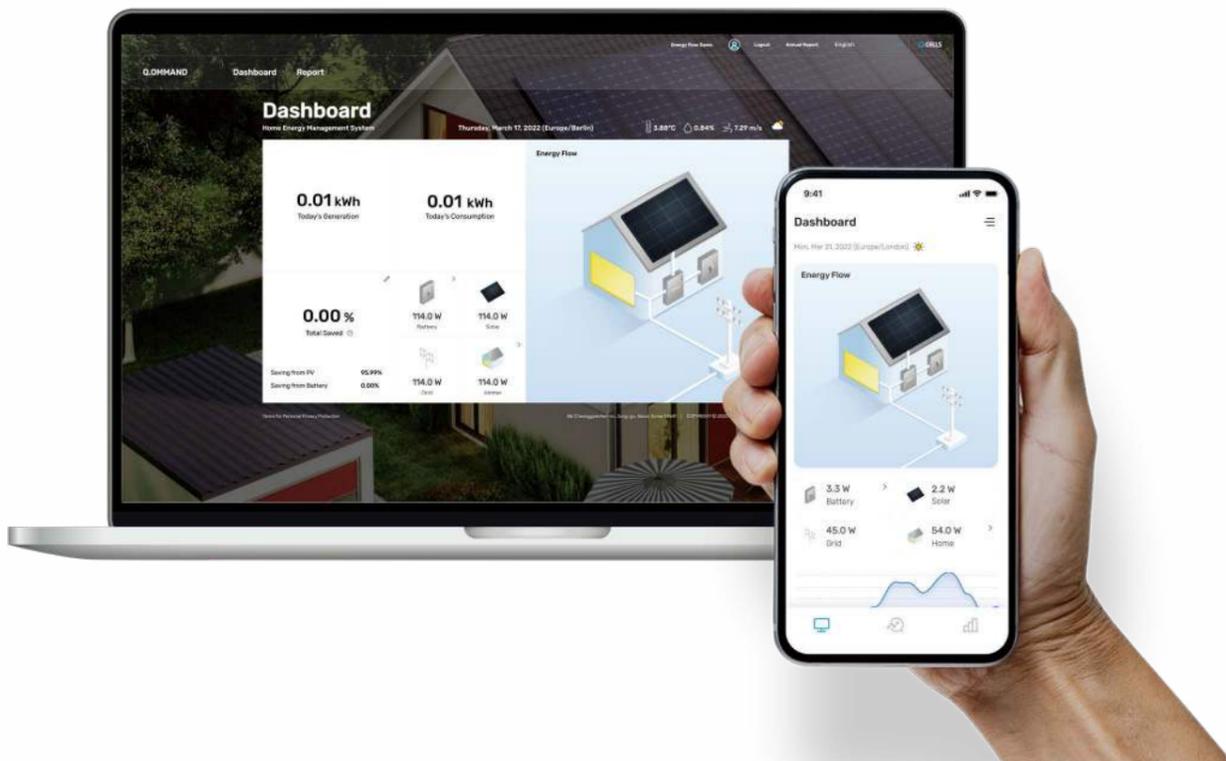
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Installers can group the sites by region to easily modify grid code, energy policy, and more.



Q.HOME+ ESS HYB-G3

2022 Q.TRON SMART Brochure

Solar power storage - the ideal complement

The Q.HOME+ ESS HYB-G3 energy storage system is the ideal solution for private homes. With it, you immediately save electricity costs and trust in long-term operational and yield security.



■ Efficient Utilization of the Self-produced Electricity

Your goal is the best possible use of your solar system with self-generated and affordable solar power. The batteries store surplus electricity that is not currently needed for later consumption. For example, when the sun is not shining and the solar modules cannot generate electricity. The average self-consumption with a solar system is about 25-30 percent. With a battery storage system, you can increase your share up to 75-80 percent.

■ Flexible Design for Any Room Situation



Your benefits at a glance



Narrow design

Intelligent design for easy installation even in small spaces. Even suitable for installation in the garage, where temperatures can be below 0 °C.



Backup power function

When the power grid is off, the PV system and batteries provide power to the loads.



External monitoring

The energy management system is easy to use and provides a very clear overview. With the remote monitoring system, users can monitor their energy production and usage anytime, anywhere.



Longevity

Thanks to a 10-year product warranty, it maintains at least 80% of the original battery capacity after 10 years.



Fast charging

The Q.SAVE-G3 battery can be fully charged after only one hour under favorable conditions.



Qcells