

EQ Tech Energy

Green and Affordable Energy for Everyone



Save Money



Fast charge



No need to add distilled water



Company Profile



Juristic person registration number:

0105562110376

Year of registration: **25 June 2019**

Total number of employees : **47 persons**

Ref. customer: **more than 40**

Licensed: **battery assembly**

Factory Registration No.: **๑3-78(2)-7/57สก**

Standard **ISO 9001:2015**

Certificate Registr. No. **01 100 2335100**

www.tuv.com



ELECTRO-QUANTUM TECHNOLOGY

EQUALITY TECHNOLOGY

The knowledge of electricity and quantum technology is applied to develop our products and solutions in order to provide energy equality for everyone.



More efficient



Affordable price and low maintenance



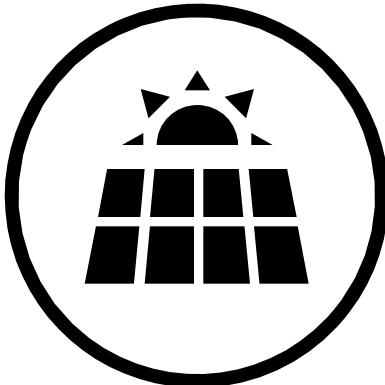
Eco-friendly

Products & Solutions



High-quality lithium-ion batteries developed from research into practical uses.

EQ Tech Energy is expert at designing solutions and developing products to meet individual customer needs.



Solar cell



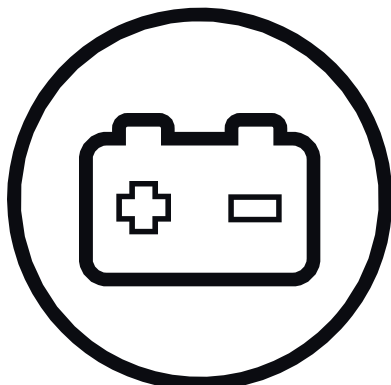
Uninterruptible Power Supply (UPS)



Golf cart



Forklift



Automobile and motorcycle



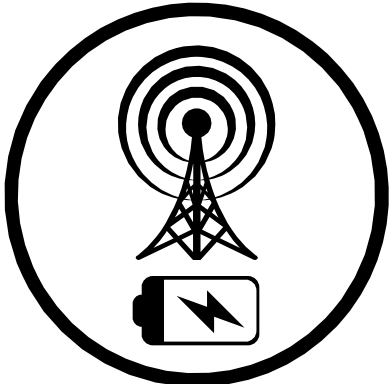
Small electric car



Electric motorcycle



Smart Farming



Energy storage system

Products & Solutions

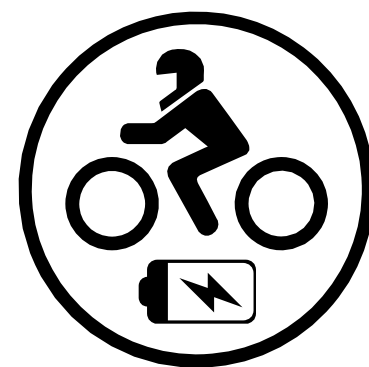
Batteries for vehicles



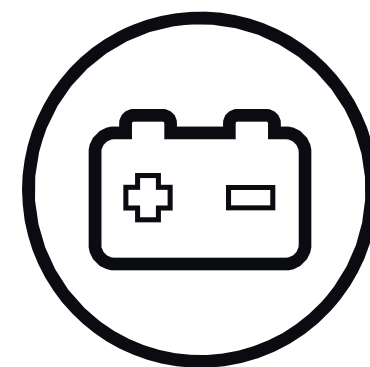
Golf cart



forklift



Electric motorcycle



Automobile and motorcycle



Small electric car



High-quality lithium-ion batteries

- ✓ Adaptable to suit all electric automobiles
- ✓ Long and continuous discharge
- ✓ Provide high electric power and effective uses
- ✓ Last longer than lead acid batteries
- ✓ Eco-friendly



Batteries for **vehicles**

EGAT E-Bike (Project: Bike White Win)

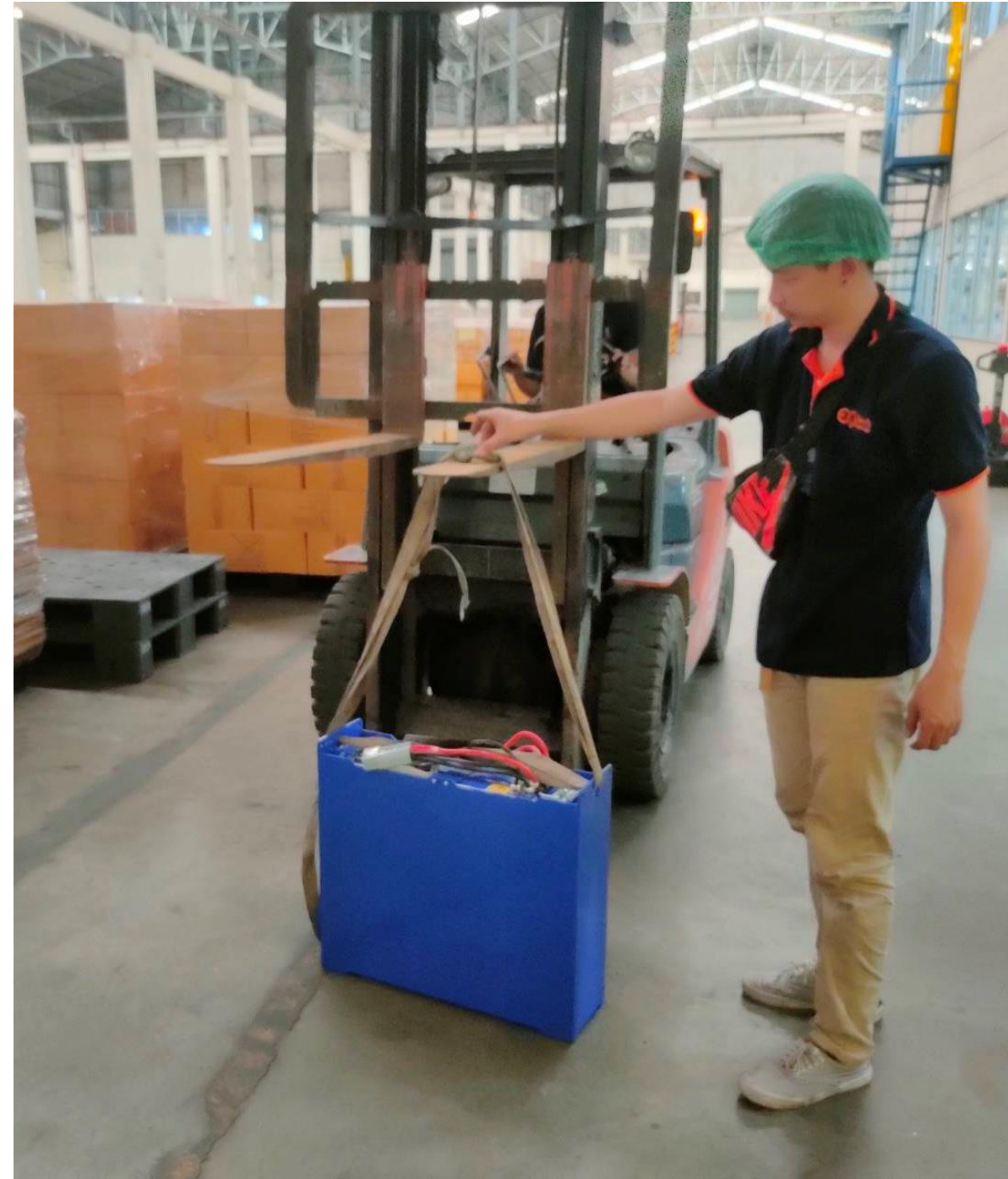
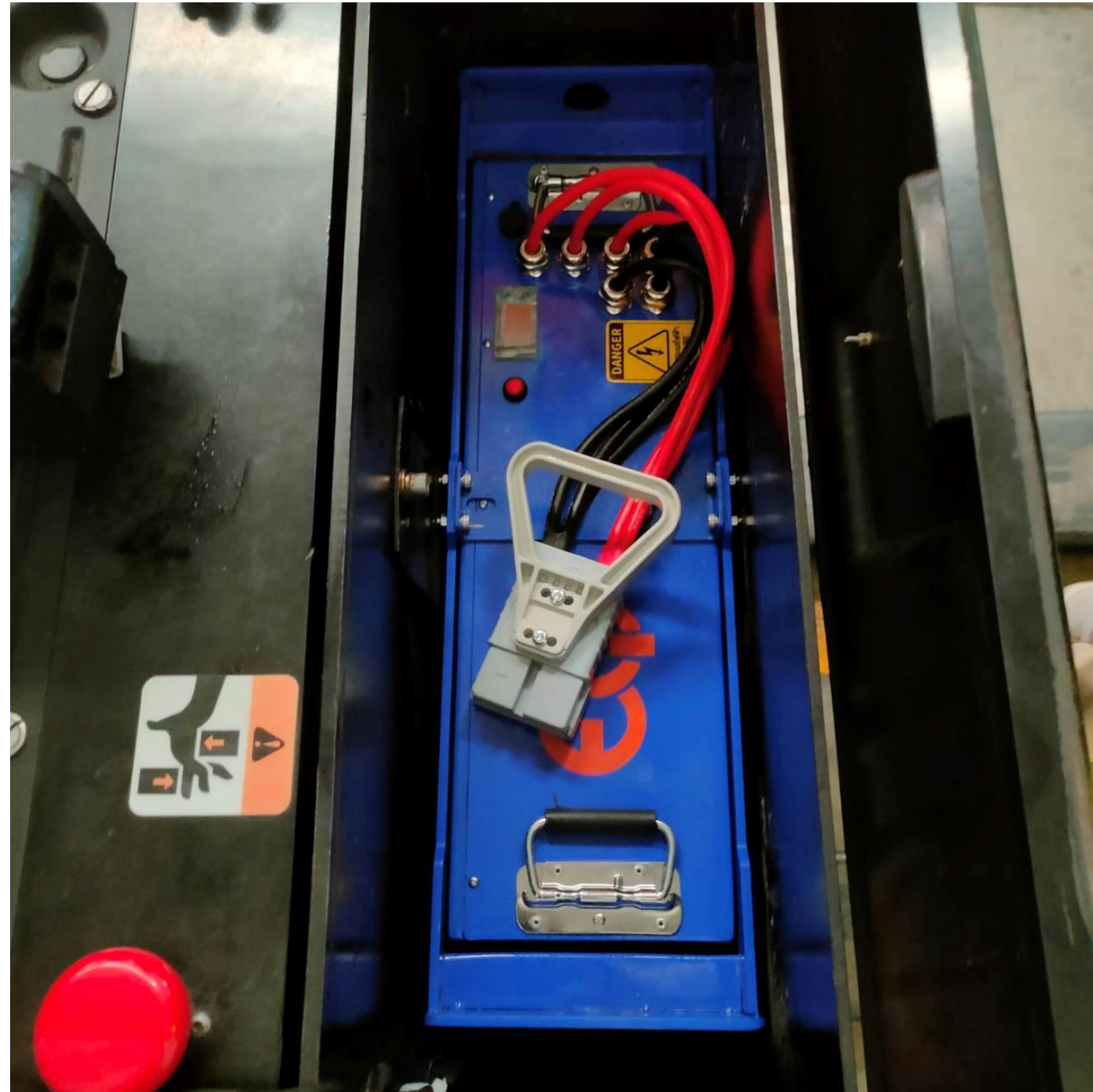


UN Regulation 136

Spec: 72V24.5Ah (NMC)



Batteries for **Electric Forklift**



Specification

FUNCTIONAL SPECIFICATIONS	
Battery Type	Lithium iron phosphate (LFP)
Standard Capacity	160Ah
Nominal Voltage	25.6V
Max. Charge Voltage	29.2V
Cut-off Voltage	20.0V
Standard Charge Current	80A (0.5C)
Quick Charge Current	160A (1C)
Charging Time	About 1.0 - 2.0 hours
Standard Discharge Current	160A (1C)
Max. Discharge Current	480A (3C)
Dimensions (W x H x L)	17.5 X 39.3 X 56.0 cm
Weight (Approx., including case)	30 kg
Charge Method (CC/CV)	0.5(CC), 29.2V cut off
	29.2V (CV), 0.05C cut off
Operating Temperature	Charge 0°C~45°C
	Discharge -20°C~60°C
	Storage -20°C~45°C
Life Cycle	≥3500
Product Standard	IEC 62133
Safety Protections	Smart BMS / Active balancer

LFP 24V160Ah
replace
Lead acid 24V210Ah



Batteries for Electric Forklift



SPEC 51.2V 200Ah

FUNCTIONAL SPECIFICATIONS	
Battery Type	Lithium iron phosphate (LFP)
Standard Capacity	200Ah
Nominal Voltage	51.2V
Max. Charge Voltage	58.4V
Cut-off Voltage	43.2V
Standard Charge Current	100A (0.5C)
Quick Charge Current	200A (1C)
Charging Time	About 1.0 - 2.0 hours
Standard Discharge Current	200A (1C)
Max. Discharge Current	600A (3C)
Charge Method (CC/CV)	0.5(CC), 58.4V cut off
	58.4V (CV), 0.05C cut off
Operating Temperature	Charge 0°C~45°C
	Discharge -20°C~60°C
	Storage -20°C~45°C
Life Cycle	≥3500
Product Standard	IEC 62133
Safety Protections	Smart BMS / Active balancer

Batteries for Mini EV Car



mini EVs



Model: EQ24V40Ah, 50Ah



FUNCTIONAL SPECIFICATIONS	
Battery type	Lithium titanate (LTO)
Standard capacity (1C40A)	40Ah
<u>Minimum Capacity (6C240A)</u>	37Ah
Rated voltage	24V
<u>Max Charge voltage</u>	28V
Cut-off voltage	18V
Standard charge current	40A (1C)
Charging Time	About 1.0 hours
Max Continuous discharge current	100A (2.5C)
Peak discharge current	400A (10C)
Diameter	40.0 X 25.0 X 22.0 cm
Weight (<u>Approx.including case</u>)	12.5 kg
Charge method (CC/CV)	1C (CC), 28V cut off
	28V (CV), 1C cut off
Operate temperature	Charge 0°C~45°C
	Discharge -50°C~65°C
	Storage 0°C~45°C
Safety protections	Smart BMS / Active balancer
Life cycle	> 20000

Golf carts

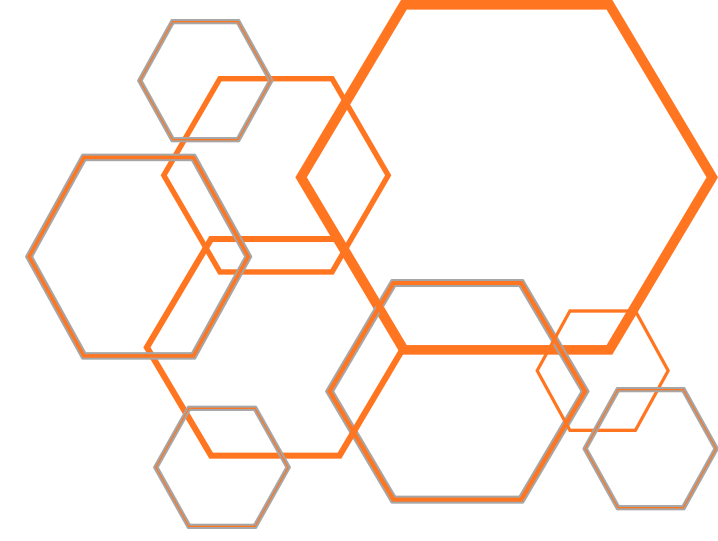


Model: EQ36V80Ah, 48V80Ah

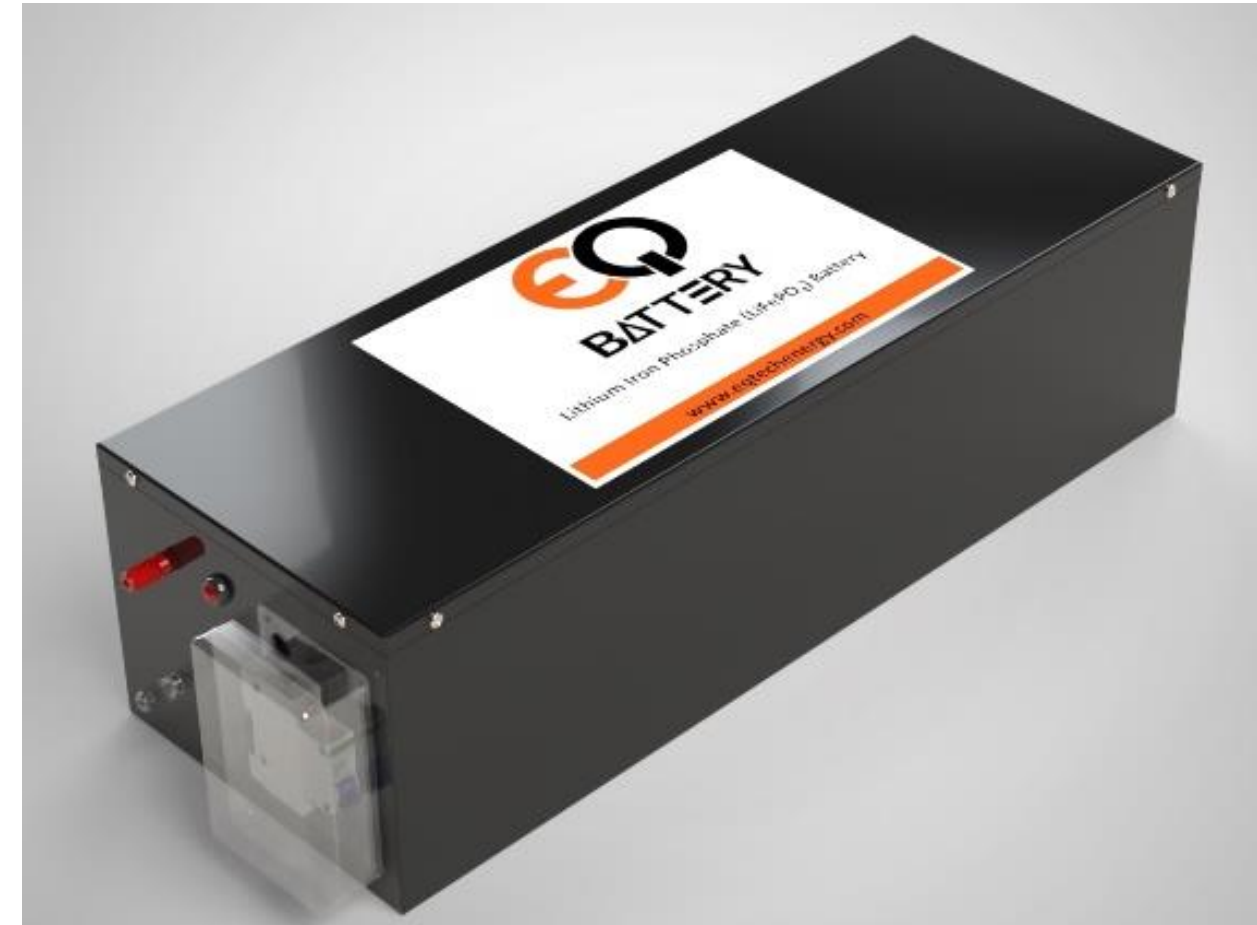


FUNCTIONAL SPECIFICATIONS	
Battery type	Lithium iron phosphate (LFP)
Standard capacity	80Ah
Nominal voltage	51.2V
Max. charge voltage	58.4V
Cut-off voltage	43.2V
Standard charge current	40A (0.5C)
Quick charge current	80A (1C)
Charging time	About 1.0 - 2.0 hours
Standard discharge current	80A (1C)
Max. discharge current	240A (3C)
Dimensions (W x H x L)	23.0 X 16.0 X 80.5 cm
Weight (Approx., including case)	45.7 kg
Charge method (CC/CV)	0.5(CC), 58.4V cut off
	58.4V (CV), 0.05C cut off
Operating temperature	Charge 0°C~45°C
	Discharge -20°C~60°C
	Storage -20°C~45°C
Life cycle	≥3500
Product standard	IEC 62133
Safety protections	Smart BMS / Active balancer

Batteries for Mini EV Car



SPEC 64V 50Ah

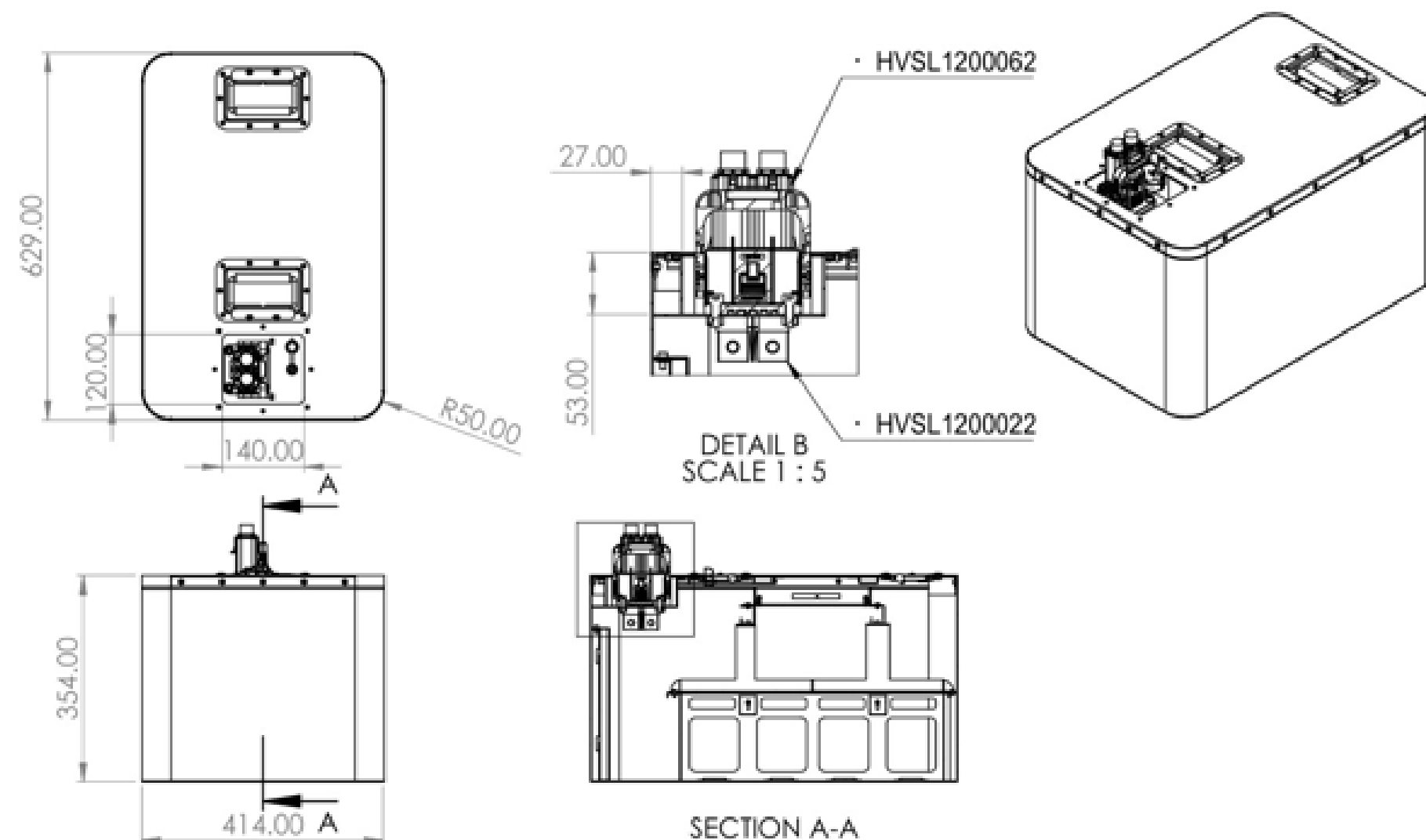


FUNCTIONAL SPECIFICATIONS	
Battery Type	Lithium iron phosphate (LFP)
Standard Capacity	50Ah
Rated Voltage	64.0V
Max. Charge Voltage	73.0V
Cut-off Voltage	40.0V
Standard Charge Current	25A (0.5C)
Charging Time	About 2.0 hours
Max. Continuous Discharge Current	100A (2C)
Peak Discharge Current	150A (3C)
Diameter (L x W x H)	64.0 X 23.0 X 18.0 cm
Weight (Approx.including case)	30 kg
Operating Temperature	Charge 0°C~55°C
	Discharge -30°C~60°C
Charge Method (CC/CV)	1C (CC), 73.0V cut off
	73.0V (CV), 0.05C cut off
Safety Protections	Smart BMS / Active balancer
Life Cycle	2000

Batteries for Mini EV Car



SPEC 73.6V 150Ah

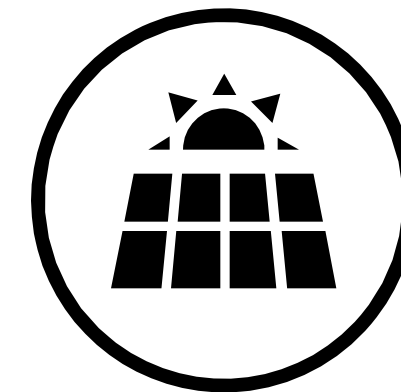


FUNCTIONAL SPECIFICATIONS

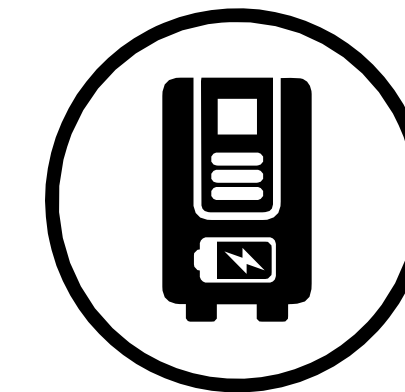
Battery Type	Lithium iron phosphate (LFP)
Standard Capacity	150 Ah
Nominal Voltage	73.6 V
Std. Charge Voltage	79 V
Cut-off Voltage	69 V
Standard Charge Current	75 A (0.5C)
Charging Time	About 2 hour
Max. Cont. Discharge Current	300 A (2C)
Peak Discharge Current (10s)	400 A (2.66C)
Dimensions (W x H x L)	41.4 X 35.4 X 62.9 cm
Weight (Approx., including case)	110 kg
Charge Method (CC/CV)	0.5(CC), 79 V cut off
	79 V (CV), 0.05C cut off
Operating Temperature	Charge 0°C~55°C
	Discharge -20°C~60°C
	Storage -20°C~45°C
Life Cycle (charge 0.5C, discharge 0.5C at 25 °C)	80% of initial capacity at 4,000 cycles
Communication port	CAN (Isolated) (All communication protocols are customizable)

Products & Solutions

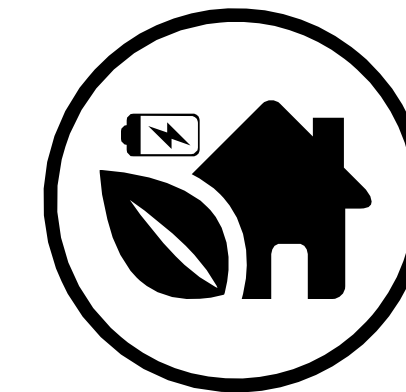
Batteries for electrical energy storage



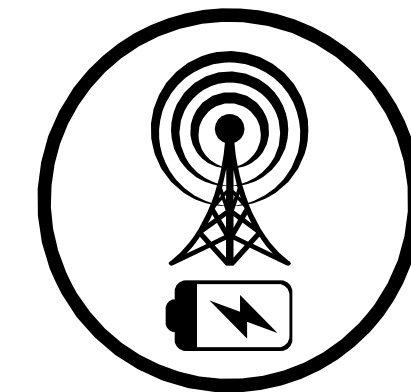
Solar cell



Uninterruptible Power Supply (UPS)



Smart Farming



Communication system

- ✓ Adaptable to suit different backup power devices
- ✓ Suitable for solar energy systems and other energy sources
- ✓ Long and continuous discharge
- ✓ Provide high electric power and effective uses
- ✓ Last longer than lead acid batteries
- ✓ Eco-friendly



BATTERY

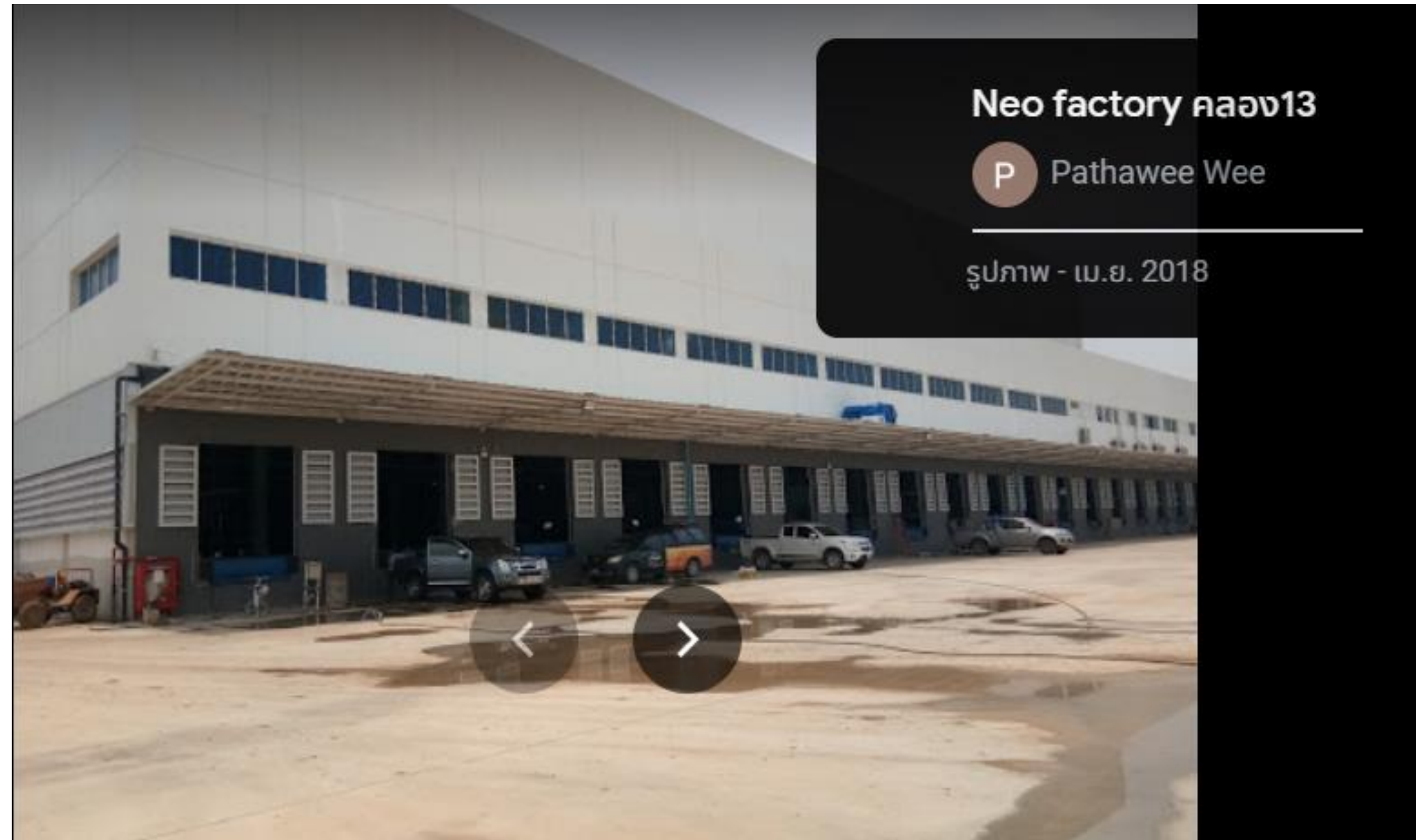
High-quality lithium-ion batteries

High Quality Power



UPS
1 kVA – 400 kVA





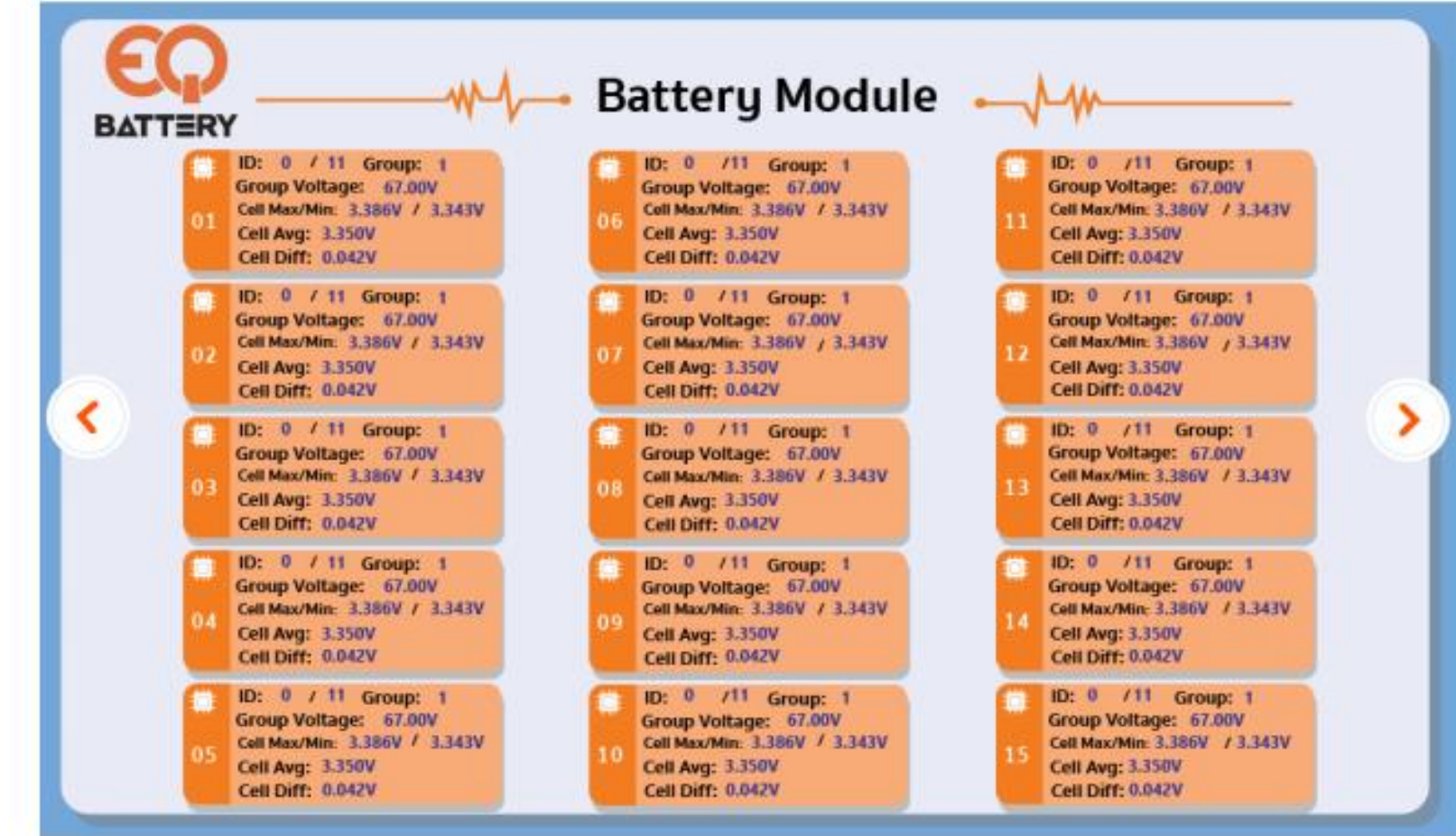
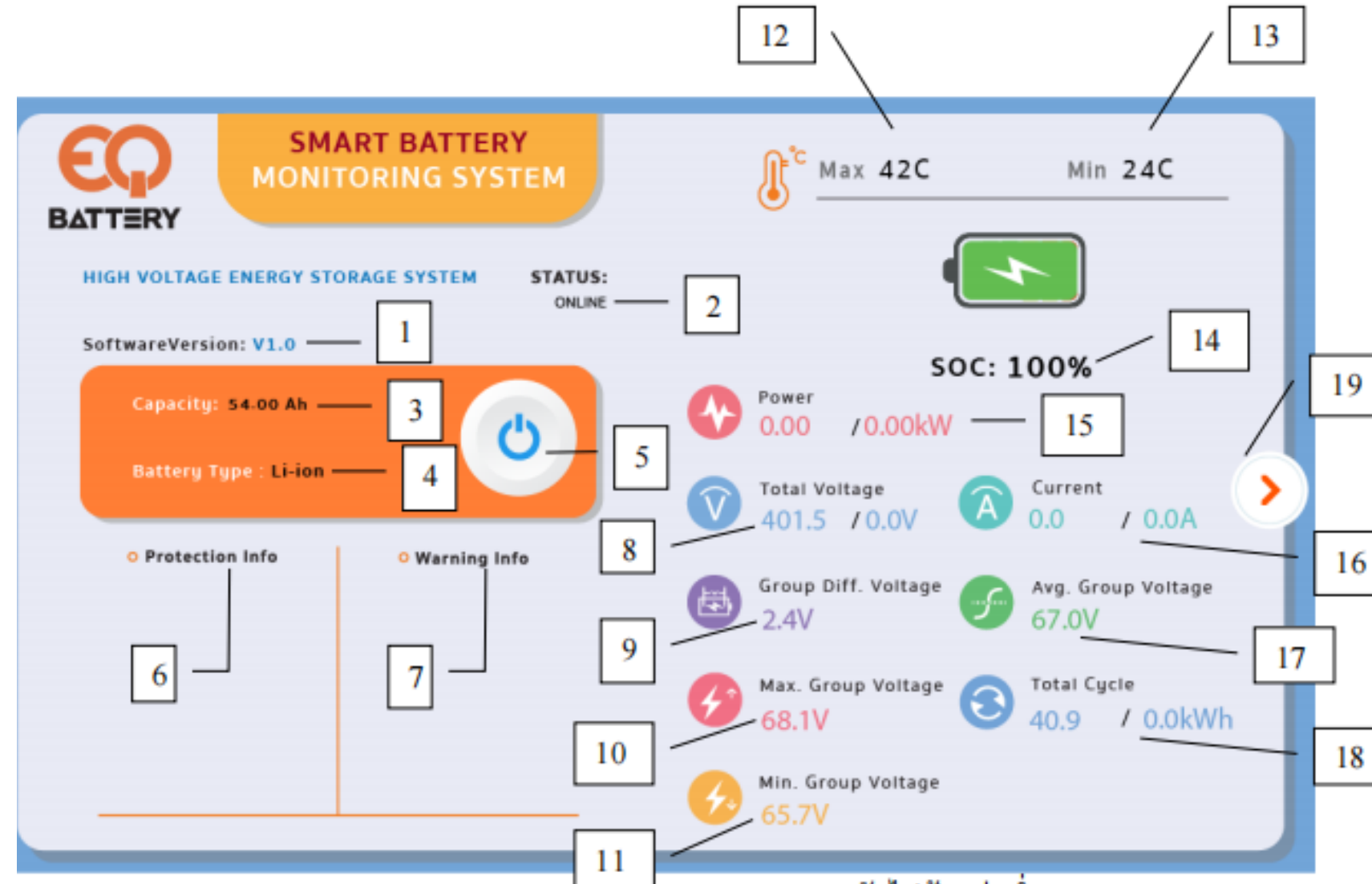
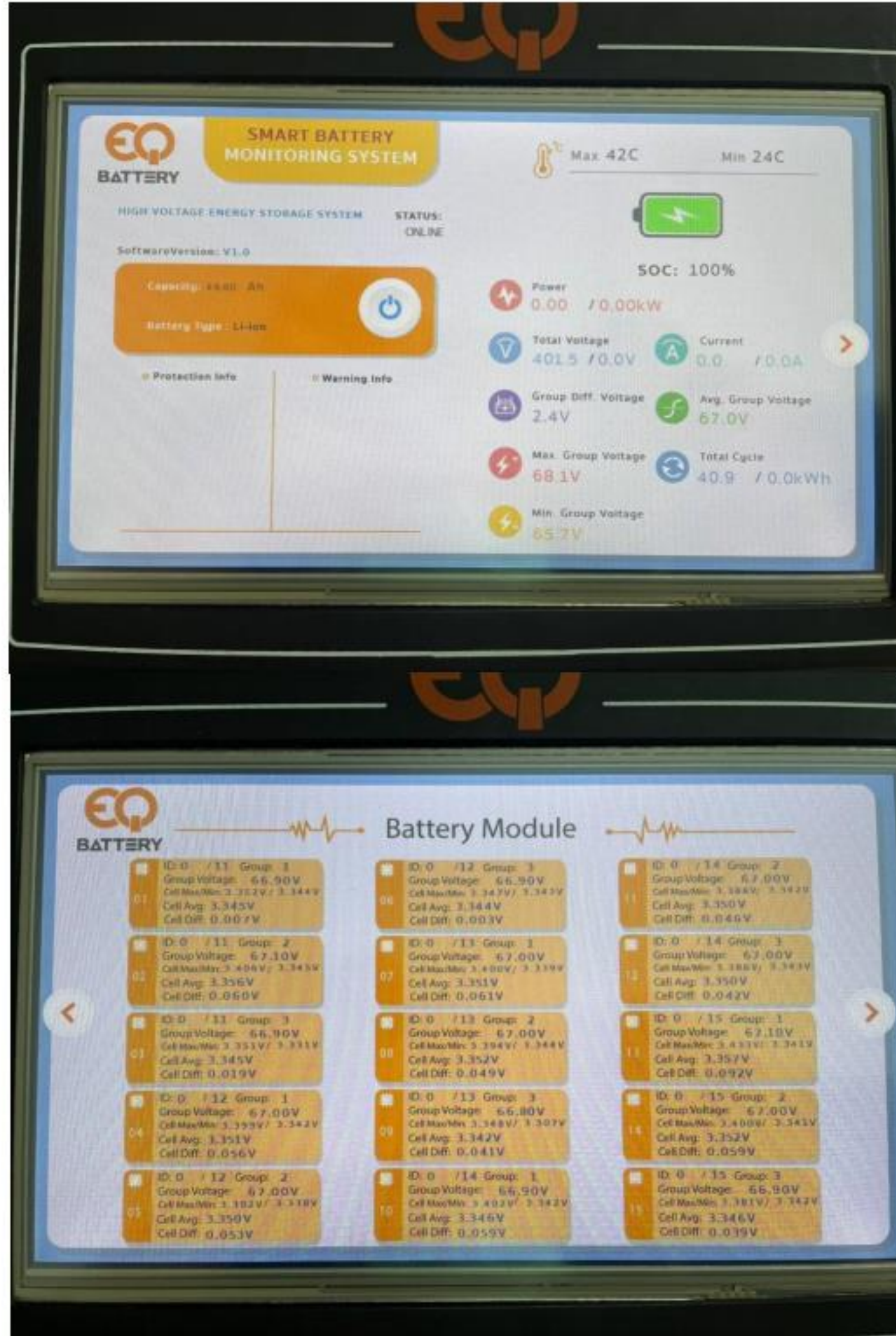
Requirement & Specification

Power: 40, 60, 80, 120 kVA
Voltage of system: 384 - 512V
Backup time: ≥ 5 mins



Monitoring System

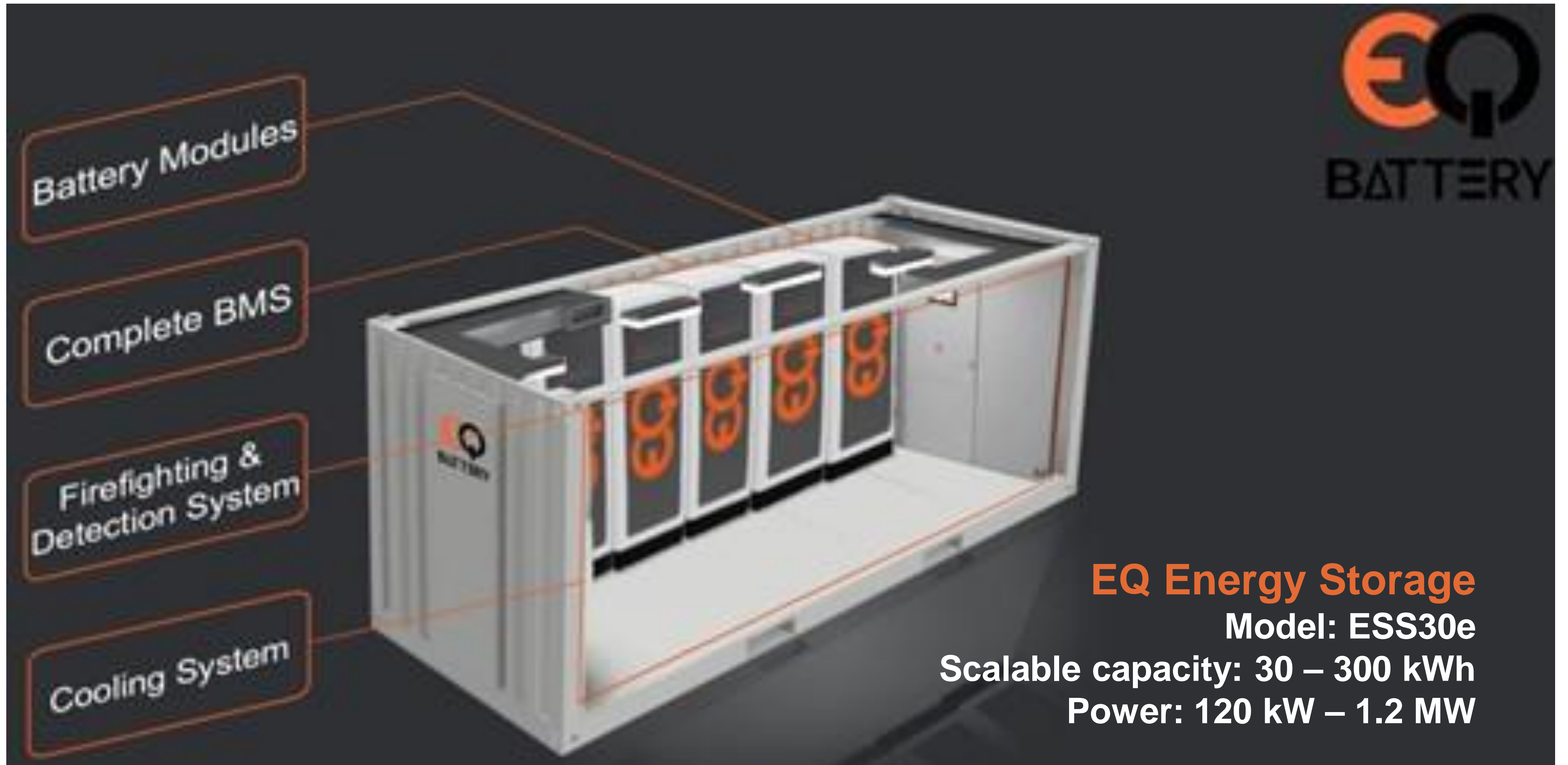
Power: 40, 60, 80, 120 kVA
 Voltage of system: 384 - 512V
 Backup time: ≥ 5 mins



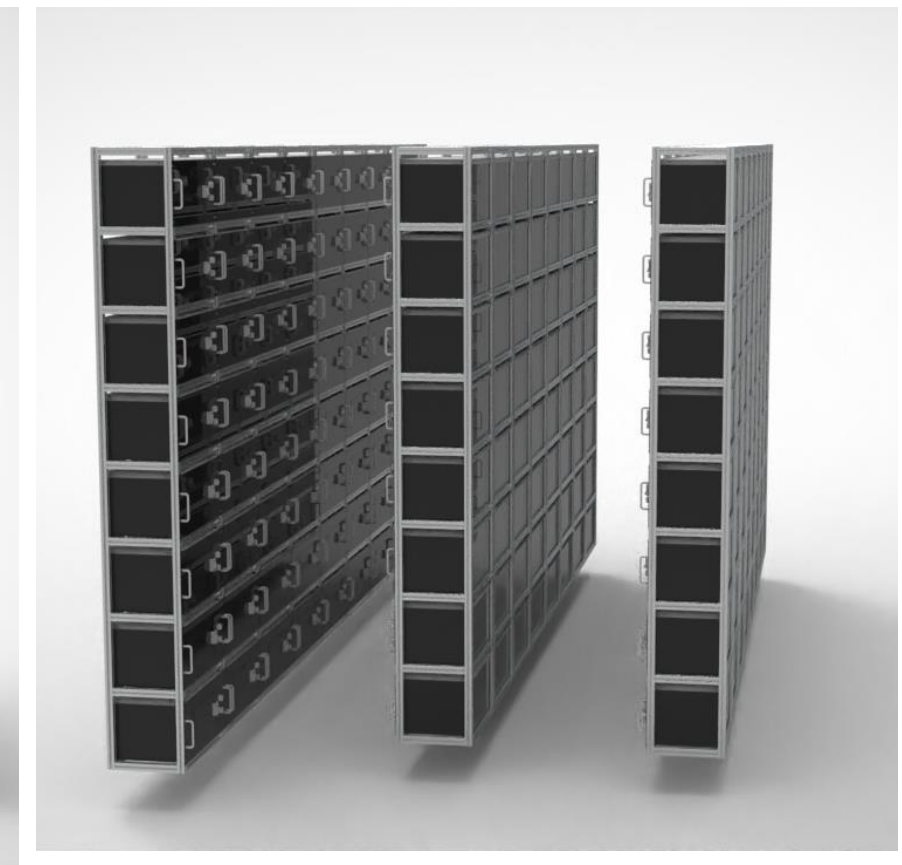
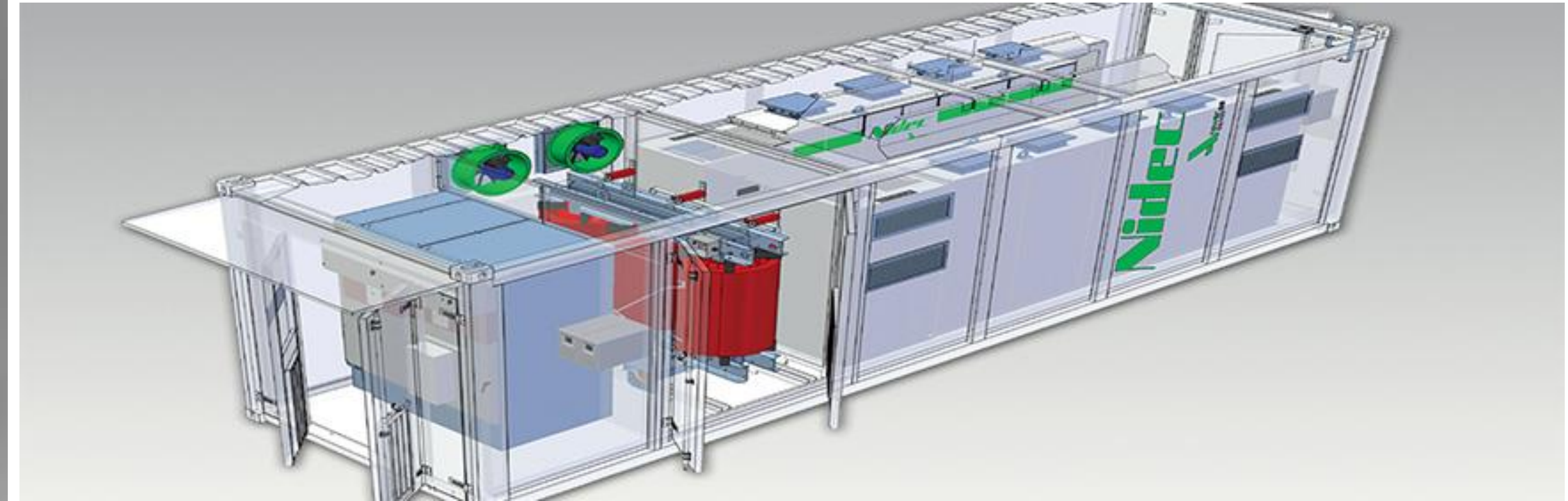
- | | |
|--|---|
| 1. หมายเลขเวอร์ชันซอฟต์แวร์ | 11. แรงดันไฟฟ้ากลุ่มต่ำสุด |
| 2. สถานะการทำงานระบบ | 12. อุณหภูมิสูงสุด |
| 3. ความจุแบตเตอรี่ | 13. อุณหภูมิต่ำสุด |
| 4. ประเภทแบตเตอรี่ | 14. ปริมาณพลังงานคงเหลือ(SoC) |
| 5. ปุ่ม เปิด/ปิด | 15. กำลังไฟฟ้ารวม |
| 6. ข้อมูลการป้องกันระบบ | 16. กระแสไฟฟ้ารวม |
| 7. ข้อมูลการแจ้งเตือนระบบ | 17. แรงดันไฟฟ้ากลุ่มเฉลี่ย |
| 8. แรงดันไฟฟ้ารวม | 18. ปริมาณการใช้พลังงานนับจากออกจาก
โรงงาน |
| 9. ความแตกต่างแรงดันไฟฟ้าสูงสุด-ต่ำสุด | 19. ปุ่มเลื่อนหน้าแสดงผล |
| 10. แรงดันไฟฟ้ากลุ่มสูงสุด | |

- | | |
|-------------------------------------|--|
| 20. หมายเลขแพ็คแบตเตอรี่ | 24. แรงดันไฟฟ้าเซลล์แบตเตอรี่ต่ำสุด |
| 21. หมายเลขกลุ่มแบตเตอรี่ภายในแพ็ค | 25. แรงดันไฟฟ้าเซลล์เฉลี่ย |
| 22. แรงดันไฟฟ้ากลุ่ม | 26. ความแตกต่างแรงดันไฟฟ้าเซลล์
สูงสุด-ต่ำสุด |
| 23. แรงดันไฟฟ้าเซลล์แบตเตอรี่สูงสุด | |

High Quality Power



High Quality Power



EQ Energy Storage

Model: ESS30e

Scalable capacity: 30 – 300 kWh

Power: 120 kW – 1.2 MW

Project Innovation

The difference between what is currently available and new ideas or technology used in the project Energy Storage System

Energy Storage System [ESS]

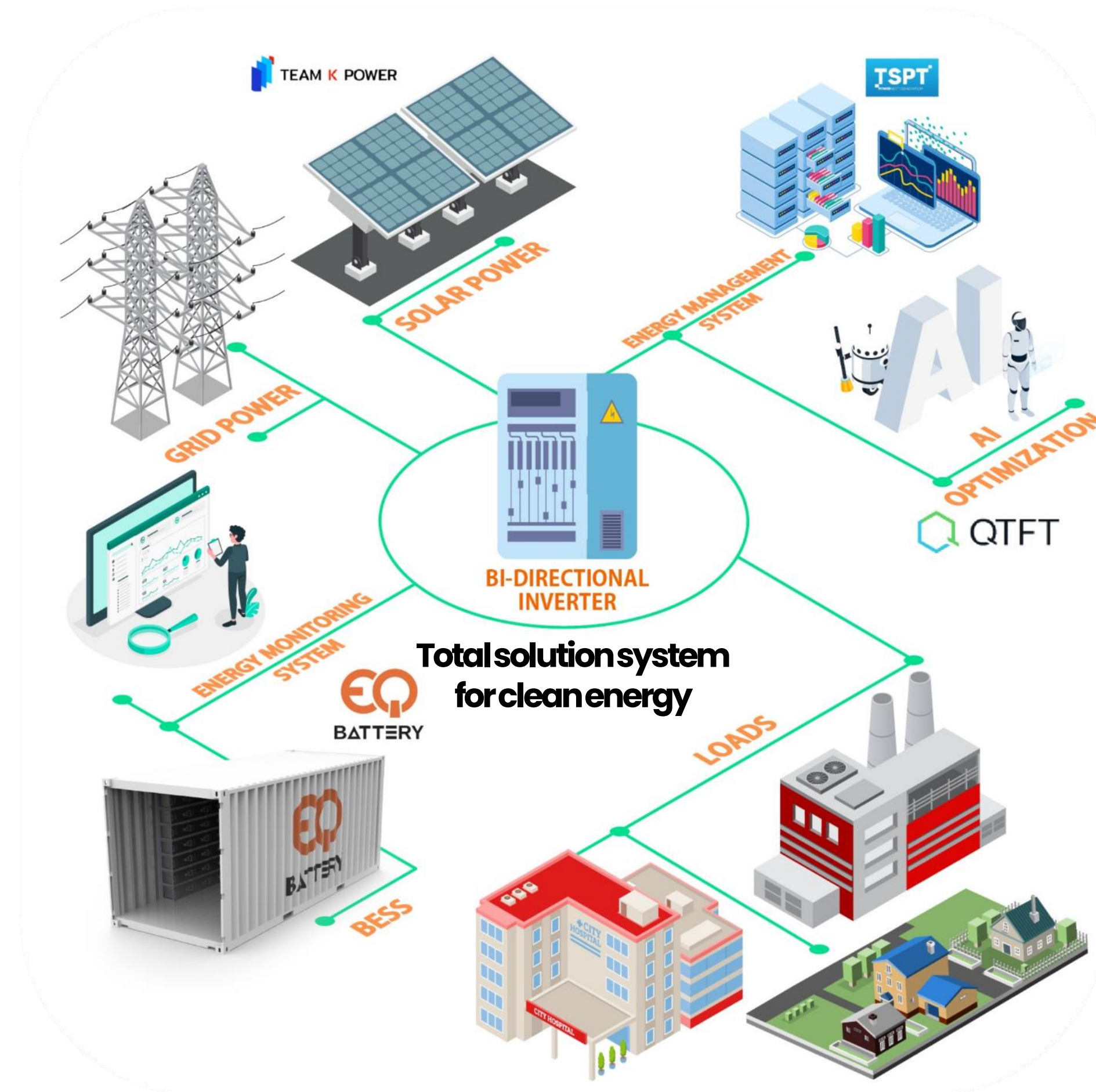
Collaborative usage and communication with grid systems, solar cells, EMS, and Optimization through protocols allow real-time monitoring of operations via the monitoring system.

EMS and Bi-directional inverter

Control electricity generation, the operation of energy storage, and the distribution of electricity to either load or feed power back to the grid.

AI/Optimization

The prediction and processing of electricity-related data from both the grid and solar cell systems, as well as the utilization of energy across different time intervals, enable decision-making and enhance the efficiency of energy storage and distribution. This involves employing a combination of hardware, software, and digital platforms in order to command and control through automated systems

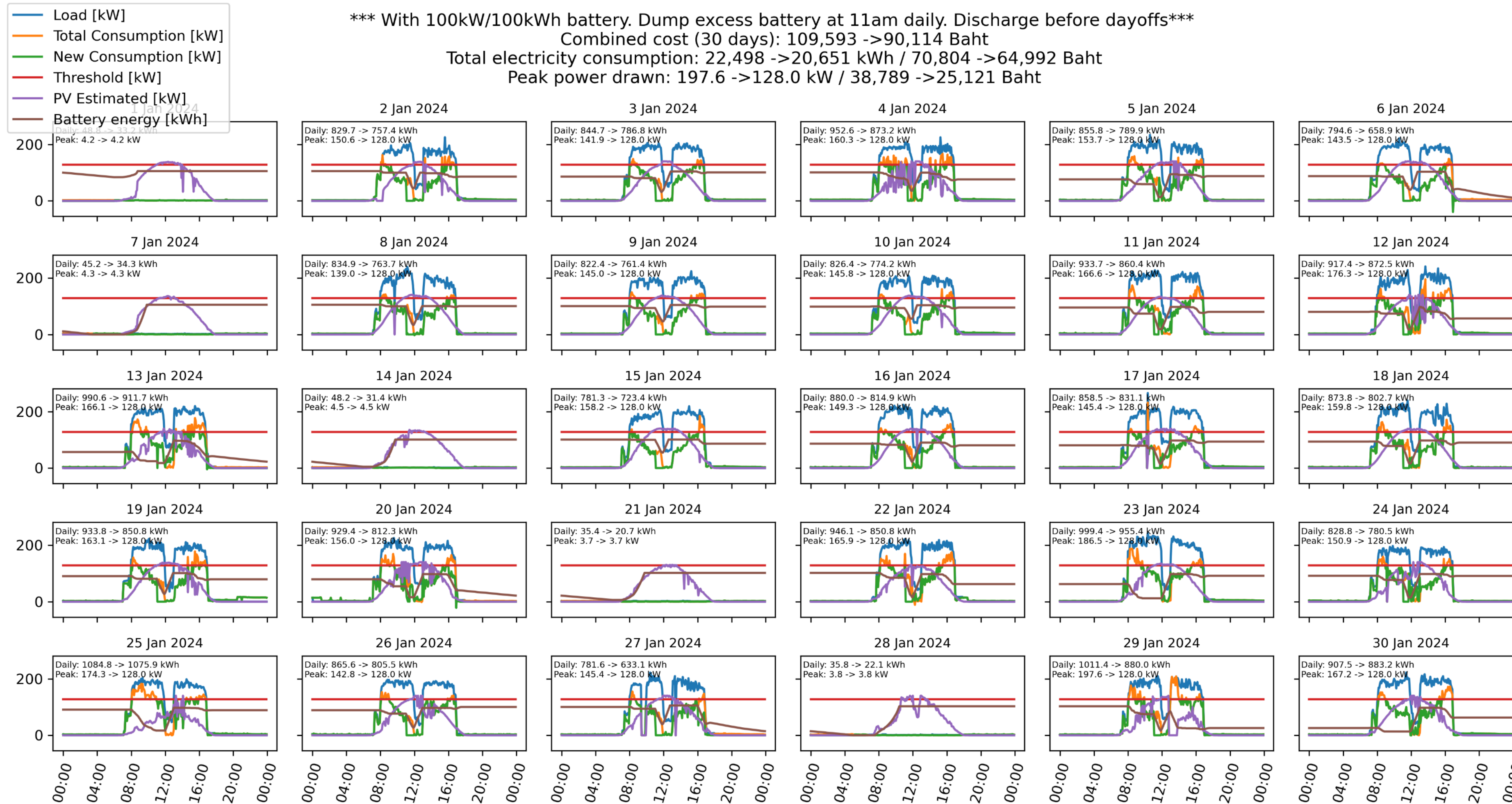


These systems already exist, but they are not yet interconnected. This leads to issues such as errors, downtime, and difficulties in controlling electricity usage. Therefore, in this project, we will integrate various systems together.

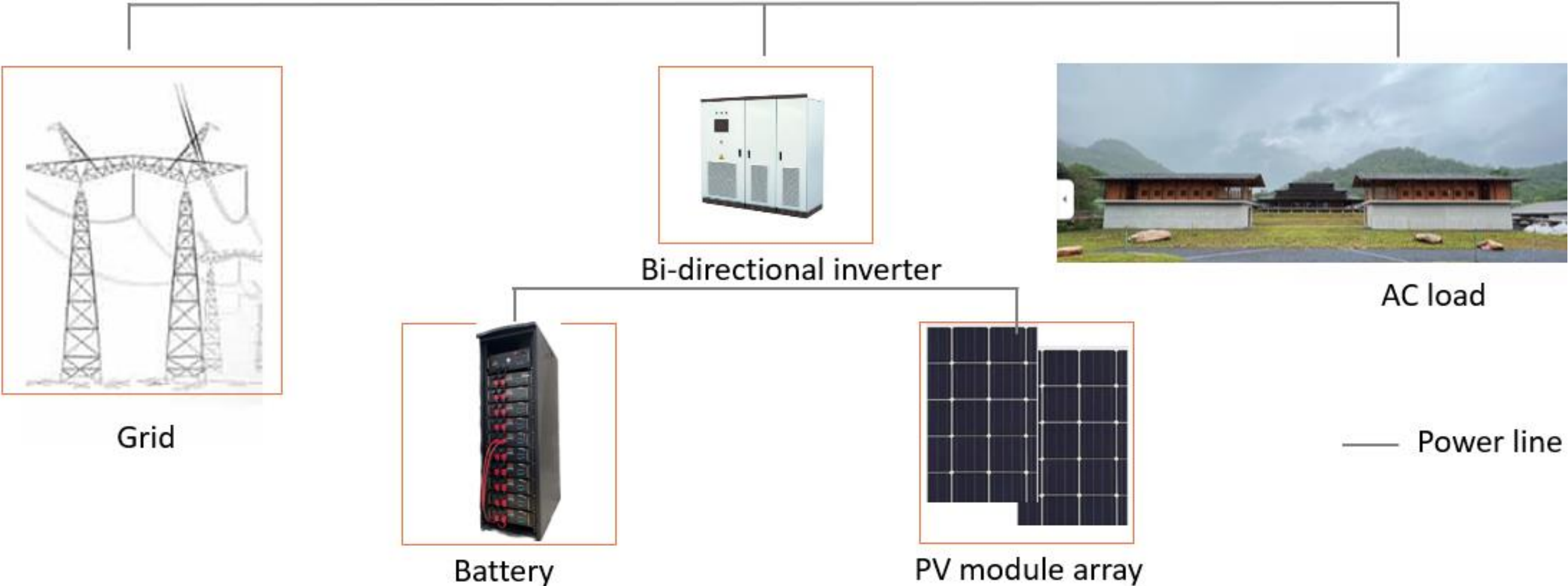
Peak shaving with excess solar power

With good hardware and smart algorithm, we can detect the excess solar and peak power drawn and adjust the battery charging/discharging time to make the best use of available energy and maximally reduce the peak electricity drawn.

With 100kWh battery: -19,417 Baht/month



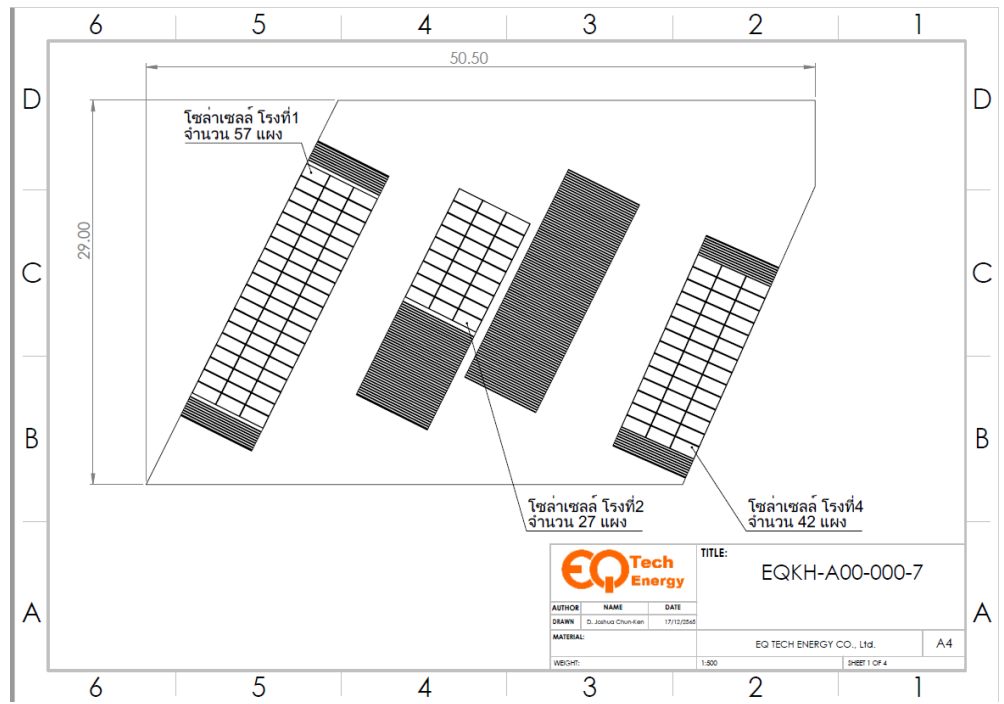
Solar cell and Energy Storage System



ศูนย์วิจัยสทนากกรรมฐานธรรมตโปทา
 ตำบล หมูสี อำเภอปากช่อง นครราชสีมา 30130

Requirement & Specification

- Solar cell: 49 kW
- Inverter: 50 kW (Bi-directional)
- Battery: 40 kWh



Solar cell and Energy Storage System



Requirement & Specification

Solar cell: 1.30 kW
Inverter: 5.00 kW
Battery: 2.11 kWh



ลานกางเต็นท์ลำตะคอง อุทยานแห่งชาติ เขาใหญ่

Requirement & Specification

Solar cell: 6.24 kW
Inverter: 5.00 kW (Bi-directional)
Battery: 8.45 kWh



หน่วยอนุรักษ์ทรัพยากร
อุทยานแห่งชาติ เขาใหญ่

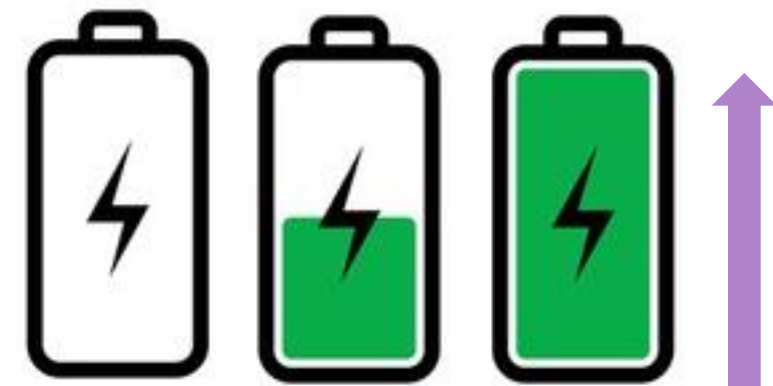
Requirement & Specification

Solar cell: 1.30 kW
Inverter: 5.00 kW
Battery: 2.11 kWh

Our R&D (NEC)

How it works: Quantum state called "negative electronic compressibility" (NEC) and its analogy

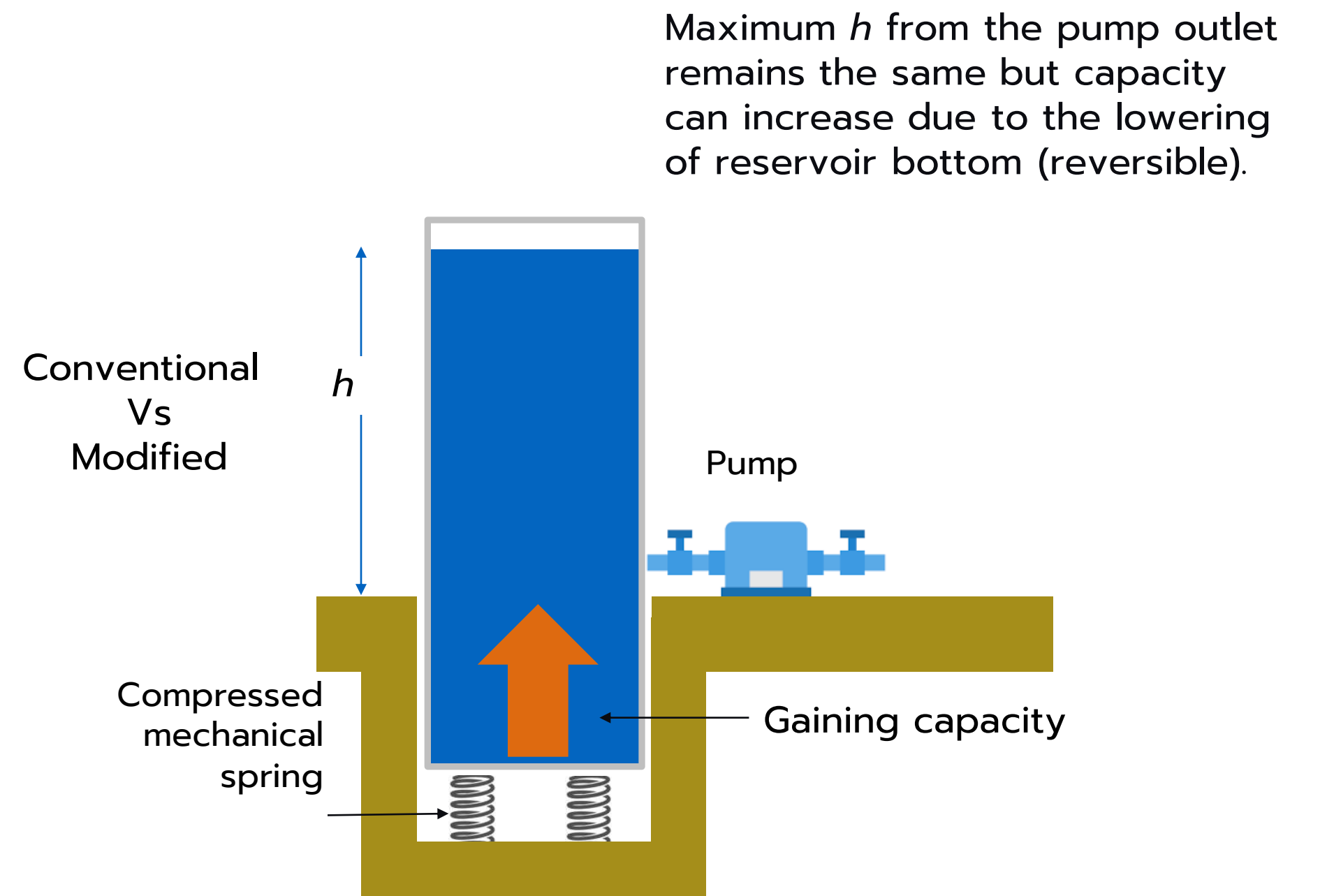
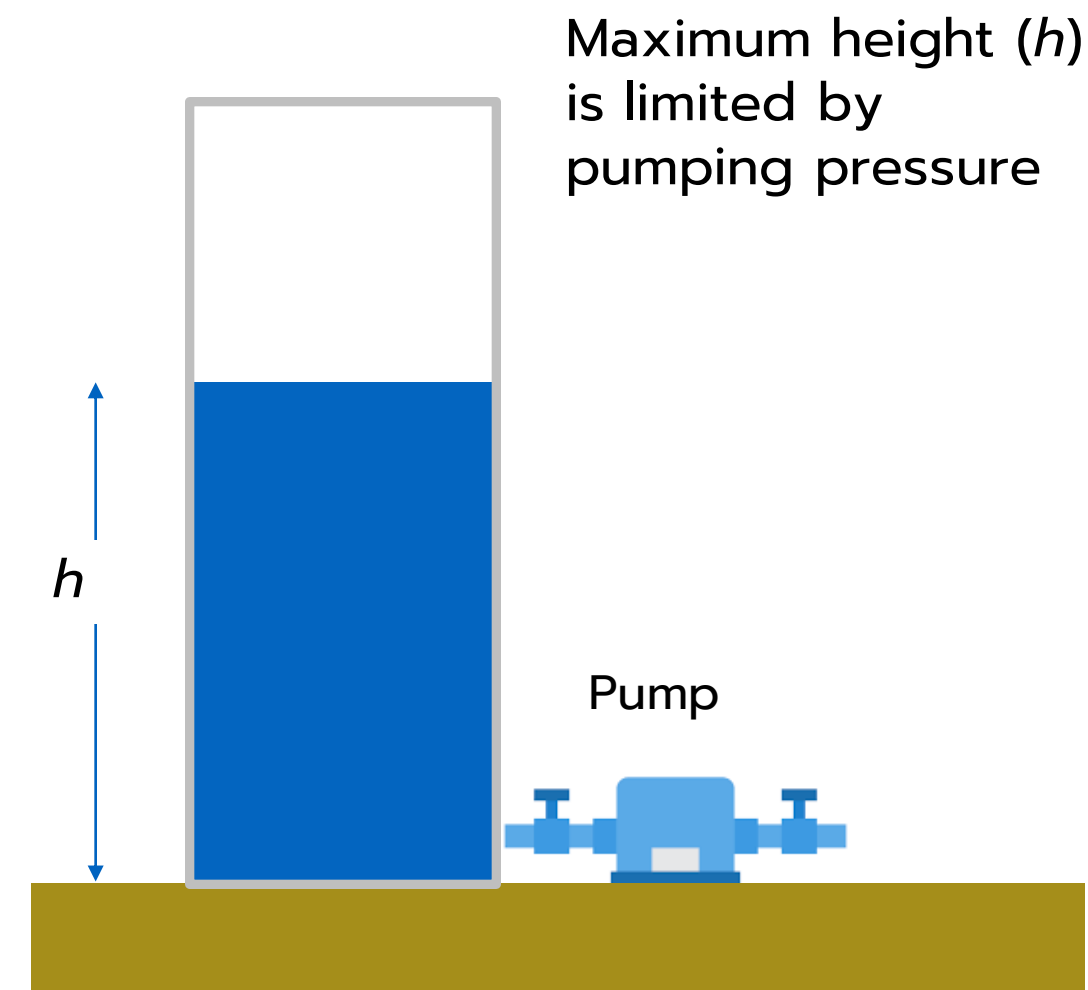
Battery
(chemical energy storage)



Increase in voltage (V)
or chemical potential
during charging



Analogy of NEC using water reservoir
(mechanical energy storage)



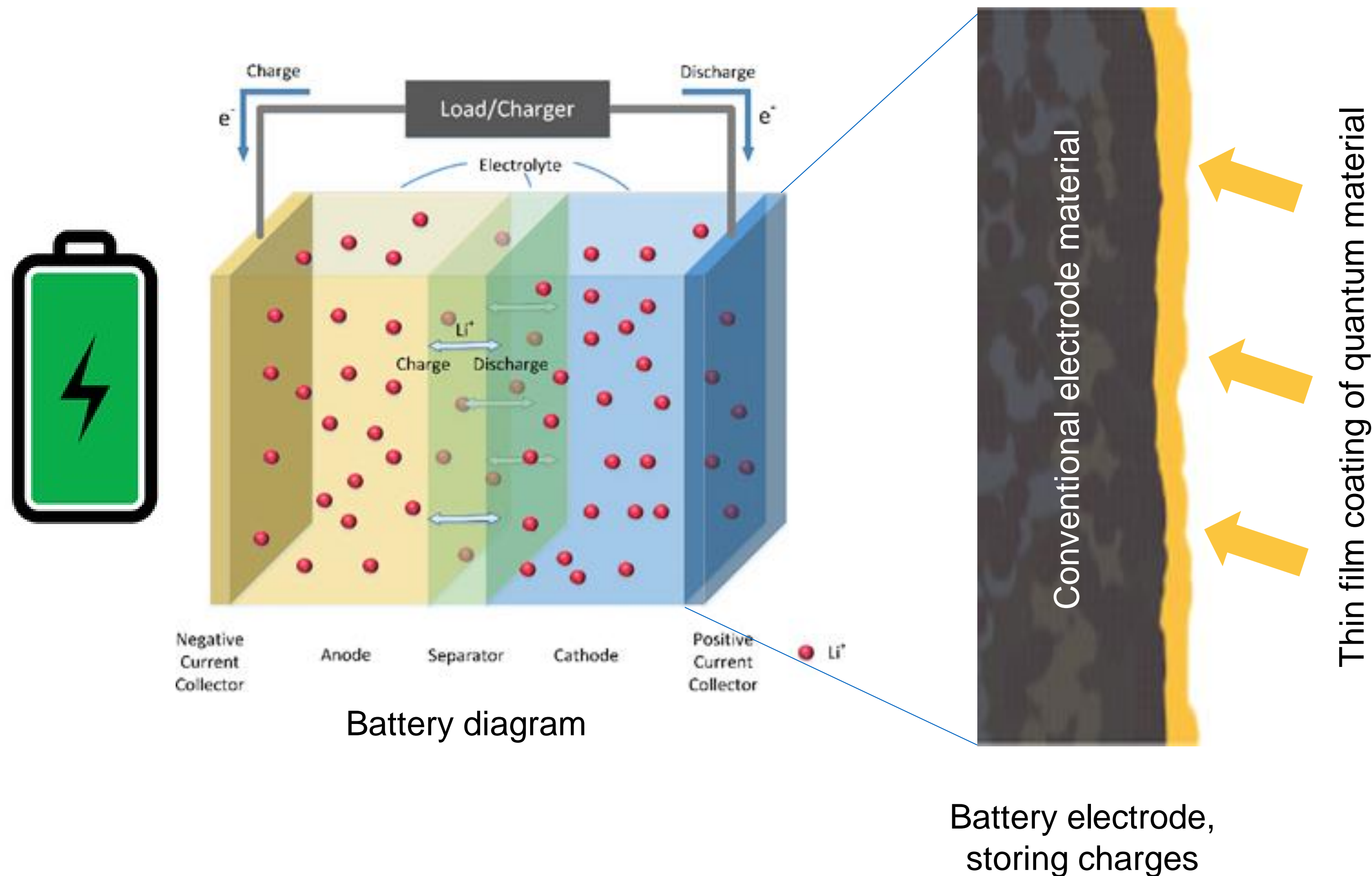
Additional Quantum NEC thin film



Quantum NEC can act as "electronic" compressed spring, *lowering the chemical potential* and hence increase energy capacity of the host material.

Our R&D (NEC)

Technology synopsis: Quantum NEC film for enhancing battery capacity



Battery diagram

Battery electrode, storing charges

Our technology

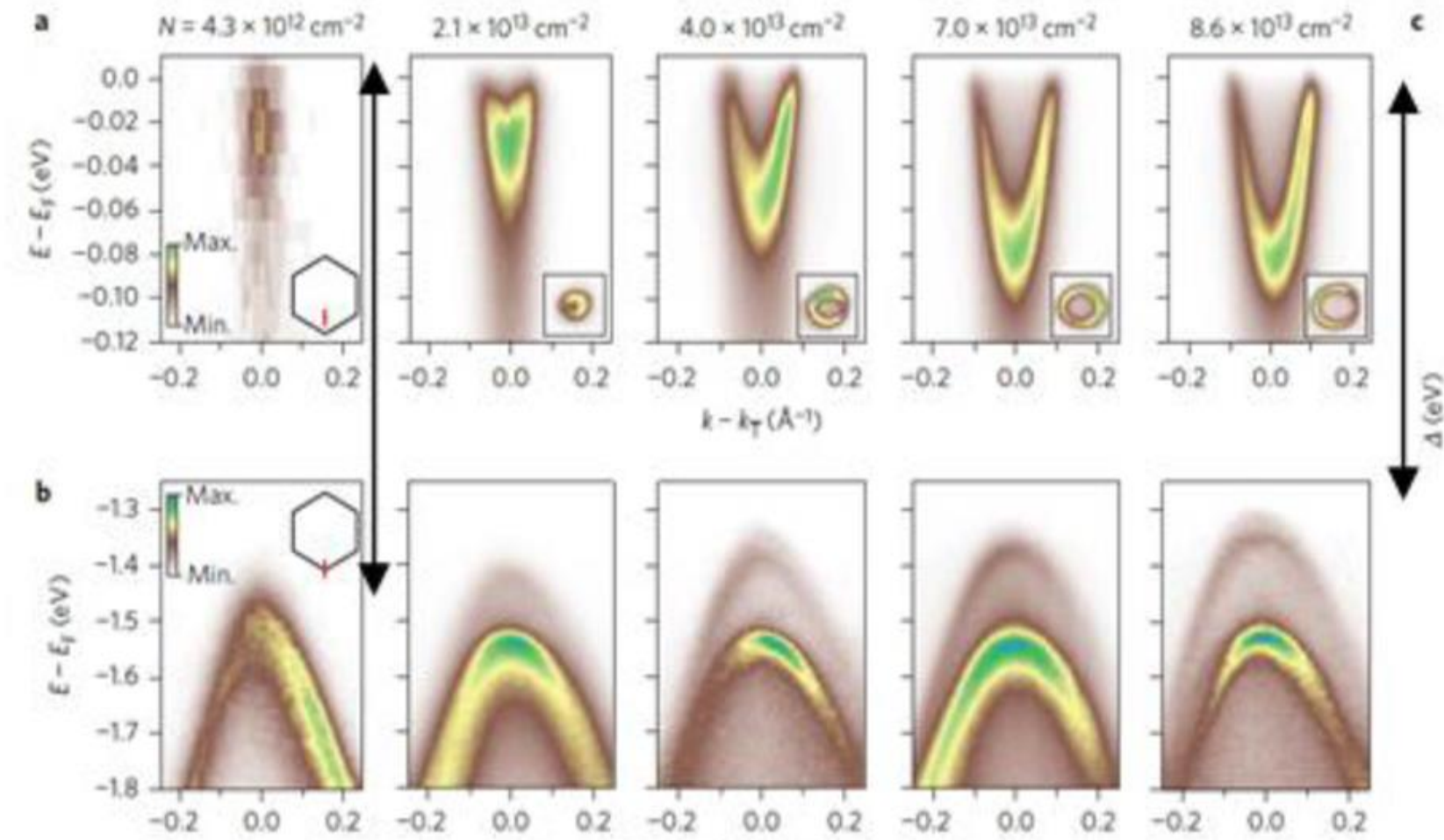
- With thin film coating of additional quantum material (<1%) on conventional battery and supercapacitor, enhancement of measured energy capacity can be in the range: 30 – 100%.
- The quantum effect used is called “negative electronic compressibility” (NEC).

Mapping analogy to the case

Our R&D (NEC)

Proven concepts: Direct observations of quantum NEC and its prototype with energy enhancement

Direct observations of quantum NEC, using synchrotron-radiation photoemission spectroscopy and impedance analyzer.

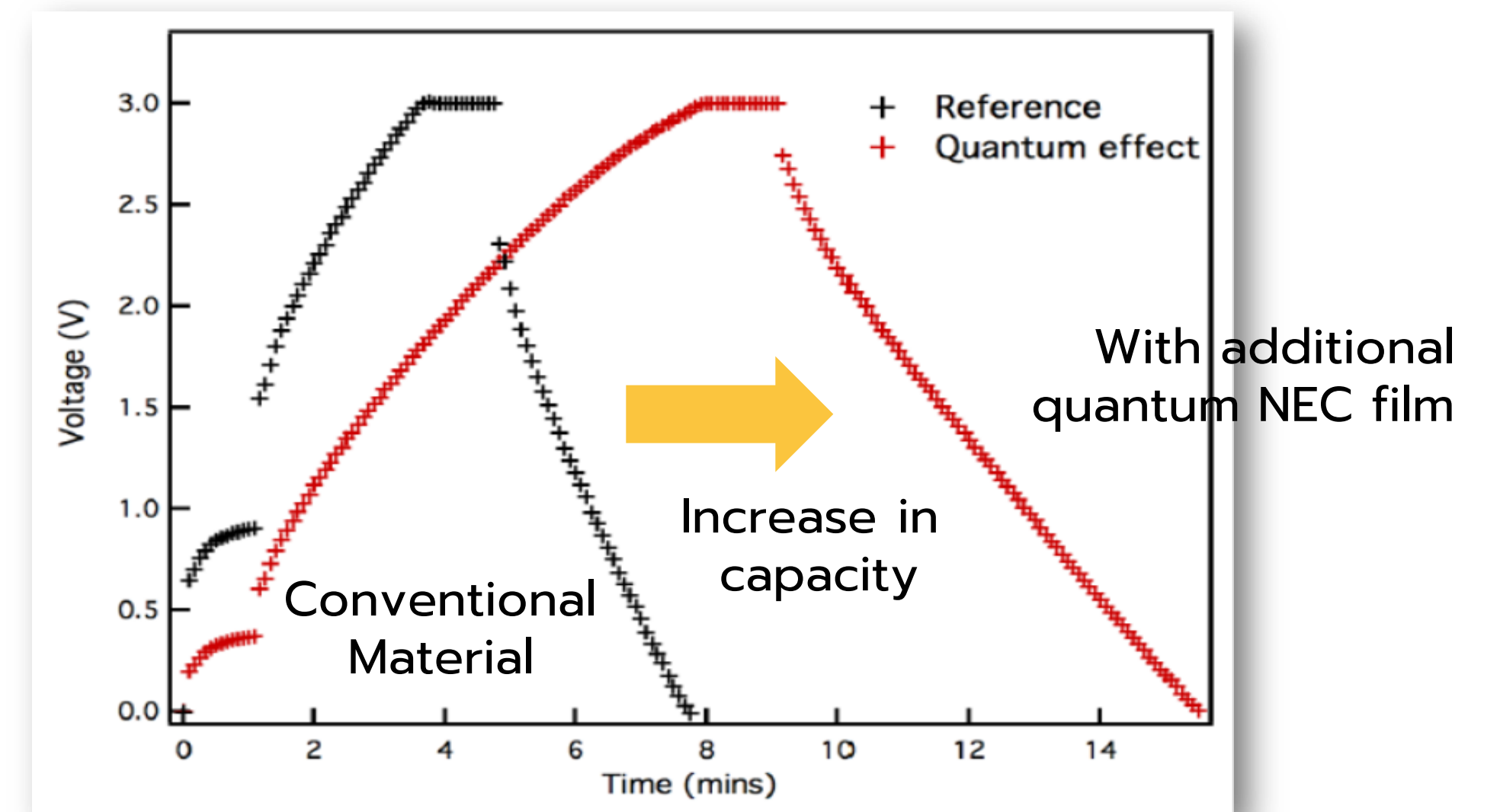


Observation of chemical potential lowering upon charging (picture above); the shift can come from the interplay between exchange interaction and correlation energy in 2D systems.

Examples of our publications are:

- J. Riley, W. Meevasana, et al., Nature Nanotech. 10, 1043-1047 (2015)
- W. Meevasana, et al., Nature Mater. 10, 114-118 (2011)
- C. Masingboon, ... , W. Meevasana, Appl. Phys. Lett. 102, 202903 (2013)

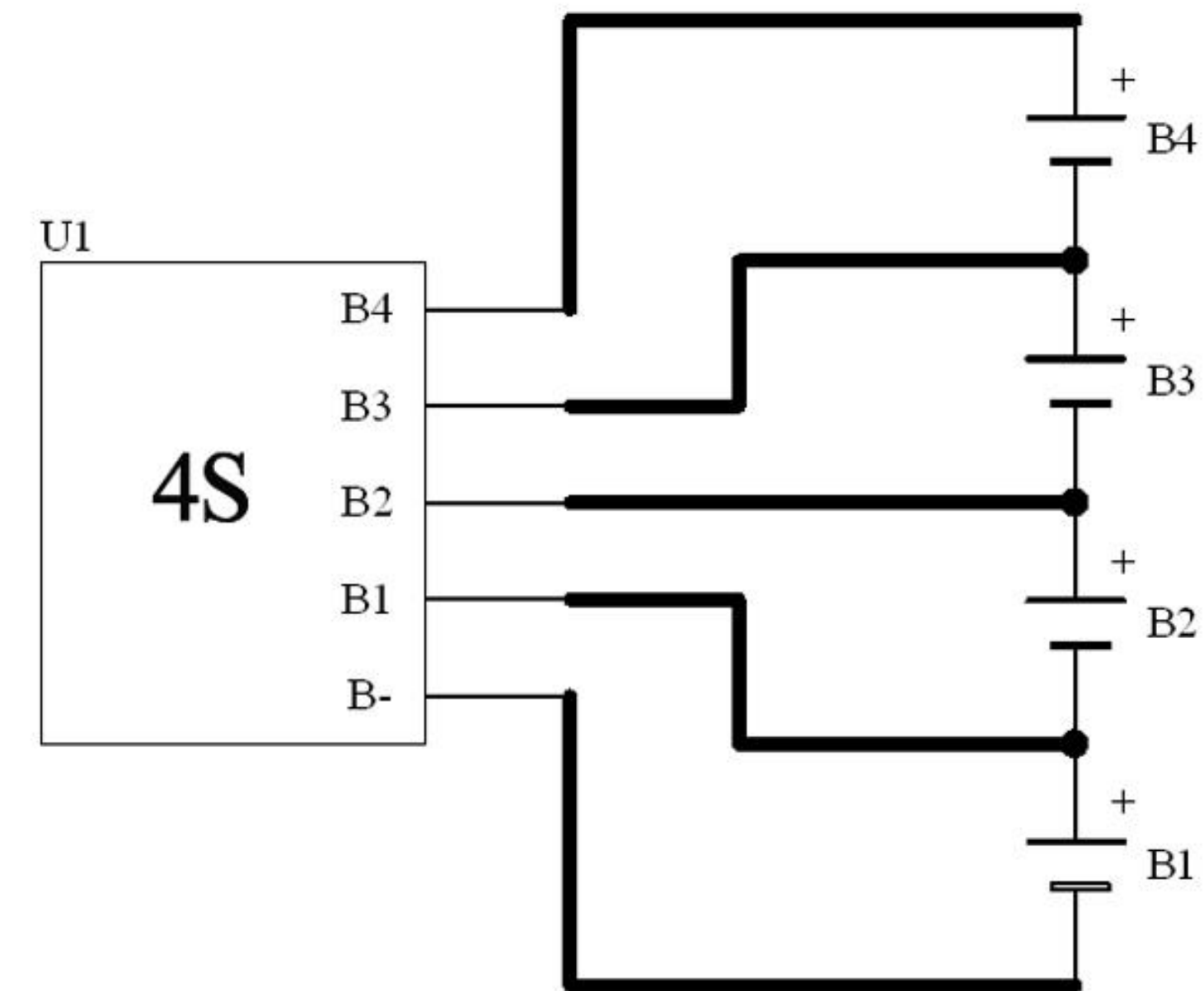
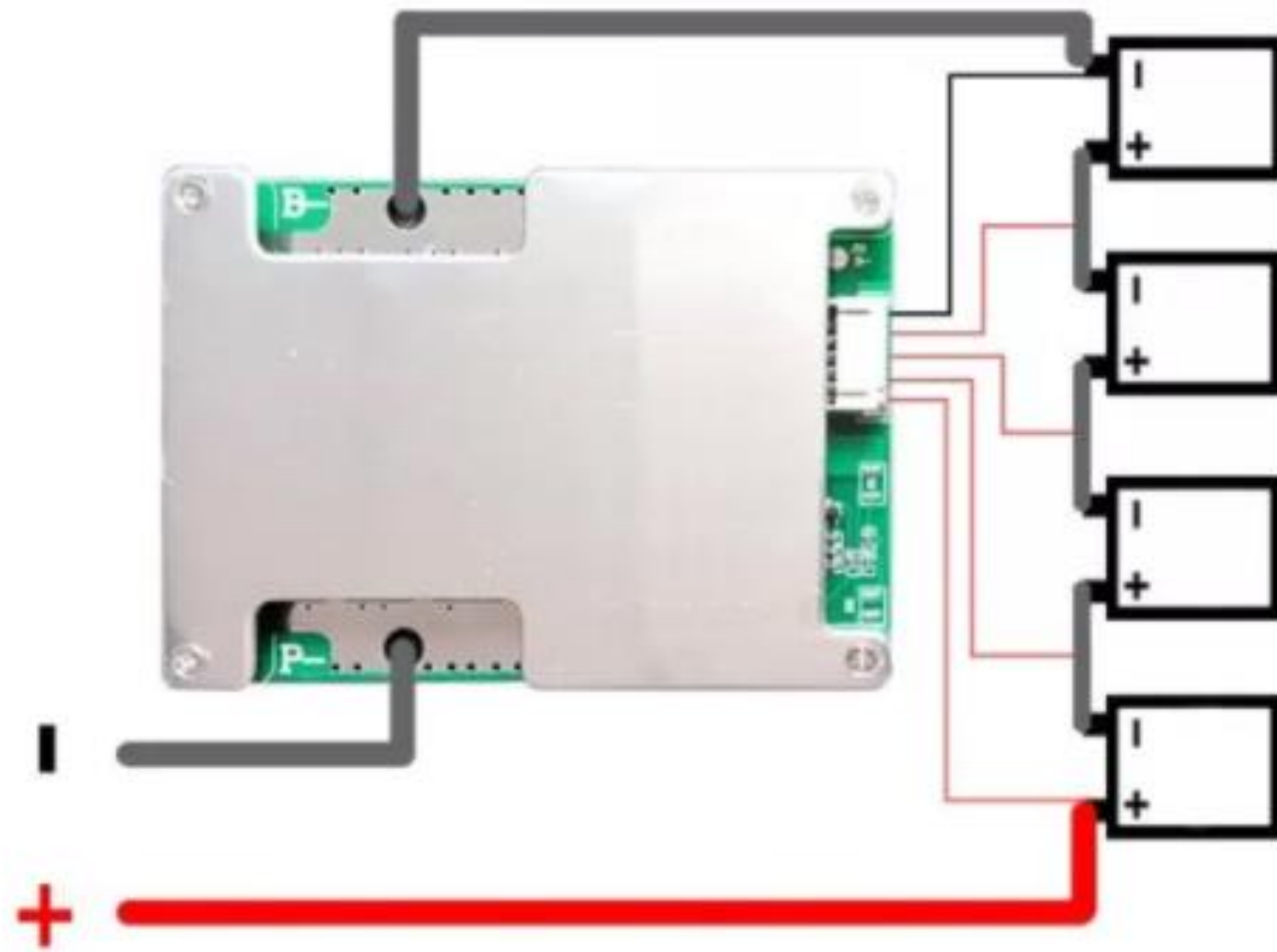
Prototype with energy enhancement



Energy density increases by 30 - 100%
with **nearly zero mass** of additional
quantum NEC materials

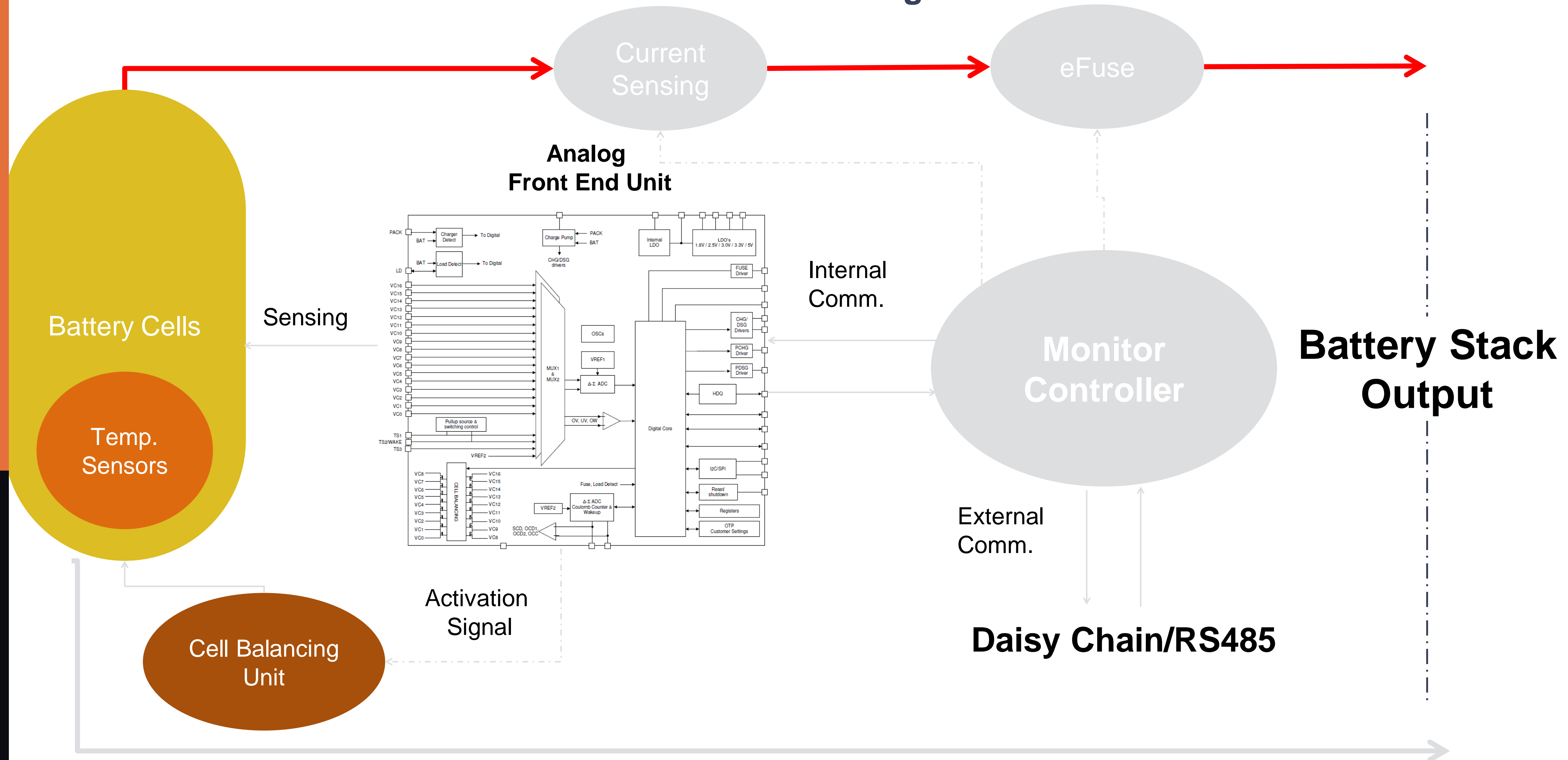
Our R&D (BMS)

Prototype & Battery management system (BMS) and Active balancer



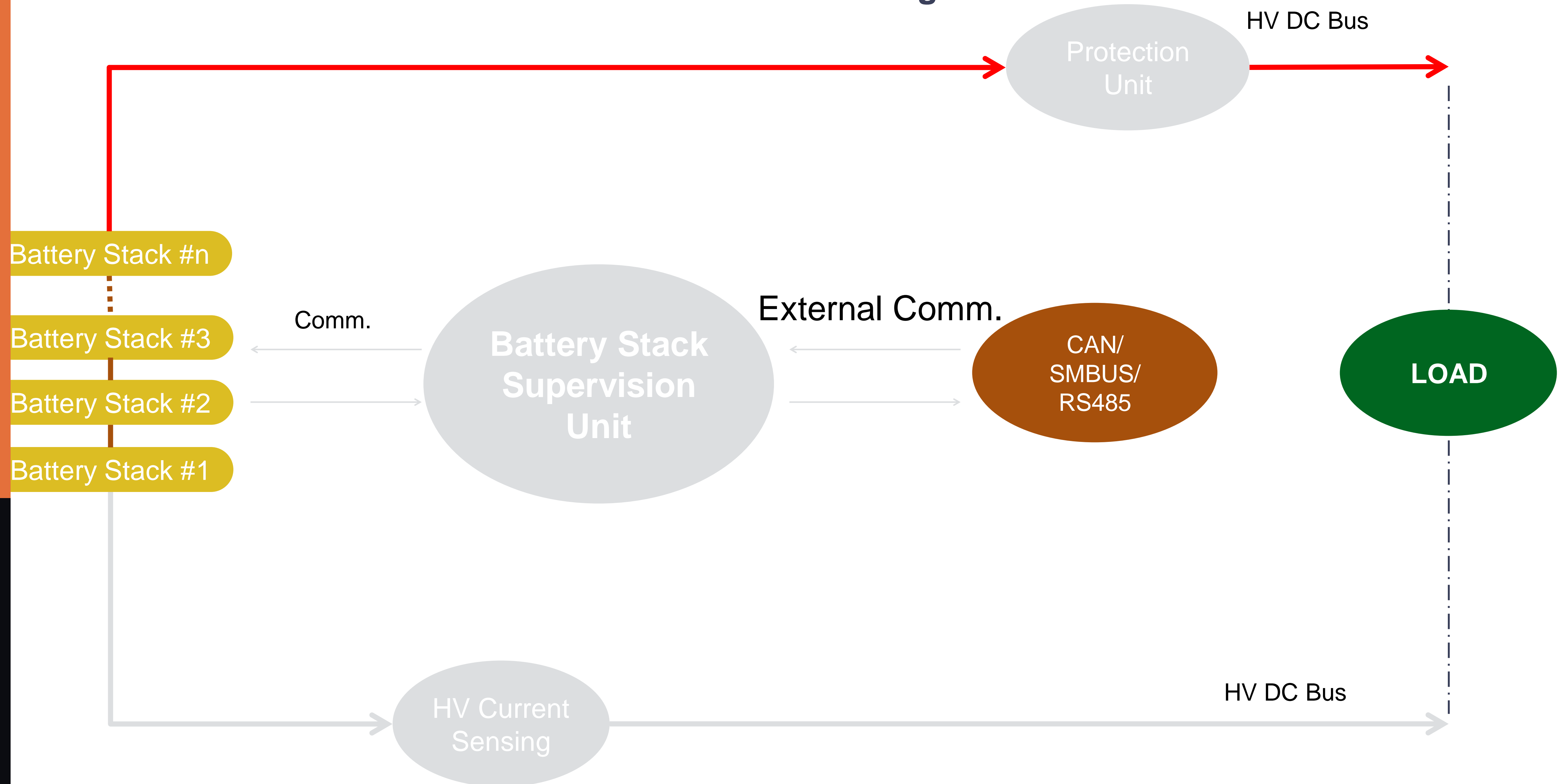
Our R&D (BMS)

Cell Monitoring Unit Functional Block Diagram



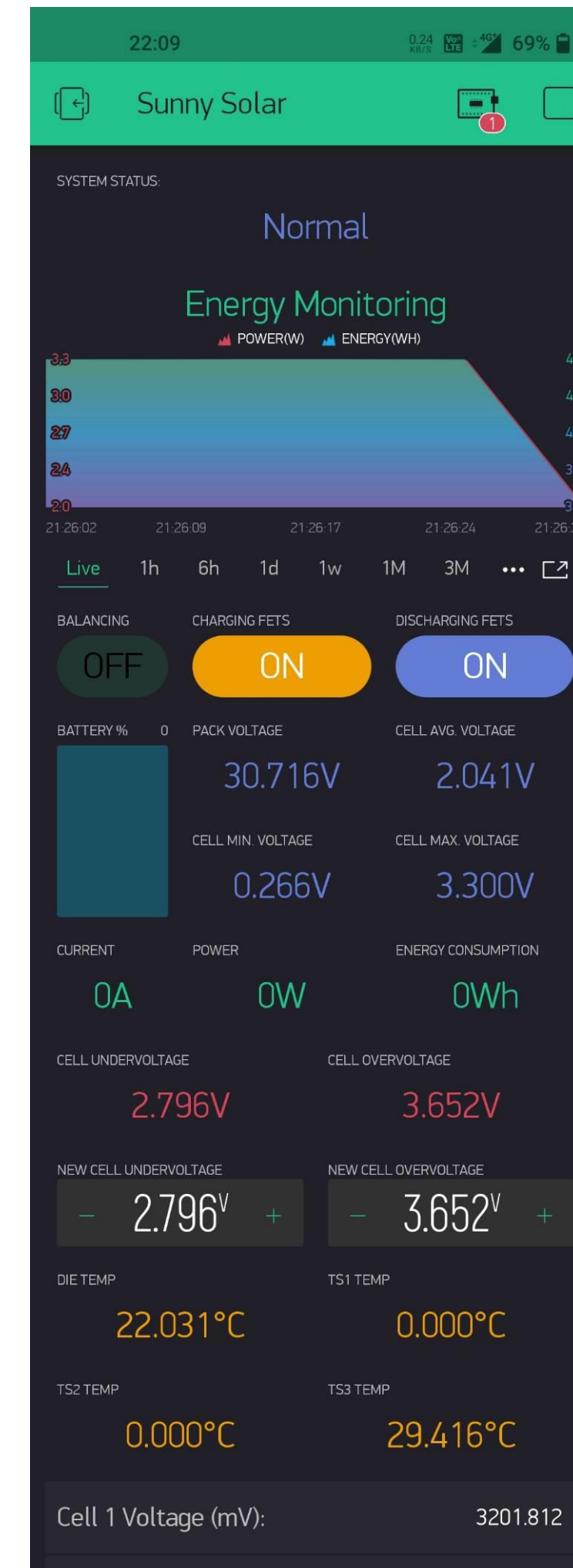
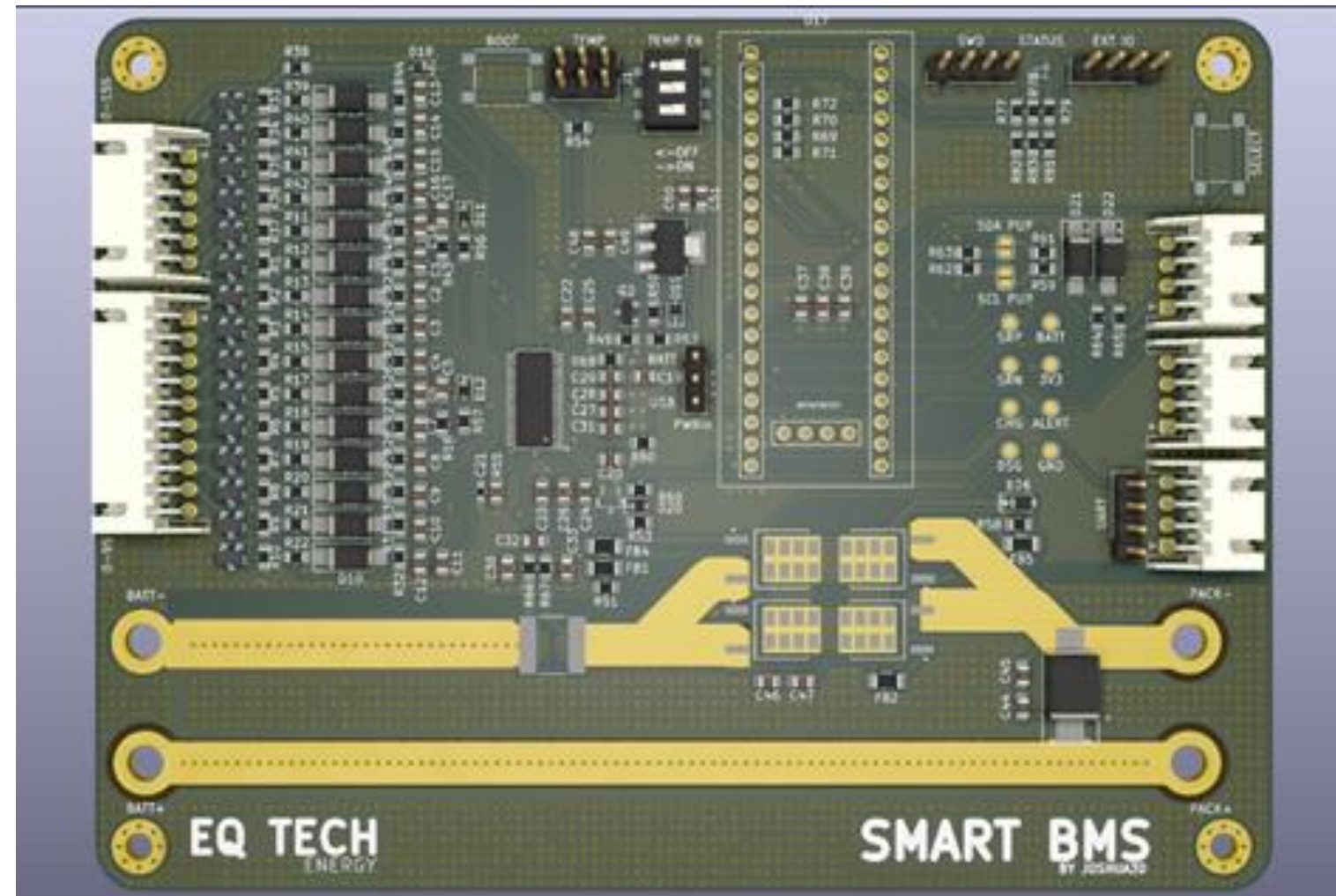
Our R&D (BMS)

Battery Stack Monitor Functional Block Diagram



Our R&D (BMS)

Product design & BMS circuit design @ EQ Tech



Existing Business

1. Battery assembly manufacturing (Our Owned Products, OEMs, ODMs)
2. Sell New Products : Cell, Module, and Packed Battery for mini EVs, UPS, and Energy Storage System (ESS)
3. Rent and Lease battery packs for mini EVs, golf carts
4. Prototyping and Customization for packed battery
5. Testing and standardization

Existing Business

1. Battery assembly manufacturing (Our Owned Products, OEMs, ODMs)



Battery Cell Testing Machine



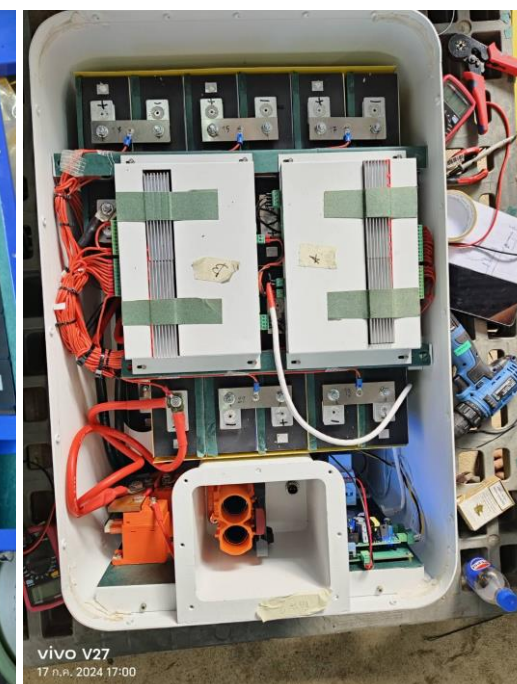
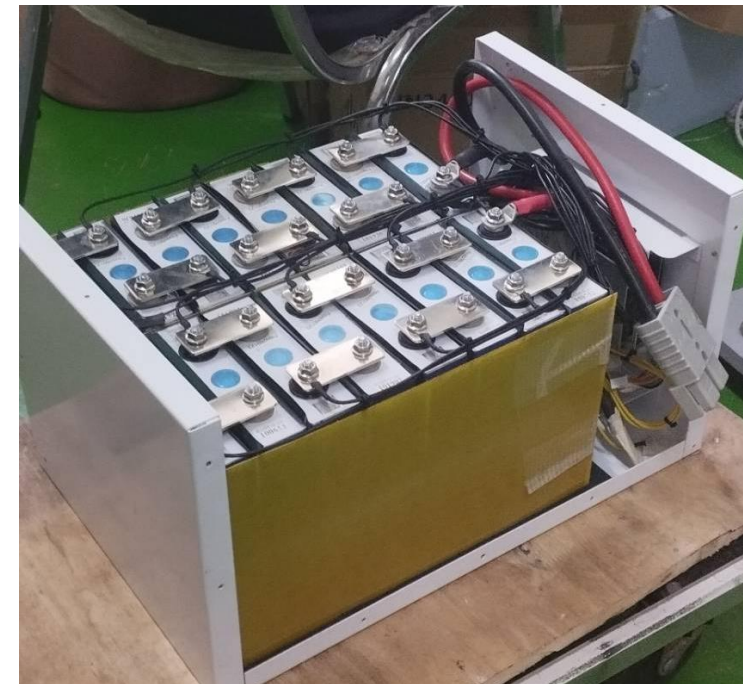
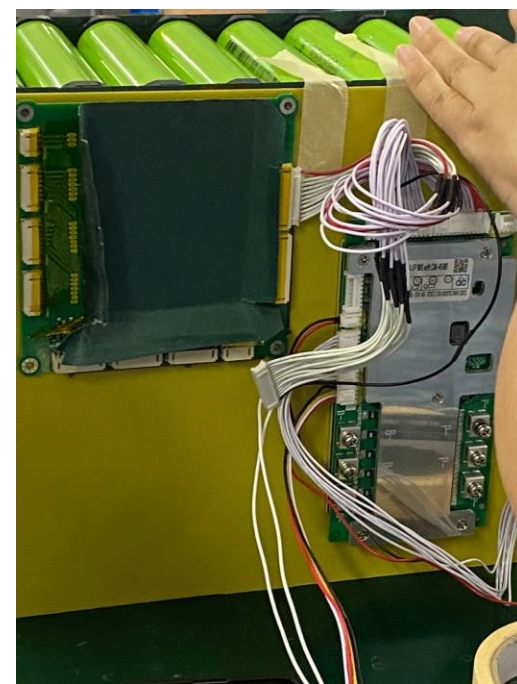
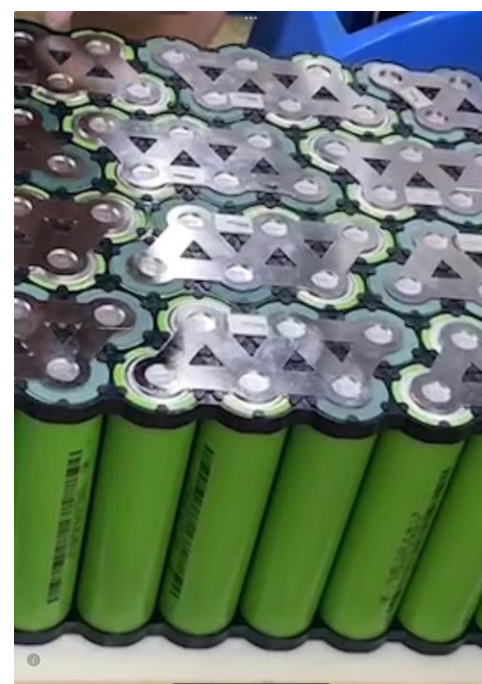
Automatic Cell Sorting Machine



Spot Welder



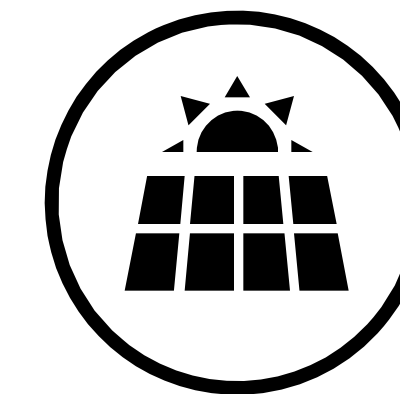
Product



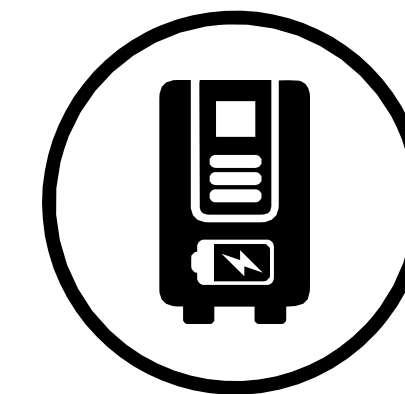
Battery assembly

Existing Business

2. Sell New Products : Cell, Module, and Packed Battery for mini EVs, UPS, and Energy Storage System (ESS)



Solar cell



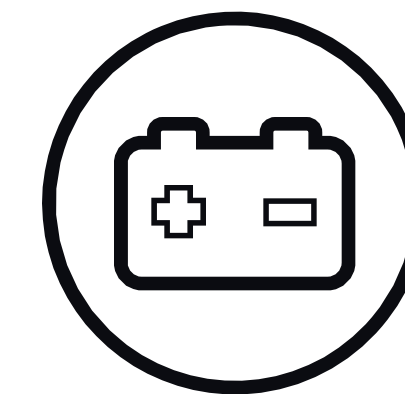
Uninterruptible Power Supply (UPS)



Golf cart



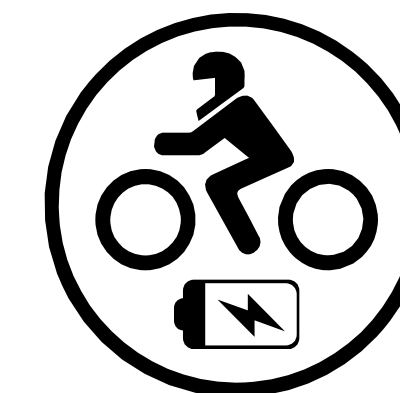
Forklift



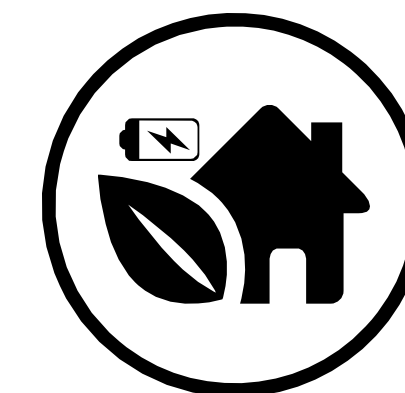
Automobile and motorcycle



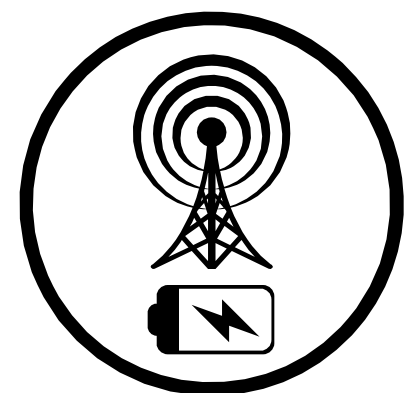
Small electric car



Electric motorcycle



Smart Farming



Energy storage system



Existing Business

Rent and Lease battery packs for mini EVs, golf carts

mini EVs



Model: EQ24V40Ah, 50Ah



Golf carts



Model: EQ36V80Ah, 48V80Ah



Existing Business

Prototyping and Customization for packed battery

ESS for Solar cell

Model: EQ51.2V100Ah



Mini EV Car

Model: EQ73.6V150Ah



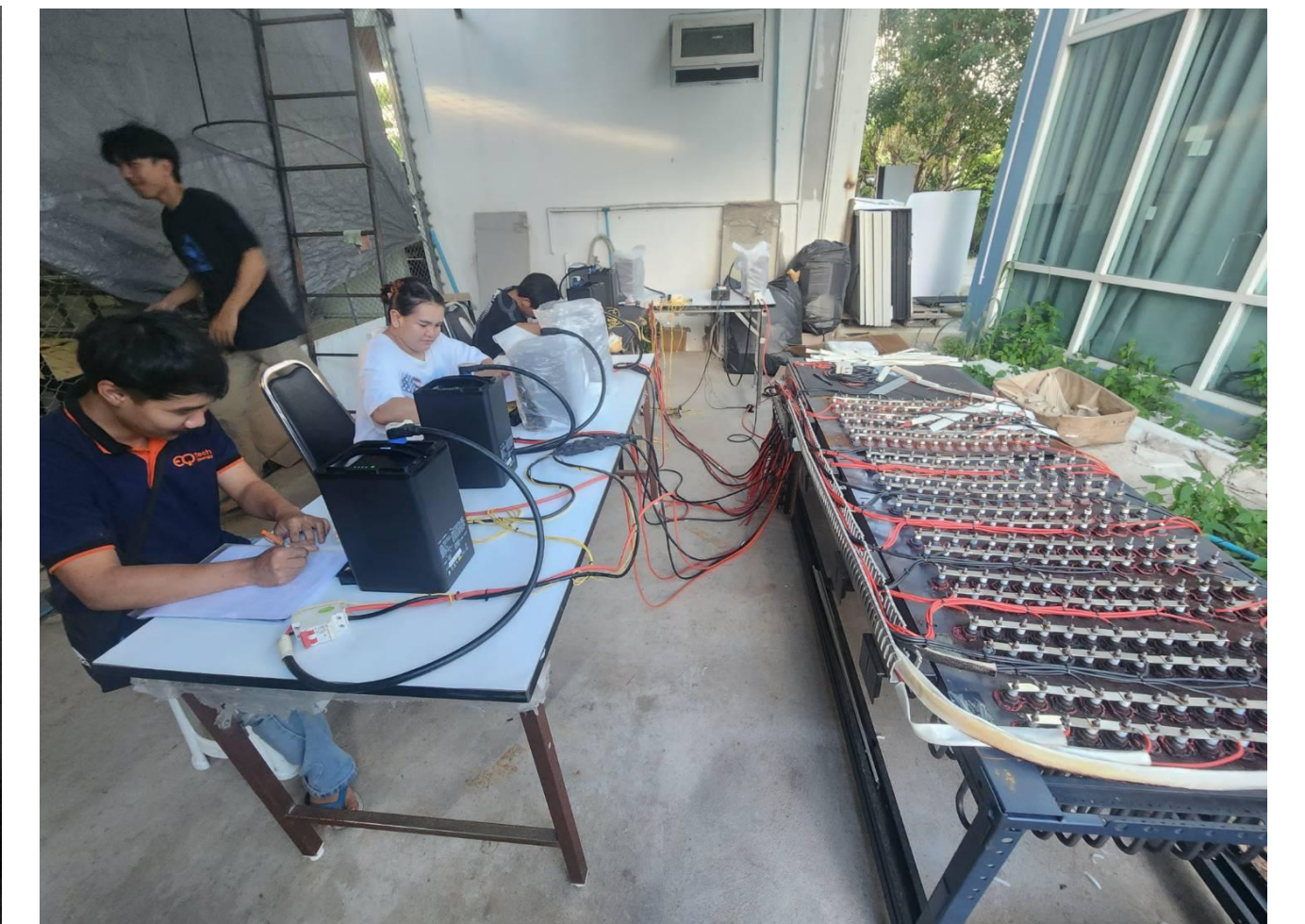
ESS for Telecom

Model: EQ48V18Ah, 36Ah, 50Ah



Existing Business

Testing and standardization



Existing Business

Testing and standardization

Batteries for vehicles



72V24.5Ah (NMC)

72V45Ah (LFP)

passed the safety standard
test **UNR 136**



ELECTRICAL AND ELECTRONIC PRODUCTS TESTING CENTER
National Science and Technology Development Agency



TEST REPORT	
UN Regulation No.136	
Uniform provisions concerning the approval of vehicles of category L with regard to specific requirements for the electric power train	
Test Report No.	350/66-003
Equipment Under Test (EUT) No.	ST-65-0067
TISI No.	—
Testing Laboratory Name.....	Electrical and Electronic Products Testing Center
Address	141 Thailand Science Park Innovation Cluster 2 Phahonyothin Rd. Khlong Nueng, Khlong Luang, Pathum Thani 12120, Thailand.
Applicant's Name	EQ Tech Energy Company Limited
Address	399/22 Moo 8, Suan Luang, Kratumban, Samut Sakhon 74110
Manufacturer's Name	EQ Tech Energy Company Limited
Address	399/22 Moo 8, Suan Luang, Kratumban, Samut Sakhon 74110
Test specification	
Standard.....	UN Regulation No.136 Rev.2: 2016
Non-standard test method	N/A
Master TRF	-
Test item description.....	Battery for electric motorcycle
Trademark	EQ BATTERY
Model and/or type reference	EQ72V24.5Ah
Date of receipt of test item	17 December 2022
Date(s) of performance of test	02 - 31 January 2023
Date of report issue	03 February 2023

Tested by

Prawit Kh.

(Mr.Prawit Khamchud)
Engineer

Approved by

N. Ruengrit

(Mr.Ruengrit Niniae)
Operation manager

REPORT No. STR/66-070



PAGE 1 OF 9

TEST REPORT	
Report No	STR/66-070
EUT No.....	ST-66-0304
Testing Laboratory Name	Electrical and Electronic Products Testing Center
Address	141 Thailand Science Park Innovation Cluster 2 Phahonyothin Rd. Khlong Nueng, Khlong Luang, Pathum Thani 12120, Thailand.
Applicant's Name	I-MOTOR MANUFACTURING CO.,LTD.
Address	90 Moo 4, Tambon Bang Chalong, Amphur Bang Phli, Samut Prakan 10540
Test specification	
Standard.....	Customer requirement
Non-standard test method	N/A
Test item description	Battery for electric motorcycle
Trade mark	EQ BATTERY
Model or type reference	EQ72V45AH
Date of receipt	12 February 2023
Date of test	29 March 2023
Date of report issue	27 April 2023

Tested by

Prawit Kh.

(Mr.Prawit Khamchud)
Engineer

Approved by

N. Ruengrit

(Mr.Ruengrit Niniae)
Operation manager






This test report is test results from the EUT only, not the product's quality certificate. It shall not be reproduced except in full without the written approval of testing laboratory.

Electrical and Electronic Products Testing Center
National Science and Technology Development Agency, Ministry of Science and Technology
141 Thailand Science Park Innovation Cluster 2 Phahonyothin Rd Khlong Nueng, Khlong Luang, Pathum Thani 12120,
Thailand.Tel- 66-2117-8600, Fax -66-2117-8624, website www.ptec.or.th



Potential Market size in Thailand for each segment


1) Vehicle (Mini Car)

Detail	Scooter	Motorcycle	Mini EV	Golf cart	Forklift
					
No. of Accumulated EV Vehicles (2030)	3,785,600	34,020,000	364,000	962,600	1,020,200
Battery Capacity per car	0.5 kWh	3.2 kWh	1.2 kWh	5.1 kWh	12.8 kWh
Total Battery Demand	1.89 GWh	1,08.86 GWh	0.44 GWh	4.91 GWh	13.06 GWh

- People start to change from ICE to EV
- We expect market share about 5 – 10%

Potential Market size in Thailand for each segment







1) Vehicle (Passenger Car)

Detail	Passenger Car	Bus	Light Commercial	Medium & Heavy Commercial	Tractor
					
No. of Accumulated EV Vehicles (2030)	28,700,000.00	308,000.00	13,300,000.00	2,240,000.00	1,400,000.00
Battery Capacity per car	50 kWh	280 kWh	40 – 150 kWh	175 – 400 kWh	100 kWh
Total Battery Demand	1,435.00 GWh	86.24 GWh	532.00 - 1,995.00 GWh	392.00 - 896.00 GWh	140.00 GWh

- People start to change from ICE to EV
- We expect market share about 5 – 10%

Potential Market size in Thailand for each segment

2) Stationary

Detail	Household ESS	VPP and ESS for rural areas	Battery for ESS C&I (Commercial and industry)	Grid	Telecom	Fast-Charging Off grid
						
No. of Accumulated ESS (2030)	13,559,540.00	14,950,525.00	101,778.00	40 - 60	266,711.00	5,600.00
Battery Capacity per unit	15 kWh	3 kWh	200 kWh	0.6 GWh	2.56 kWh	50 kWh
Total Battery Demand	203.39 GWh	44.85 GWh	20.36 GWh	37.12 GWh	0.68 GWh	0.28 GWh

- We expect market share about 5 – 10%

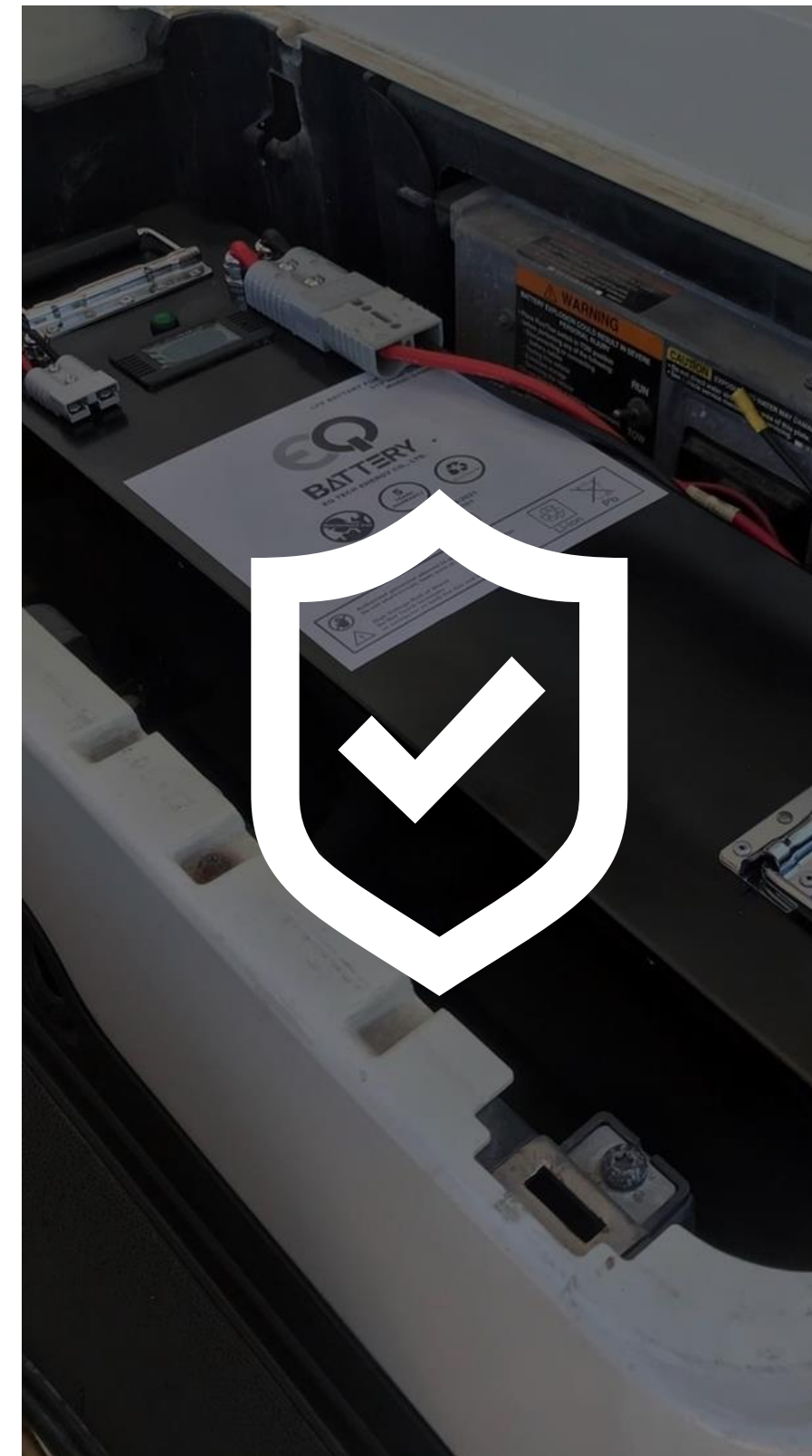
Be comfortable with our services.



Solutions designed according to your needs



Free guidance on maintenance



A warranty—up to a maximum of 10 years*— for products' lifetime



Available alternate batteries to use during diagnostic check*

*according to the types of products and conditions of the warranty

Contact info



EQ Tech Energy Co. Ltd.

บริษัท อีคิว เทค เอ็นเนอร์ยี จำกัด

Phone: 090-2705533

LINE: eqtechenergy

Email: eqtech.estorage@gmail.com

Website: www.eqtechenergy.com

Address: 399/22 Village No.8 Suan Luang
Sub-district, Krathum Baen district, Samut
Sakhon 74110