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6 June 2023

11:00 am – 12:00 pm | PDT, Los Angeles

12:00 pm – 1:00 pm | CST, Mexico City

8:00 pm - 9:00 pm | CEST, Berlin

Approaching bankability for grid-scale energy storage



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Editor
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MBA Principal Engineer
VDE Americas




Devon Wilson

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Gotion

Welcome!

Do you have any questions? ? 

Send them in via the Q&A tab.  We aim to answer as many as we can today!

You can also let us know of any tech problems there.

We are recording this webinar today. 

We'll let you know by email where to find it and the slide deck, so you can re-watch it at your convenience.  

Bankability of Energy Storage Systems

June 6, 2023

Dr. Ralph Romero

Senior Managing Director,
Black & Veatch Management Consulting, LLC

Black & Veatch Today



120+
Offices



10,600+
Professionals

\$4.3B

2023 Revenue

Founded
1915

Projects on



6 Continents

One of the largest employee-owned companies in the U.S.

with

The size and experience to
achieve your goals

7,000

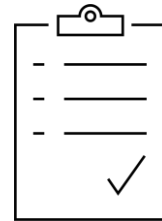


Active Projects
Worldwide

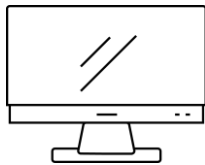
A Bankability Study:



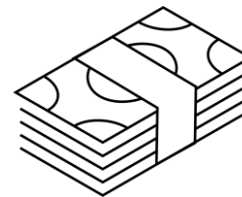
Is a component in a financial institution's risk assessment process.



Provides an honest evaluation and representation of the manufacturer and product to the outside world.



Helps stakeholders get comfortable with technology.



Can help to finance projects using new products/technologies.

How Do We Assess ESS Risk?



Tracker Design



Manufacturing



Company



Performance and
Reliability



Installation, Operation
and Maintenance



ESS Design

Is the ESS design capable of meeting the technical specifications claimed by the manufacturer?

Design Specifications:

- Electrical
- Mechanical
- Performance
- Safety



Performance and Reliability

Does the ESS performance and reliability meet the technical specifications?

- Field Performance
- Benchmarks
- Qualification testing results
- Durability testing results



Manufacturing

Are the manufacturing operations capable of consistently delivering ESS that meet the technical specifications?

- Manufacturing Process
- Quality Assurance
- Documentation Control
- Human Resources
- Supply Chain



Installation, Operation and Maintenance

What does system ownership entail?

- Product Installation Process
- Regular Operational Procedures
- Ongoing Maintenance Activities
- Ownership costs



Company

How well is the company positioned to meet its objectives?

- Organization and management
- Financial position and trends
- Market and competition
- Warranty
- Manufacturing capacity
- Intellectual property

Dr. Ralph Romero

Senior Managing Director | Black & Veatch Management Consulting, LLC

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Independent Engineering Perspective
BESS Bankability Studies

Bill Reaugh
Principal Engineer
VDE Americas



VDE

About VDE Americas

VDE Americas provides technical due diligence and risk mitigation services to financiers, project developers, and insurance companies working on large solar and energy storage transactions.

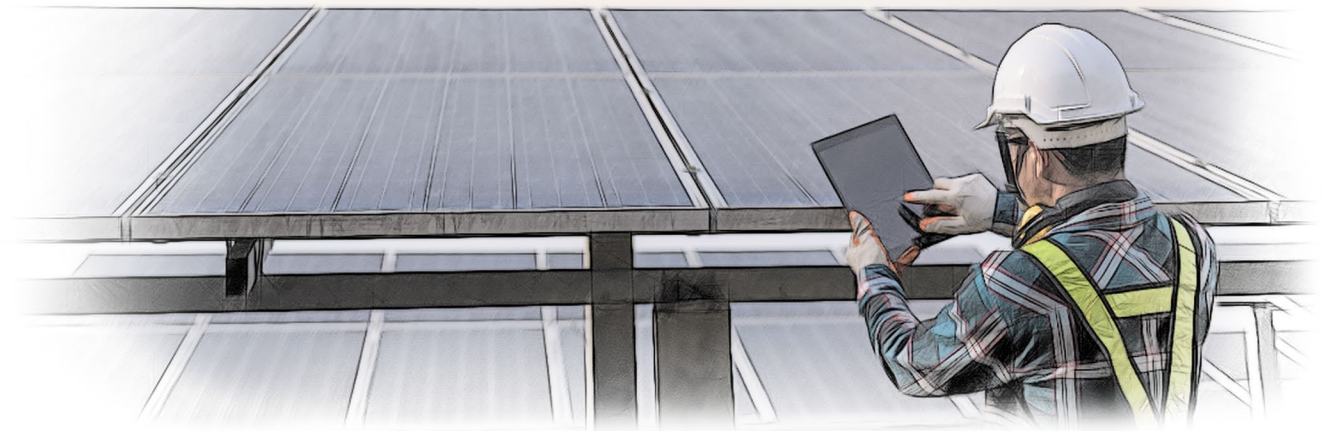
Since 2016, VDE Americas has supported funding for over 5 GW of operating solar projects in the U.S.—or about 10% of fielded utility-scale PV project capacity over that time. Since 2021 VDEA has supported funding on nearly 1GW/4GWh of BESS projects in the U.S.

Our parent company is one of the largest technology organizations in Europe.

Technical due diligence

Celebrating 10 years of PV + BESS transaction support in the Americas.

2013–2023



VDE Americas and BESS advisory services

- VDE Americas is actively supporting financing for **3.4 GW of utility-scale PV + BESS projects** being built in 2023 and 2024.
- Advisory services:
 - Owner's engineering
 - Independent engineering
 - Risk mitigation
 - Performance modeling
- Representative applications:
 - AC- & DC-coupled systems
 - Retrofits & new builds
 - BESS only





Primary BESS investor concerns

What criteria are most important to the finance community?

Top three areas of concern:

- Developer's project completion track record
 - History and experience
- Project-specific technical design requirements
 - Interconnection, offtake, and environmental
- Technical components' ability to meet these requirements
 - Right-fit technology solution





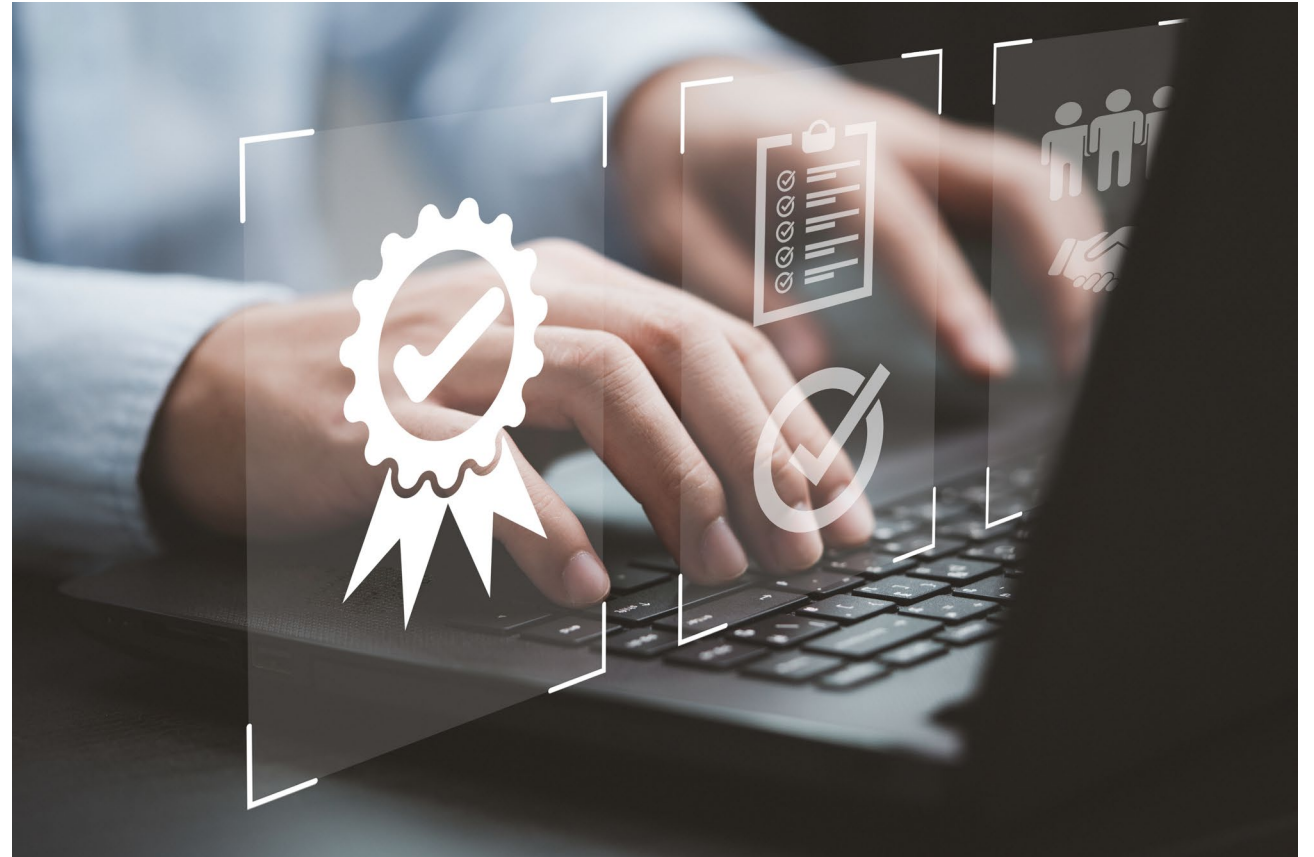
RISK MANAGEMENT

De-risking projects with new BESS technologies

Is the original equipment manufacturer (OEM) bankable?

OEM bankability considerations:

- Financial strength & ownership structure
- Production quality systems & track record
- Manufacturing capacity & locations
- Service infrastructure
- Warranty terms



PREREQUISITE: Bankability study from a reputable IE firm

Bankability report checklist:

- Company history
- Technology review
- Installation & Operation manual reviews
- Unique risk factor overview
- Beyond-certification test results
 - ALT, HALT, HASS, and others



Risk is reduced as you move up the “Pyramid of Quality”

Top-tier players

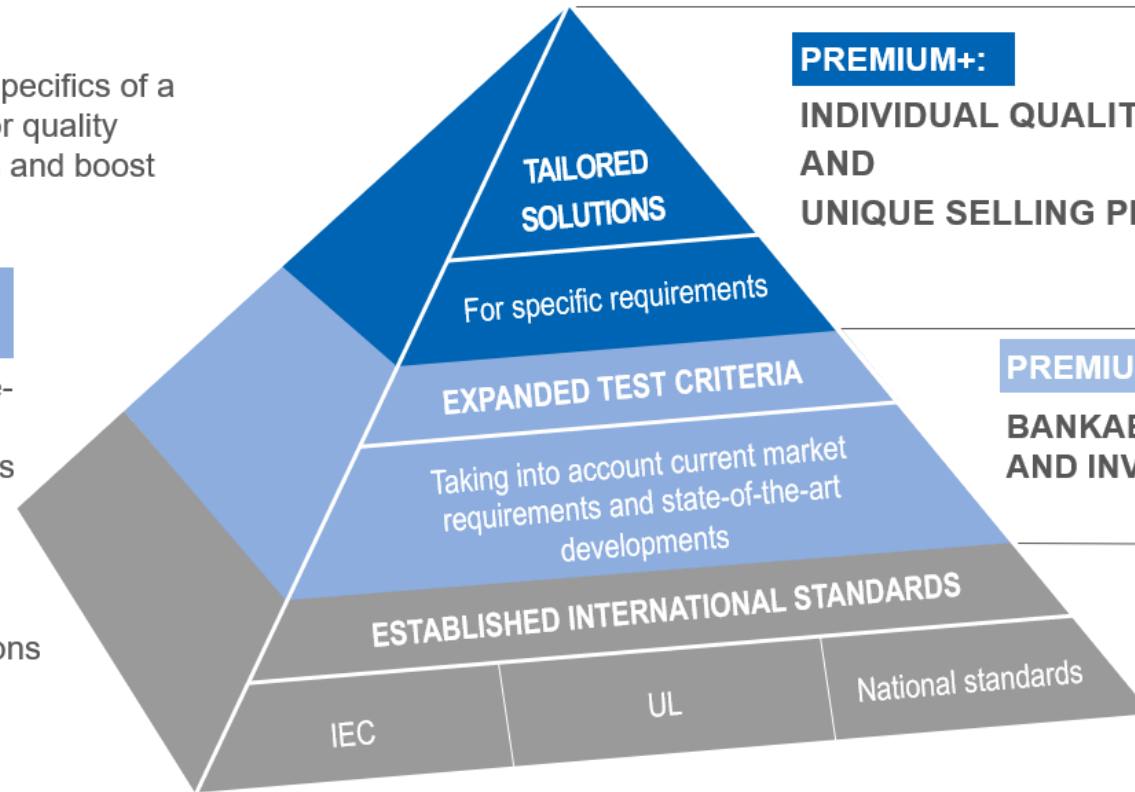
Fully understand unique specifics of a project, engage in superior quality assurance, minimize risks and boost profitability

Competent and responsible businesses

Keep their pace with state-of-the-art developments, create high quality projects

Companies with short term focus

Only follow basic regulations



PREMIUM+:

INDIVIDUAL QUALITY CRITERIA
AND
UNIQUE SELLING PROPOSITIONS

PREMIUM:

BANKABILITY, INSURABILITY
AND INVESTIBILITY

BASIS:

STANDARD MARKET
CRITERIA

Benefits of bankable technologies: 1.) reduced operational risks; 2.) increased reliability and safety.

We are building the e-dialistic future.
Please join us.

Contact information:

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VDE Americas

Bill.Reaugh@vde.com
vde-americas.com

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▲ learn more ▲



VDE

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Bankability Review

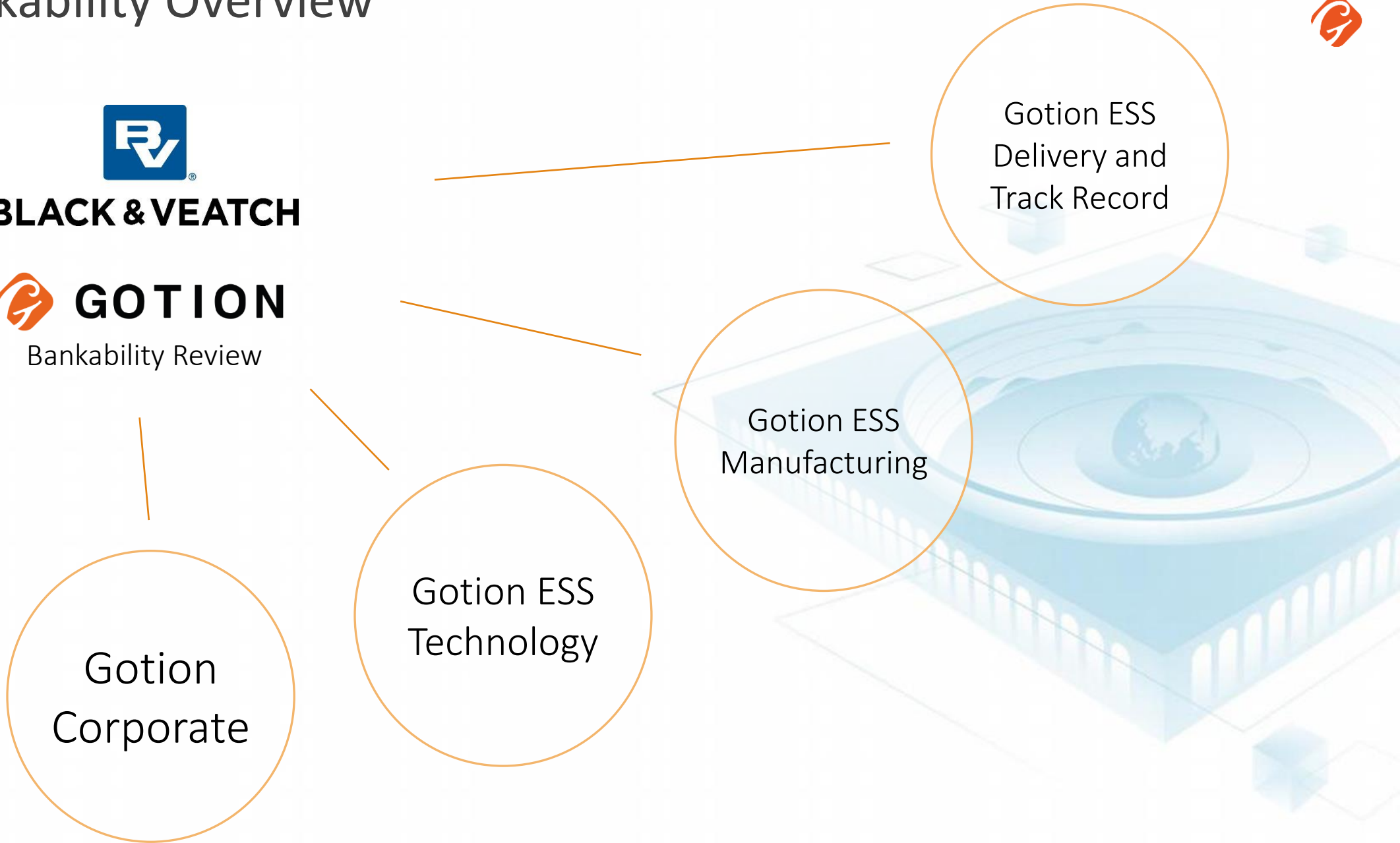


Gotion

www.gotion.com.cn



Gotion Bankability Overview





GOTION

\$3.34 billion
in Revenue
(2022)

Publicly Traded
(Shenzhen and
Swiss
Exchanges)

Top 3 LFP
Battery
Manufacturer
Globally



Volkswagen
26%
Ownership
Share

Gotion Operations (2022)



Founded in **2006**,

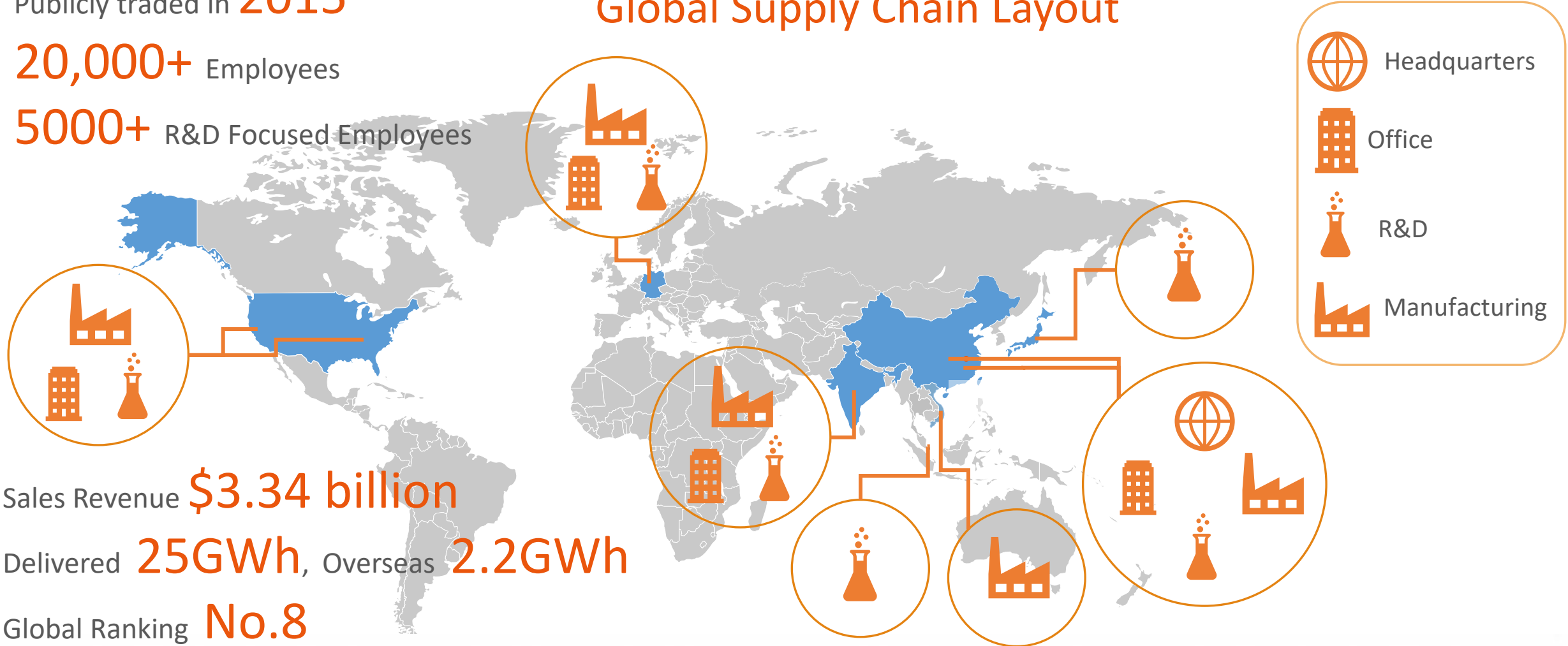
Publicly traded in **2015**

20,000+ Employees

5000+ R&D Focused Employees

14 battery production sites, **8** R&D centers worldwide

Global Supply Chain Layout



Sales Revenue **\$3.34 billion**

Delivered **25GWh**, Overseas **2.2GWh**

Global Ranking **No.8**

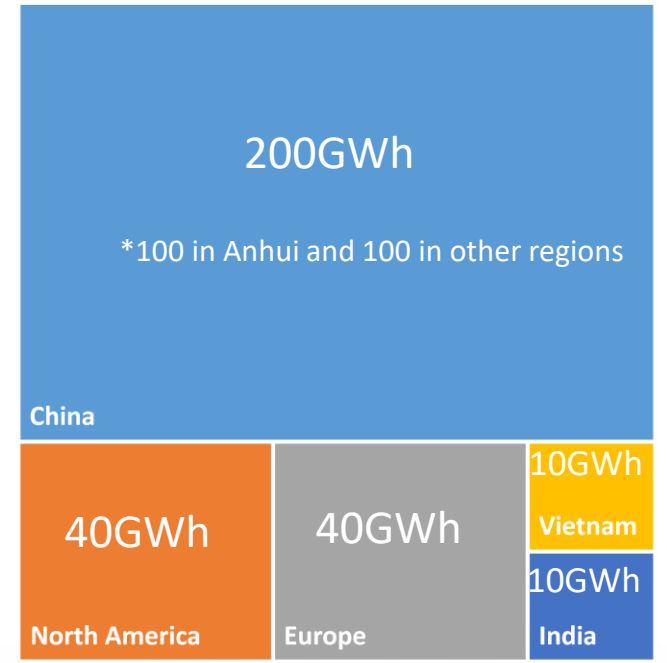
Gotion Production (2022)



14
 Global Facilities
 Producing
100 GWh
 of Annually
 Capacity

Forecast:
300 GWh
 By 2026 With
100 GWh
 Overseas

Capacity Plan 2026



Gotion Technology (2022)



100Ah
LFP Cell



100Ah Based
Air-Cooled
Cell Pack



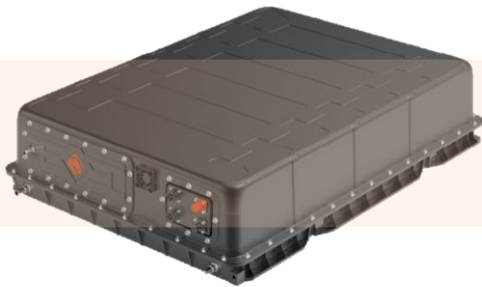
Air-Cooled
Rack



Gotion 2.7MWh Air-Cooled System



300Ah
LFP Cell



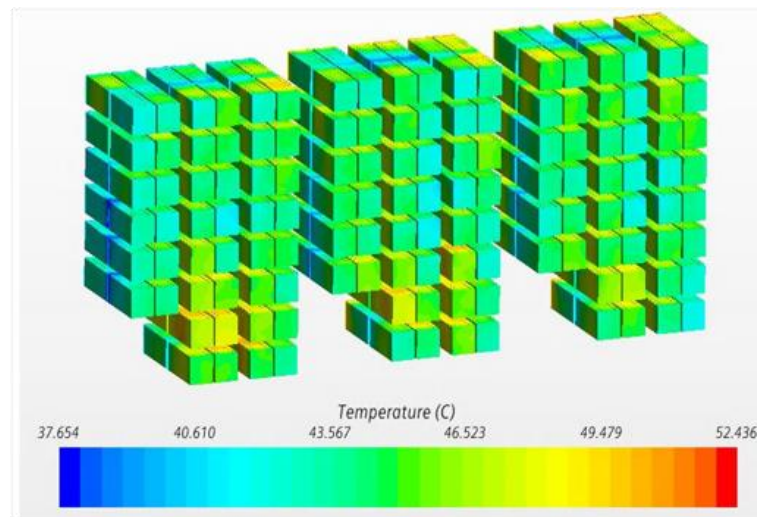
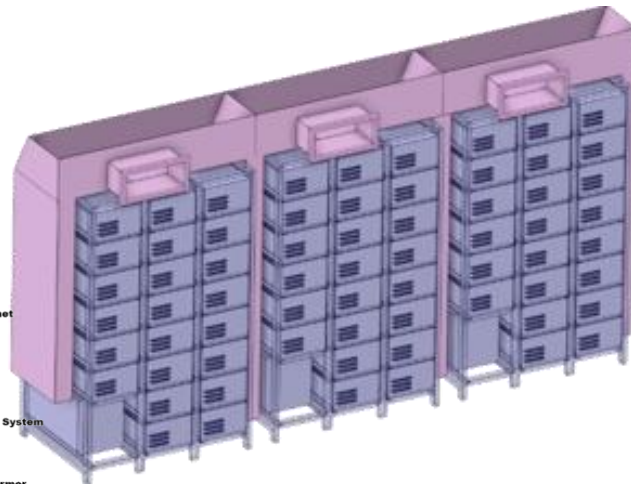
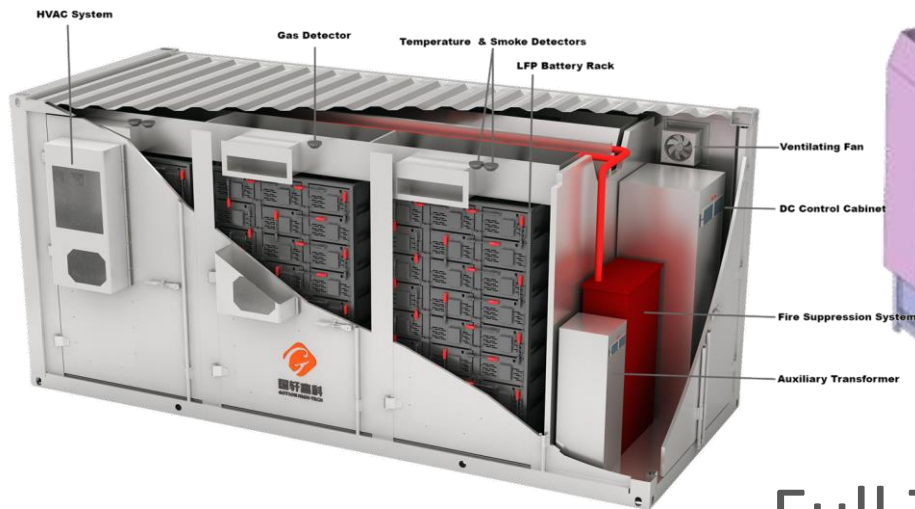
300Ah Based
Liquid-Cooled
Cell Pack



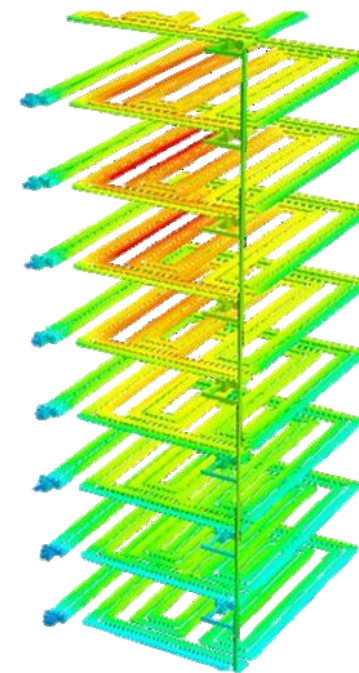
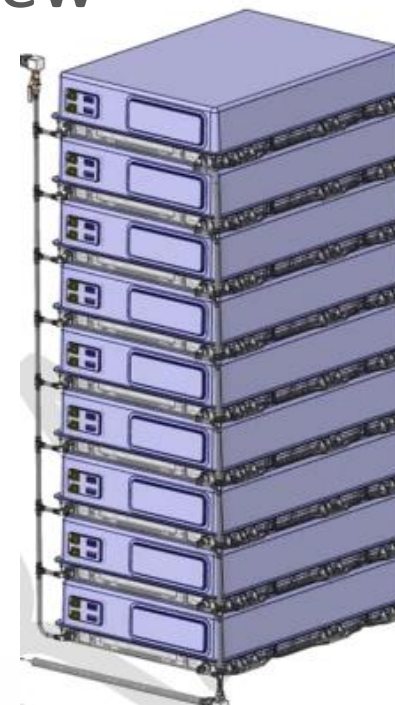
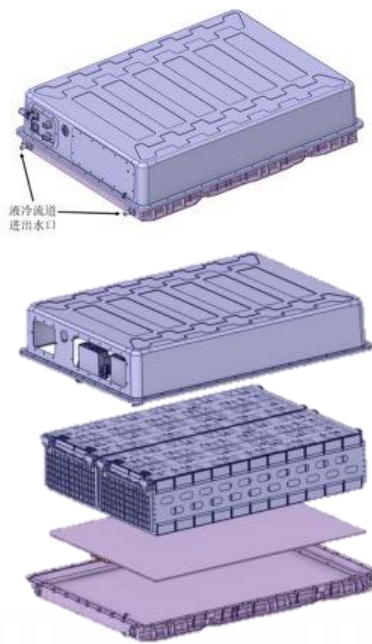
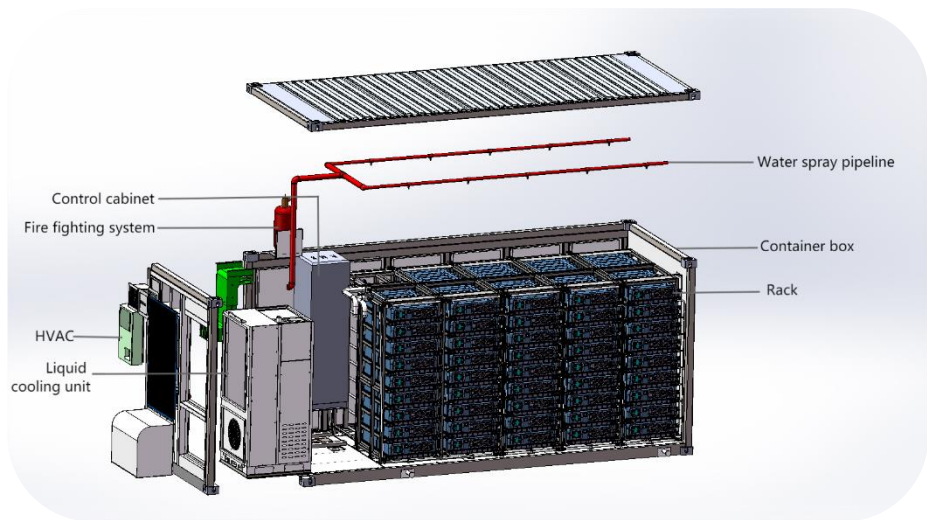
Liquid-Cooled
Rack



Gotion 3.38MWh Liquid-Cooled System



Full Technology Review



Certification Review



UL 1973

CSA GROUP™ Laboratory Test Data - UL 9540A Checklist and Test Result (Cell Level)
ORIGINAL TEST DATA

CSA GROUP™ Laboratory Test Data - UL 9540A Checklist and Test Result (Module Level)
ORIGINAL TEST DATA

CSA GROUP™ Laboratory Test Data - UL 9540A Checklist and Test Result (Unit Level)
ORIGINAL TEST DATA

Standard(s): ANSI/CAN/Thermal Ru

Master Contract:	301698	Model:	ERD1267-OSP376	Page number	1 of 36
Project / Network:	80154839	Description:	Lithium-ion Battery System for use in stationary application		

Standard(s): ANSI/CAN/UL 9540A:2019 Fourth Edition, Dated November 12, 2019 - Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems

UL 9540A



UL 9540

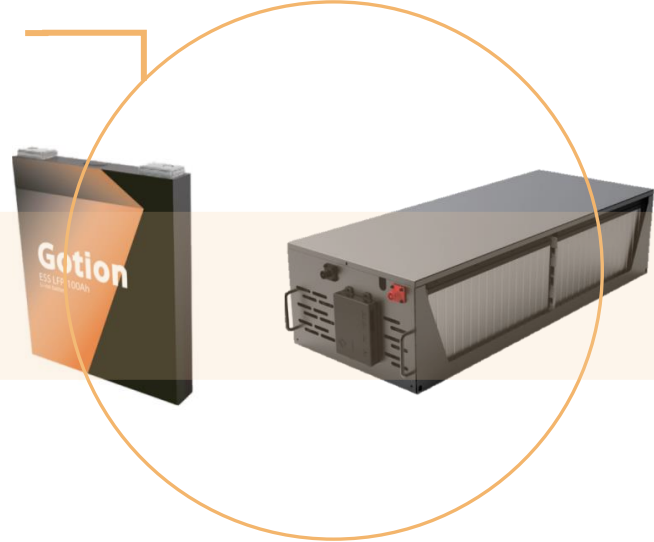
Gotion ESS Manufacturing Audit



Nantong Containerization Facility

Nantong Cell Factory

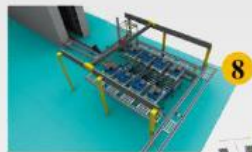
Gotion 2.7MWh
Air-Cooled System



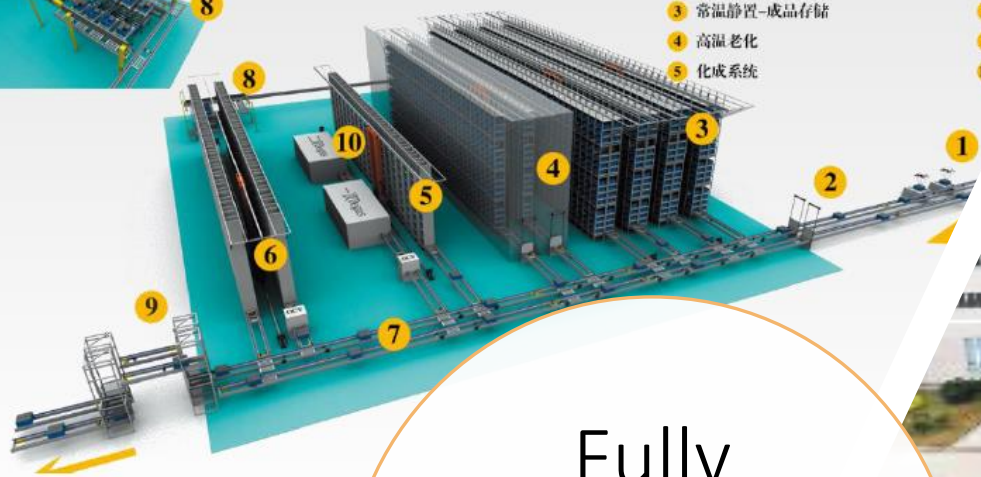
Tangshan Cell Factory

Gotion 3.38MWh
Liquid-Cooled System



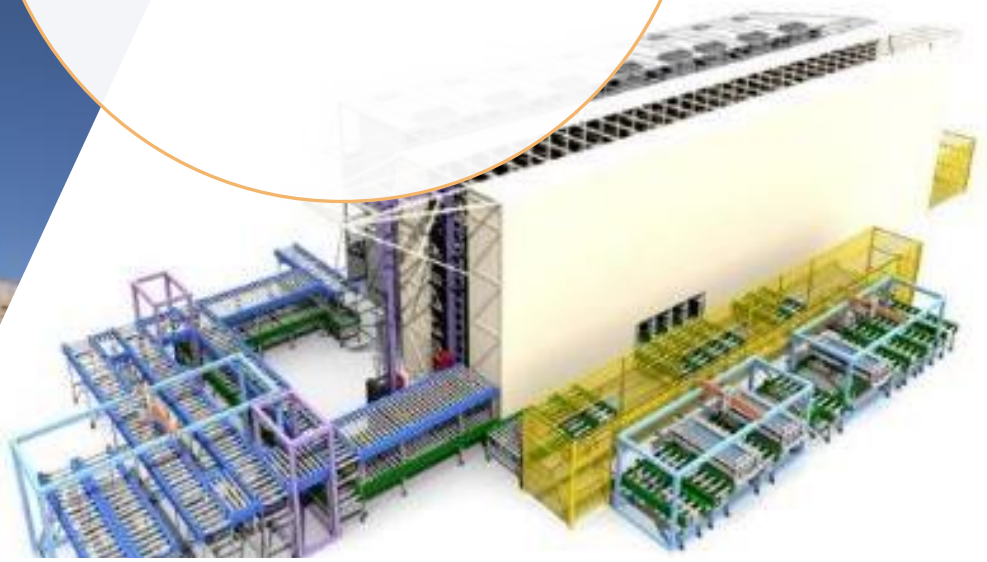




- 1 注液后组盘机器人
- 2 库内隔离门
- 3 常温静置-成品存储
- 4 高温老化
- 5 化成系统
- 6 分容系统
- 7 自动化运输
- 8 六档分选
- 9 提升机
- 10 轻载



Fully Automated Cell Facilities

High Volume Containerization






Over 1 GWh
of ESS
Capacity
Delivered in
the US



Air-
Cooled
Install



Liquid-
Cooled
Install

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Q&A



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UK plans to slash VAT on residential batteries
by Emiliano Bellini



Ecoflow unveils new balcony PV system
by Marie Bayer



Coming up next...

Thursday, 8 June 2023

3:00 pm – 4:00 pm BST, London

4:00 pm – 5:00 pm CEST, Berlin

Thursday, 22 June 2023

11:00 am – 12:00 pm CEST, Berlin

1:00 pm – 2:00 pm, Dubai

Many more to come!

**Grid-forming
inverters: What
advanced grid
functionalities
should inverters
offer?**

**Autarky today:
how the desire for
self-sufficiency can
be realized in
homes and
businesses**

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Marija Maisch
Editor
pv magazine

**Thank you for
joining today!**