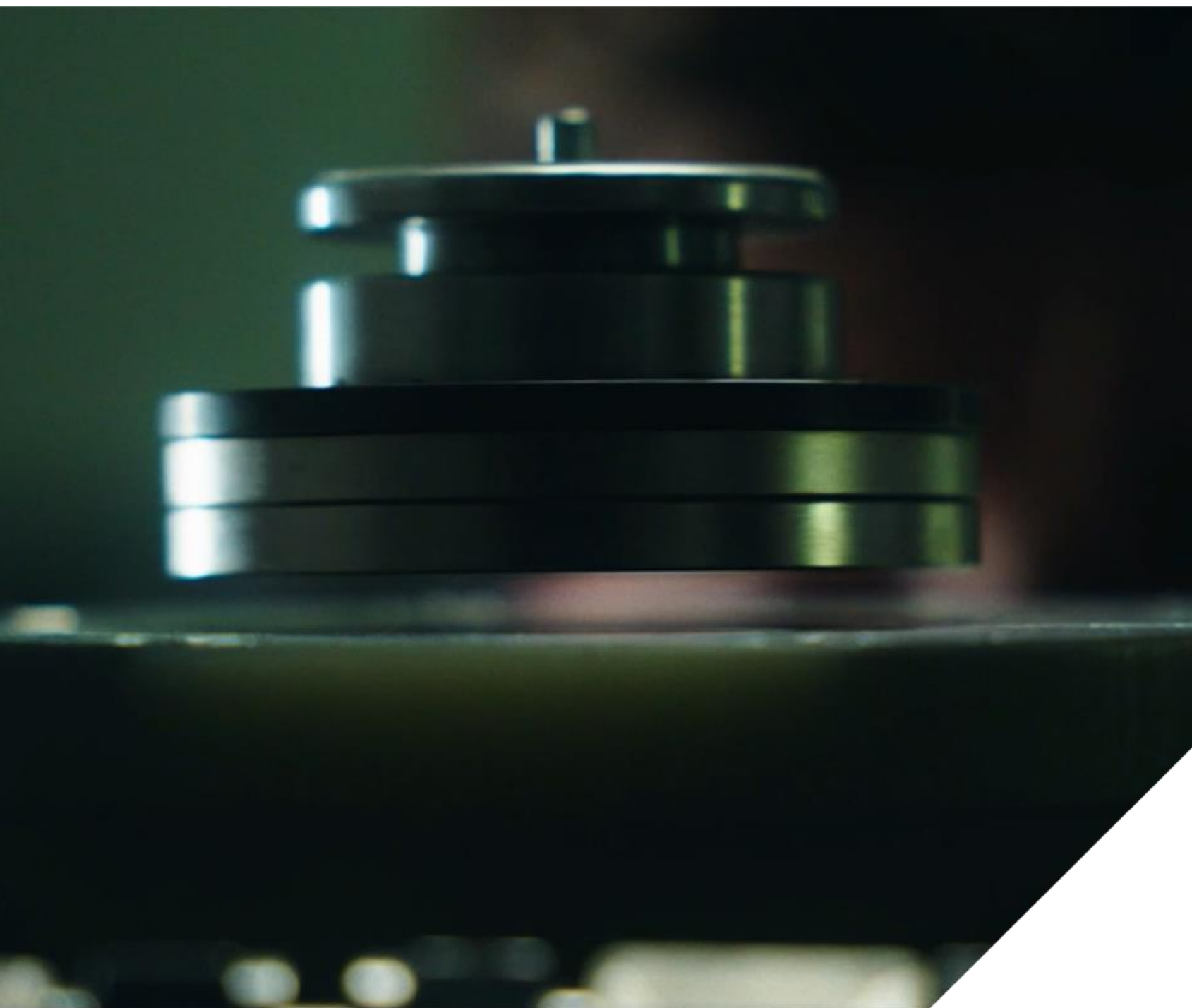


QUINTEQ

Flywheel Energy Storage

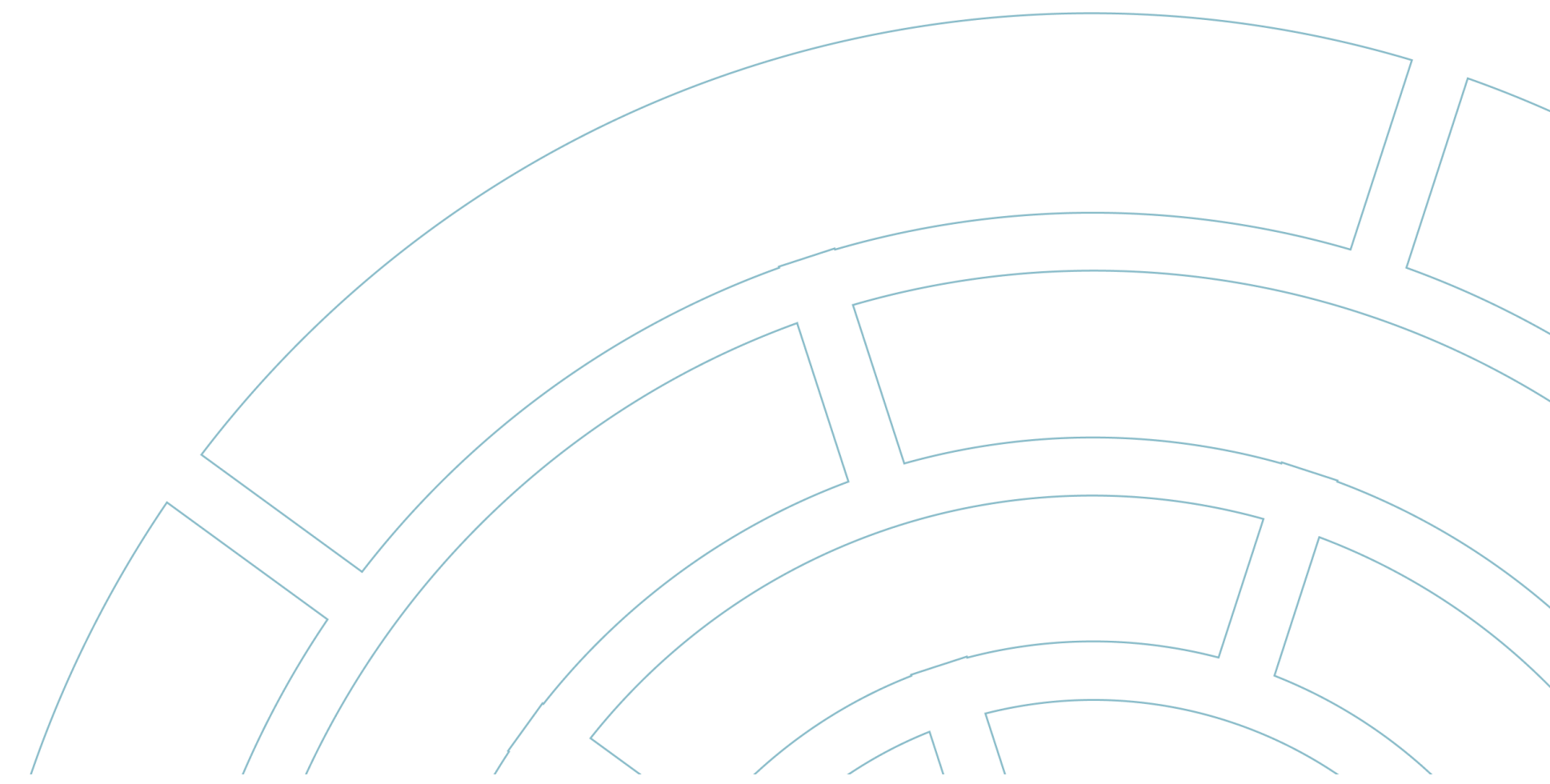
Empowering the energy transition





Bottom line upfront

Introducing the world's most advanced Flywheel Energy Storage Solution,
developed by the Boeing Company,
brought to market by QuinteQ,
made in the Netherlands.





PROBLEM

No Transition is Painless

Energy Transition Issues

1. Unpredictable and unstable power supply

Increase in renewable energy penetration leads to unpredictable and unstable power supply

2. Frequent high-power peaks

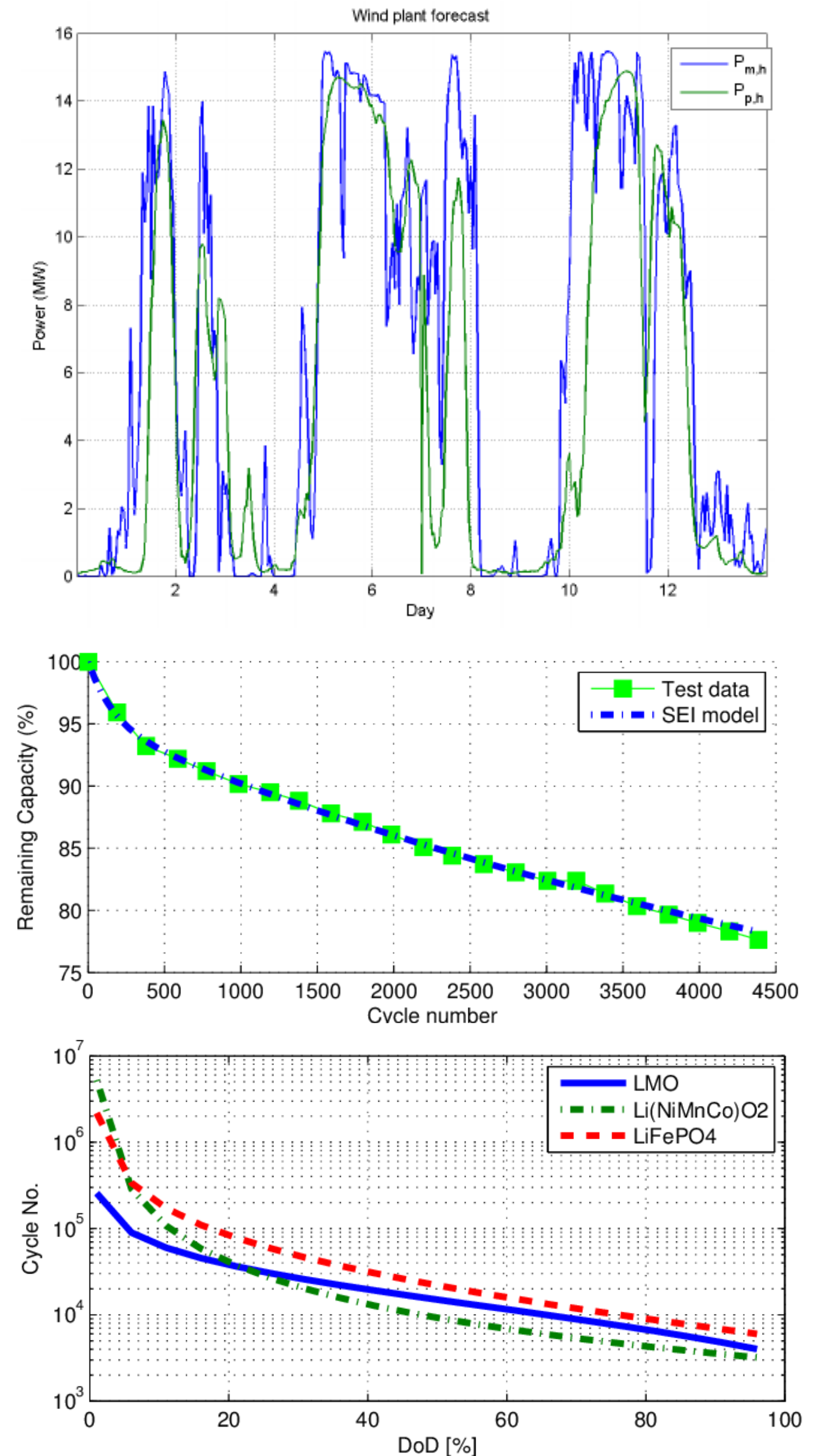
Uptake in electrification leads to increased demand for electricity, including high power peaks, occurring frequently.

3. The need to operate, stabilize and balance the (micro) grid

Existing electricity infrastructure is not equipped to handle these changes and requires the introduction of flexible and distributed energy assets to operate, stabilize and balance the (micro) grid.

4. Current battery solutions can't address these changes

Battery solutions do not have sufficient cycling capability and lifetime to address all these changes and challenges.

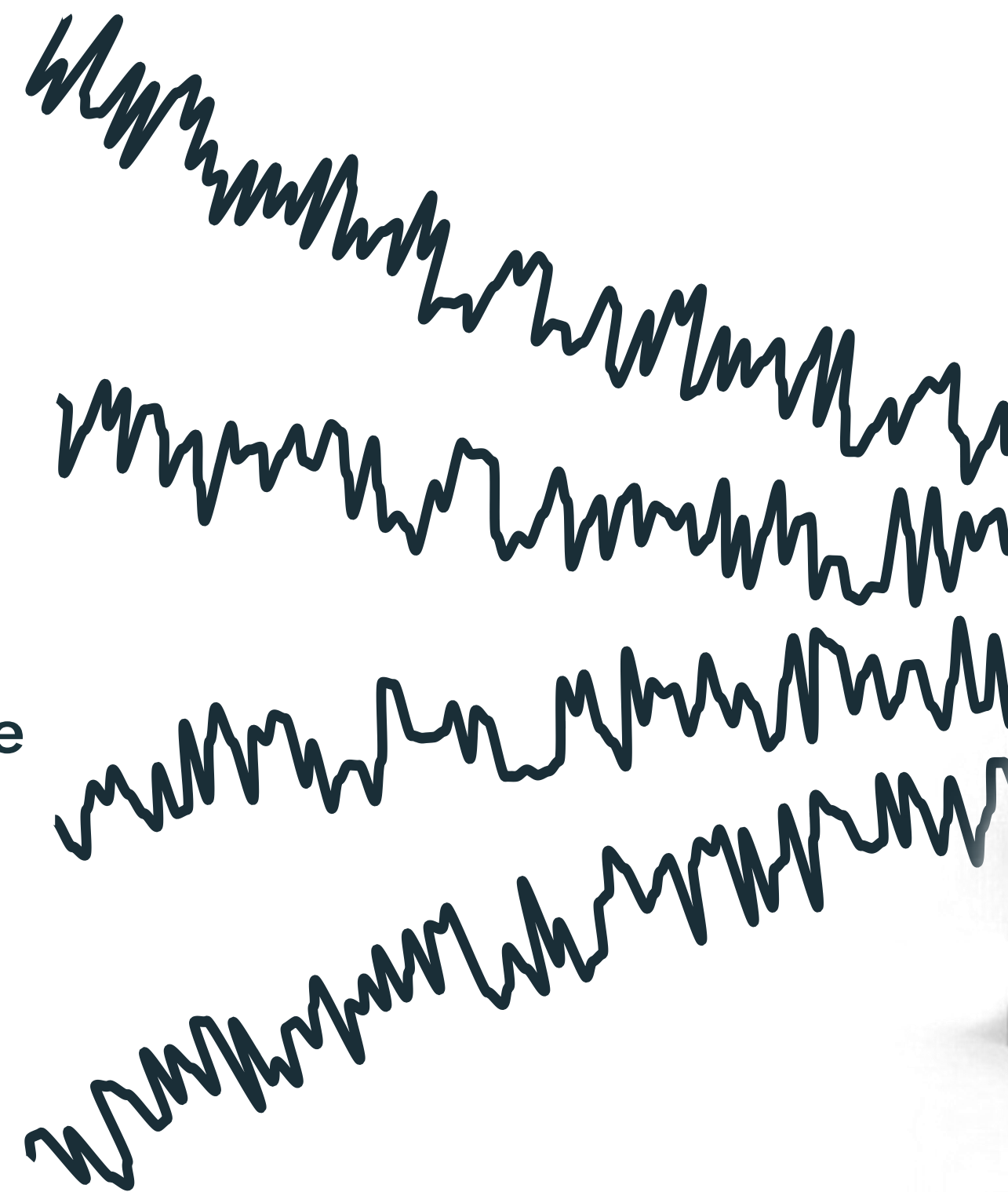


QuinteQ Energy Transition Solution

QuinteQ can be the shock-absorber in the Energy Transition

Through its high and deep cycling capability at EUR0.03/kWh cycling cost.

- 1 Unpredictable and unstable power supply
- 2 Frequent high-power peaks
- 3 The need to operate, stabilize and balance the (micro) grid
- 4 Current battery solutions can't address these changes



Meet QuinteQ's Flywheel

- high-speed vs. mass
- Compact, containerized solution, suitable for temporary projects
- Unique bearing system for zero friction and maximum efficiency
- Peak durations of seconds to minutes (depending on power required)

Other USP's

- Endless cycles, 30 years lifetime
- Fast response for balancing & frequency regulation
- Modular, adaptable to local puzzle. 100kW to MW per solution
- Kinetic battery, not chemical, fully recyclable

 1.5m x 1m x 1m

 2000 kg

 <0.1%/hr stand-by loss

 C20

 <3ms response time



Market applications



Microgrids

- Peakshaving and frequency regulation in small, variable grid

Enable energy transition in microgrids



Construction sites

- Enable high power applications in small grid connections

Reduce need for generators



Port electrification

- Peakshaving harbour cranes to free up +60% of grid connection

Optimize grid connection for higher utilization



Rail & lightrail

- Enable regenerative break energy to peakshave traction peaks of departing metro's, trams or trains

Reduce energy loss and lower peak load to optimize traction network



QuinteQ
energy storage

Other developments

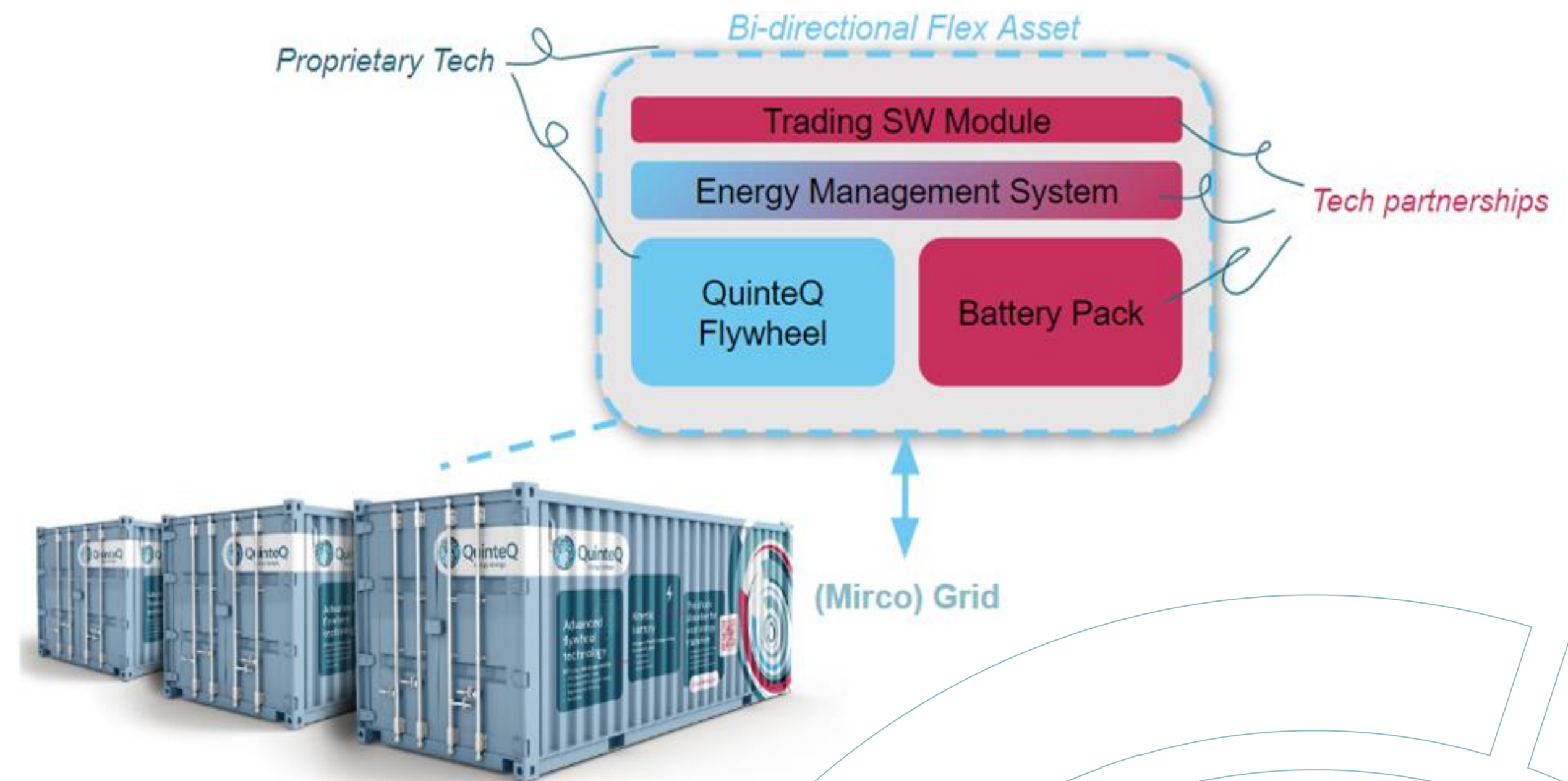
Combining complimentary storage technologies

Hybrid energy storage system

- High power and energy capacity by combining a flywheel and sodium-ion
- Modular, configurable, compact, containerized
- Real-time energy management, trading and transaction platform
- A market-disruptive product lifetime reducing TCO

Why sodium-ion?

- Abundant raw materials, reducing cost and resource concerns
- Sodium batteries are less reactive than lithium batteries, reducing safety risks



A configurable solution



Flywheel

- Enable high-frequency power peaks with small grid connections
- Peakshaving tower and port cranes
- Frequency stabilisation in variable (micro)grids

Optimises available grid connection



Sodium - ion

- Energy buffer in case of energy shortage
- Perfect for high energy demand
- Load shifting renewable energy and reducing curtailment
- Enabling energy trading for on-grid microgrids

Additional energy for on grid and off grid solutions and load shifting



Integrated flywheel & sodium - ion

- For energy shortage and variable power demand
- Complementary technologies for complex challenges

Hybrid solution for variable power and high energy demand

How we bring our energy storage systems to market

- Direct business-to-business sales
- **Leasing & rental** options for businesses where ownership is less relevant
- **Energy storage as a service**; an all-inclusive service that reduces maintenance and utilization management
- Business model for customers is a combination of fuel savings, avoiding grid expansion and enabling electrification where it would otherwise not be possible





We are QuinteQ

Meet the team

Company

- Formed in 2016, launched in 2019
- Based in The Netherlands
- QuinteQ has over 200 Boeing patents exclusive, worldwide license.

Team

- Development & production
- Funding & finance
- Sales & marketing
- Small core-team enhanced with strong partner network

Organisational culture

- Collaborative
- Entrepreneurial
- Responsible

Mission: To empower the energy transition



Paul Vosbeek
CEO



Wouter Biemans
CTO



Thieu Mooren
CFO



Darin Olson
CSO



Timo Pael
Business Development



Stefan Hartl
Lead Engineer



Andre Lucas
**Power Electronics
Engineer**



Iris Hijne
Software Engineer



Jeroen Goudswaard
**Electromagnetic
Engineer**



Jaap van de Vorst
Ip Specialist



Sanne Wassink
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Çan Nemlioglu
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