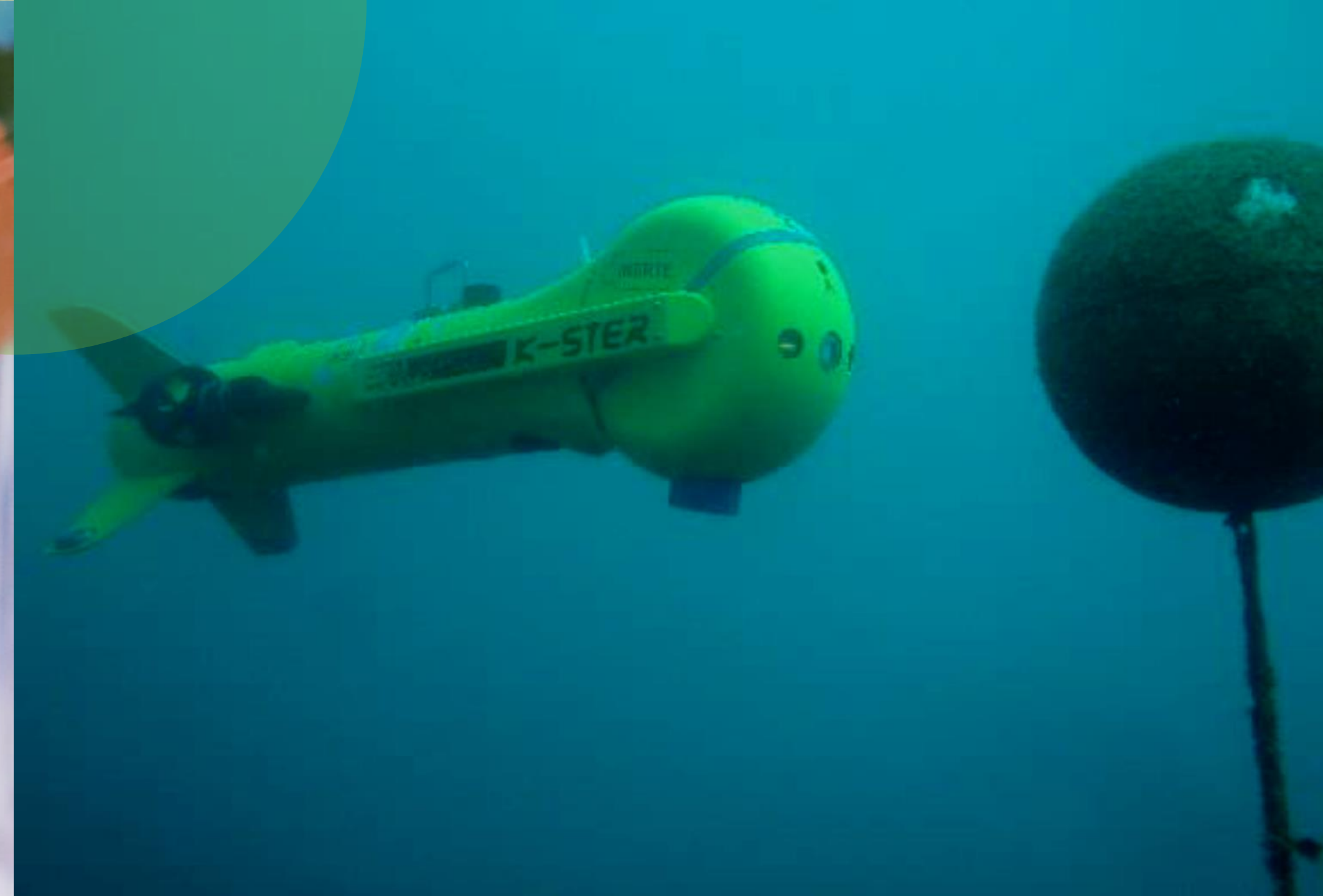
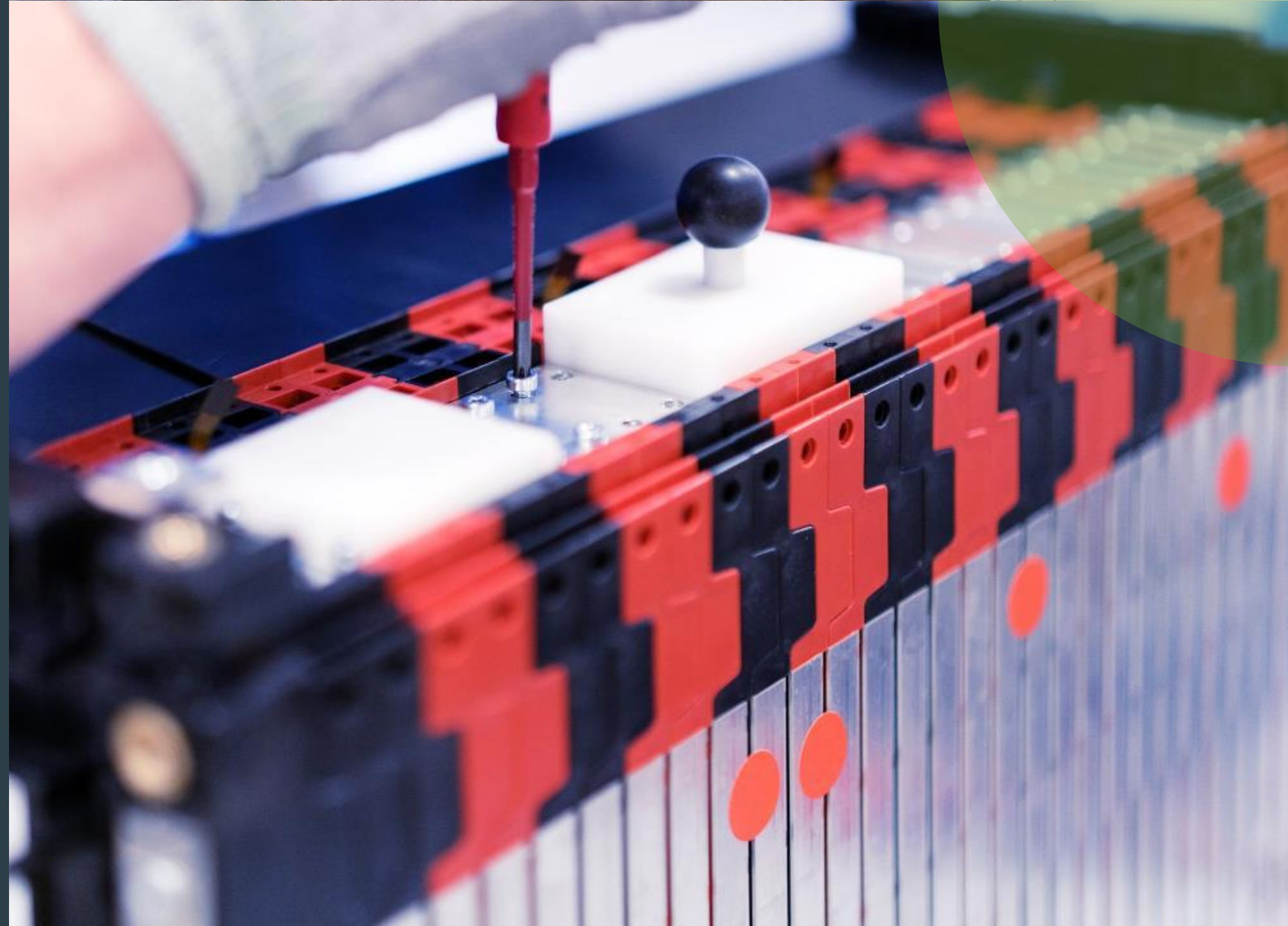


Corporate  
Presentation



Yverdon-les-Bains, Switzerland

March 2020



# AGENDA

Who we are

Leclanché technologies

Our reference customers

Our leadership team





## Company history

**1909**

### Company founded

---

- Georges Leclanché inventor of modern Leclanché cell., first modern battery
- Manufacturing of Zinc Carbon cell
- Manufacturing of Lead Acid batteries
- Manufacturing of Capacitors
- Manufacturing of Alkaline batteries

**2006**

### Acquisition of Lithium ion Technology

---

- Technology developed by the Fraunhofer Institute in Germany
- Development of technology for industrial applications
- 2009 implementation of automated production
- 2012 implementation of large-scale manufacturing, using water-based process (world's first)

**2015**

### Implementation of Growth Plan

---

- Anil Srivastava joins as new CEO
- 2016 Golden Partner joins as shareholder and funds the company development
- 2015 - 2017 Further investments in System technology
- 2018 Large scale deployment of technology in Transport and Stationary Energy Storage Systems
- 2018 Acquisition of Energy Management System (EMS)
- 2018 Joint Venture in India with largest local battery company (Exide)

- STATIONNARY
- e-TRANSPORT
- SPECIALTY BATTERY
- LECLANCHE OFFICES



“We are a world leading provider of high-quality energy storage solutions, accelerating the integration of renewable energy into our grids and powering the electrification of transport systems. We have over 100 years of battery and energy storage innovation, powered by German engineering and Swiss quality.”

## What we do

### Electrification of transport systems

- We deliver integrated Battery Packs for Electric Vehicles of all sizes, with intelligent interface to the charging infrastructure.

### Renewable energies integration

- We deliver Energy Storage Systems that reliably add intermittent solar and wind energies in the electricity network as dispatchable power on an as needed basis.

### World leading in-house technologies

- *Electrochemistry to Energy Management Software:* Lithium Cells, Battery Modules, Racks & Packs; Battery Management System; Energy Management Software.



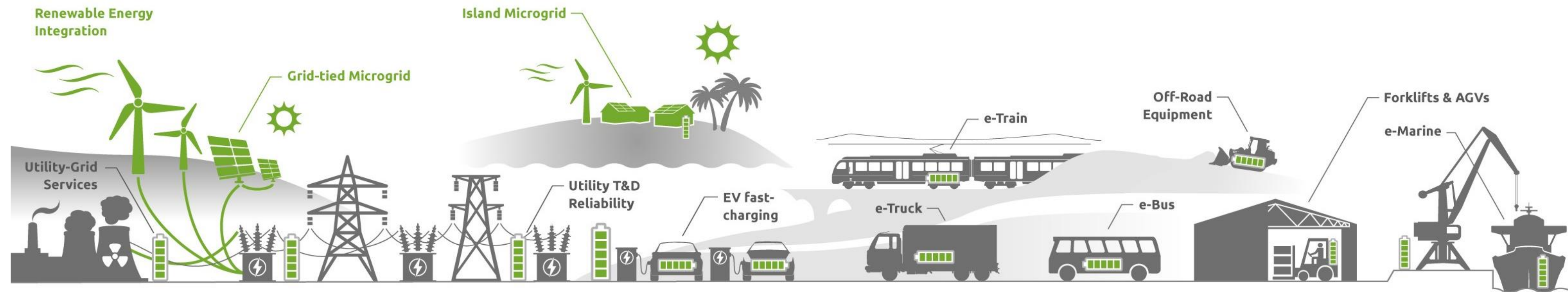
# Our value proposition



- Grid Ancillary Services
- Solar/Wind + Storage
- Microgrid Systems
- C&I Solutions
- Community Storage
- EV Charging Stations



- Electric Buses
- Electric Ferries
- Warehouse Equipment
- Industrial Marine
- Electrification/Hybridisation
- Fleet Trucks
- Rail & Off-highway



## Analysis & Optimization

- System Modeling and Opportunity Analysis
- Project Optimization
- FEED

## Flexible Sales Structure

- Turnkey EPC
- Supply & Commissioning
- PPA & Project Finance

## System Control & Operation

- Multi-Application Energy Management System (EMS)
- System Degradation and Replenishment
- Remote Monitoring and Service

## Total Integration

- Full process control: from in-house cell production to complete packs
- Infrastructure such as chargers and connectivity
- Fully integrated electric drive trains
- Homologation & Certification

## System Engineering

- Scalable lithium-ion battery packs with thermal management
- State-of-art DNV-GL type approved battery racks for marine applications
- Battery packs engineered to operate faultlessly on majority of vehicles

## Fleet Management

- Dynamic route simulation
- System planning
- Remote monitoring of all system components via a cloud service



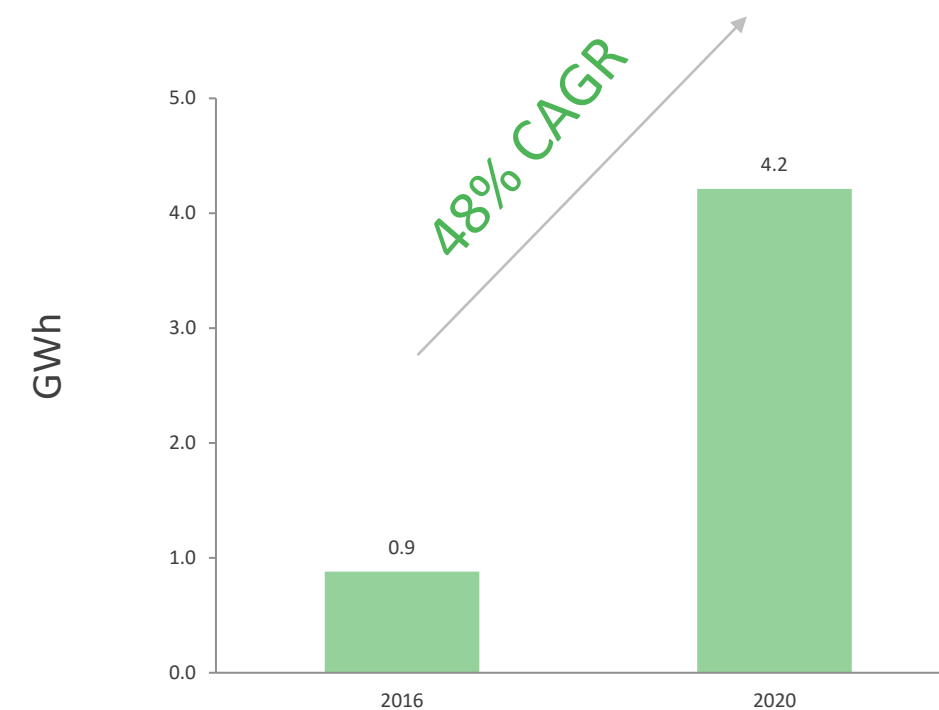
We address USD 10 billion market growing @37% CAGR



## Utility-scale generation & microgrids



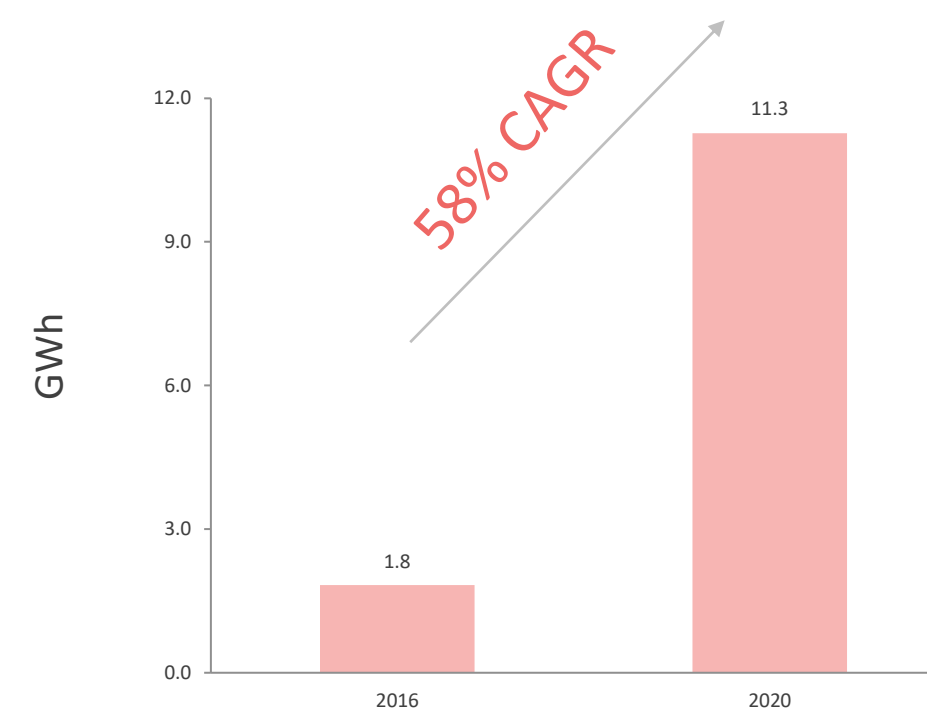
- Micro-grids: renewable integration
- Grid stabilisation and peak shifting
- Fast EV Charging



## Commercial & industrial battery systems



- Commercial, industrial & residential
- Solar lighting, medical, telecoms, security & defence
- Branded consumer (selected markets)



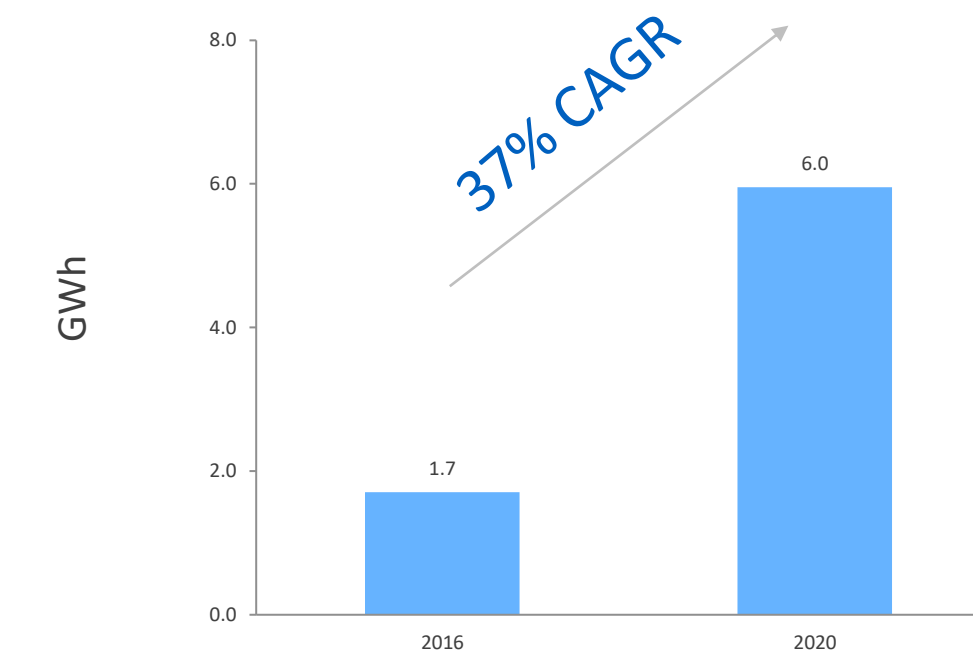
Source: Navigant Research



## eTransport



- Fleets of buses, trains & trams
- Ferries and tugboats
- Forklifts, cranes, mining vehicles





World leading  
Leclanché energy  
storage  
technologies





# Our Technology

## Lithium cells

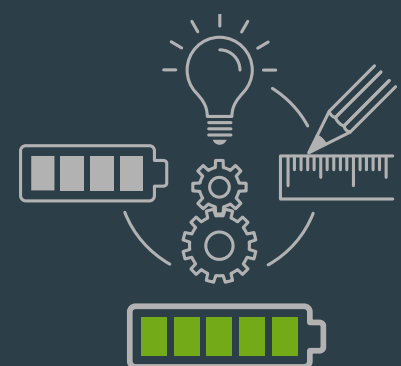
- G/NMC cells for high energy density applications
- Titanate cells for high power, fast charge applications
- Industry leading cycle life, energy & power performance
- Automated production facility in Germany



**e-TRANSPORT  
SOLUTIONS**



**STATIONARY  
SOLUTIONS**



**SPECIALTY BATTERY  
SYSTEMS**

## Modules, Packs and Racks

- Competitive custom design of Lithium cells, with in-house BMS, to design Battery Packs for a wide range of Electric Vehicles: from eAuto rickshaw in India, to large eCargo vessel in Norway.
- Hybrid Battery Systems with fuel cells/ gas engines under development for long range vehicles.
- Inhouse EMS-led Systems Integration for stationary storage solutions

### Advanced production techniques



### Battery chemistry technologies



Proprietary Lithium Titanate Oxide (LTO) cells for leading performance in long-life and rapid-charge applications (sole manufacturer in Europe)



Proprietary G-NMC cells for energy intensive applications (continued R&D enhancements made)

### Module design





# Common technology stack: serving multiple markets, enhancing margins

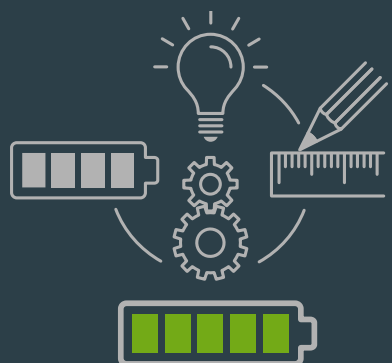
We deploy our proprietary cells, yet remain flexible to incorporate other storage technologies with our software and controls



**e-TRANSPORT  
SOLUTIONS**



**STATIONARY  
SOLUTIONS**

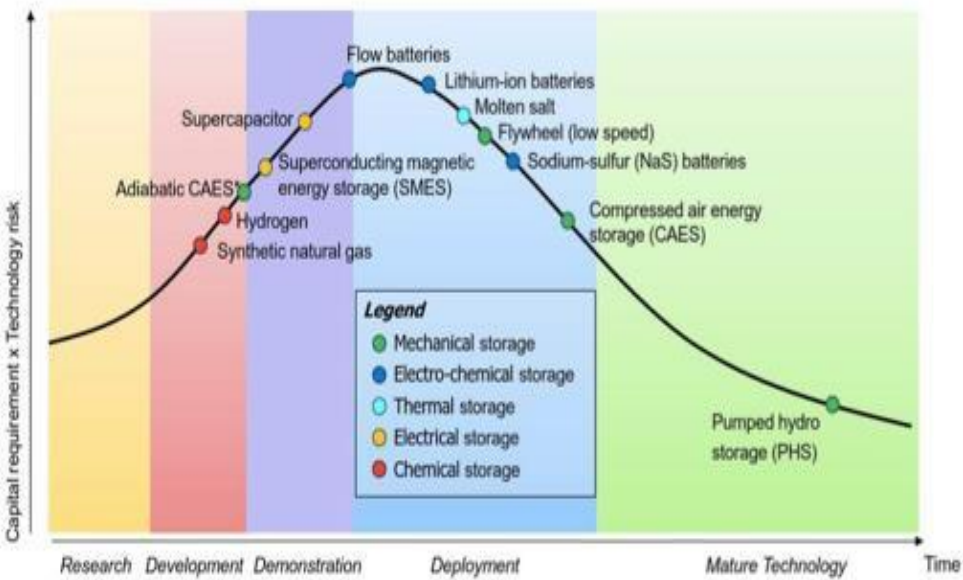
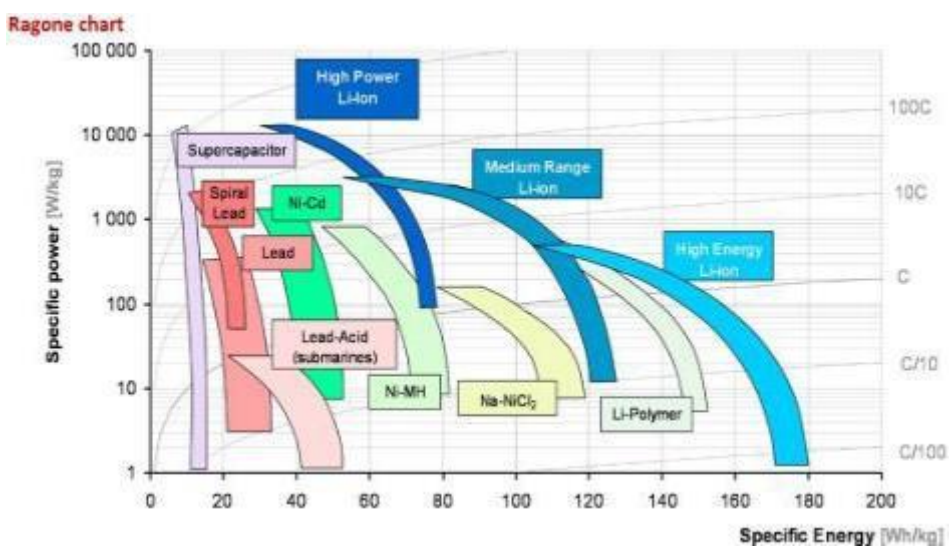


**SPECIALTY BATTERY  
SYSTEMS**

	Lithium Titanate Oxide (LTO)	Lithium Graphite/NMC (G-NMC)
Cycle life	>20,000 @ 80% DoD	8,000 @ 80% DoD
Lifetime & Warranty	Up to 20 years	Up to 10 years
Charge time to 90% SoC	Less than 15 minutes (4C)	1 hour (1C)
Charge acceptance	Symmetrical to discharge (max. c-rate 7)	Asymmetrical to discharge (max. c-rate 1)
Energy density	70 Wh / kg	210 Wh / kg within 2019 270 Wh/ kg in 2020
Temperature range	-20°C to +55°C	0°C to +45°C
Safety	Laminated ceramic separator	Laminated ceramic separator
Ideal use cases	<ul style="list-style-type: none"><li>•Power intensive applications</li><li>•Long lasting applications</li><li>•Applications needing rapid response</li><li>•Grid stability projects</li></ul>	<ul style="list-style-type: none"><li>•Energy intensive Electric Vehicles</li><li>•Renewable energy integration</li><li>•Low cycle applications</li><li>•Bulk storage or weight critical applications</li></ul>

## Integrated 3<sup>rd</sup> Party Technologies

- Hydrogen fuel cells
- NiMH
- Lead acid
- Ultracapacitors





# Our patents portfolio

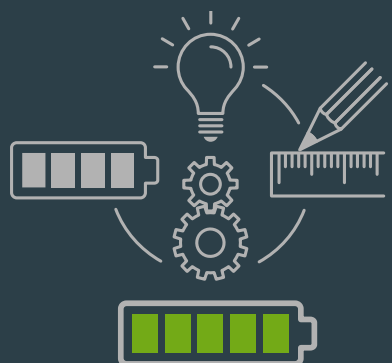
Our IP portfolio of patents protects our proprietary cell technologies and water-based processing methods



e-TRANSPORT  
SOLUTIONS



STATIONARY  
SOLUTIONS



SPECIALTY BATTERY  
SYSTEMS

Coverage area	# of patent families	# patents granted	# patents filed
LTO specific	5	35	5
Manufacturing process	3	37	30
Separator technology <sup>(1)</sup>	1	-	5
System/module integration	2	-	3
	11	72	43



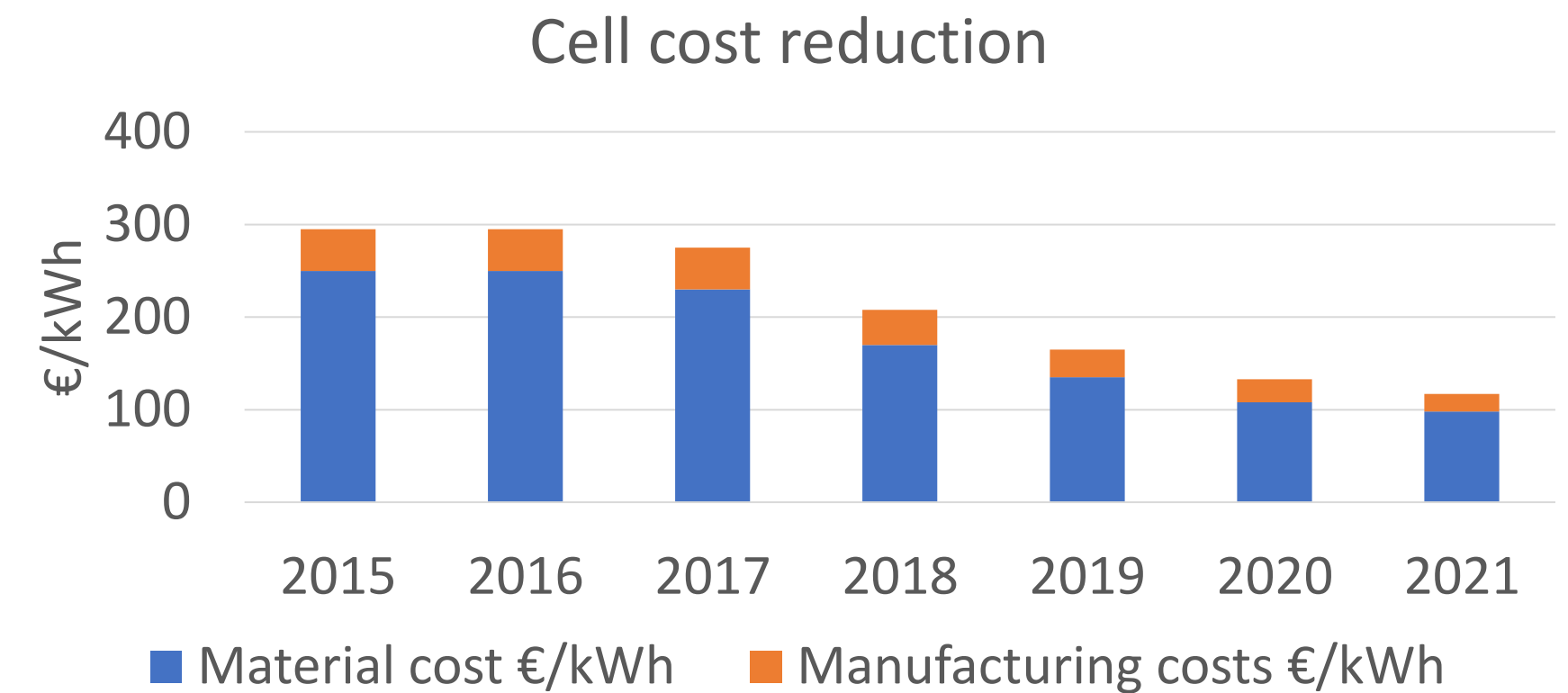
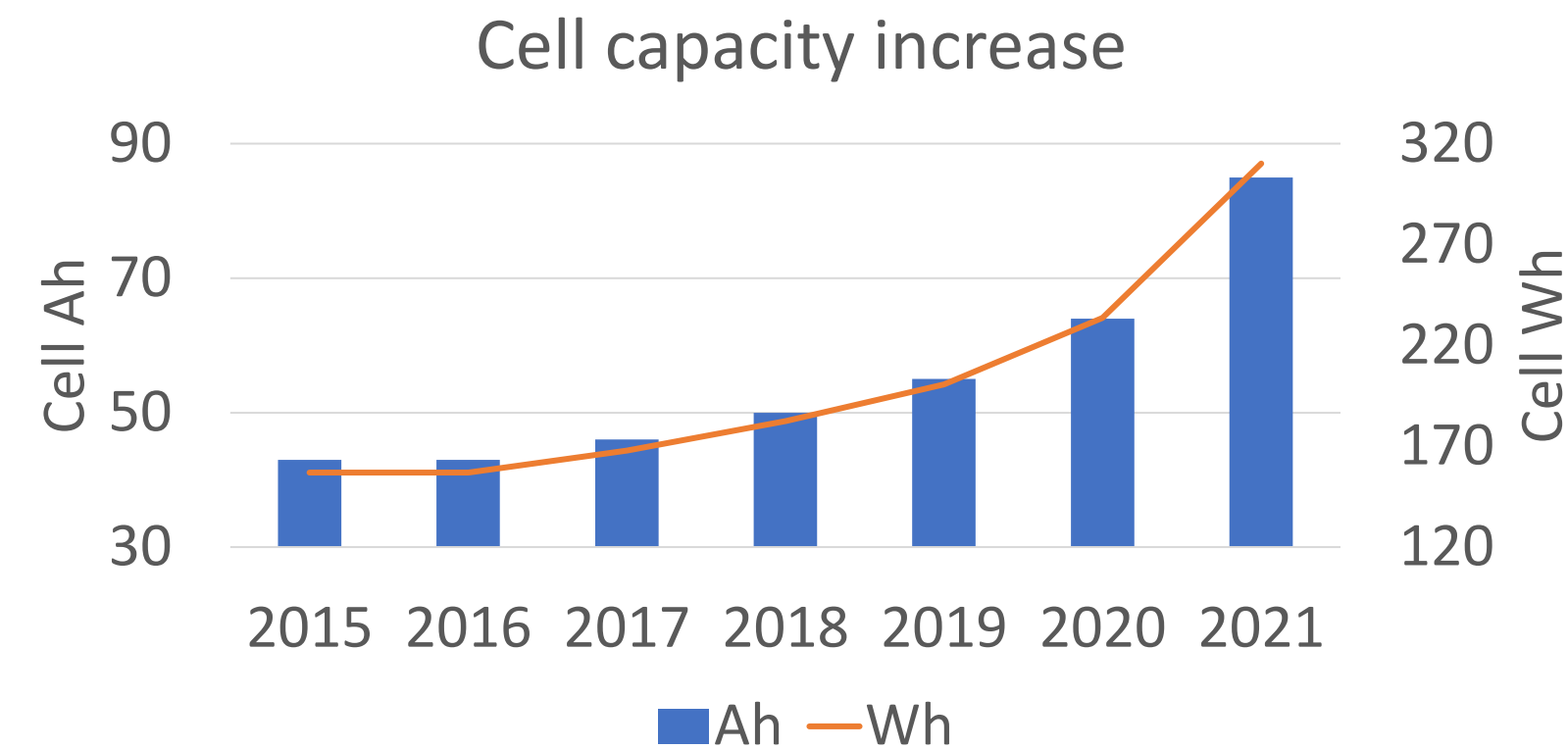
Reduced cost-base by  
more than  
50%

Plans to triple cell  
manufacturing capacity

Systems Assembly and  
Testing capacity  
build-up

Competitive products: on target to achieve 55% cost reduction between 2015 and 2020 through innovation and engineering

**49% increase in Cell capacity; >90% for high energy density Cells**



### New modules for eTransport applications

- New gen M3 modules design: 30% reduction in component costs.
- New automated assembly line in Yverdon, Switzerland, by mid-2020 in partnership with Comau (Fiat Chrysler Automotive group company): >5 fold increase, 350 MWh in Module manufacturing capacity.



EUR 500 million  
initiative launched by  
the German Federal  
Ministry of Education  
and Research (BMBF)

Largest industrial partner  
within the consortium  
German funding  
budget of EUR 1 billion

By 2020, Leclanché  
aims to deliver >300 Wh per  
kg/ 500 cycles  
cells for cars; >230 Wh per Kg/  
>2'000 cycles cells for heavy  
duty transport vehicles

## Continuous innovation: strong national and European alliances for lithium cells

### Battery cell research and production centre

- Cell development plant for the battery industry, set-up through the Fraunhofer Institute, to produce cylindrical and pouch cells.
- Leclanché part of the industry consortium contributing to the plant set-up and operation.

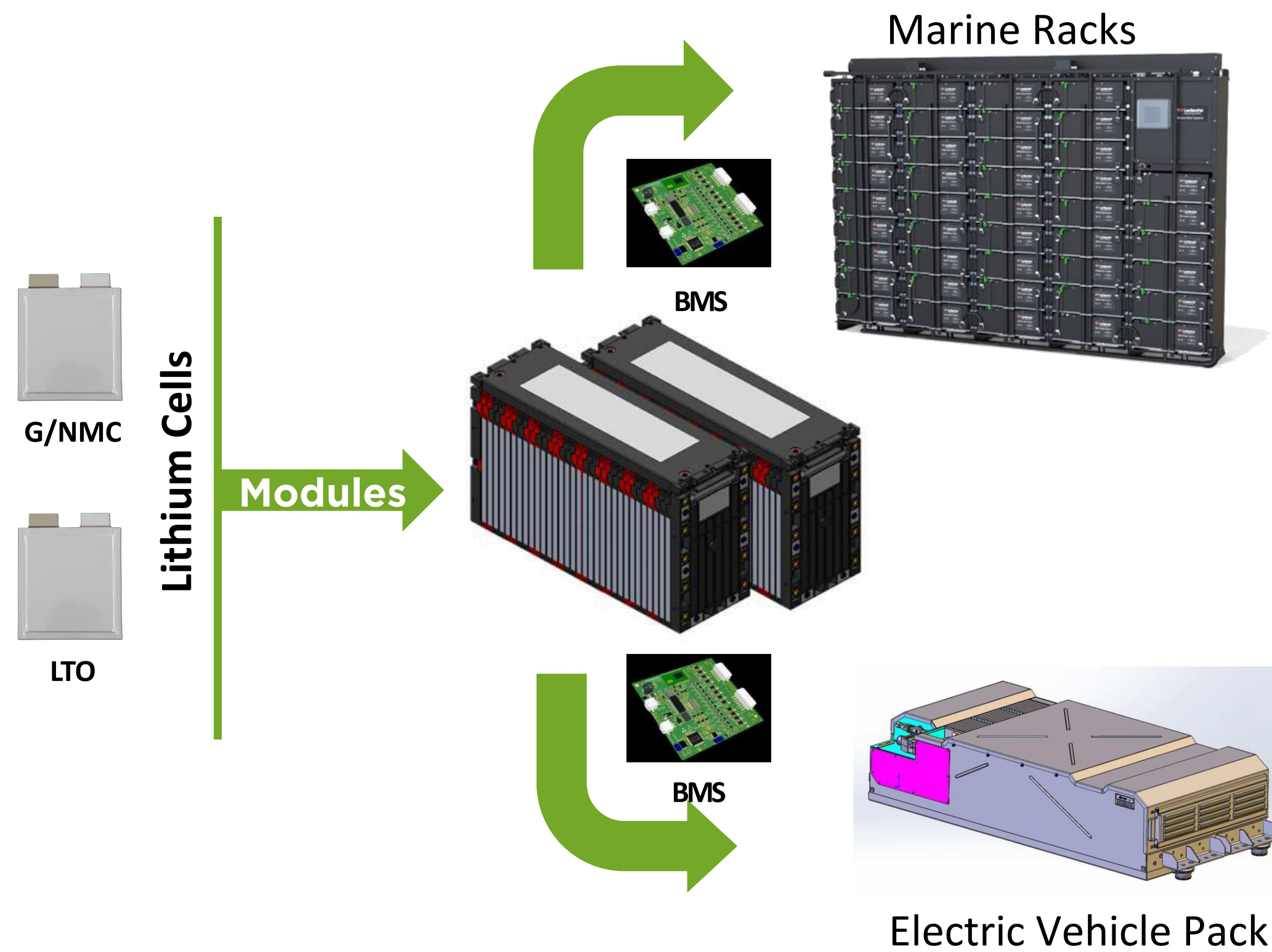
### European Battery Alliance and “Batteriezellfertigung”

- Major cell production industrial ramp-up support from Germany through the EU's European Battery Alliance and the use of an IPCEI (Important Project of Common European Interest) process.
- Leclanché has notified its interest in participating in the process through the establishment of an industrial consortium led by Leclanché and other partners (Umicore, Solvay, SGL Carbon, CS Additive, Manz, PEC).



## Leclanché integrated solutions for electrification of transport systems

- Superior in-house Cells and Battery Management Systems (BMS) to custom design Battery Packs for Electric Vehicles of all sizes.
- Intelligent and dynamically configurable integration with charging infrastructure to optimize fleet operations.

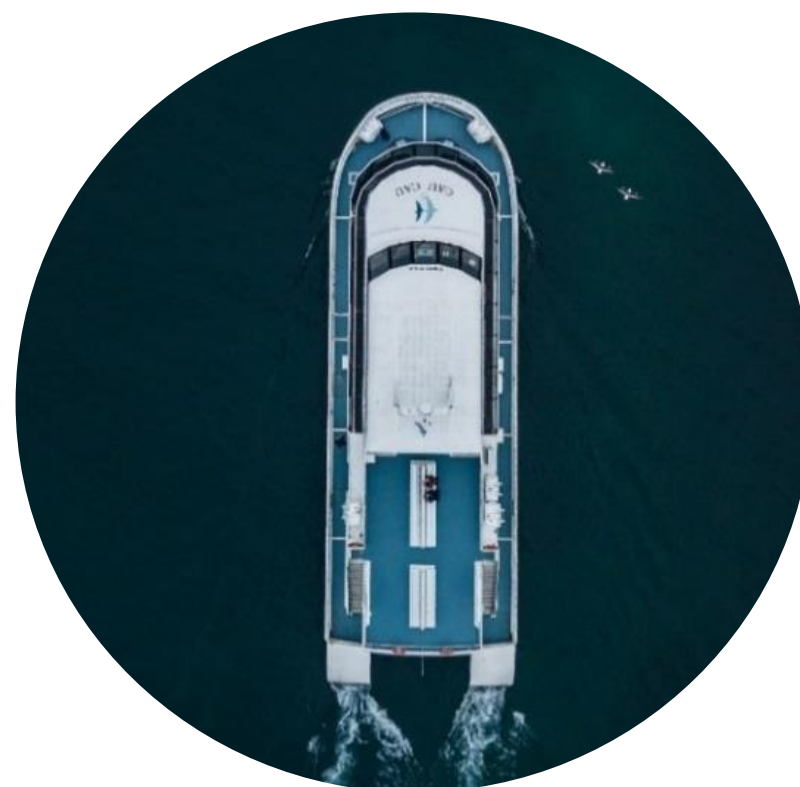




## Transport systems application

### Marine vessels

- Ferries
- Tugboats
- Containers



### Off highway

- Cranes
- Construction Equipment
- Mining



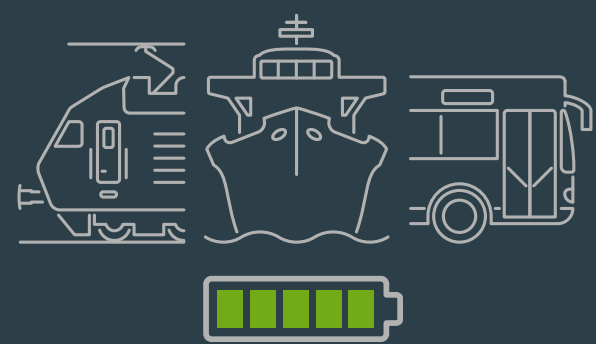
### Land transport

- Transit bus
- Trolley bus
- Light rail
- Heavy rail
- Rickshaws,
- 2-3 wheelers



### Material handling

- Forklift trucks



e-TRANSPORT  
SOLUTIONS



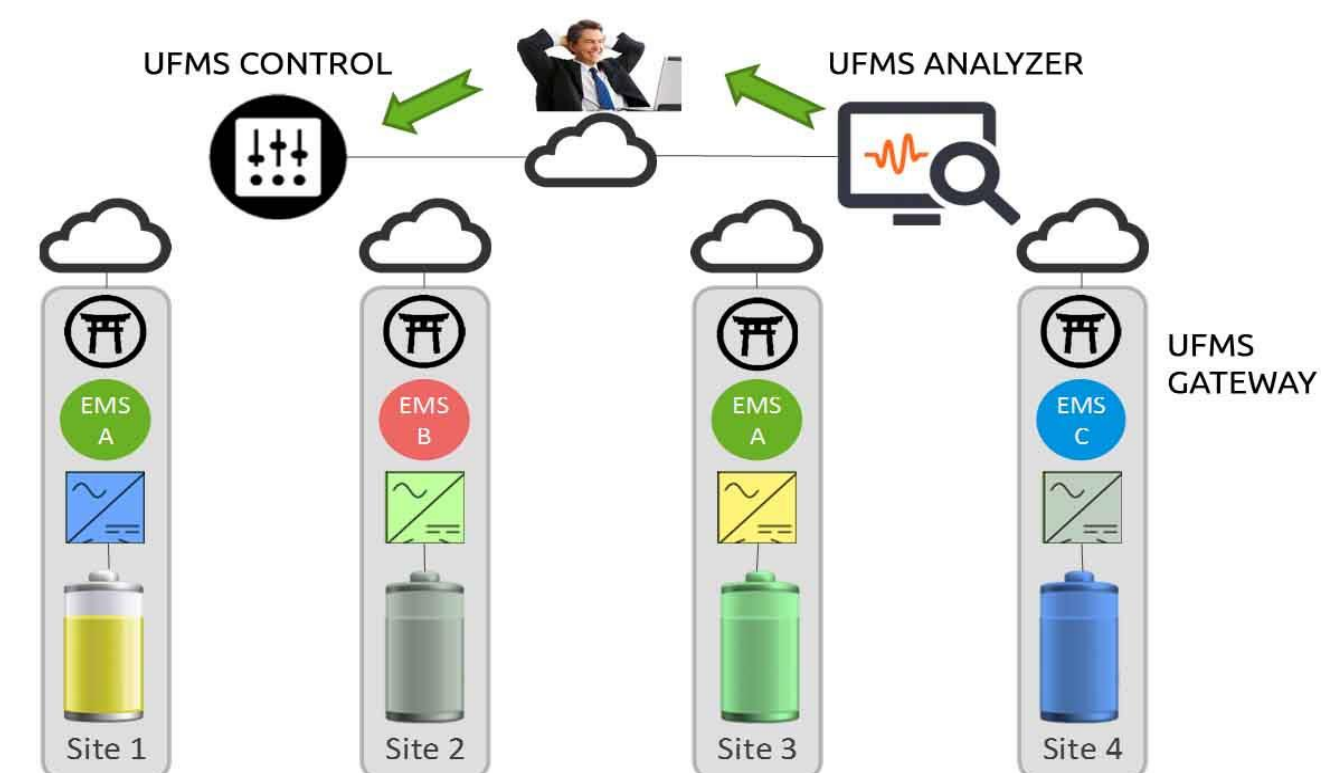
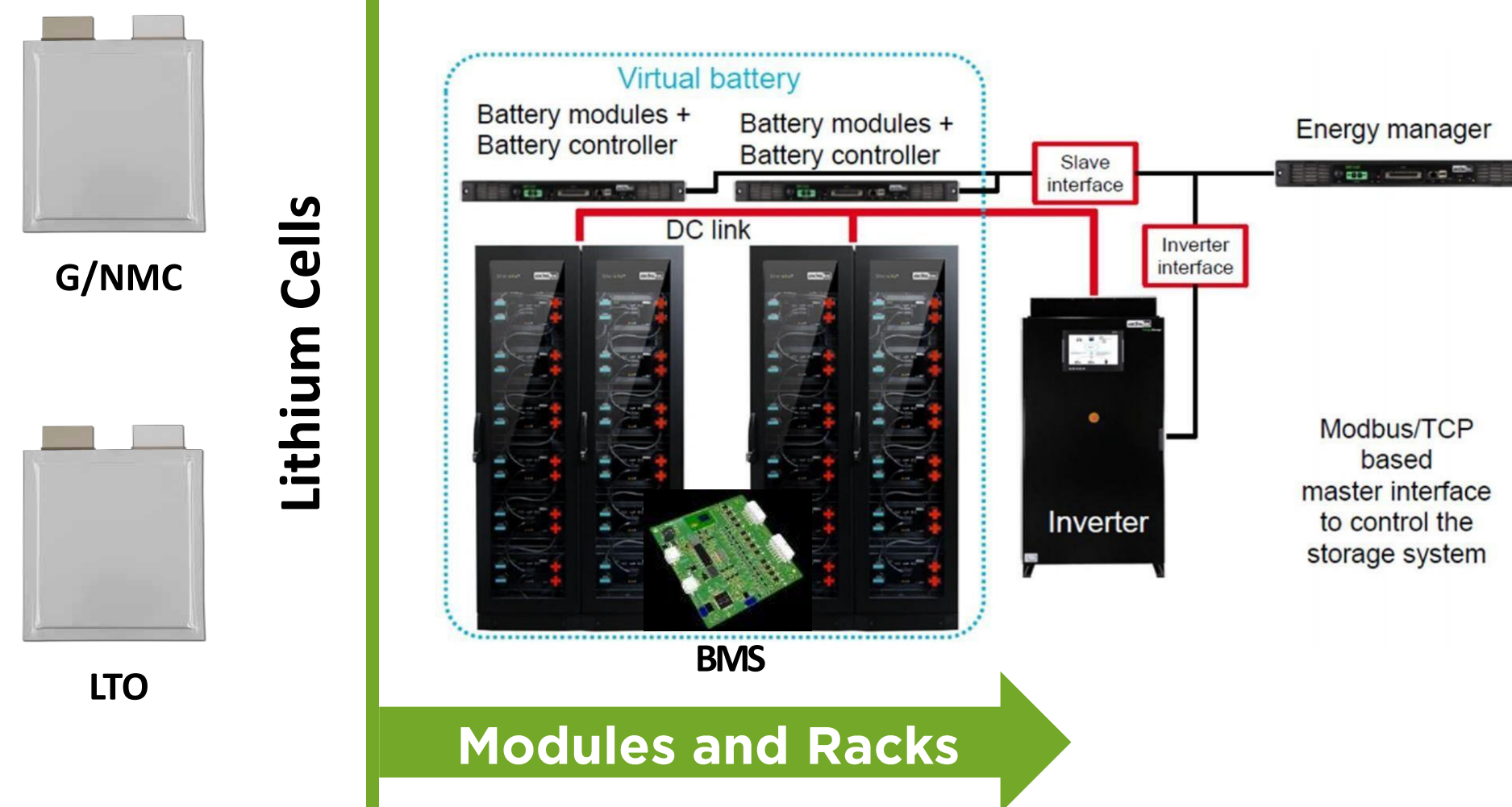
# Leclanché energy storage systems for better integration of renewable energies

Energy Management  
Software (EMS)

Universal Fleet  
Management Software  
(UFMS)



**Leclanché Software and Controls package provides  
flexibility across multiple applications**





## Customer applications delivered

### C&I / behind the meter

- Demand charge reduction
- Backup power/UPS
- PV optimization

### Microgrids

- Diesel displacement
- Renewables integration
- Grid stability

### Solar PV related

- Solar ramp rate control
- Load shaping-shifting

### Utility services / grid connected

- Ancillary services
- Transmission deferral

### EV fast charging

- Rapid DC EV charging





Our reference  
customers





Master Supply Agreements  
with recurring annual  
revenues

Custom-designed battery  
packs for fleets of Electric  
Vehicles based on 100%  
Leclanché technology

Energy storage  
solutions for smart  
charging infrastructure



## Stealing a march on our competitors in the fast-growing Electric Vehicles (EV) market

We have created a new business  
unit in the  
fast growing EV market

Solutions developed and  
Engineered for Fleet EVs and  
Shared Mobility

We are focused on the  
Underserved e-Marine market



# BOMBARDIER



## DAMEN

## wasaline

## TOYOTA

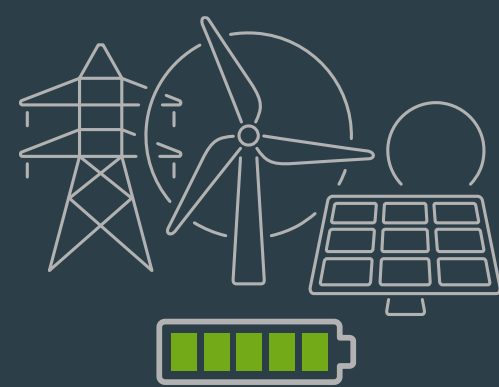
Yara Birkeland will be the world's first fully electric and autonomous container ship, with zero emissions. With this vessel, Yara will reduce diesel-powered truck haulage by 40,000 journeys a year.



From less than 1 MWh in 2015  
to 100 MWh projects  
commissioned  
by 2018

Comprehensive  
set of software and  
controls for Leclanché  
Energy Management  
Software (EMS)

EPC turnkey solution  
for a wide range  
of applications



STATIONARY  
SOLUTIONS

## Stationary storage solutions for leading customers worldwide

EPFL



Gracióllica

CanadianSolar

enel  
Green Power

NRSTOR

ENERTRAG

S4energy

swb

ieso

pjm

EXIDE

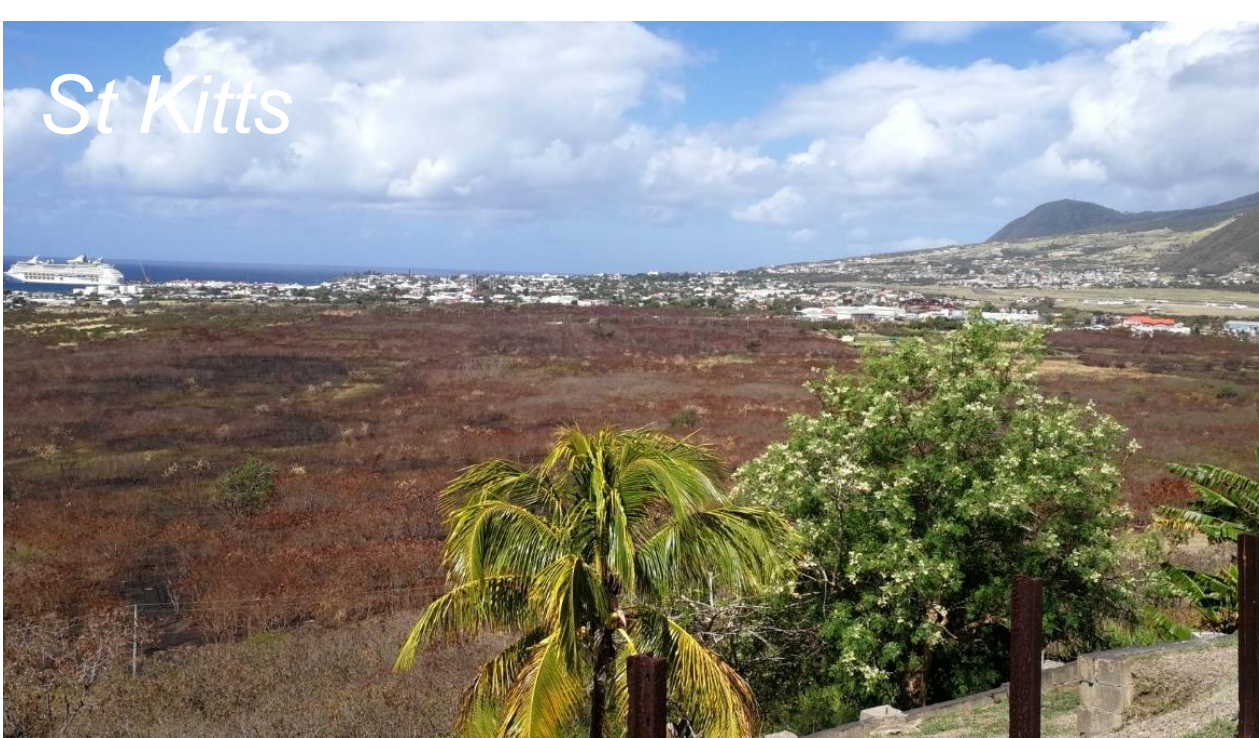


*Bombardier Transportation* is a global mobility solution provider leading the way with the rail industry's broadest portfolio.

*E-Ferry* is the largest all-electric passenger vessel

*St Kitts* is the largest Solar+Storage Project in Caribbean

## Recent Announcements of Industry-leading Projects



### PRESS RELEASE



#### **Bombardier Transportation selects Leclanché SA as preferred global provider of Battery Systems to power Rail Transportation**

*After the imminent delivery of the first performance demonstrator battery systems, the contract will enable Leclanché to become the selected supplier for a potential business revenue of more than 100m € over the next 5 years, delivering battery systems for about 10 different railway projects.*

**Yverdon-les-Bains, Switzerland, October 2<sup>nd</sup>, 2019** – Mobility solution provider Bombardier Transportation has signed a Memorandum of Understanding (MOU) with Leclanché, one of the

### PRESS RELEASE



#### **Leclanché powers the world's largest electric ferry which has completed its maiden voyage**

*"Ellen", the world's largest all-electric ferry, today connected the ports of Søby and Fynshav (Denmark). As the project's energy storage partner, Leclanché provided the ground breaking battery system for this project.*

**YVERDON-LES-BAINS, Switzerland, August 15, 2019** – The world's largest all-electric ferry, named E-ferry Ellen, made its first commercial trip early this morning, Thursday, August 15, 2019, connecting the ports of Søby and Fynshav, on the islands of Aerø and Als, in southern Denmark. This

### PRESS RELEASE



#### **Leclanché and Government of St. Kitts Agree to Build Largest Solar Generation Plus Storage Project in Caribbean**

*Fully Integrated Solar Photovoltaic and Lithium-ion Battery Energy Storage System Will Provide Clean and Reliable Energy for Residents of St. Kitts and Nevis*

**BASSETTERRE, St. Kitts and Nevis; DALLAS and YVERDON LES BAINS, Switzerland, August 7, 2019** – The largest solar generation plus energy storage project ever to be built in the Caribbean has been announced by the Government of St. Kitts and Nevis, the state-owned St. Kitts Electric Company



Our leadership  
team





# Our leadership team



Anil Srivastava

CEO



Hubert Angleys

CFO & COO  
Corporate Services

- Finance
- HR & Facilities
- Legal
- Sales Operations
- Procurement
- Quality & EHSS
- Global Customer Services
- IT
- MarCom



Phil Broad

EVP  
eTransport Solutions

- Sales
- Product Management
- Engineering
- Project Management
- Integration
- Homologation & Testing



Bryan Urban

EVP  
Stationary Storage Solutions

- Sales
- Product Management
- EPC: Engineering, Procurement, Construction
- FEED, Project Finance
- EMS Development
- Project Management
- O&M



Fabrizio Marzolini

EVP  
Specialty Battery Systems

- Sales
- Business Development
- Engineering
- Project Management



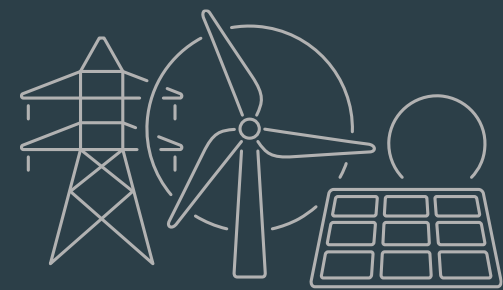
Pierre Blanc

CTIO  
Product Delivery

- R&D Cells
- Module Technology Development
- BMS & Software Development
- Cells Production
- Modules & Battery Packs Production



e-TRANSPORT  
SOLUTIONS



STATIONARY  
SOLUTIONS



SPECIALTY BATTERY  
SYSTEMS

## Disclaimer

This presentation has been prepared by Leclanché S.A. (the “Company”) solely for informational purposes.

None of the Company or any of its directors, officers, partners, employees, agents, affiliates or advisers nor any other person makes any representation or warranty of any sort as to, and no reliance should be placed on, the accuracy, completeness, fairness or reasonableness of the information or the opinions contained in this presentation or in any other document or information made available in connection with this presentation. No person shall have any right of action against the Company or any of its directors, officers, partners, employees, agents, affiliates or advisers or any other person in relation to the accuracy or completeness of any such information or for any loss, however arising, from any use of this presentation or its contents or otherwise arising in connection with this presentation.

This presentation contains non-IFRS measures (including certain ratios and key performance indicators, such as MWh, or megawatt hour, which means a unit of energy equal to 1MW of power being applied continuously for one hour, which the Company uses to illustrate its overall production as demonstrated through the electrical energy storage capacity of its battery systems). These measures have limitations as analytical tools and should not be considered in isolation or as substitutes for analysis of the Company’s results as reported under IFRS.

This presentation contains statements that constitute forward-looking statements relating to the business, financial performance and results of the Company and the industry in which the Company operates. Such forward looking statements in this presentation are for illustrative purposes only. These statements may be identified by words such as “expectation”, “belief”, “estimate”, “plan”, “target”, “forecast”, “pipeline”, and similar expressions or the negative thereof; by the forward-looking nature of discussions of strategy, plans or intentions; or by their context. All statements regarding the future are subject

to inherent risks and uncertainties, and various factors could cause actual future results, performance or events to differ materially from those described or implied in these statements. Such forward-looking statements are based on numerous assumptions regarding the Company’s present and future business strategies and the environment in which the Company will operate in the future. Further, certain forward-looking statements are based upon assumptions of future events that may not prove to be accurate, and neither the Company nor any other person accepts any responsibility for the accuracy of the opinions expressed in this presentation or the underlying assumptions. Past performance is not an indication of future results and should not be taken as a representation that trends or activities underlying past performance will continue in the future. The forward-looking statements in this presentation speak only as at the date of this presentation, and the Company expressly disclaims any obligation or undertaking to release any updates or revisions to these forward-looking statements to reflect any change in the Company's expectations with regard thereto or any change in events, conditions or circumstances on which any statement is based after the date of this presentation or to update or to keep current any other information contained in this presentation or to provide any additional information in relation to such forward-looking statements.

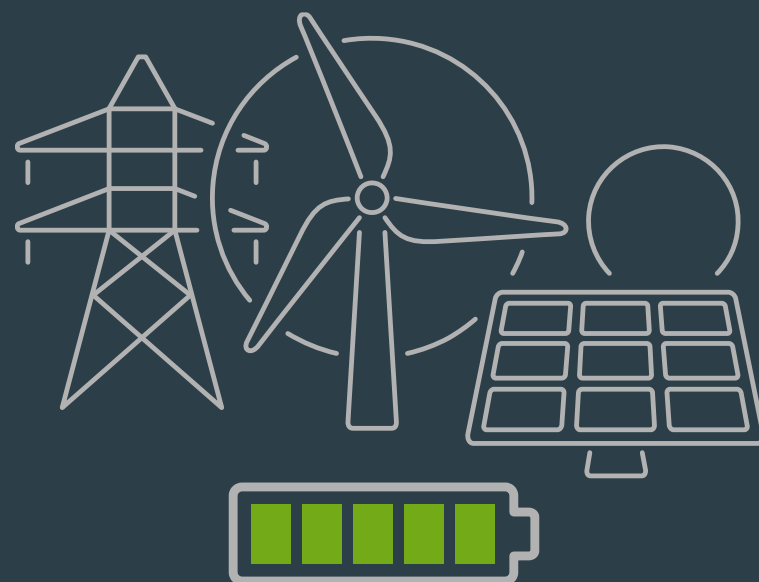
This presentation does not constitute, and should not be construed as, an offer to sell or issue securities or otherwise constitute an invitation, inducement, solicitation or recommendation to any person to purchase, underwrite, subscribe for or otherwise acquire securities in the Company or any of its affiliates or constitute an inducement to enter into investment activity in any jurisdiction.



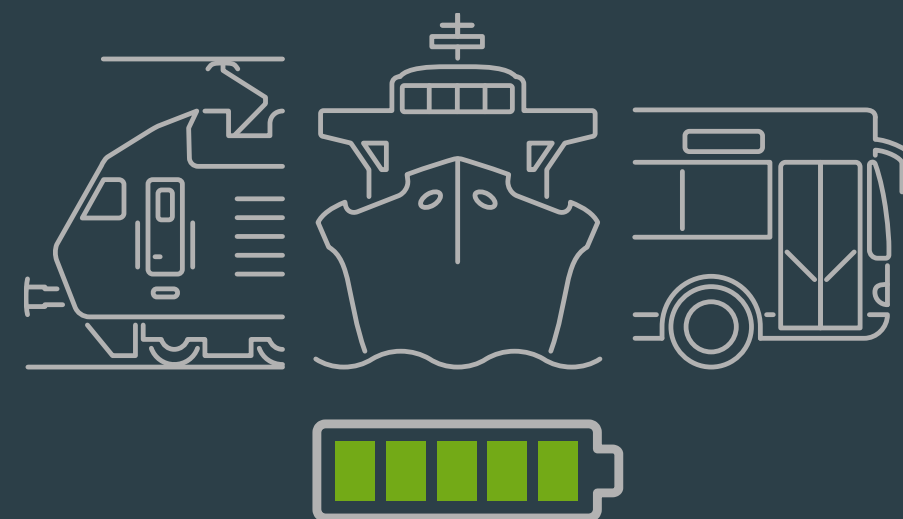
# Leclanché

## Energy Storage Solutions

Thank you



**STATIONARY  
SOLUTIONS**



**e-TRANSPORT  
SOLUTIONS**



**SPECIALTY BATTERY  
SYSTEMS**