E-Mobility

„Pure Play“

Investor/Analyst Presentation

BHL German Equity Forum, London | Jan. 31, 2019

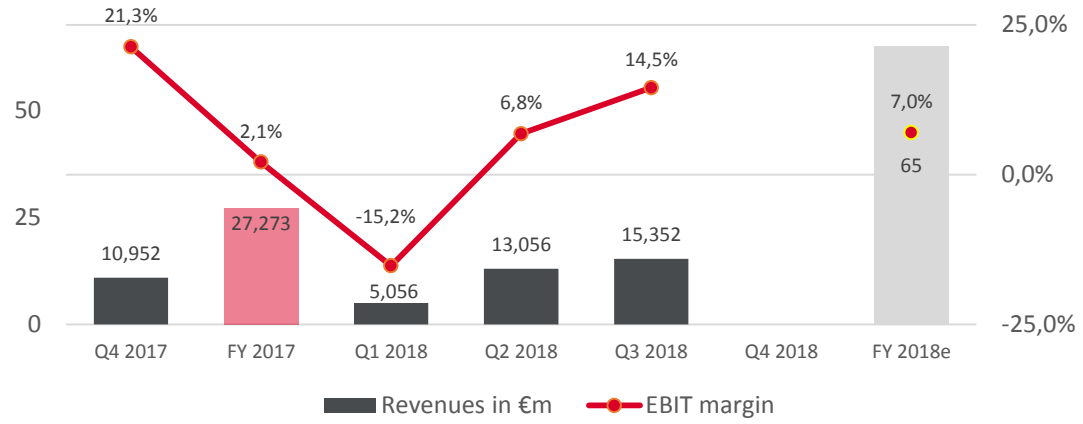
VOLTABOX®

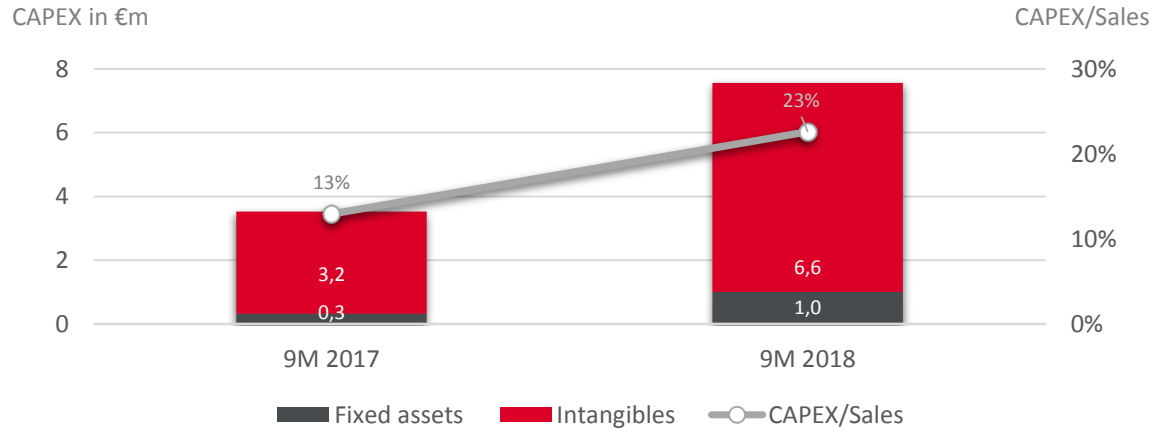
Agenda

- Highlights
- Business Overview
- Financials
- Appendix

Highlights from nine months 2018

- Continued top line growth +105%
- EBIT margin soars to 7.0%
- First time after-tax profit (€ 1.9m)
- Intralogistics and Public Transportation as main drivers in Q3 – First effects of the new Triathlon deal apparent
- CAPEX € 7.6m / Liquid funds € 55.8m
- Equity ratio remains high at 89.1%
- Revenue and profitability outlook confirmed for FY 2018 (Rev.: € 65-70m, EBIT margin 7%)





Corporate Development

1988
- Mother company paragon founded by Klaus Dieter Frers (as private ownership)

1994
- Certification as automotive Tier 1 for electronics

2000
- IPO of paragon AG (now paragon GmbH & Co. KGaA) at Frankfurt Stock Exchange (now: Prime Standard)

2011
- Market entry into Lithium-Ion Batteries: E-Mobility launched as a new business segment of paragon AG

2014
- Foundation of Voltabox as legal entities in Germany and the US (100% subsidiaries of paragon AG)

2017
- Voltabox IPO in Frankfurt after change of legal form into a stock corporation with Voltabox of Texas, Inc. as a 100% subsidiary

2018
- Acquisitions of
  - Concurrent Design, Inc., and
  - ACCURATE Smart Battery Systems GmbH

  marking key milestones in M&A growth strategy
- Rearrangement of intralogistics partner agreement with Triathlon Batterien GmbH to occupy a leading market position

2019
- Entry into North-American Intralogistics market

Location Overview

- With 220 FTE*, technology hubs and state-of-the-art production facilities, Voltabox is well positioned to grow its business on a global scale.

VOLTABOX AG

147 FTE

Headquarters

Delbrück

7 FTE

R&D Center Voltamotion

Aachen

16 FTE

R&D Center Voltaforce

Korntal-Münchingen

VOLTABOX of North America, Inc.

50 FTE

VOLTABOX of Texas, Inc.

Concurrent Design

Austin, TX (USA)

75 FTE in Research & Development (34%)

0 FTE**

VOLTABOX Kunshan Co., Ltd.

Kunshan (China)

Administration ● Production Research & Development

** Full time equivalents (FTE) incl. 27 temporary employees, as of September 30, 2018.*
*** In the course of formation.*

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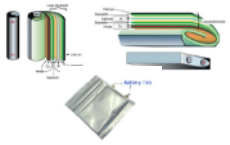
E-Mobility Pure Play

Structural representation of a battery system

Base Components → Battery Cells → Battery Modules → Battery System

- Separator
- Anode
- Cathode
- Electrolyte
- Cell Housing
- Insulation Strips



- Cylindrical cells
- Prismatic cells
- Pouch cells

in various Li-Ion chemistries

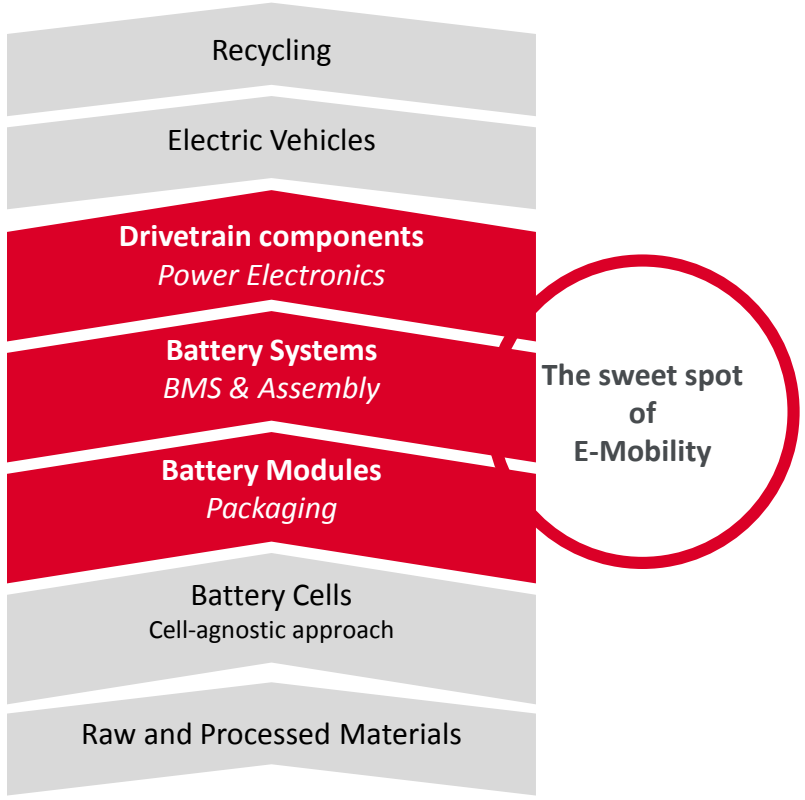
- LFP
- NMC
- LTO
- NCA

- Module cases with integrated
  - Cooling Devices
  - BMS Slave Circuit Board
  - Sensors
  - Wiring Loom
  - Lids
  - Sealings
  - Rupture Discs

in various low and high voltage versions

- Robust housing with integrated fixing points
- Master ECU
- Data interfaces
- Power switchers
- DC/DC converters
- Compensators
- Fuses / Resistors
- Climate systems
- (Chargers, cable rewinds)

E-Mobility Value Chain



Li-Ion-Battery Technology Overview

Available Li-Ion Cell Chemistry

- Li-Ion chemistries are replacing the leading battery technologies of the past like Nickel-Metal Hydride, Nickel Cadmium and Lead-Acid
- Future technological developments are also carefully tracked and evaluated by Voltabox
- New lithium based technologies like Li-Air, Li-Sulfur and Lithium Solid State cells are expected to achieve market readiness around 2023

Cell Supplier Base

SAMSUNG, A123 SYSTEMS, XALT Energy, K2 Energy, Kokam, LithiumWerks New Energy. New World., CATL, TOSHIBA

Li-Ion Cell Chemistry Types used by Voltabox

Lithium Iron Phosphate (LFP)

- Nominal cell voltage: 3.2 V to 3.3 V
- No risk of thermal runaway (in case of an accident)
- High cycle stability of up to 4,000 cycles at 80% DoD
- Large operating temperature range -20/+ 55 °c
- High energy density (125 Wh/kg and 292 Wh/l)
- Using only a small portion of rare earths

Nickel Manganese Cobalt (NMC)

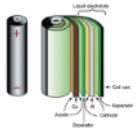
- Nominal cell voltage: 3.6 V to 3.7 V
- High cycle stability of at least 6,000 cycles at 80% DoD
- Great operating temperature range of -30/+ 60 °C
- High energy density (136 - 230 Wh/kg and at least 309 Wh/l)

Lithium Titanium Oxide (LTO)

- Nominal cell voltage: 2.3 V
- Highest cycle stability of up to 30,000 cycles at 80% DoD
- High level of safety thanks to LTO anode
- Great operating temperature range of -30/+ 55 °C
- Energy density of 96 Wh/kg or 202 Wh/l
- Great SoC range useable with the highest performances

Agnostic Approach to Cell Types

Cylindrical



A spirally wound design (jelly-roll). Designated by size, e.g. 26650 cylindrical battery (Diameter: 26mm, length: 65.2 mm; code for cylindrical shape: 0)

Prismatic

A prismatic design indicate a flat battery design. The stacks can be wound (as shown in the photo) or stacked (with alternating cathode/separator/anode structure). The stacks are usually inserted into rigid casing to form prismatic

Pouch

Rather than rigid metallic casing, conductive foil-tabs are welded to the electrodes and seal the battery fully. The tacks inside can be wound or stacked. Swelling and gassing could be a concern for pouch cells

Cell Package	Impedance	Thermal	Tabbing	Cell Cost	Battery Cost
Cylindrical	Poor	Poor	Minimal	Medium	High
Prismatic (Wound)	Poor	Poor	Minimal	Medium	Medium
Prismatic (Stacked)	Good	Poor	High	High	Medium
Pouch (Wound)	Poor	Good	Minimal	Medium	High
Pouch (Stacked)	Good	Good	High	High	High

Source: IDTechEx

Modular Development & Production Approach*


NMC 24V standard


NMC 24V air-cooled


NMC 24V water-cooled


NMC 48V standard


NMC 48V air-cooled


NMC 48V water-cooled


NMC 103V water-cooled


NMC 36V standard


NMC 40V standard


NMC 40V water-cooled


LTO 48V standard


LTO 83V standard


LTO 83V long


LFP 24V standard


NMC 48V Pouch


2x8 LFP round cell module


3x8 LFP round cell module


4x9 LFP round cell module

** Excerpt from product portfolio.*

Li-Ion Battery System Supplier for Industrial Applications

- **Many years of experience in development and production of electronic components**
  (via parent company paragon GmbH & Co. KGaA)
  - **Exceptional integration power**
    (experience in automotive interfaces)
  - **Mindset focus on applications**
    (authentic added value solutions)
  - **Superior realization processes**
    (short time-to-market with modular kit)

Electrification Specialist in High-Performing Applications*

VOLTAPOWER®

Public transport buses

KiepeElectric

Intralogistics

TRIATHLON® INTELLIGENT BATTERIES

KUKA

Mining vehicles

KOMATSU®

Agriculture/ Construction vehicles

Schäffer

VOLTAFORCE®

Motorcycles

BMW Motorrad

Pedelecs / E-Bikes

FAZUA take a spin

** Excerpt from customer/application portfolio.*

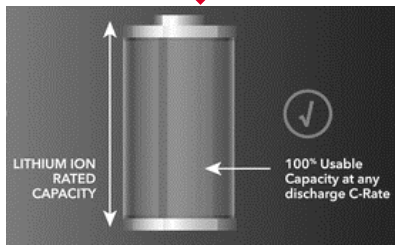
Characteristics of selected battery systems

	systems	modules	
Public transport buses			**Current System for Seattle order** **33 x 3x8 LFP module** in 33s1p >> 435.6 V nominal, 26.1 kWh [System with electrical room and HV system]
Forklifts			**More than 1.000 form factors** Various battery systems with **24V, 48V and 80V** and preferred **NMC** cell technology
AGVs			**Extender** **8 x 24V NMC module** in 4s2p >> 100.8 V nominal, 10.6 kWh
Mining vehicles			**BH 18/20 Battery system** **108 x 4x9 LFP module** in 18s6p >> 237.6 V nominal, 156.7 kWh [System in two separate housings with one additional, separate electronics housing]

	systems	
Agriculture vehicles		**Battery system for yard loader** **5 x 48V module** in 5s1p >> 252V nominal, 6.7 kWh [A system can consist of either one or two battery troughs, so a maximum of 13.4 kWh at 252V nominal is possible]
Motorsport		**Starter battery for Motorsport applications (10 Ah)** **40 x 3,3V LFP round cells** in 4s10p >> 13,2V nominal, 330 Wh
Motorcycles		**Starter battery for high-performance motorcycles (10 Ah)** **16 x 3,3V LFP round cells** in 4s4p >> 13,2V nominal, 132 Wh
Mass Markets		**Battery system for Fazua Pedelec drive system** **20 x 3,6V NCA round cells** in 10s2p >> 36V nominal, 252 Wh

TCO-advantages driving substitution of Lead-Acid by Li-Ion

Li-Ion Technology

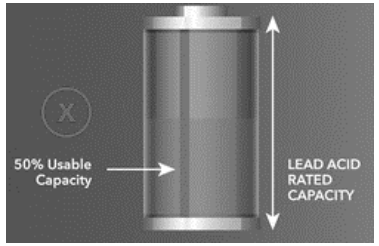


Additional advantages:

- No memory effect (opportunity charging)
- Very low self-discharge
- No maintenance
- Full functionality at low temperatures
- Optimum control and (remote) monitoring

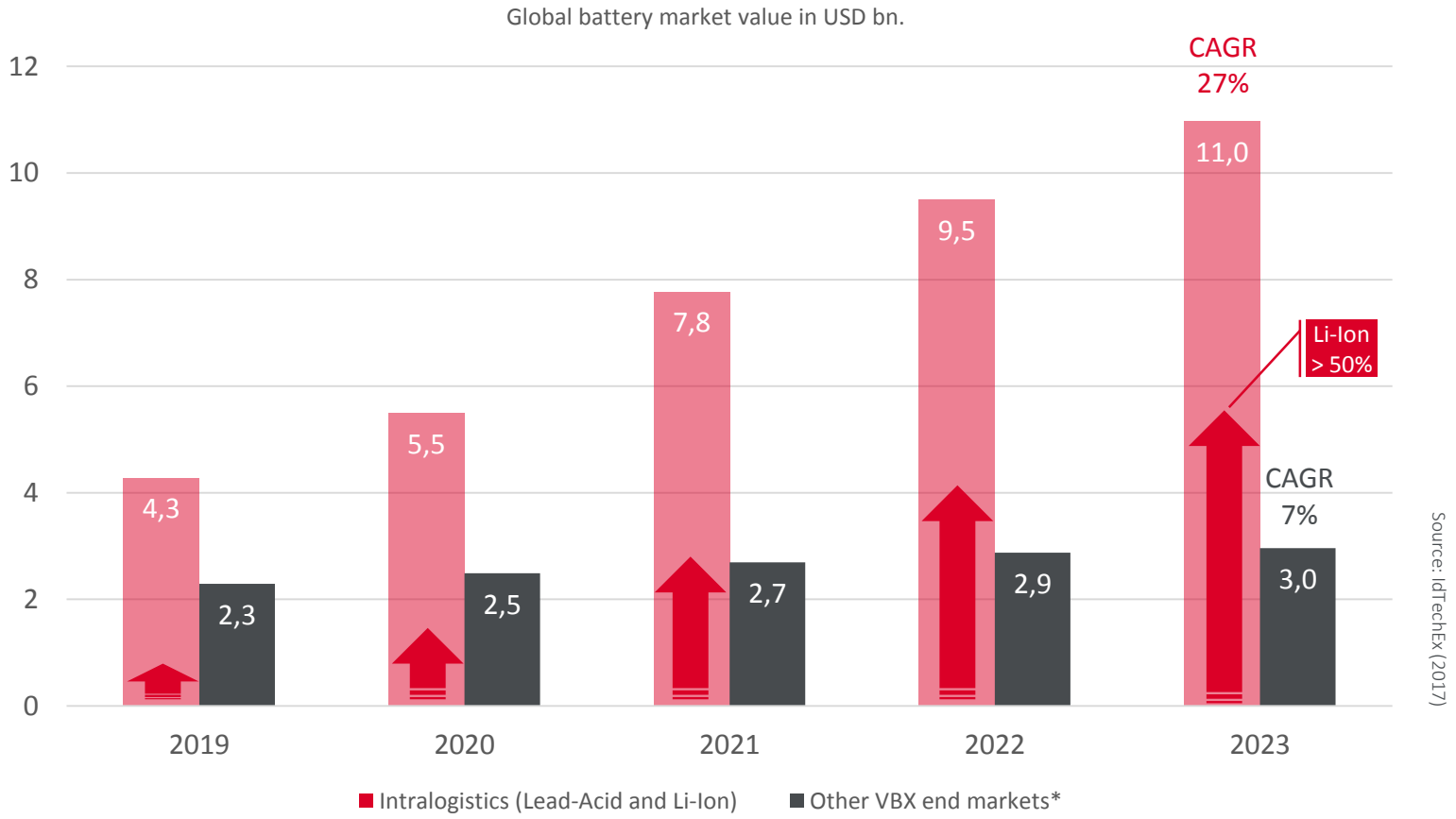
Li-Ion Technology		Lead-Acid Technology
Up to 240 Wh/kg	**Energy density**	40 Wh/kg
Up to 95%	**Charging efficiency**	Up to 70%
Up to 30,000 cycles at 80% DOD	**Cycle life**	1,200
Up to 80% in 6 min (10C)	**Fast charging**	50% in 3 hrs.
Zero emissions	**Emissions**	Gassing & water loss

Lead-Acid Technology



Market Dynamics

- Overall usage of batteries will increase due to E-mobility mega trend
- Ongoing substitution of lead acid batteries resp. diesel generators by lithium-ion batteries in occupied submarkets
- 12% global market growth expected for battery systems in current Voltabox end markets in 2019
- Intralogistics submarket expected to show fastest adoption of Li-Ion technology due to TCO advantages
- Market penetration of Li-Ion expected to exceed 50% of new sales by 2023 in intralogistics



** HEV/PHEV Buses over 5 meters, mining vehicles, agriculture & construction, motorcycles, pedelecs/e-bikes.*

Market Penetration: Intralogistics in EU

The Intralogistics market accepts more and more Lithium-Ion technology over lead-acid.

OEMs and big customers don't want a vendor as additional trade level.

June 2018

New agreement was signed!

- Direct access of Voltabox to the intralogistics market
- Triathlon remains biggest customer for Lithium-Ion modules to build Triathlon systems
- Triathlon currently building additional systems with Voltabox label
- Voltabox received certain rights for use of Triathlon's know-how

In return…

- Investment grant to Triathlon to increase capacity
- License for intellectual property
- Extended payment terms for H2/2018

Consequences

- P&L 2018 burdened by € 2m
- Increase of inventory at Triathlon (ca. € 5m - € 10m)
- Increase in inventory of finished goods and work in progress at Voltabox (ca. € 7.2 in Q3/18) to ensure fast delivery times

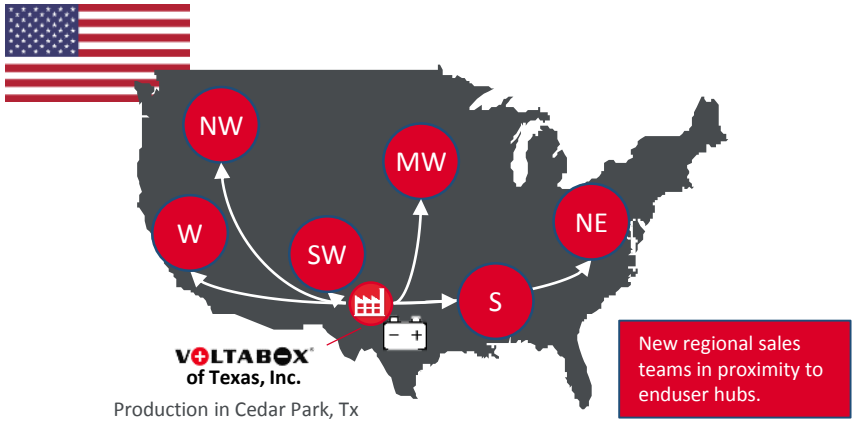
Market Penetration: Intralogistics in North America

Entry into North American Intralogistics market

Focus on management of growth

New battery system for Intralogistics applications available within 2019

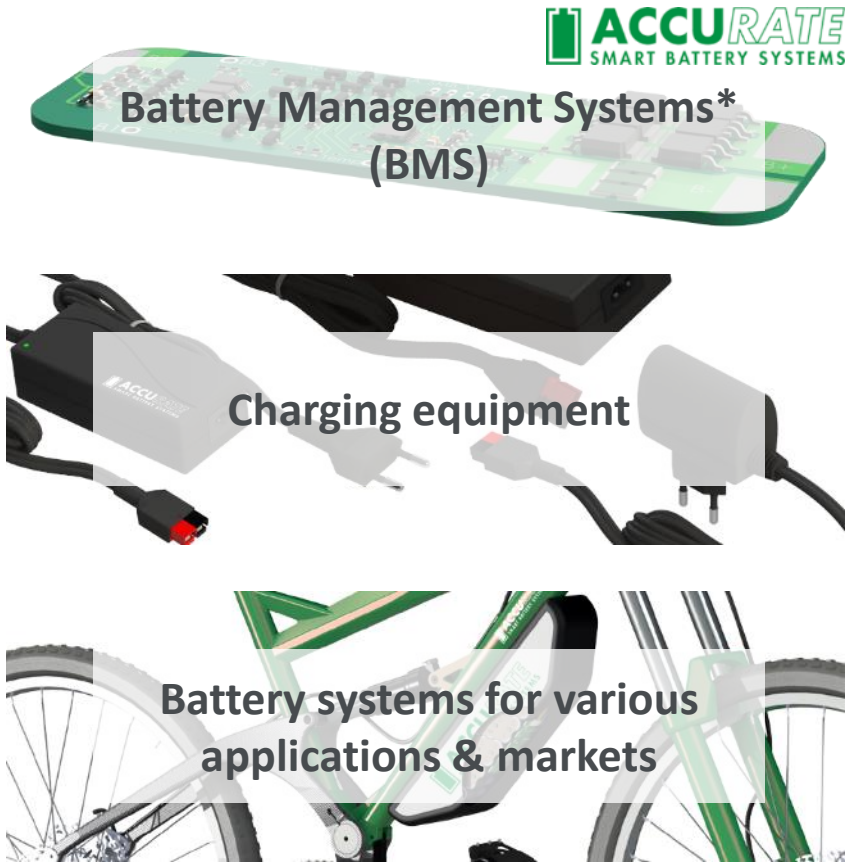
- Immediate **access to brand new prismatic LFP cells** (Lithium Iron Phosphate) thanks to close cooperation with leading cell manufacturers
- Use of these cells for the **development of a system tailormade for the North American market demand**.
- **UL certificate** expected within 2019



Use of available production capacity and launch of US-based marketing

- Using **Voltabox's available production capacity** for prismatic cells > CAPEX light approach
- Establishment of a **US nationwide sales network** for the intralogistics market within H1/2019

Horizontal Diversification: Acquisition of ACCURATE



Voltabox acquired ACCURATE Smart Battery Systems GmbH in August 2018 for an amount of € 5m. The company and its portfolio will be a cornerstone for the expansion of the segment Voltaforce.

Development and production of
high-quality battery systems
for
several **volume markets**

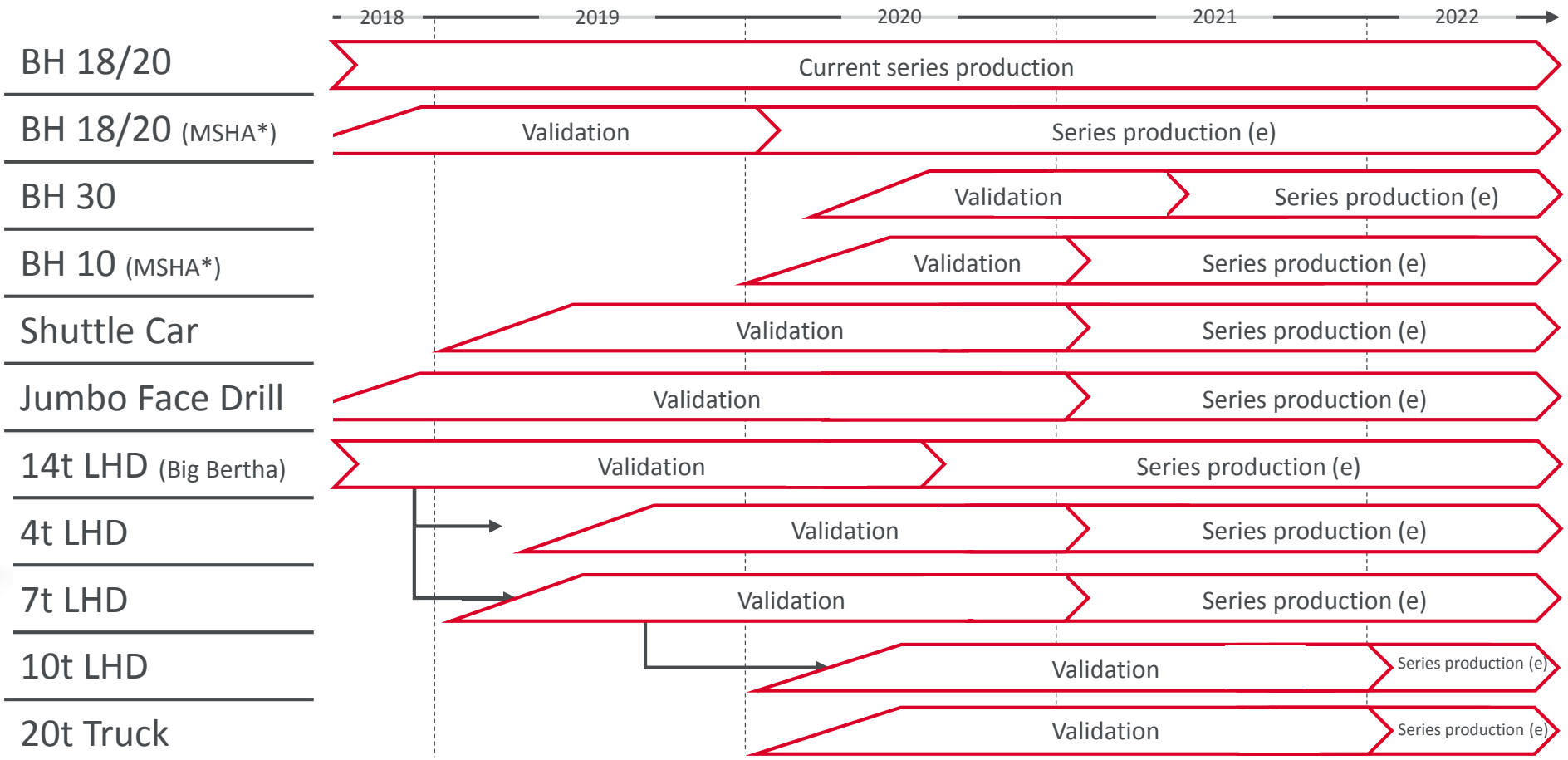
ACCURATE will form the
centre of the Voltaforce-segment
and hereby focus on
high-margin mass market applications
such as pedelecs, E-scooters,
gardening, medical technology etc.

Wide performance spectrum of battery packs to complex Lithium-Ion Systems incl. self-developed BMS – ACCURATE is a **pivotal puzzle piece** in terms of providing a full-service offer for electrification of new target markets

** Only available as an integrated system component/ not to be sold separately.*

Roadmap for Electrifying the Komatsu Fleet

Image sources: Komatsu Mining



** Mine Safety and Health Administration*

USPs of Voltabox

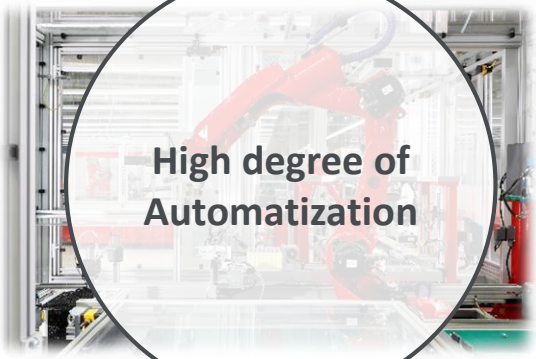
System Provider
Complete portfolio for electrification of vehicles

Modularity

Expertise in Automotive Electronics

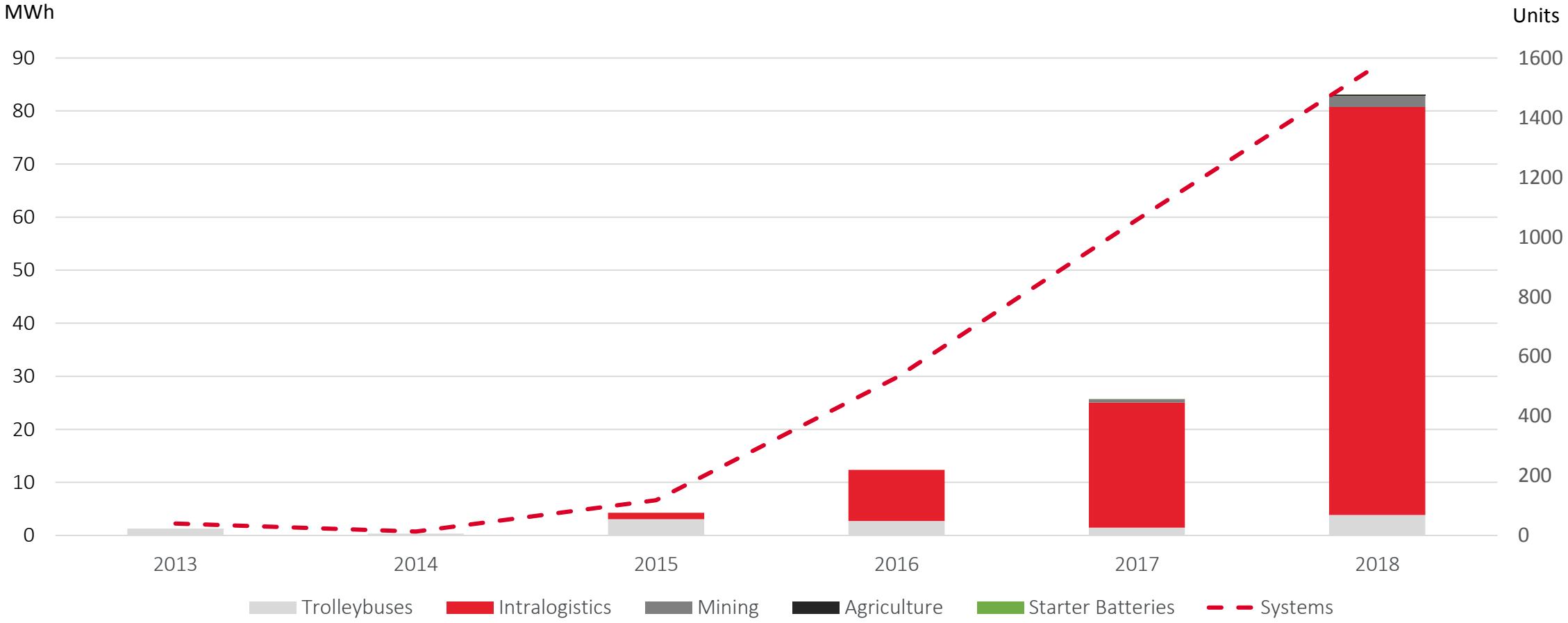
Scalability

Application Specialist



High degree of Automatization

Installation of Energy by End Markets



Multiple Growth Paths

Market penetration


Public transport


Intralogistics


Underground Mining

Expansion of end markets

Market development


Surface Mining


Agricultural Vehicles


Construction Vehicles


Ground support equipment


Rail

Expansion of product portfolio

Horizontal diversification


Starterbatteries for Motorbikes and Performance Motorcars

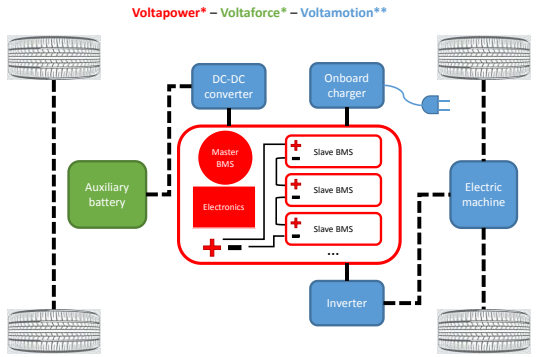

Pedelecs / E-Bikes


Golf Trolleys


Medical equipment

Expansion of value chain

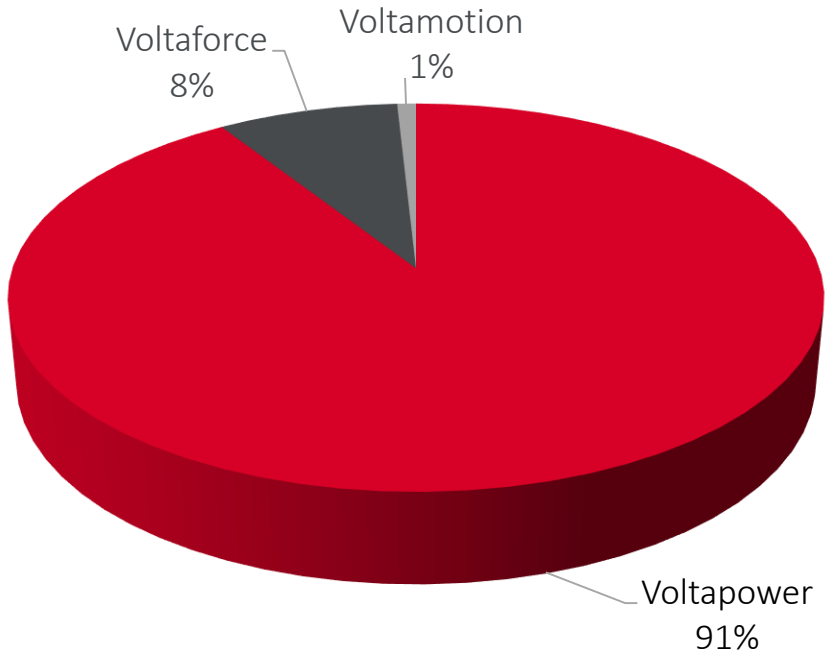
Vertical diversification



60-Months Order Backlog (Q2 2018 – Q2 2023)

- Total 60-months order backlog amounts to more than € 1bn*.
- Thereof approx. 74% signed orders and framework agreements (weighted with 100%)
  - Estimated order backlog is weighted according to the expected lifetime and the probability of occurrence
  - Serves as base for planning
  - Evaluation system in place since inception in 2011

60-months order backlog with 100% weighting as of H1/2018



** As of Jun. 30, 2018*

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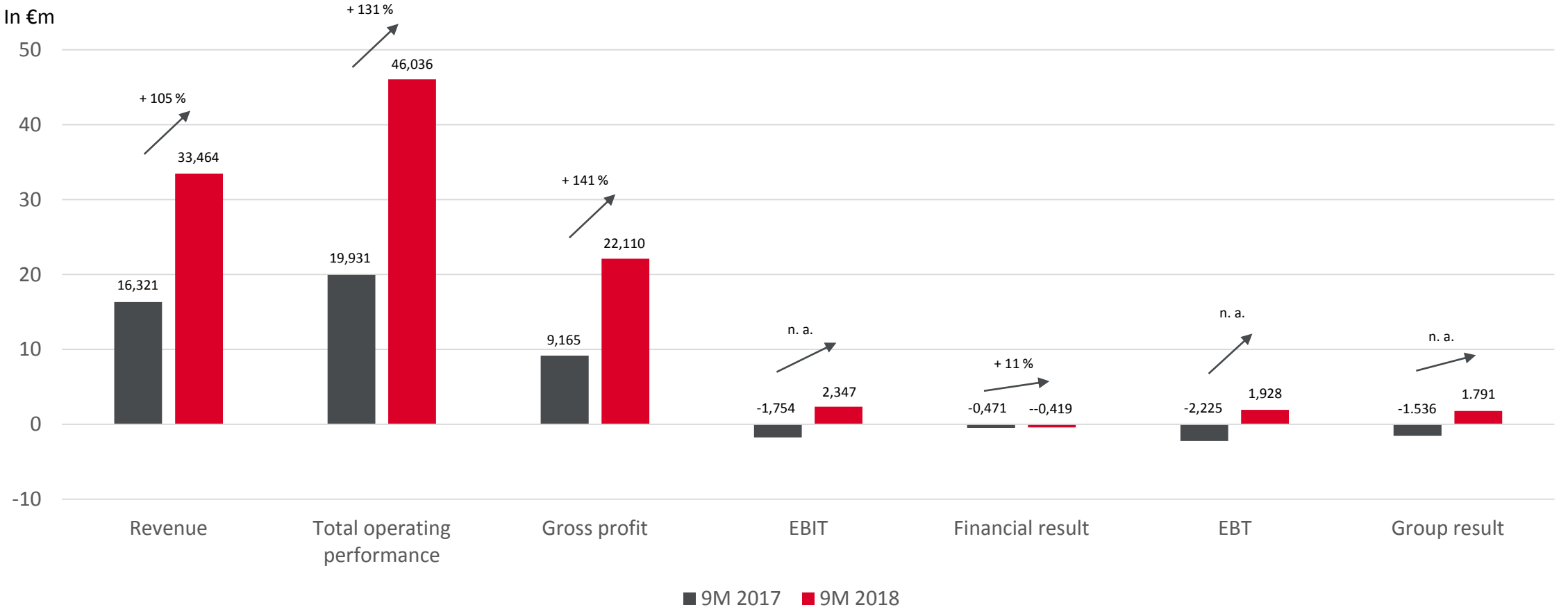
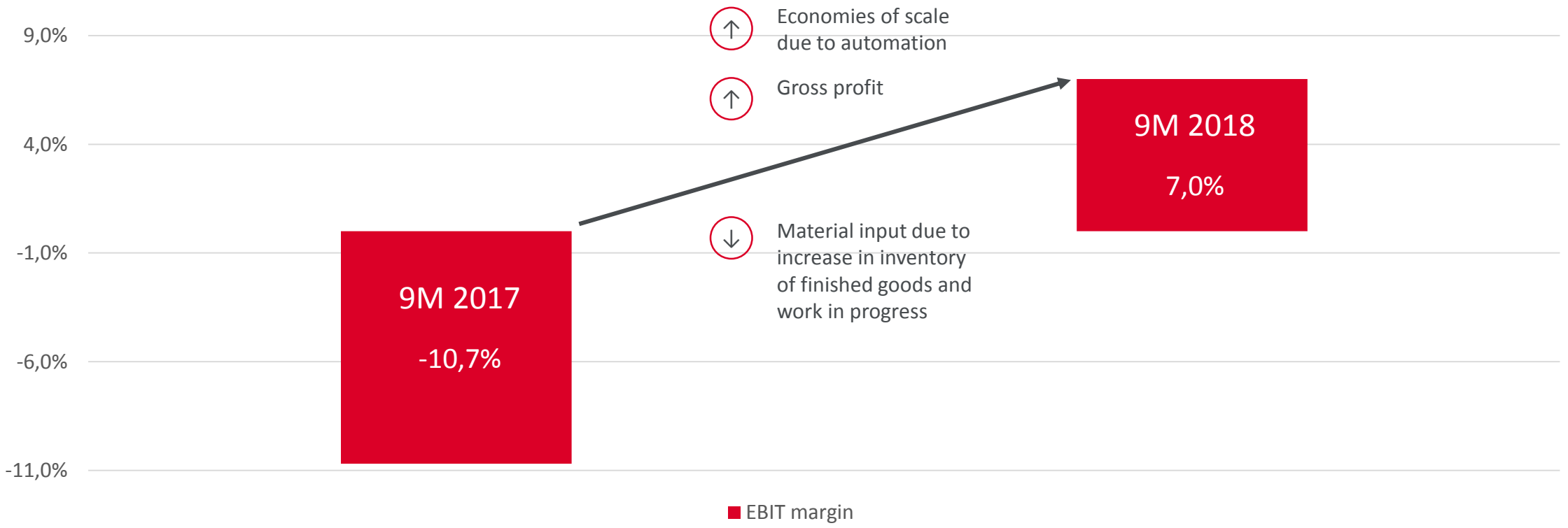
Strong Top Line Growth – First Time After-Tax Profit



9M 2018: Key Factors for Profitability Development



Cash Flow Statement

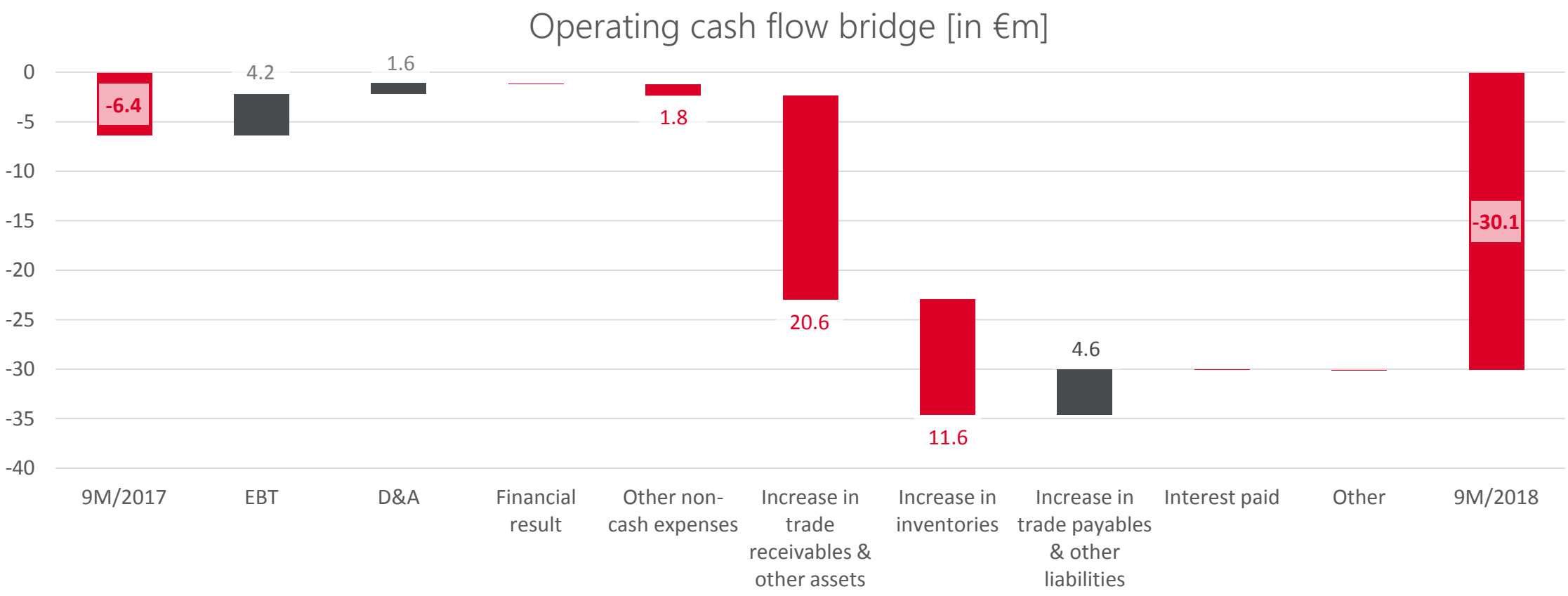
- Significant increase in trade receivables owing to very good business development in the Voltapower segment and sales financing support for main Voltabox partner (limited to 2018)
- Significant increase in inventories due to expansion of business activities
- Increase in trade payables and other liabilities
- Increased amortization of noncurrent fixed assets

Free Cashflow: € -46.4m
(Previous year: € -9.6m)

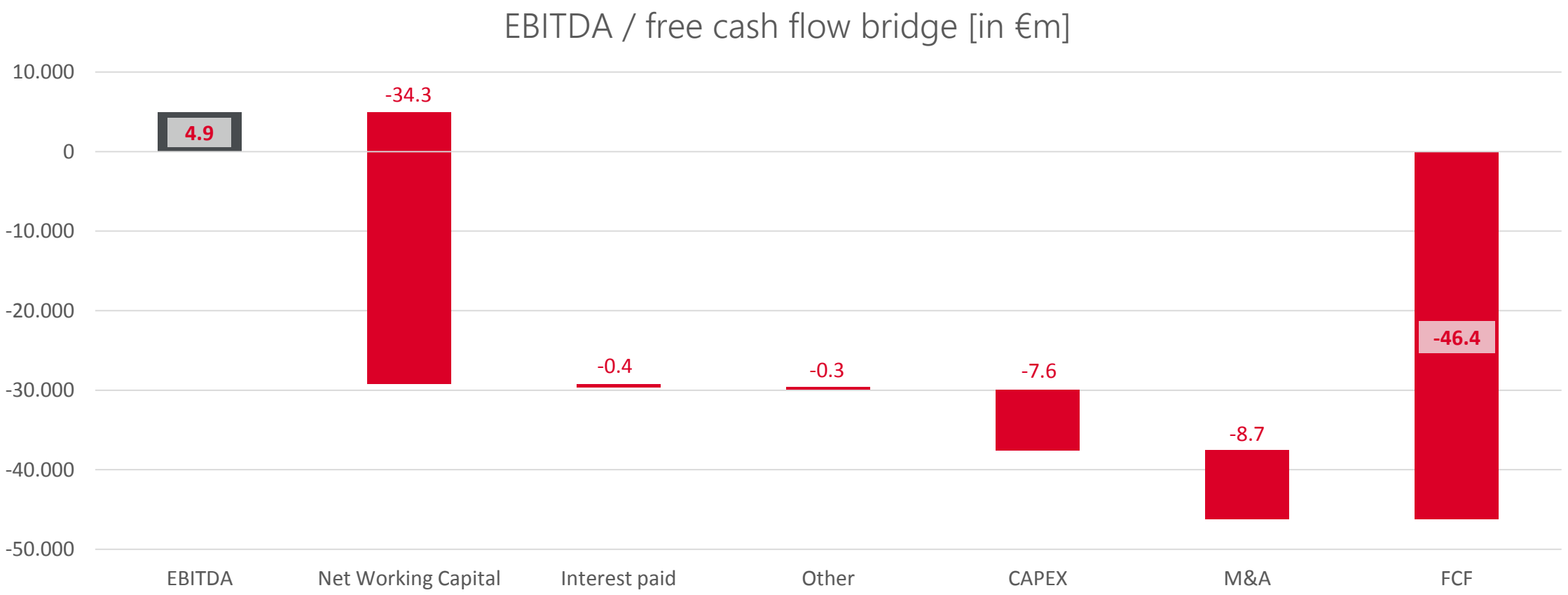
€ -30.1m	€ -16.3m	€ -0.4m
(Previous year: € -6.4m)	(Previous year: € -3.2m)	(Previous year: € 9.4m)
Cash flow from **operating activities***	Cash flow from **investment activities***	Cash flow from **financing activities***

** 9M 2018*

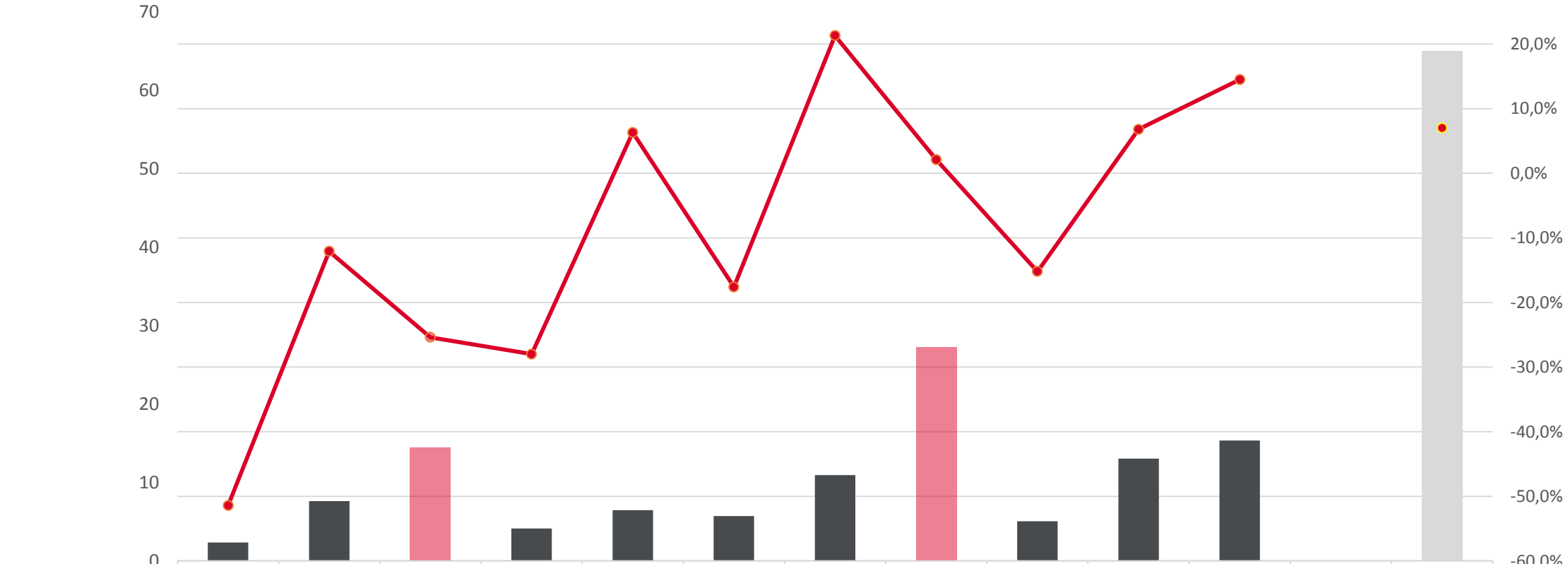
Operating Cash Flow Bridge



Key Cash Flow Developments in 9M/2018



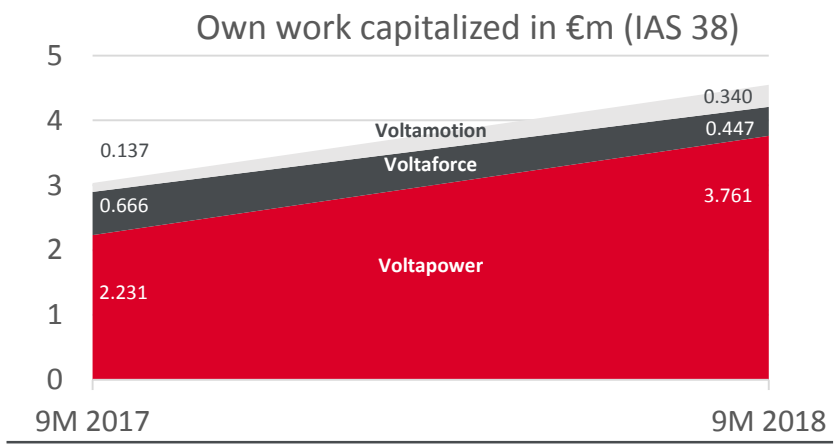
Revenues & EBIT Margin Development

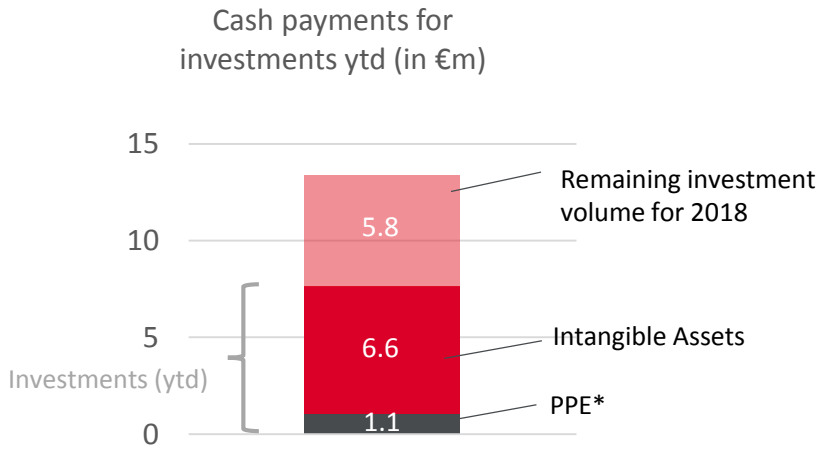


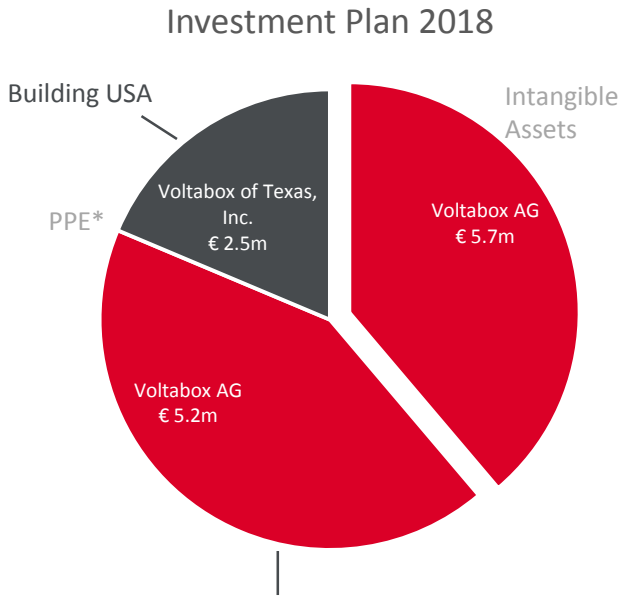
	Q3 2016	Q4 2016	FY 2016	Q1 2017	Q2 2017	Q3 2017	Q4 2017	FY 2017	Q1 2018	Q2 2018	Q3 2018	Q4 2018	FY 2018e
Revenues in €m	2,349	7,631	14,493	4,124	6,47	5,727	10,952	27,273	5,056	13,056	15,352		65
EBIT margin	-51,4%	-12,1%	-25,4%	-28,0%	6,3%	-17,6%	21,3%	2,1%	-15,2%	6,8%	14,5%		7,0%

9M/18: Investing in Further Growth

- FY 2018 CAPEX breakdown: € 10.9 million in Germany and € 2.5 million in the US
- Capitalized development costs expected to increase by 6.6%
- Investments year-to-date at € 7.6m (thereof € 6.6m Intangible Assets)
- Own work capitalized mainly in the Voltapower segment (share of 83%) – increased R&D in the Voltamotion segment







i.e. prismatic line (outstanding payment), pouch line (not yet ordered), technology/ e-machines, charger/inverter, property deposit, measuring devices etc.

**Property, Plant and Equipment*

Forecast 2018*

↗ € 65-70 m

Revenues 2018 (e)

↗ ca. 7 %

EBIT Margin 2018 (e)*

***Considering € 2m add. expenses from rearrangement of intralogistics partner agreement**

** Updated in H1/2018 interim report.*

Forecast and Analyst Consensus

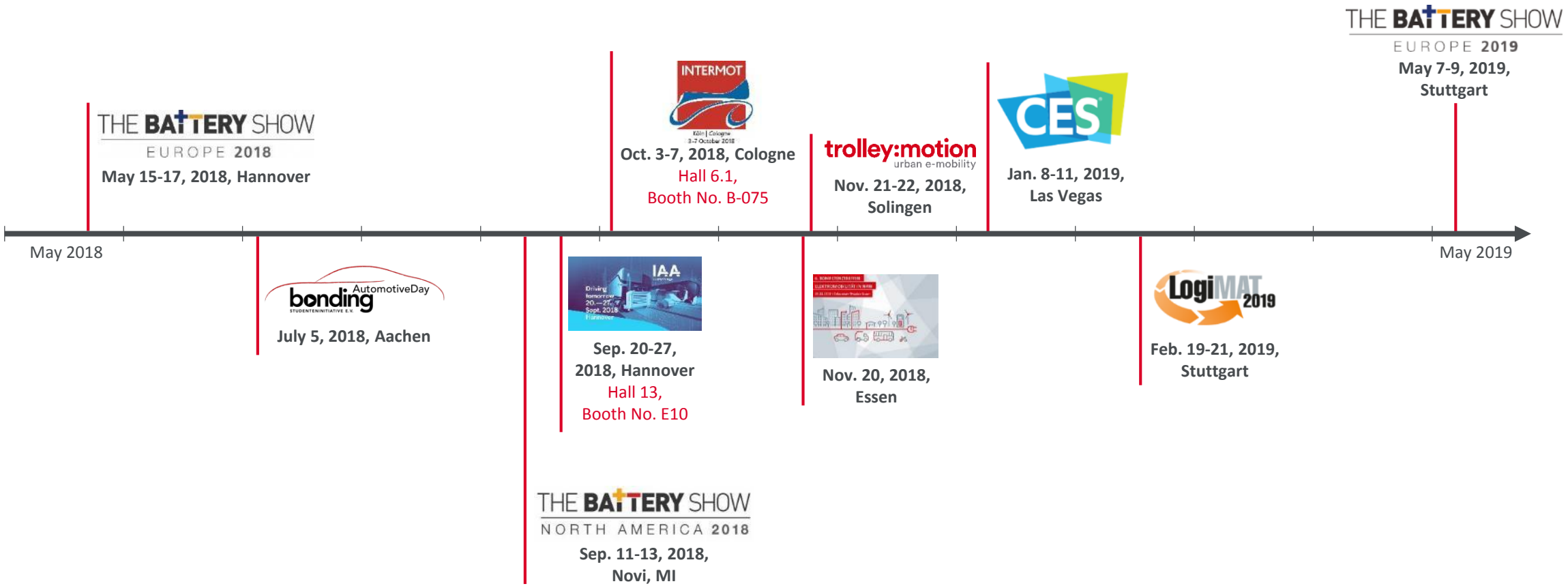
Financial performance indicators of Voltabox AG	2017		2018	
[in € million / as indicated]	Forecast	Results	Forecast (old)	Forecast (new)
Group revenue	25	27*	Approx. 60	Approx. 65-70
EBIT margin	Slightly positive	2.1%	Approx. 10%	Approx. 7%**

Analyst estimates	*2017*	*2018*
Group revenue	*25.5*	*65.3*
EBIT margin	*0.8%*	*6.7%*

* Thereof around € 2 million with parent company paragon AG (now paragon GmbH & Co. KGaA)

****Considering € 2m add. expenses from rearrangement of intralogistics partner agreement**

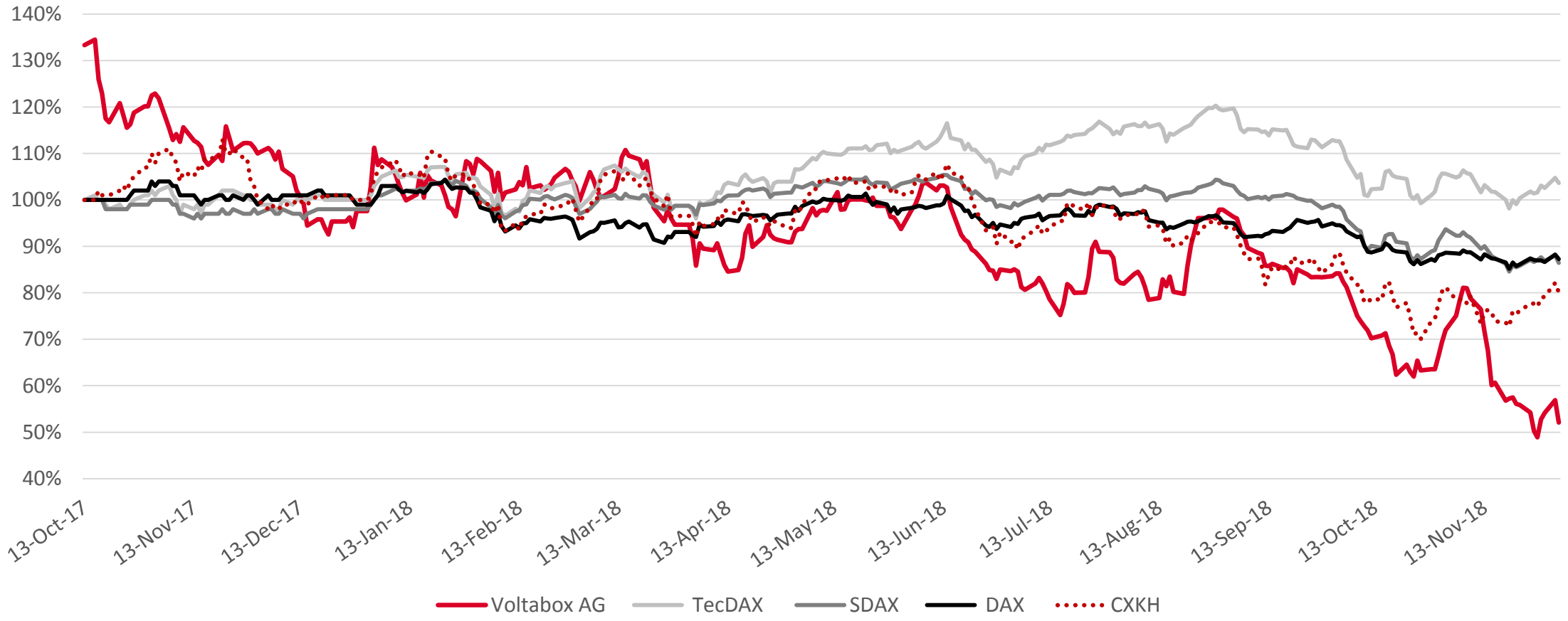
Voltabox on Tour – Trade Fairs and Exhibitions



Financial Calendar 2019

January 10-11	ODDO BHF FORUM, Lyon
January 31	Bankhaus Lampe German Corporate Conference, London
February 19-20	ODDO BHF German Conference, Frankfurt am Main
April 1	Annual Report – Consolidated Financial Statements 2018
April 11	Solventis Aktienforum, Frankfurt am Main
April 3-5	Bankhaus Lampe German Conference, Baden-Baden
May 13	Group Interim Report as of March 31, 2019 – First quarter
May 16	Annual General Meeting, Delbrück
August 21	Group Interim Report as of June 30, 2019 – Half year
September 2-3	Equity Forum Fall Conference, Frankfurt am Main
November 13	Group Interim Report as of September 30, 2019 – 9 months

Performance of Voltabox Share (VBX)



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