

E-Mobility

# “Pure Play”

Investor/Analyst Presentation

H1 2018 - Group Interim Report

**V+LTABOX®**



# Executive Summary: Highlights H1/2018

**↗ € 18.1 million** <sup>↗ 71 %</sup>

Revenues (previous year: € 10.6 m)

**↗ 144 employees** <sup>↗ 85 %</sup>

(June 30, 2017: 78)

On the way to a new level

**↗ € 1.7 million** <sup>↗ 758 %</sup>

EBITDA (previous year: € 0.2 m)

**↗ € 0.1 million**

EBIT (previous year: € -0.7 m)

# Agenda

- Introduction of Voltabox
- Business Overview
- Financials

# 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

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

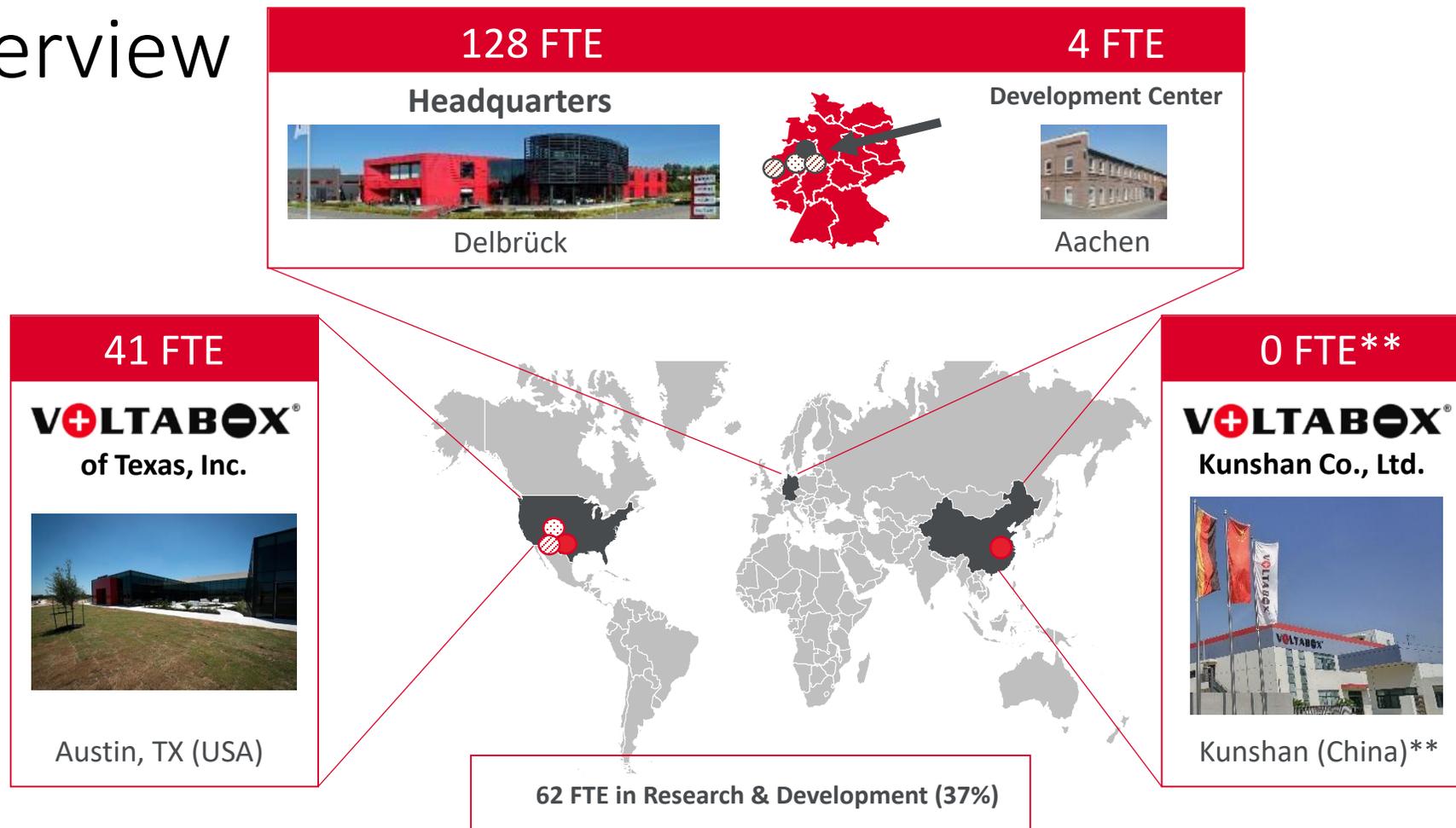
2018

- Acquisitions of Concurrent Design, Inc. and of Navitas Systems, LLC. as achieved key milestones in the expansive M&A growth strategy
- Rearrangement of intralogistics partner agreement required for targeted market leadership / Start of direct sales activities in the intralogistics market



## Location Overview

- With 169 FTE\*, technology hubs and state-of-the-art production facilities, Voltabox is well positioned to grow its business on a global scale.



\* Full time equivalents (FTE) incl. 25 temporary employees in Delbrück, as of June 30, 2018  
 \*\* In the course of formation

# Management Team

## Management Board



**Jürgen Pampel, CEO**

- Former Head of Electromobility business unit at paragon
- Various leadership positions at paragon since 2004
- Design Engineering graduate



**Andres Klasing, CFO**

- Joined Voltabox in 2017
- Former Head of Accounting & Controlling at paragon since 2016
- Various finance positions for Bertelsmann group
- Business administration (VWA) / Engineer (FH) graduate

## Supervisory Board



**Klaus D. Frers, Chairman**

- Founder / majority owner & CEO of Automotive Tier 1 paragon GmbH & Co. KGaA
- Former CEO of Voltabox
- Received numerous awards for entrepreneurial activities
- Leadership positions at AEG-Telefunken and Nixdorf Computer
- Mechanical Engineering graduate



**Prof. Dr. Martin Winter, (Deputy Chairman)**

- Professor at the Institute of Physical Chemistry at the University of Münster
- One of the most renowned German scientists in the energy-storage field with a focus on Lithium-Ion batteries



**Hermann Börnemeier**

- Shareholding director of Treu-Union Treuhandgesellschaft mbH, a tax consultancy
- Long-term advisor to the parent company paragon GmbH & Co. KGaA

# Agenda

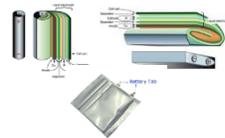
- Introduction of Voltabox
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# E-Mobility Pure Play

## Structural representation of a battery system



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



- Cylindrical cells
  - Prismatic cells
  - Pouch cells
- in different Li-Ion chemistries
- LFP
  - NMC
  - LTO
  - (NCA)



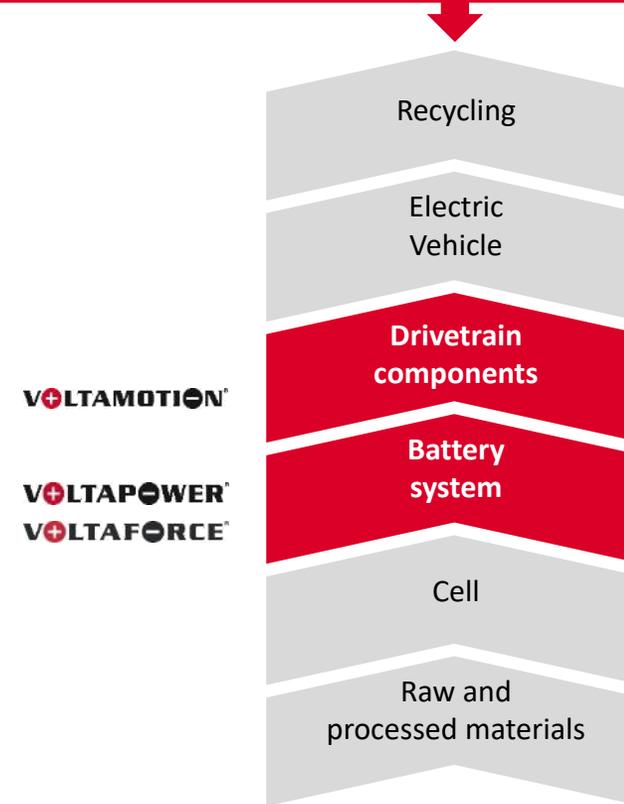
- Module cases with integrated
- Cooling Devices
- BMS Slave Circuit Board
- Sensors
- Wiring Loom
- Lids
- Sealings
- Rupture Discs

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)

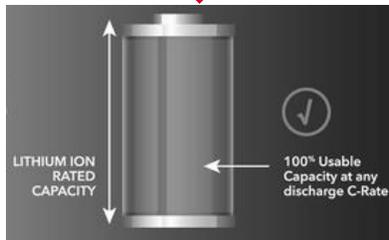
## E-Mobility Value Chain



The sweet spot of E-Mobility

# Li-Ion vs. Lead-Acid Technology

## Li-Ion Technology

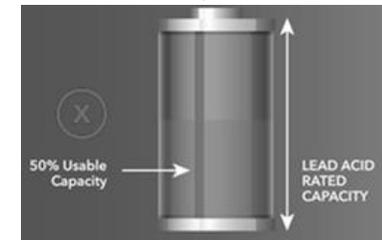


### Additional advantages:

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

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

## Lead-Acid Technology



# 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



## 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)

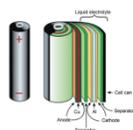
- Nominal cell voltage: 3.6 V to 3.7 V
- High cycle stability of at least 6,000 cycles at 80% DoD
- Great operating temperature range of -30/+ 60 °C
- High energy density (136 - 230 Wh/kg and at least 309 Wh/l)

### 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)

## Prismatical



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



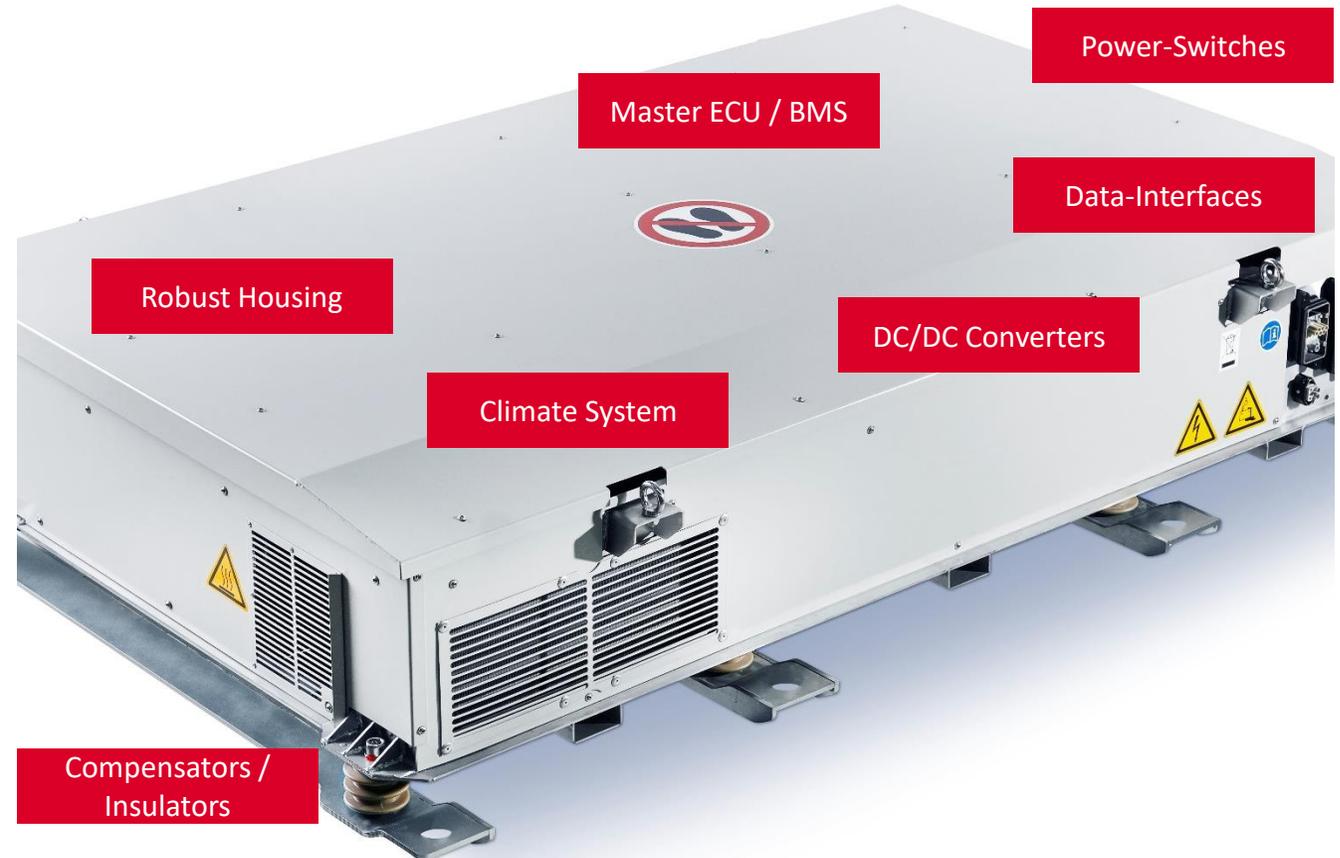
Rather than rigid metallic casing, conductive foil-tabs are welded to the electrodes and seal the battery fully. The tacks inside can be wound or stacked. Swelling and gassing could be a concern for pouch cells

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

Source: IDTechEx

# 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*)



# Market Penetration by Voltabox



Today:

- Q2 2014: First major US-contract for battery systems in trolleybuses
- Q2 2016: Exclusive strategic partnership with leading mining equipment provider
- Q4 2016: Expansion of intralogistics market with batteries for Automated Guided Vehicles
- Q3 2017: First selected mass market entry with starter batteries for motorbikes
- Q4 2017: First strategic partnership in the area of agriculture and construction
- Q1 2018: Acquisition of the engineering services provider Concurrent Design
- Q2 2018: Strategically important rearrangement of intralogistics partner agreement
- Q2 2018: Takeover of Navitas systems and entry into production of customized battery cells

***Significant future growth prospects backed by strong 60-month order backlog of € 740 million\* weighted 100 percent***

*\* As of June 30, 2018*

# Roadmap for Electrifying the Komatsu Fleet



BH 18/20

BH 18/20 (MSHA)

BH 30

BH 10 (MSHA)



Shuttle car



Jumbo Face Drill

14t LHD

4t LHD



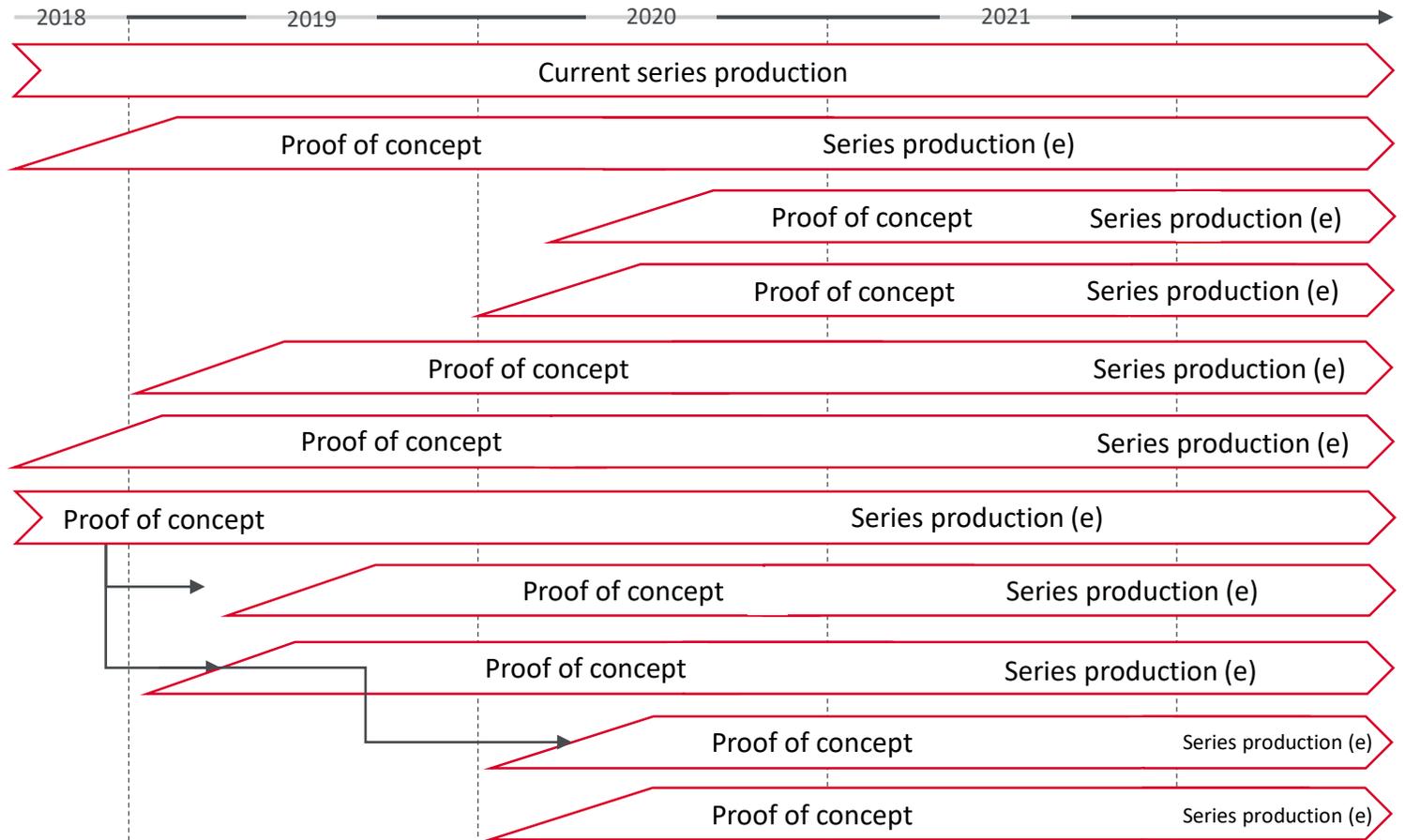
7t LHD

10t LHD



20t Truck

Image sources: Komatsu Mining



# New Agreement for Targeted Market Leadership

In June 2018 Voltabox rearranged the strategically important agreement with Triathlon for a close partnership in order to supply the market with innovative and technologically advanced Lithium-Ion batteries.

Early implementation of a differentiation strategy with three essential manufacturing and sales players: Voltabox, Triathlon, Navitas

Ensuring an accelerated market penetration at Voltabox' own pace in Europe and the USA in order to achieve market leadership

Creating competitive advantages through technological know-how transfer

Creating barriers to market entry for competitors by securing access to specific resources/components

Time and cost advantages compared to own development work

Additional development of the (shared) margins from the end customer business (compared to the previous module sales)



# Market Potential for Voltabox

- 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
- 11% global market growth expected for battery systems in current Voltabox end markets in 2018

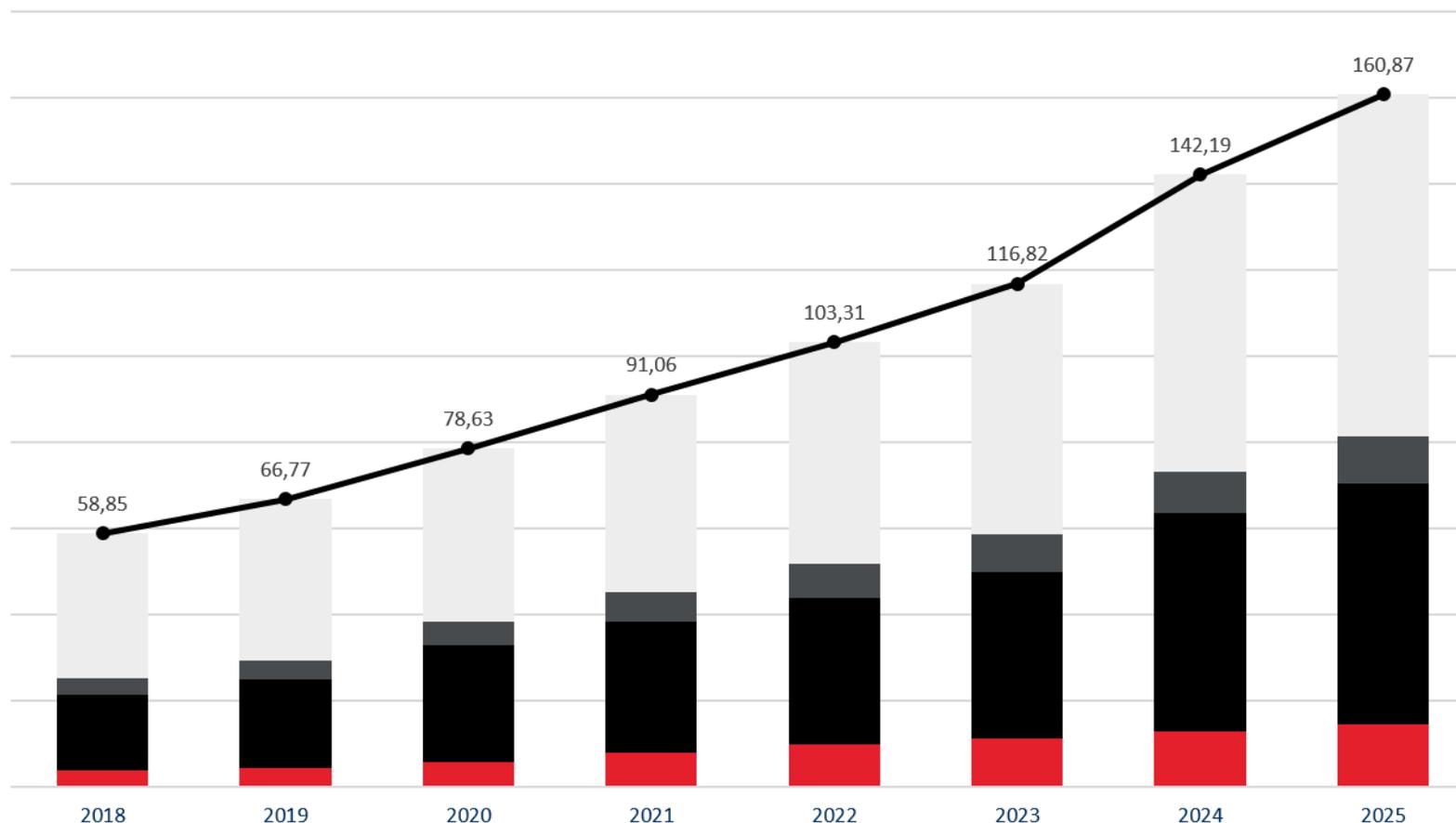
**Current Voltabox end markets**  
 HEV/PHEV buses over 5 meters, forklift/intralogistics, mining vehicles/equipment

**Further potential Voltabox end markets**  
 Delivery trucks & other on-road excl. buses, indoor cranes/platform lifters, pedelecs/e-bike, motorbike, etc.

**Future Voltabox end markets**  
 Construction & agriculture, Pure Electric Buses over 5 meters, Airport, Car (hybrid) – PHEV, microEV, etc.

**Others**  
 Pure electric cars (premium & mainstream), microEV – 3 wheel & rickshaw, wearables, consumer, military, etc.

Battery market value by end markets (USD bn.)\*



\*Partly Lead Acid and Li Ion

Source: IdTechEx (2017)

# Voltabox Growing Into a New Dimension

New facilities,  
more sites

- Tripling of production area (esp. in USA) and space expansion for R&D as well as administrative functions
- Foundation of Voltabox Kunshan Co., Ltd., Kunshan, China (3,400m<sup>2</sup>)

Increase of resources  
and brilliant minds

- R&D staff to increase to a total of 70 employees in FY 2018
- Further setting up of the R&D site in Aachen

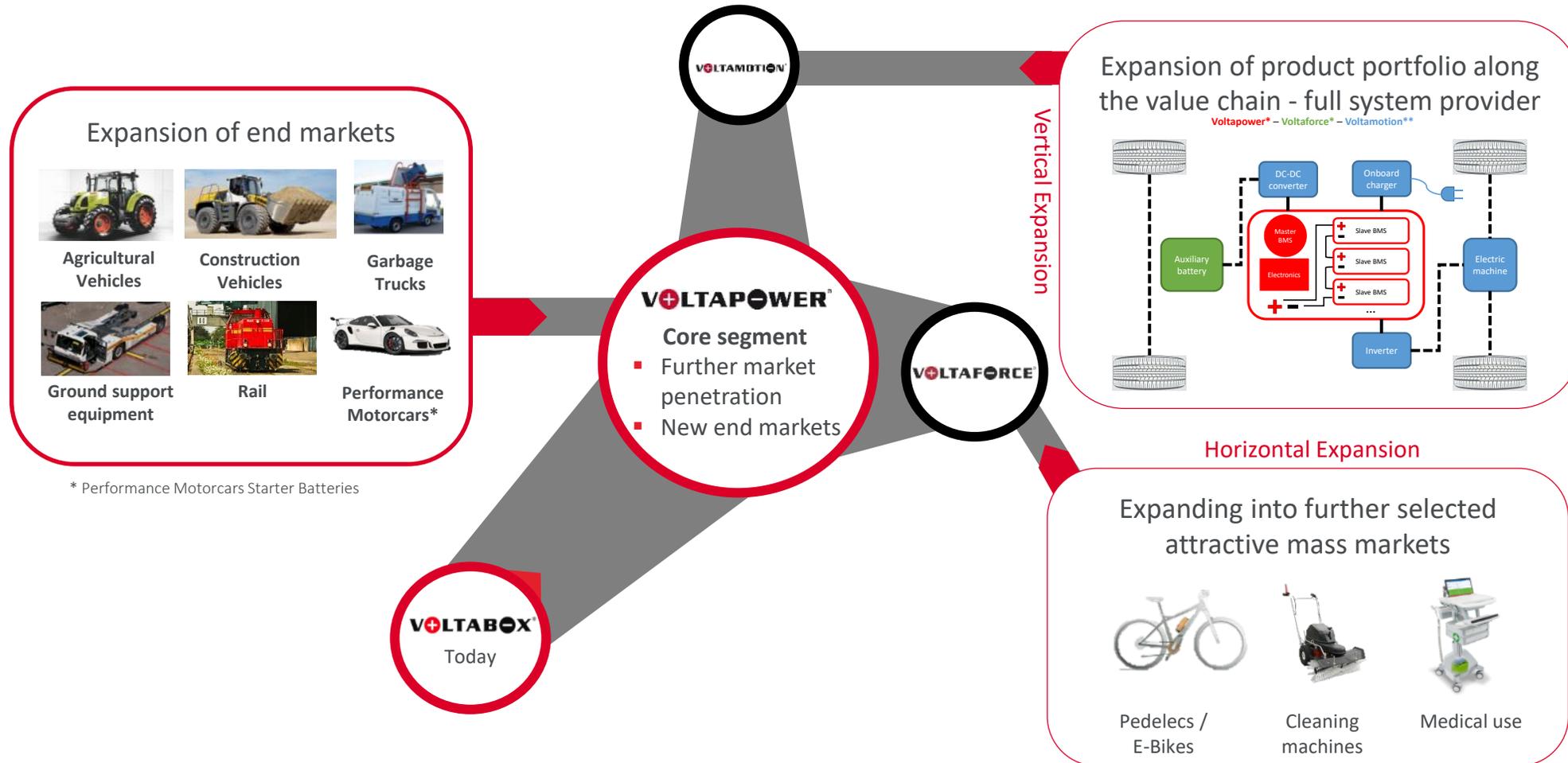
Innovative products,  
new markets

- Expanding product portfolio into selected mass markets
- Entering into new market segments (i.e. airport ramp, rail, pedelecs/E-Bikes)

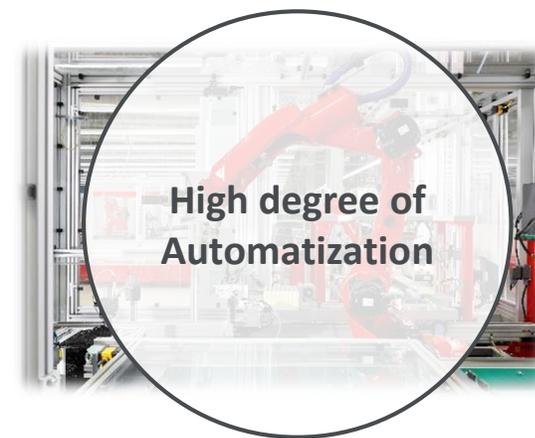
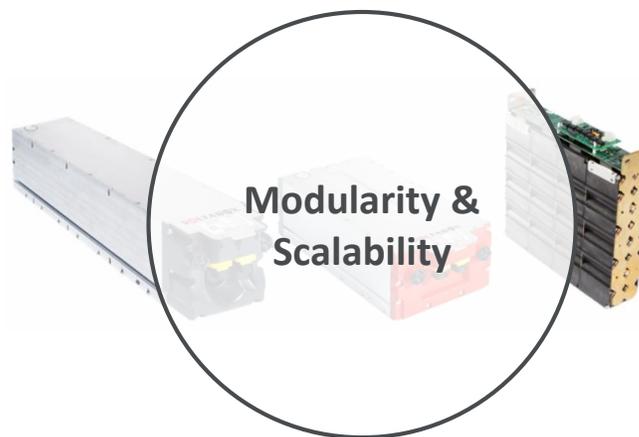
Pushing organic growth  
by M&A

- Working on the integration of acquired companies (esp. Navitas Systems) and on further precisely fitting M&A opportunities, e.g. to accelerate market penetration

# Multiple Growth Paths



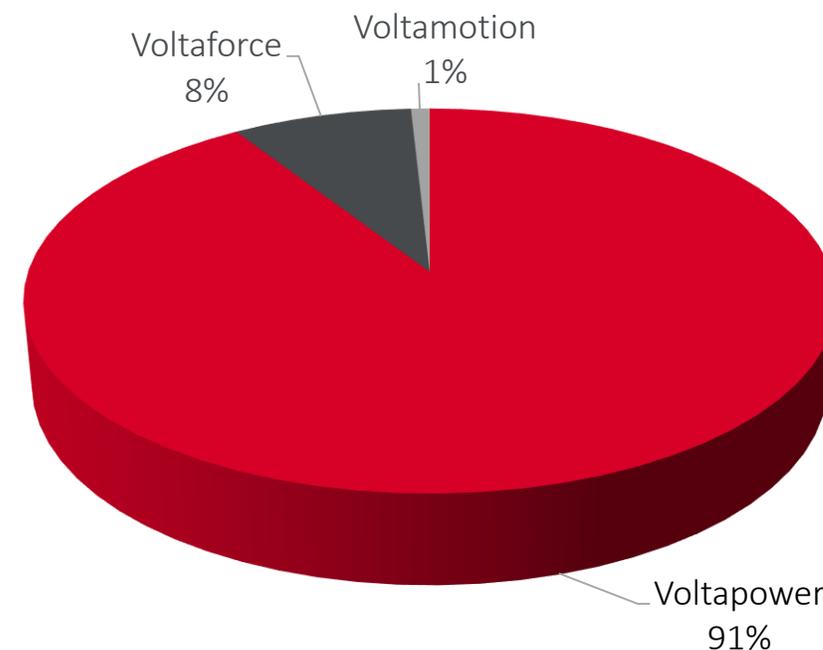
# USPs of Voltabox



# 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

# Agenda

- Introduction of Voltabox
- Business Overview
- Financials

# Key Figures for the Group from H1 Report 2018

## Strong Financial Background

- Equity ratio of 91.5 % (equity: € 154.9 million)
- Liquid funds of € 74.2 million
- Balance Sheet Total: € 169.2 million

## Dynamic Growth in all areas

- Group revenue increased 71 % to € 18.1 million
- FTE up 45.5 % to 144 (excl. 25 temporary employees)

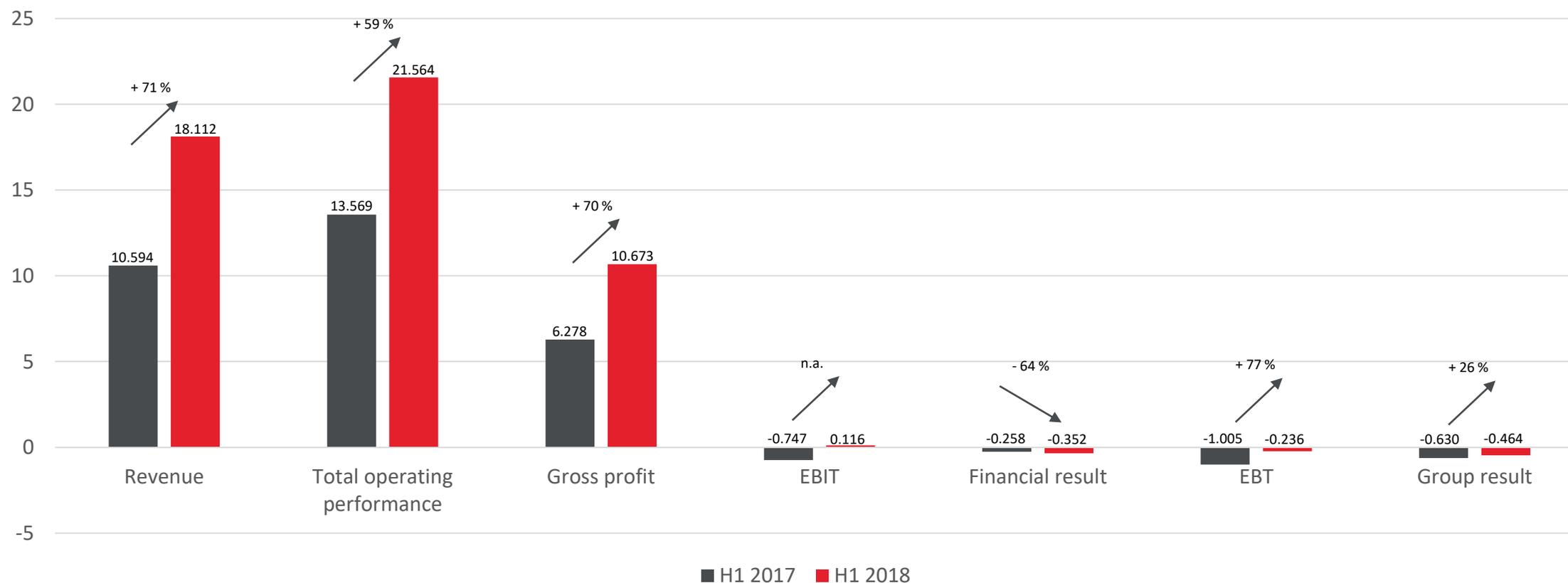
## Profitability on track

- EBITDA increased 758 % to € 1.7 million
- EBIT margin at 0.6 %

## Successful Execution of Growth Strategy

- Entry into direct sales activities in Intralogistics
- Auspicious Takeover of Navitas Systems for € 37 million incl. excellent market access in the US
- Investments of € 3.5 million as expected

# Top Line Growth with Increasing Profitability



# H1/2018 Cash Flow Statement

- Large 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)
- Other non-cash expenses increased due to currency effects
- Significant decrease in trade payables and other liabilities of € 7,798m
- Slightly increased amortization of noncurrent fixed assets

Free  
Cashflow:  
€ -28.1m  
(Previous year:  
€ 1.9m)

€ -24.6m

(Previous year: € 4.4m)

Cash flow from  
**operating activities\***

€ -3.5m

(Previous year: € -2.5m)

Cash flow from  
**investment activities\***

€ -0.3m

(Previous year: € -0.5m)

Cash flow from  
**financing activities\***

# New R&D Capabilities: Takeover of Concurrent

Concurrent Design is an engineering services provider located in Austin, Texas with proven and long-standing expertise in R&D

More than **20** highly skilled  
**employees,**

mostly engineers, software developers &  
project managers

Expertise from more than **1,700**  
successfully completed **projects**

**Multiple** boost of  
**velocity** for **Voltabox**  
by additional resources



# On Way to Market Leadership: Acquisition of Navitas

- Profitability broadly similar to Voltabox
- Expected revenues of around €25m in 2018



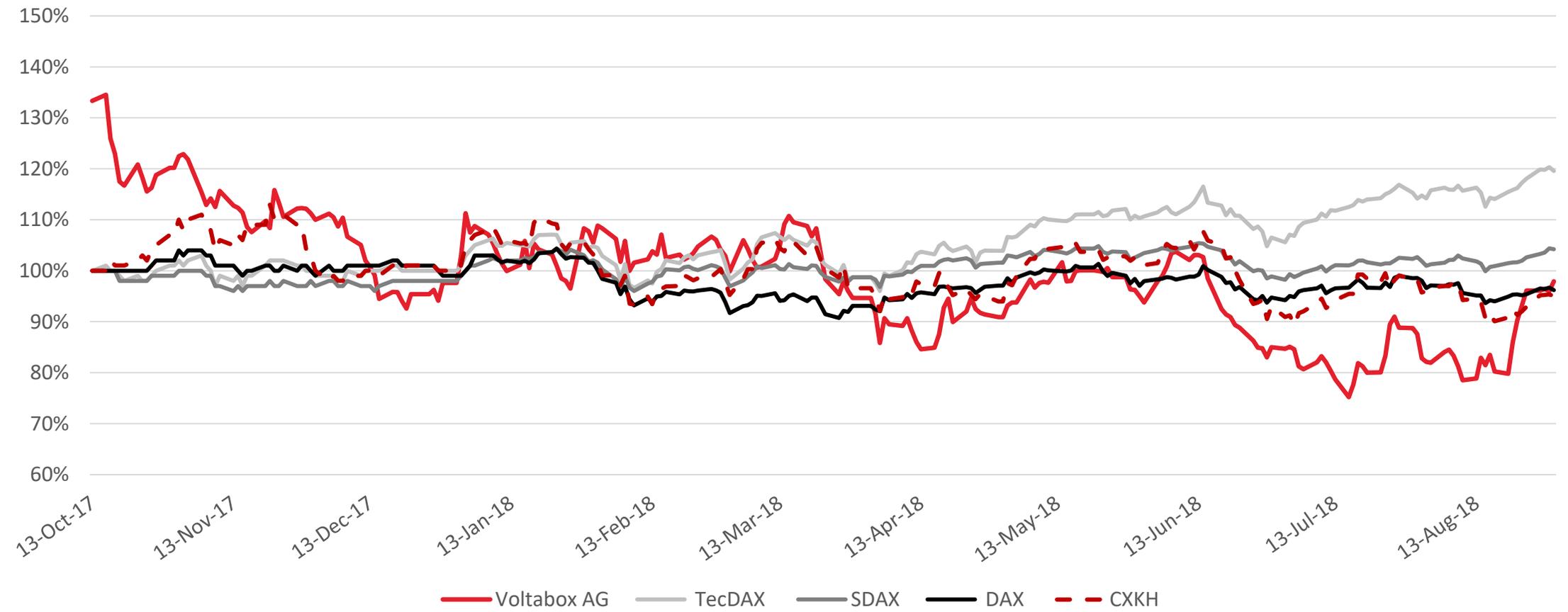
Voltabox took over Navitas Systems for €40m in order to accelerate market penetration in the market segments of particularly rapid growth.

Navitas has established a **market-leading position** in the region with its **“Starlifter” batteries**.

With the acquisition, Voltabox have come a **great deal closer** to the goal of becoming the **global market leader** in the field of battery systems for intralogistics.

Navitas opens up **new applications** and thus **completely new prospects** in the North American market.

# Performance of Voltabox Share (VBX)



# Updated Forecast 2018

**↗ € 65-70 m**

Revenues 2018 (e)\*

\* In the course of the acquisition of Navitas System – expected initial consolidation in Q3 2018

**↗ ca. 7 %**

EBIT margin 2018 (e)\*\*

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

# Forecast and Analyst Consensus

Financial performance indicators of Voltabox AG	2017		2018	
	Forecast	Results	Forecast (old)	Forecast (new)
[in € million / as indicated]				
Group revenue	25	27*	Approx. 60	Approx. 65-70**
EBIT margin	Slightly positive	2.1%	Approx. 10%	Approx. 7%***
<i>Analyst estimates</i>	2017		2018	
<i>Group revenue</i>	25.5		58.2	
<i>EBIT margin</i>	0.8%		10.1%	

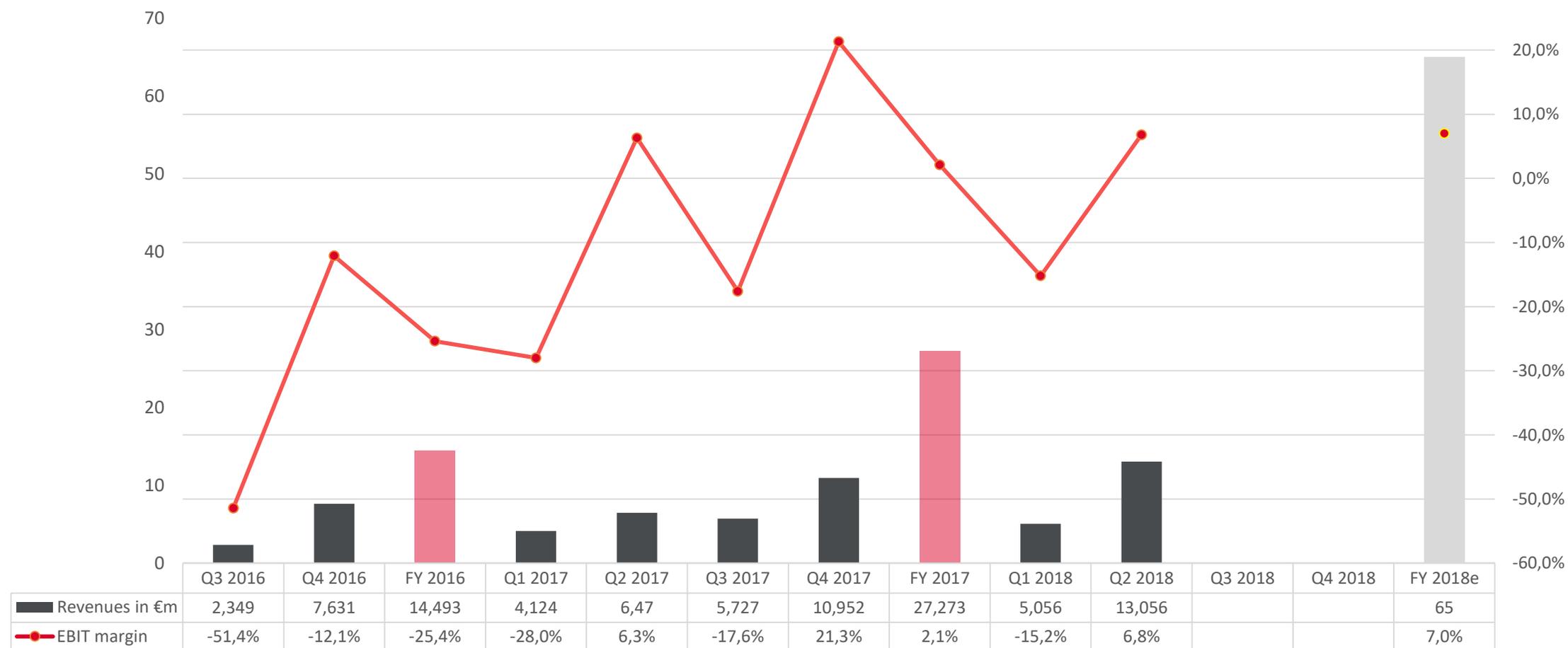
\* Thereof around € 2 million with parent company paragon AG (now paragon GmbH & Co. KGaA)

\*\* In the course of the acquisition of Navitas System – expected initial consolidation in Q3 2018

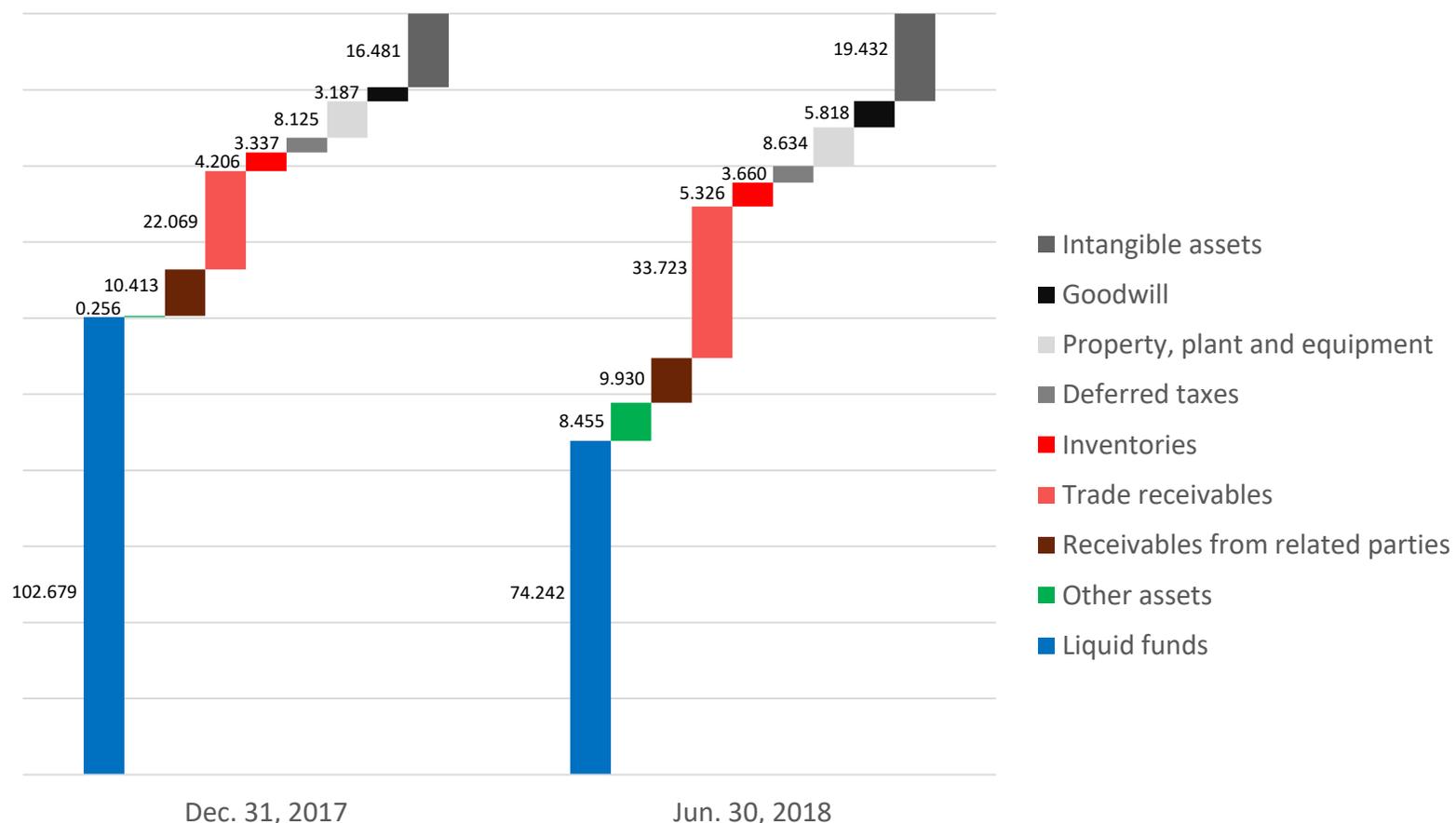
\*\*\* Considering € 2m add. expenses from rearrangement of intralogistics partner agreement

# Financials - Appendix

# H1/18: Revenues & EBIT Margin Development

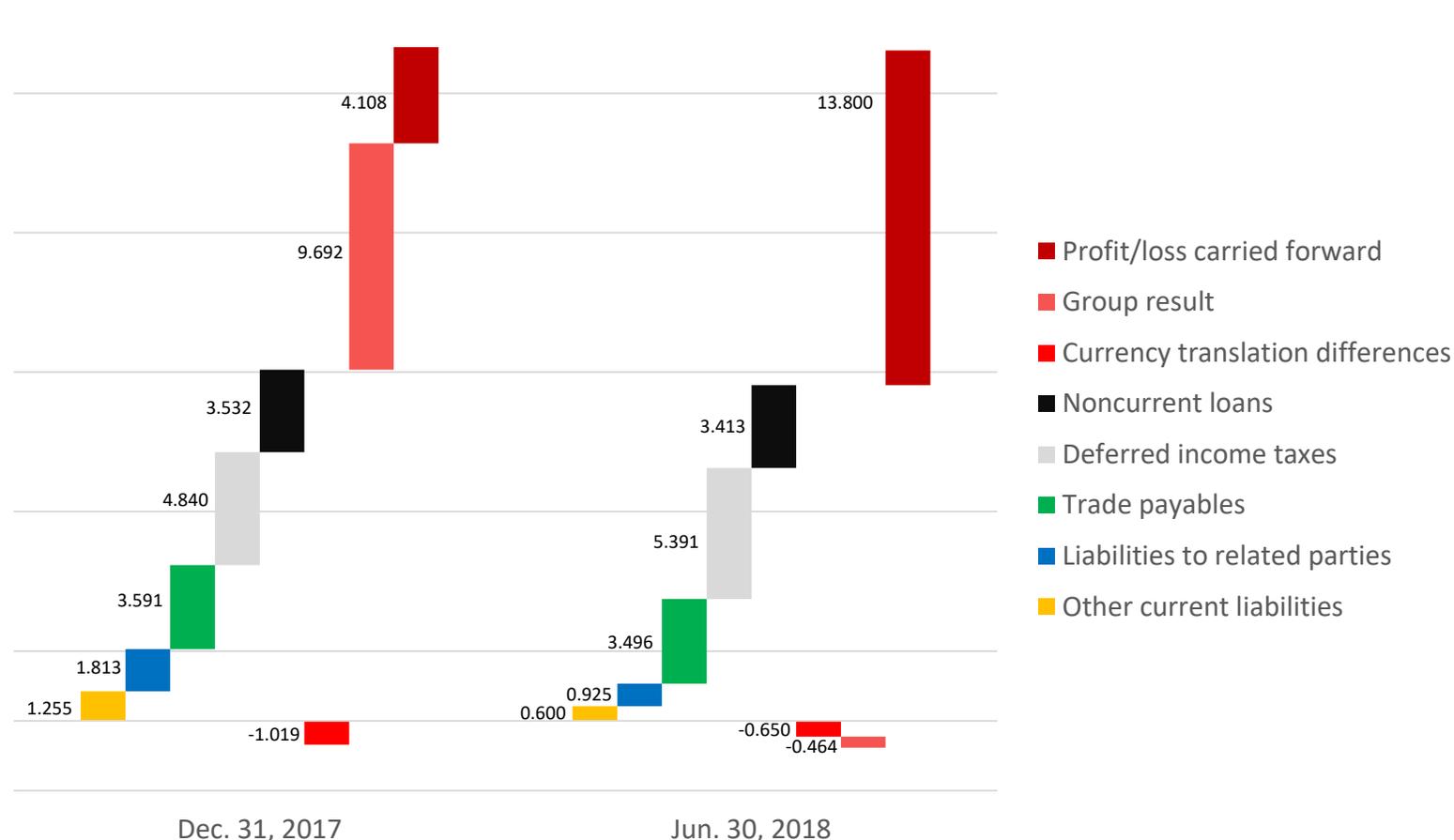


# H1/18: Significant Changes of Group's Assets



- Increase in noncurrent assets by € 6.4m
  - Intangible Assets up € 3.0m owing own work capitalized
  - Increased Goodwill as a consequence of the Concurrent Design acquisition
- Decrease in current assets by € 7.9m
  - Increase in Trade Receivables about € 11.7m due to sales supporting activities in intralogistics
  - Other assets up € 8.2m due to the capitalization of the one-time investment subsidy for capacity expansion granted by Voltabox due to the revised cooperation agreement with the partner Triathlon
  - Liquid funds went down about € 28.4m mainly through operating expenses in connection with the dynamic growth strategy

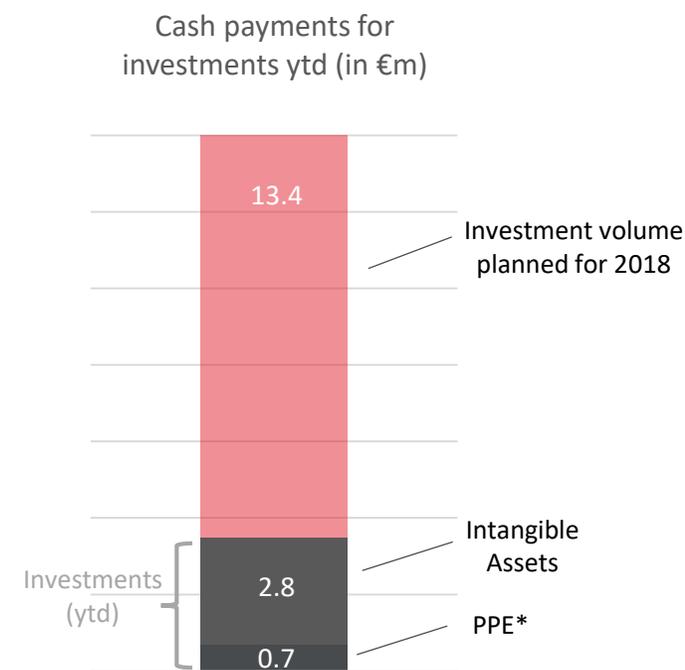
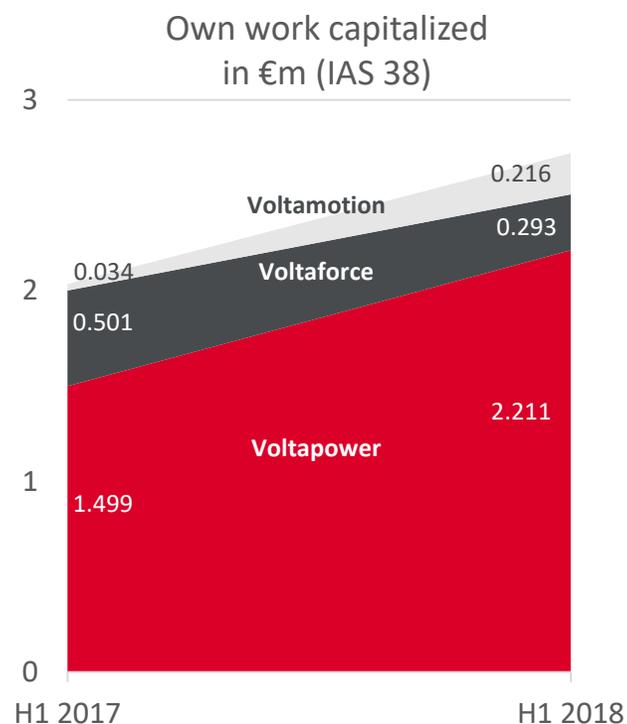
# H1/18: Significant Changes of Equity and Liabilities



- Equity remained nearly unchanged at € 154.895m
- Noncurrent provisions and liabilities slightly increased to € 8.818m
- Current provisions and liabilities decreased about € 1.9m to € 5.507m
  - Liabilities to related parties went down about € 0.9m
  - Other current liabilities reduced about € 0.7m

# H1/18: Investing in Further Growth

- 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 € 3.5m (thereof € 2.8m Intangible Assets)
- Own work capitalized mainly in the Voltapower segment – increased R&D in the Voltmation segment



\*Property, Plant and Equipment

# FY17: Highlights

## Strong Financial Position

- Equity ratio of 90.8 % (equity: € 154,990 million)
- Liquid funds of € 102.7 million

## Dynamic Top Line Growth

- Group revenue increased 88.2 % to € 27.3 million

## Increasing Profitability

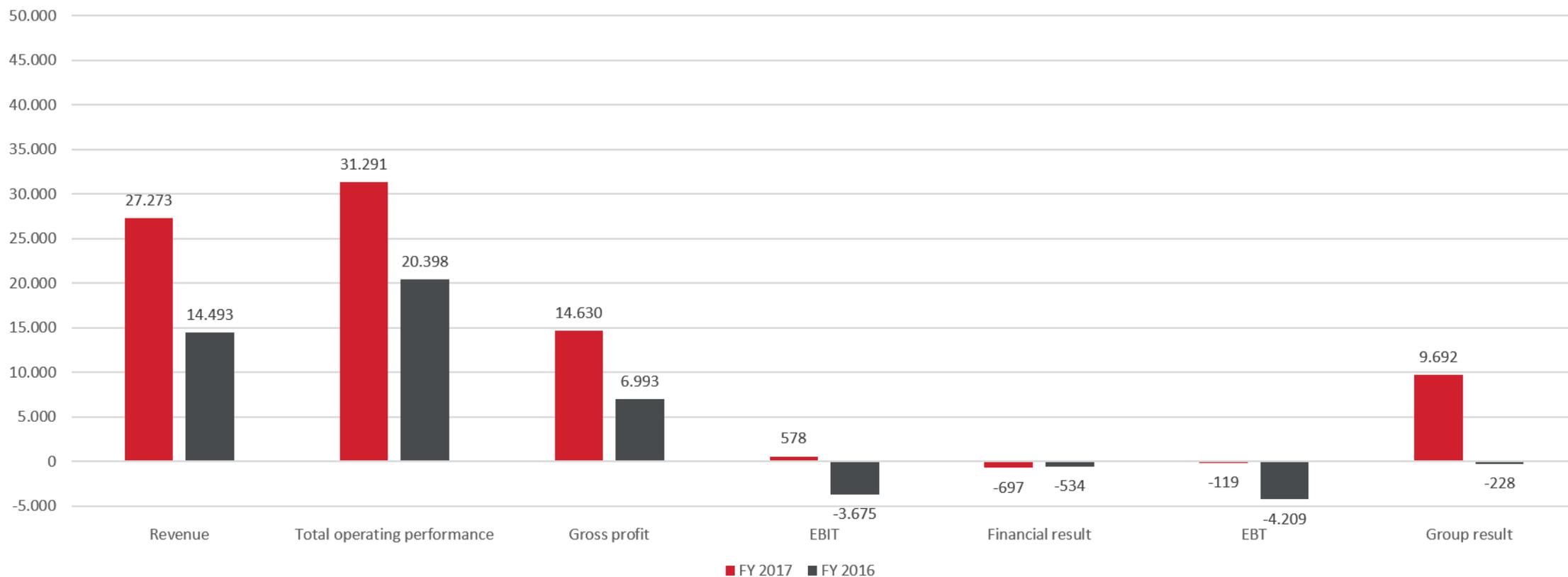
- EBITDA increased 240,9 % to € 3 million
- EBIT margin at 2.1 %

## Set for Future Growth

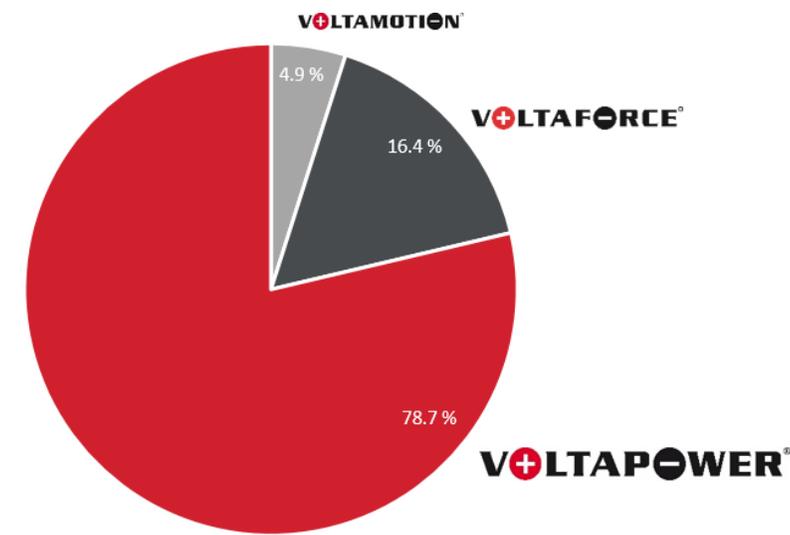
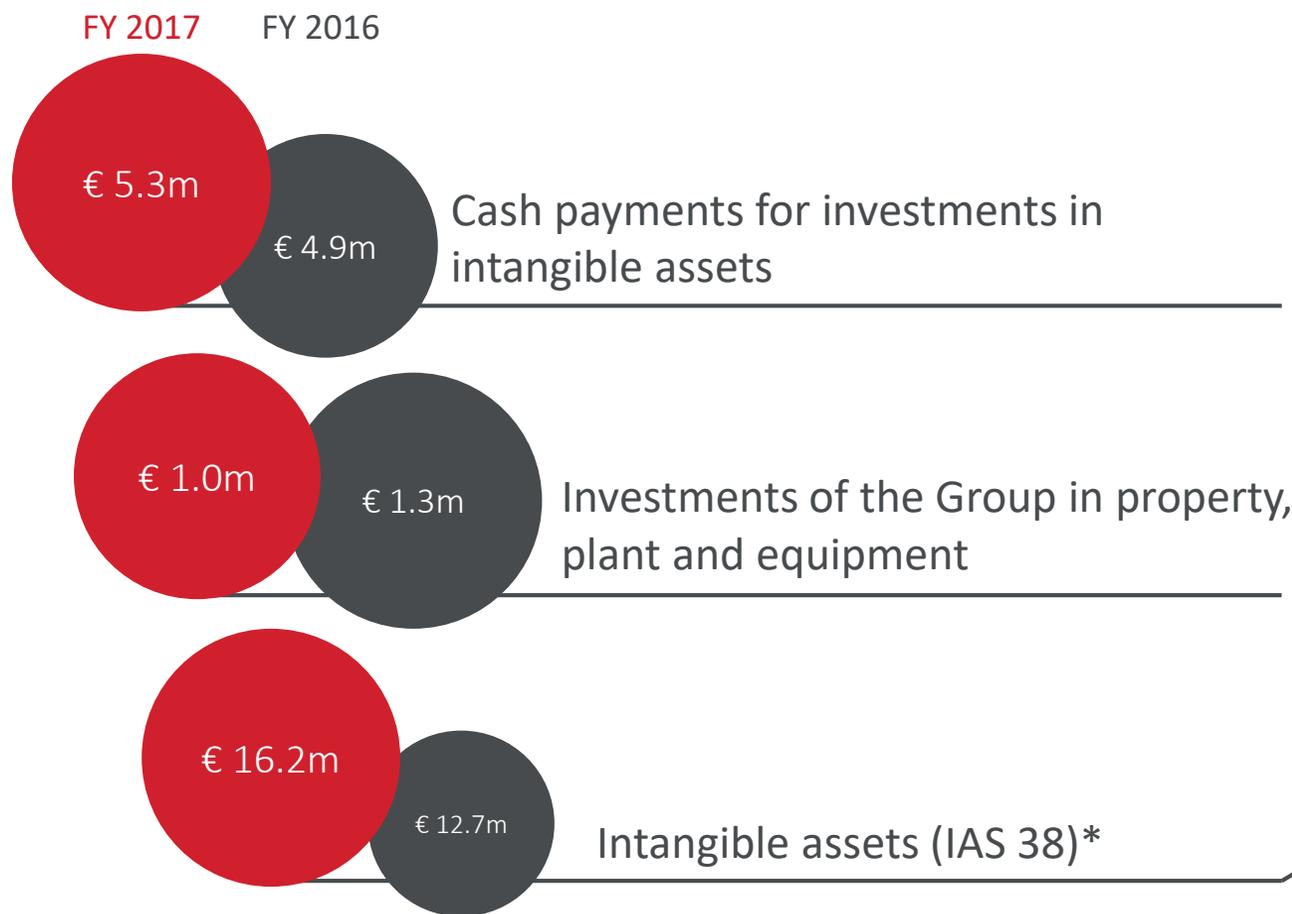
- Launch of a new R&D site in Aachen
- € 5.2 million internal R&D (R&D ratio 19.0 %)

# FY17: Top Line Growth with Increasing Profitability

Selected parameters from the consolidated income statement of Voltabox AG



# FY17: Investments as a Key Factor



by segments

\* Capitalized development expenses

# FY17: Cash Flow Statement

- Significant increase in trade receivables owing to strong revenue in Q4/17
- Reduction in trade payables as planned in consequence of the IPO
- Increase in payments for investments in intangible assets by 9.0% amounting to € 5.3 million (prior year: € 4.9 million)
- Increased amortization of noncurrent fixed assets
- Cash and cash equivalents increased to € 102.7 million as of the end of the reporting period (prior year: € 0.9 million)

Free  
Cashflow:  
€ -20.9m  
(2016: € 0.4m)

€ -15.0m

(2016: € 6.6m)

Cash flow from  
**operating activities\***

€ -6.0m

(2016: € -6.2m)

Cash flow from  
**investment activities\***

€ 122.7m

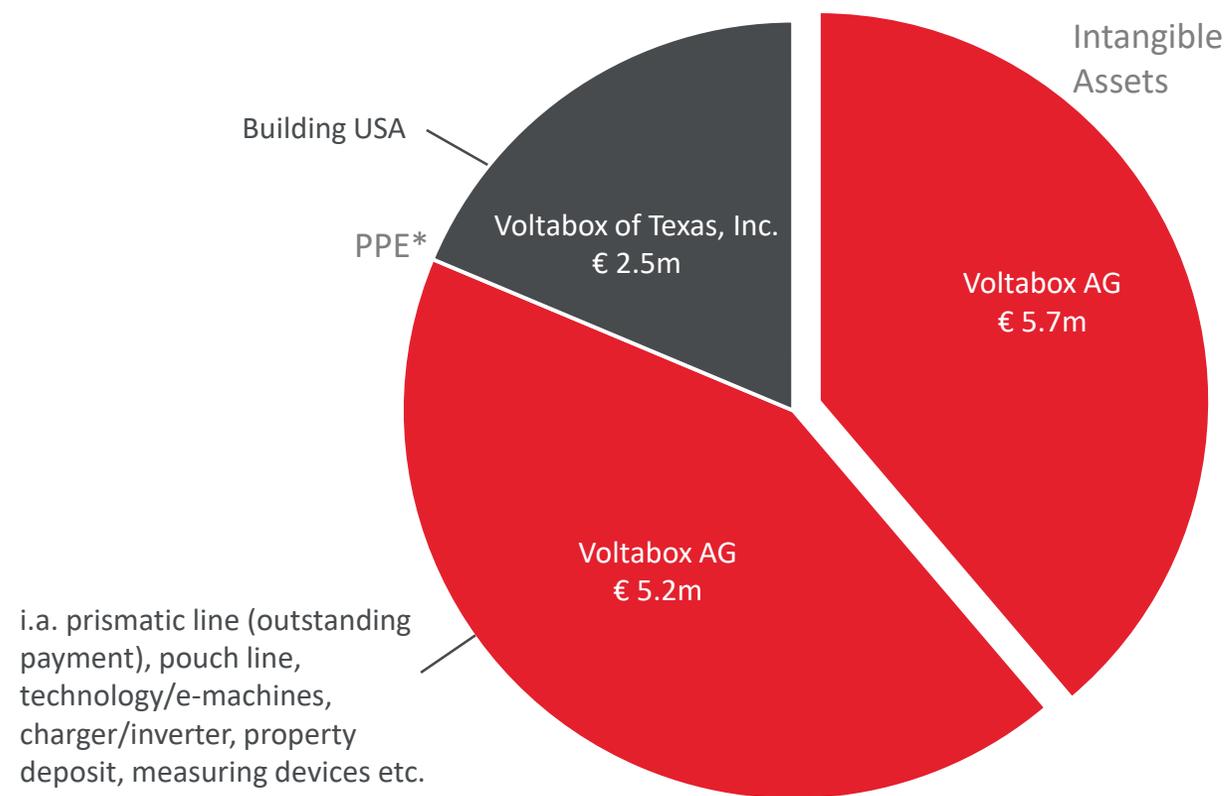
(2016: € -0.2m)

Cash flow from  
**financing activities\***

\* FY 2017

# FY17: Investment Plan 2018

- Total investment volume of € 13.4m in 2018
- Thereof € 10.9m in Germany and € 2.5m in the US
- Capitalized development costs expected to increase by 6.6%



\*Property, Plant and Equipment

# Financial Calendar

- Jan. 11/12, Oddo Forum, Lyon
- Feb. 1, Bankhaus Lampe German Corporate Conference, London
- Feb. 21/22, 12. Oddo-BHF German Corporate Conference, Frankfurt am Main
- Mar. 13, Annual report 2017
- Apr. 18-20, Bankhaus Lampe Deutschlandkonferenz, Baden-Baden
- May 8, Interim release as of March 31 – 3 months
- May 9, Annual general meeting, Delbrück
- May 16, Berenberg Investor Forum at The Battery Show, Hannover
- Jun. 7, quirin Champions 2018, Frankfurt am Main
- Jun 21/22, Berenberg Pan-European Discovery Conference
- Aug. 21, Interim release as of June 30 – 6 months
- Sep. 3/4, Equity Forum Fall Conference, Frankfurt am Main
- Oct. 25 Berenberg Discovery USA Conference, New York
- Nov. 13, Interim release as of September 30 – 9 months
- Nov. 26-28, Deutsches Eigenkapitalforum 2018, Frankfurt am Main

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