

# NORDIC ELECTRIFICATION EVENT

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VALMET AUTOMOTIVE

# FROM VEHICLE MANUFACTURER TO **LEADING EV PLAYER**

MORE THAN 50 YEARS OF INNOVATION. AND NEWER THAN EVER



3.0

BEUR Gross Sales (2021)



4.100

Employees



3

Countries



3

Shareholders (Pontos, Tesi, CATL)



ZERO

emissions (Scope 1 and 2)

ELECTRIFYING

ACTUATING

MANUFACTURING

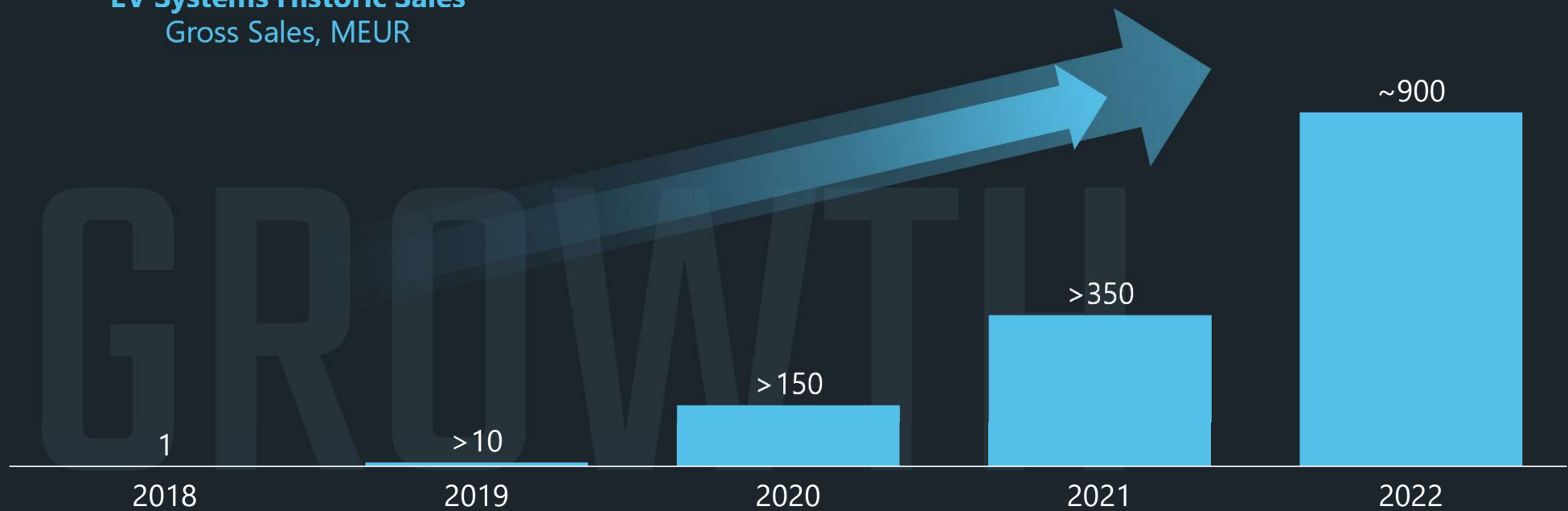
1968

2023



# EV SYSTEMS – OUR GROWTH

EV Systems Historic Sales  
Gross Sales, MEUR



Valmet Automotive is growing strongly in EV Systems – a pillar the size of car manufacturing in a few years.



# EV SYSTEMS – BROAD SCOPE OF PRODUCTS AND APPLICATIONS

## AUTOMOTIVE



- Cell modules
- Battery systems



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## TRUCK & BUS



- Modular Battery Platform (Valmet Automotive Intellectual Property)
  - Power Pack 48V, incl. BMS
  - Power Pack HV
  - PDU (Power Distribution Unit), incl. BMS

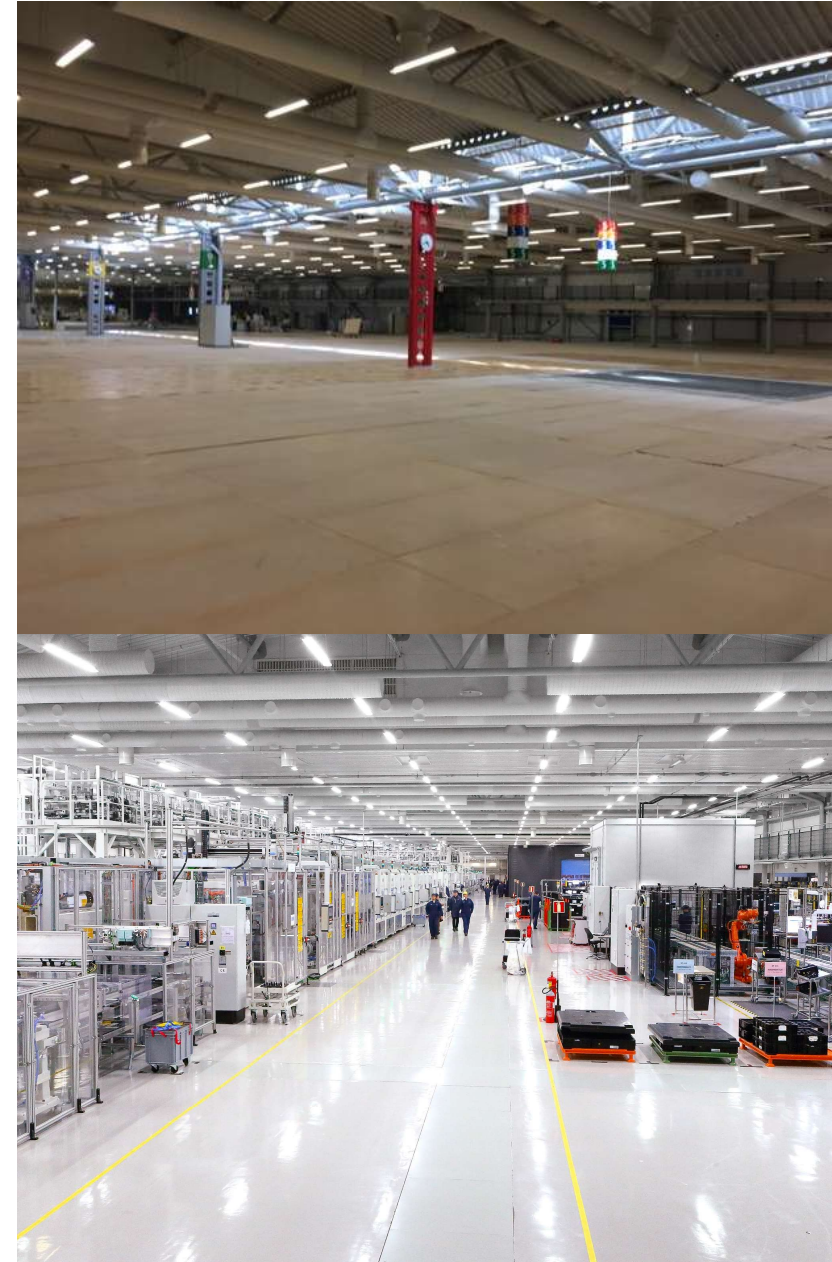
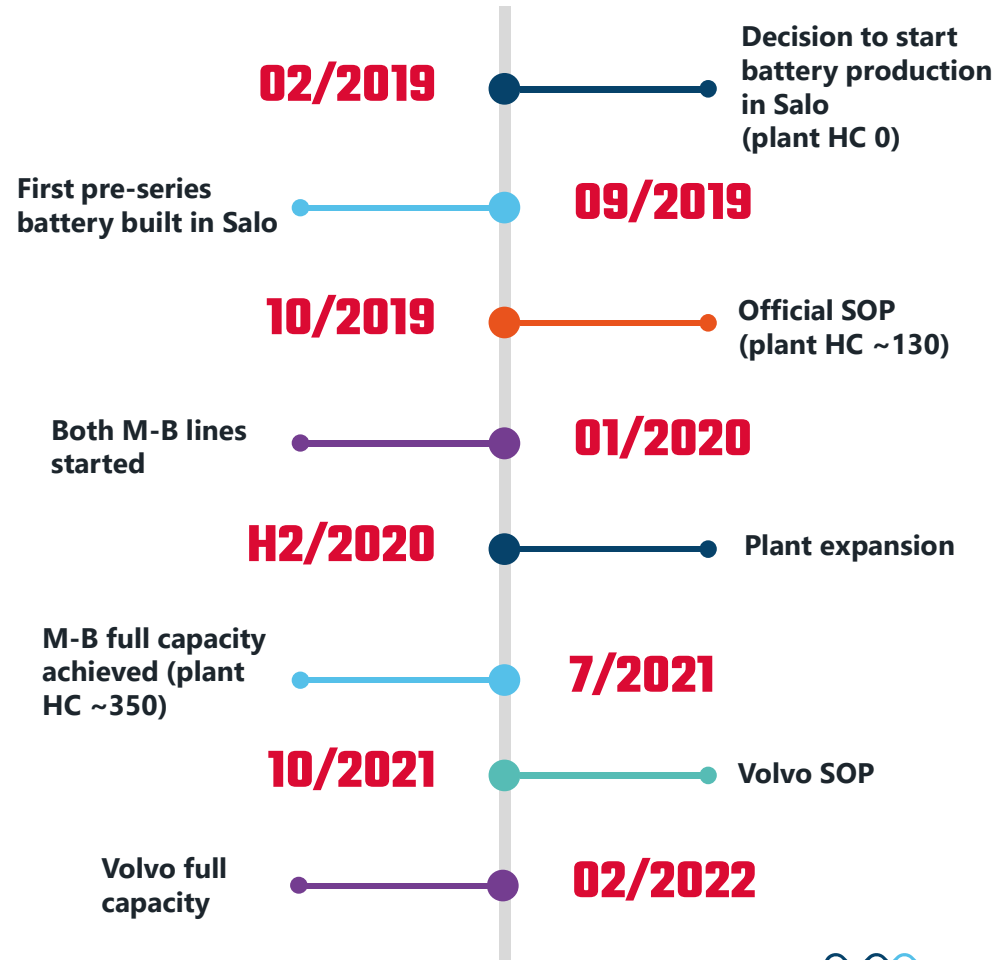


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## OFF-HIGHWAY



# SALO RETROSPECTIVE



# SALO RETROSPECTIVE

## CHALLENGES AND LESSONS LEARNED

- **Schedule**
  - Only 7 months to build the facility
  - Plenty of simultaneous activities: hiring, plant restructuring, line building, etc.
- **Stakeholders**
  - Many of them were not familiar with battery manufacturing, for instance the fire department
- **Support functions**
  - Maintenance staff hired after the lines had already been built, the training proved difficult
  - Laboratory requirements were not known in advance
- **Staff**
  - Sufficient HR resources a must from the beginning
  - Emphasis on talent management and personnel development processes
  - Employment office services could not keep up with the pace of the Salo plant growth



# SALO RETROSPECTIVE

## SUCSESSES

- **Recruiting**
  - Initially challenging, but eventually succeeded well
- **Personnel training**
  - Short classroom trainings and on the job training
- **Partner collaboration**
  - Support and full service, especially from those with experience from the car plant
- **Cooperation with Salo IoT Campus and City of Salo**
  - Flexibility and fast responses to requests
- **Close collaboration with Vehicle Contract Manufacturing**
  - Personnel with competence from high volume and highly automated automotive manufacturing



# VA BATTERY ECOSYSTEM LANDSCAPE

**Business Ecosystem**

ETRA  
IT-line  
SALO CAMPUS  
Putkiaivot  
PREMET  
fortum  
COMPASS GROUP  
PACCO  
Remeo  
SALON ALUESÄHKÖ OY  
Salo

Business Ecosystem

Innovation Ecosystem

Knowledge Ecosystem

Finnish battery and manufacturing ecosystem



SIX cluster

EU: IPCEI, Horizon

**SIX**  
Sustainable Industry X

Global players...

PONSSE EPEC SANDVIK VALTRA  
KALMAR normet TANA NOKIA  
Junttan VTT

...with joint vision...

Horizon Europe





# TRUCK&BUS AND OFF-HIGHWAY OVERVIEW

## SELECTED SEGMENTS, CATEGORIES AND SUB-CATEGORIES

### Truck&Bus

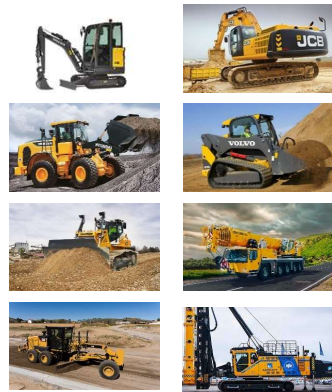
- Heavy-duty truck (HDT)
- Medium-duty truck (MDT)
- City & Intercity bus
- Coach



### Off-highway

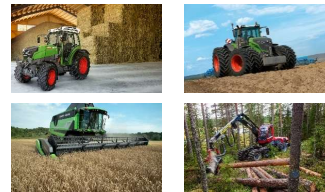
#### Construction

- Mini-to-small excavators
- Skid-steer loaders
- Medium-to-large excavators
- Wheeled & backhoe loaders
- Bulldozers
- Cranes
- Specialized construction machines



#### Agriculture

- Small Tractors
- Medium & large Tractors
- Combine harvesters
- Other agricultural machines
- Forestry machines



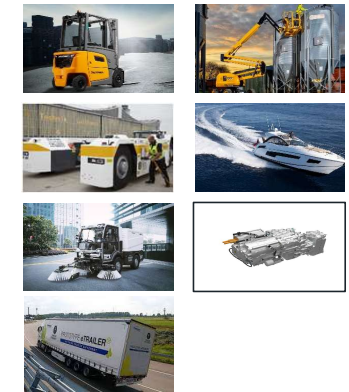
#### Mining

- Trucks
- Rigid haulers
- Loaders
- Excavators
- Drills
- Other Mining machines



#### Others

- Material handling
- Aerial work platforms
- Ground handling
- Marine
- Municipal vehicles
- Truck Trailers<sup>1</sup>
- Special powertrain applications<sup>1</sup>



### Integrators

<sup>1</sup>Included to Off-highway since they do not need to fulfill automotive standards

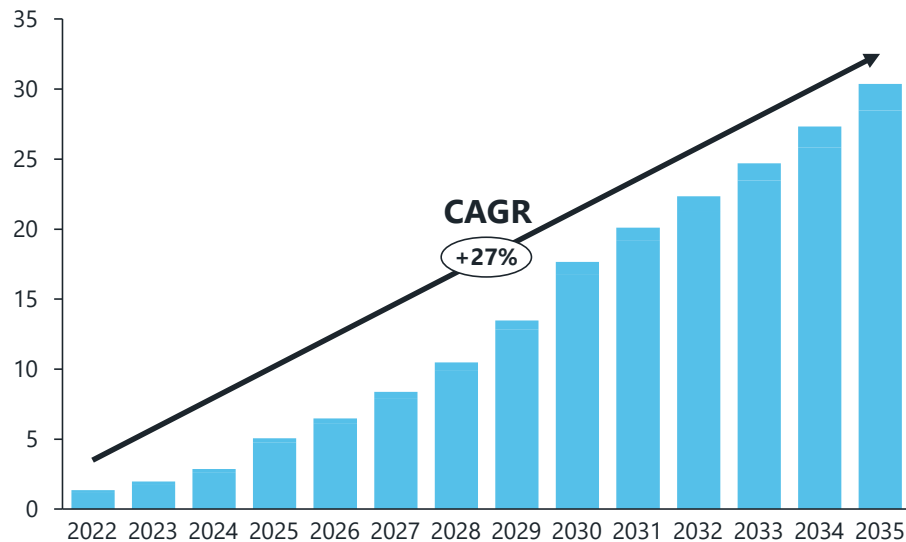


# TRUCK&BUS AND OFF-HIGHWAY – MARKET SIZE AND GROWTH

- **Lithium-ion battery market on/off-hwy<sup>1</sup>, 2022–2035**

Total market

- In € BN



## Valmet Automotive - Modular Battery Platform

### Comprehensive product family

- Modular and flexible – Power Pack (48v, High Voltage), Energy Pack
- Providing solutions for all potential applications and lifetime volumes, best utilizing available space and enabling easy integration
- Sparing customers the one-offs like development and testing costs and production line invest supporting

Overall market still small but growing rapidly in the following years. Total market size in € expected to be at least 10-fold by end of decade compared to 2022



# MODULAR BATTERY PLATFORM

## MODULAR POWER PACK FEATURES AND HIGHLIGHTS

### Direct Cell-to-Pack Concept

- Rigid sub-module structure not is needed
- High packaging density

### Exceptional Cooling Performance

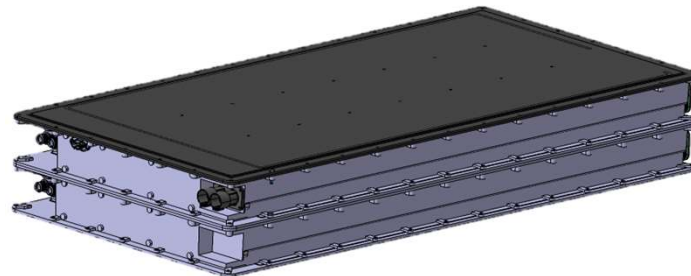
- Advanced liquid cooling
- Prolonged cell cycle life
- High continuous current capability

### High performance

- High peak power capability
- Fast charging compatibility
- Reliable cell

### Efficient Use of Available Space

- Space saving by high level of integration
- Possibility to distribute the packs to various locations in the system



### Designed for Harsh Environment

- Die-casted aluminum housing controls the cell swelling and provides protection from external forces
- High ingress protection grade, IP6k9k

### Designed for Safety Critical Applications

- Safety certified Battery Management System
- High level of EMC protection

### Thermal propagation prevention

- Cells protected by aluminum housing
- Advanced safety valve
- Advanced Safety features

### Designed for Mass Production and Easy Integration

- Design for automatic high-volume assembly
- System integration can be done without high voltage work



# THE FAST LANE TO FUTURE VEHICLES



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