

## Battery AGV



Automated container transport  
**Electric mobility provided by Gottwald**

# Gottwald Battery AGV

Taking a load off the environment, improving cost effectiveness



By developing, building and operating Battery AGVs for automated container transport, Gottwald is implementing a drive concept that is both highly efficient and environmentally compatible. Both energy consumption and emissions are sustainably reduced and a key factor in a potentially uninterrupted green energy chain is established.

## Innovative drive concept

In contrast to the diesel-electric drive, the Battery AGV is powered by high-performance rechargeable cells in place of the diesel engine, generator and ancillary units.

The advantages of the Battery AGV:

- More than double the efficiency
- Simplified drive train
- Minimised energy used during standstill
- Reduced maintenance requirements
- Fully automated battery changing station.

## Reducing operating costs

The high efficiency rating of the battery drive and the energy savings during waiting times reduce the operating costs of a fleet of Battery AGVs considerably. The maintenance requirements are also much reduced.

## Zero exhaust gas emissions

In addition to the noticeable reduction in noise level, the battery drive also enables locally generated exhaust gas emissions to be completely eradicated. If the batteries are recharged using electricity from renewable sources, this even reduces the overall CO<sub>2</sub> rating to zero.



exhaust gas emissions from Battery AGVs in terminals



# Another milestone in the development of AGV technology

As pacesetter and innovator in the automation of terminal logistics, Gottwald has, for many years, been providing impetus in automated container handling using AGV Automated Guided Vehicles. Since pioneering the technology 20 years ago, Gottwald has continuously developed its AGV technology and consistently focussed on using electric drives, simple construction and low weight.

Now, Gottwald is offering the latest enhancement in terms of cost effectiveness and environmental friendliness of these unmanned, software-controlled container transporters by presenting the Battery AGV.



### Benefits of the Battery AGV:

- Less energy consumption
- Reduced fleet operating costs
- Zero exhaust emissions
- Minimised noise emissions
- Potential for an uninterrupted green energy chain.

## The evolution of Gottwald's AGV technology

The first diesel-hydraulic AGVs are put into commercial service



2006

The launch of the diesel-electric Lift AGV results in optimised processes



2009

Battery AGV in a live working environment



2011

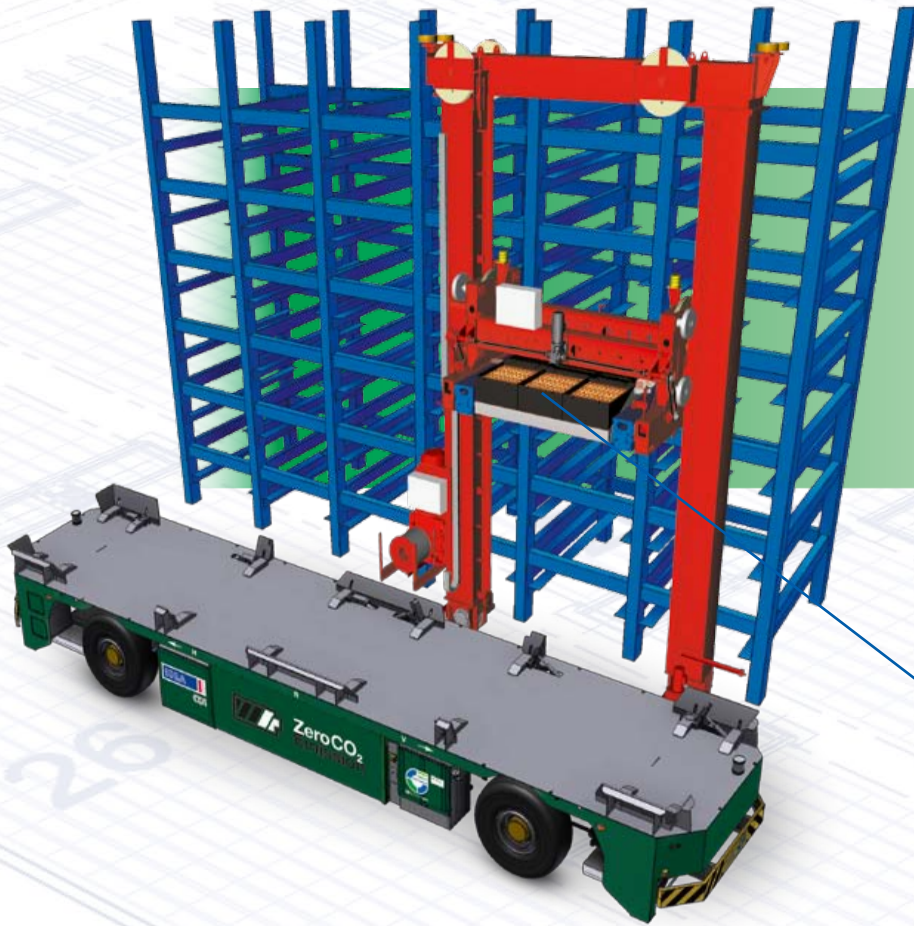
1993



Gottwald launches the first AGV to have a diesel-electric drive



First trial runs lay the foundations for the development of the Battery AGV

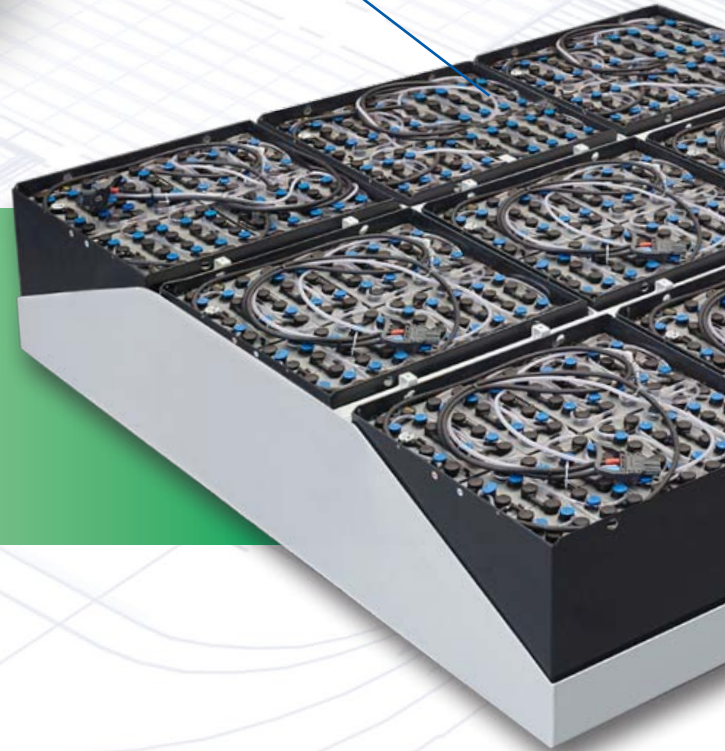


### Battery changer and charging station

Part of the development process for Gottwald's Battery AGV involved developing a battery changer and charger.

This system enables:

- decoupling the travel and charging processes
- fully-automated battery changing in approx. five minutes
- optimised load on the mains power supply thanks to smart charging management.



### High-performance batteries

Gottwald uses high-performance, standard lead batteries for these vehicles. Of all the possible battery types compatible with the application, these are the only type that are fully recyclable and do not require additional equipment for cooling or monitoring. In addition, lead batteries offer excellent value for money.



The Battery AGV is one of the machines in Gottwald's Green Range. With these products and drive concepts, Gottwald is setting standards in terms of environmental sustainability

### Battery powered drive train

- Low power consumption and high battery capacity
- Average duty cycle per battery charge is considerably longer than recharging time in the changing station.

# Battery-powered Lift AGV

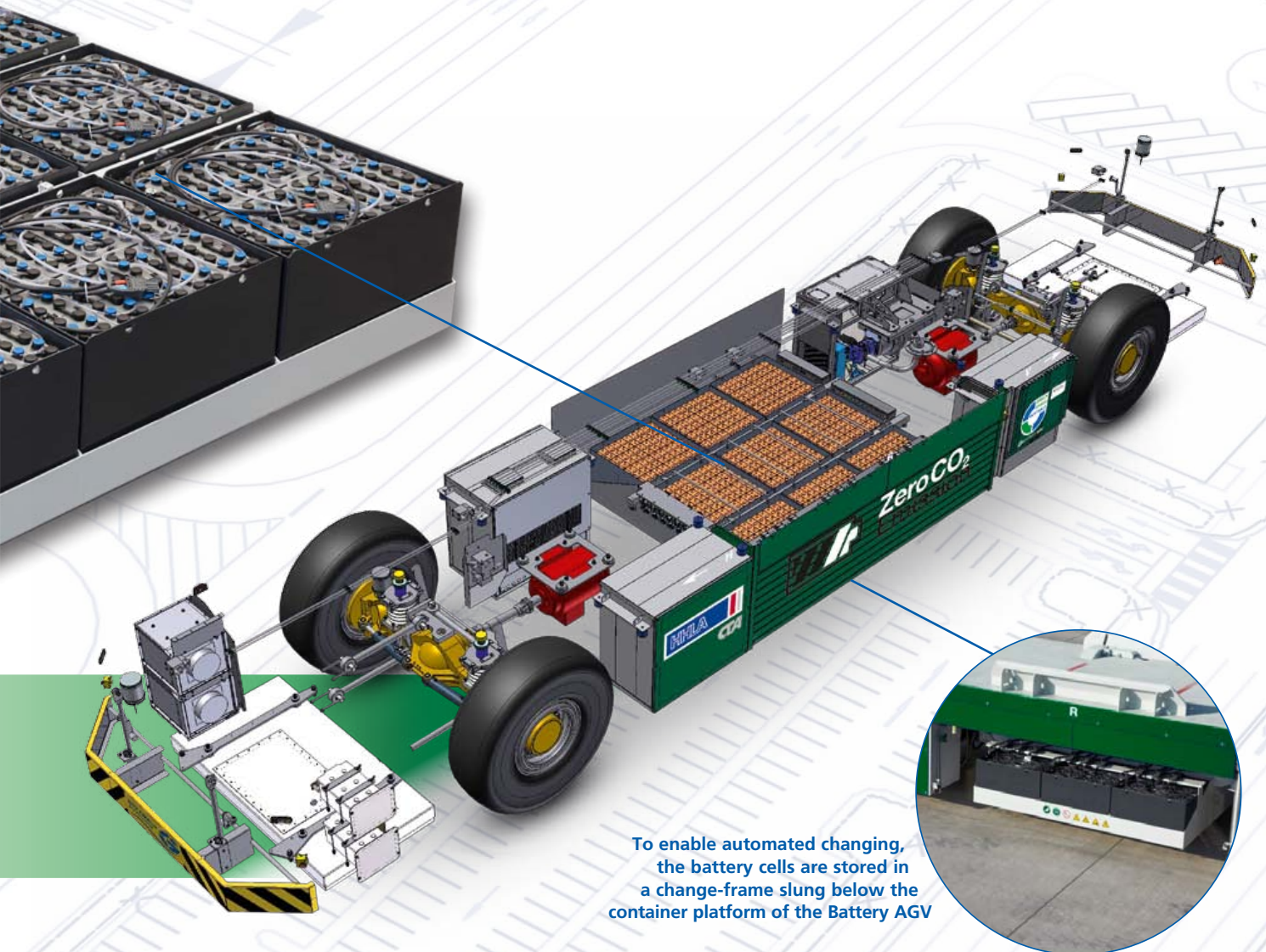
A combination of electric mobility and process optimisation

If the battery-powered drive concept is blended with Lift AGV technology, terminal operators can harvest even more benefits. Decoupling the transport and storage processes results not only in a higher working frequency and a reduction in the fleet of machines but also leads to additional economic and ecological benefits.

## Additional applications

Apart from this application, the battery drive concept used in Gottwald's AGVs opens up more potential uses:

- in additional cargo-handling machinery
- in heavy-load vehicles at airports
- in heavy transfer machines within industrial sites.



To enable automated changing, the battery cells are stored in a change-frame slung below the container platform of the Battery AGV

**Gottwald Port Technology GmbH** • PO Box 18 03 43 • 40570 Düsseldorf, Germany  
Phone: +49 (0) 211 7102-0 • Fax: +49 (0) 211 7102-3651 • [info@gottwald.com](mailto:info@gottwald.com) • [www.gottwald.com](http://www.gottwald.com)

Gottwald Port Technology GmbH – A subsidiary of Demag Cranes AG

