

ALL-ELECTRIC MOBILE HARBOR CRANE

# First battery-driven mobile harbor crane operates in Sweden

**"In the decision-making process, we looked at Konecranes' electric expertise not only in cranes, but across the entire port. We were impressed by the battery-driven automated guided vehicles, for example."**

Lars Widlund ,  
CEO Port of Skellefteå



# The right mobile harbor crane for Skellefteå, Europe's "battery capital"

**Skellefteå is not called the new European capital of battery production for nothing. In this town of 70,000 inhabitants in northern Sweden, a state-of-the-art battery manufacturing facility covering some 500,000 m<sup>2</sup> was opened at the end of 2021, with direct access to international shipping routes through the town's Baltic Sea port. It makes sense, therefore, that an all-electric Konecranes Gottwald Mobile Harbor Crane with a battery drive has been working in the port since end of February 2022.**

The city of Skellefteå is the port's operator, and relies on Konecranes' unique global expertise in battery drives with this new crane. Its acquisition marked the next round of cooperation that has already lasted 20 years. Since 2002, a Konecranes Gottwald HMK 260 E mobile harbor crane has been a workhorse at the port, located 300 km south of the arctic circle. It is electrically powered as well, but it's equipped with a diesel generator. The new Model 6 crane is all-electric. At the quay, it is powered by electricity drawn from the harbor mains, and when it's moved within the port it's battery-driven. There is no onboard diesel engine so there are no local exhaust emissions. This new crane is a fine example of Konecranes' Ecolifting™ initiative, which aims to create a decarbonized and circular world for customers and society.

## Part of sustainable living

With this drive concept, the new mobile harbor crane fits naturally in the eco-efficient environment of Skellefteå, as the port's CEO Lars Widelund emphasizes: "Battery technology is inextricably linked to the socio-economic development of our town. The new battery plant will soon employ around 3,000 people, and many new jobs will be created in supplier companies.



The all-electric Konecranes Gottwald Mobile Harbor Crane with battery drive handles containers in the Port of Skellefteå to support the new battery plant

Also, new knowledge-based institutions will be established."

Against this background, the city has raised its forecast for population growth. In 2015 it was estimating a population of 80,000 for 2030, but the figure now stands at 90,000. Skellefteå has developed a concept for sustainable growth in which the port plays a central role. It was particularly important for the town, as the port operator, to purchase an all-electric crane, which is all the more appropriate since the new crane is an essential link in the supply chain to and from the new battery plant. As a result, batteries will – like other goods – be handled with the help of batteries.

## Pioneering tradition: good experience with the first crane

This was also a concern for the owner of the new battery factory, Lars Widelund continues, for reasons of environmental awareness: "We focus on efficiency in regards to both economic and ecologic to

develop our terminal further. The new crane is the next step in this direction, and by using the port's own electricity and batteries, we are forging ahead in terms of eco-efficiency. We turned again to Konecranes, the pioneer of all-electric crane operation and the only company offering this combination. In the decision-making process, we looked at Konecranes' electric expertise not only in cranes, but across the entire port. We were impressed by the battery-driven automated guided vehicles, for example."

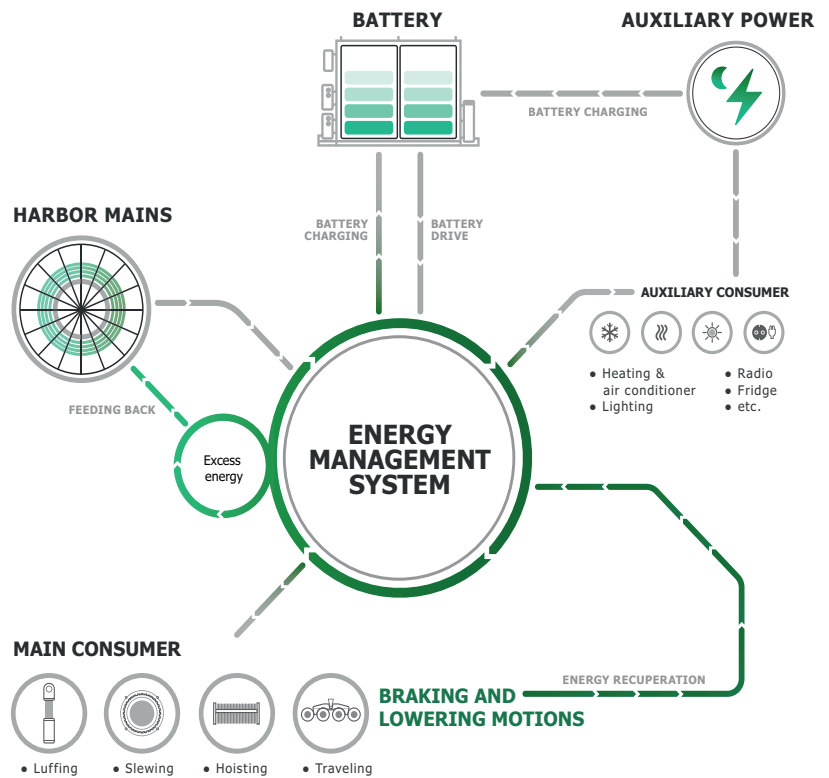
Another factor in favor of Konecranes, besides its electric innovation, was the good experience with the first Konecranes Gottwald mobile harbor crane, explains Lars Widelund: "We use the crane since 20 years in both bulk and container handling. And heavy lifts are also regularly on the agenda. This alone shows how versatile the crane is. This is particularly remarkable given that the climatic conditions near the arctic circle are a permanent challenge to modern technology."

## High demands for performance and eco-efficiency

In addition to the climatic challenges, the battery factory's operations have put new requirements on the performance of the material handling infrastructure in Skellefteå. A comprehensive restructuring package is currently being implemented in the port. Storage areas are being expanded along with the material handling capacities. The new crane is the key element in the latter effort, explains Lars Widelund: "It is a larger crane with a maximum working radius of 51 m and a maximum lifting capacity of 125 t. It is a symbol of our organic growth in recent years and will help us to fully exploit our further growth potential."

The eco-efficiency aspect was important to everybody involved. The new crane is even a world premiere in this respect, as Hans-Jürgen Schneider, Regional Sales Manager Mobile Harbor Cranes, Konecranes Port Solutions, points out: "Skellefteå's new crane is the first all-electric mobile harbor crane with a battery drive. Ordered at a time when Generation 6 was not yet on the market, it is a bridge between Generations 5 and 6, anticipating Generation 6 in terms of drive technology. Built on the proven electric

drive concepts of our Generation 5 cranes, it was a logical next step for Konecranes to integrate batteries as a standard option in our modular drive system for all of our Generation 6 mobile harbor cranes."



The all-electric mobile harbor crane is controlled by the smart energy management system

## Eco-efficient to the max

The result is maximum eco-efficiency: the all-electric operation gives zero tailpipe emissions on-site and particularly low noise emissions. In addition, the crane is equipped with a smart energy management system that enables, among other things, very flexible use of recovered energy. This can be used by other energy-consuming functions in the crane itself or it can be fed back into the port's mains.

As for the batteries, Konecranes uses state-of-the-art lithium-ion technology which has proven itself in automated guided vehicles (AGVs) for many years. With a 250 kWh battery pack, the crane is mobile in the most environmentally friendly way in of the areas of the port where mains power is unavailable. The batteries store enough energy to move the crane unplugged for over one hour, and enough energy to execute propping functions and to handle cargo with single crane movements like hoisting, slewing and luffing.



The Model 6 mobile harbor crane is equipped with a 250 kWh battery pack to move and operate the crane unplugged

The batteries can be charged at almost any power supply with 400V/63A. If the crane is connected to the harbor mains and working, the charging process is automatic and very fast. This is due in part to the smart energy management system, which recovers energy from the crane itself while drawing power from the harbor mains.

High efficiency, low maintenance costs  
The smart energy management system makes a significant contribution to the crane's cost-effectiveness, which is very high thanks to its ability to use an external power supply in combination with batteries. Clas Eriksson confirms: "Using batteries as a drive backup maximizes the eco-efficiency of our crane while significantly reducing its maintenance costs and thus the total cost of ownership."

## The electric pioneer

Hans-Jürgen Schneider says: "This crane is a fine example of two of our key principles: on the one hand, it stands for all the eco-efficiency possibilities that we as an electric pioneer can provide. On the other hand, it shows how Konecranes responds flexibly to meet the individual needs of its customers."



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Charging of the batteries is also possible when the crane is connected to an auxiliary power source of min. 400V/63A

### Customer

- Port of Skellefteå

### Industry

- Port of Skellefteå with direct access to the Baltic Sea
- Cargo handling turnstile for a new state-of-the-art battery manufacturing facility close by

### Challenge


- Battery technology is inextricably linked to the socio-economic development of the town
- Cargo handling equipment thus needs to operate eco-efficient and all-electric, as well

### Solution

- Konecranes Gottwald Model 6 Mobile Harbor Crane – the very first battery driven mobile harbor crane
- All-electric drive combining external power supply with on-board battery drive

### Benefits

- A maximum eco-efficient mobile harbor crane
- Smart energy management system for flexible use of recovered energy
- Significant reduction of maintenance costs and total cost of ownership

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