



# SUSTAINABLE SHIP UNLOADING OPERATIONS

BULK TERMINALS 2024 ANTWERPEN

# AGENDA

1

## **Our Offers and Solutions given Dry Bulk Handling in urban areas**

Covering market factors and the solutions

2

## **Characteristics of sustainable ship unloading**

Technologies for the highest efficiency with dust emission control

3

## **Success stories**

Real-World Impact

## **Contacts**

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# OUR OFFERS

## Products



Ship-to-shore  
Unloader



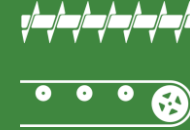
Shore-to-ship  
Loader



Ship-to-shore  
Mobile Unloader



Terminal  
equipment



Conveying

## Accessories



Digital  
solutions



Modular  
add-ons

## Services



Inspections



Maintenance



Remote  
Assistance



Siwertell  
Smartview



Spare Parts  
Management



Training &  
Education

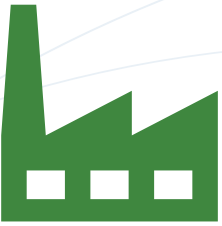


Operational  
Management

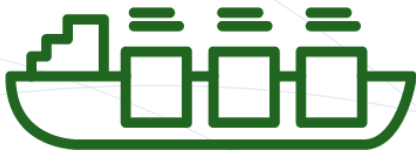
# OUR FOOTPRINT



Siwertell equipment operate >300 sites worldwide



Installed base globally >400 loaders/unloaders



19, and counting, of the worlds first IIoT solution for Ship Unloaders

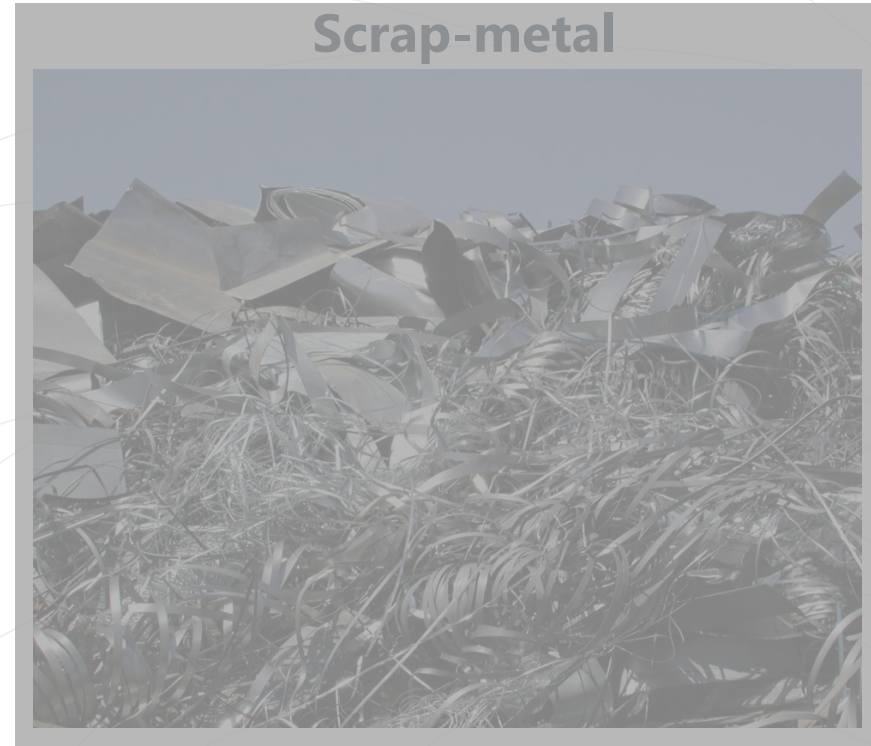
# OUR CUSTOMERS – DRY BULK HANDLING OPERATIONS

Two (2) major types of imported bulk products in the Port of Antwerpen-Bruges

Fertilizers



Scrap-metal



**Minor bulk products:** zinc ore, kaolin, gravel, sand, potassium salts, wood waste, malt, granite blocks, cement clinker, marble, soda, rapeseed, glass

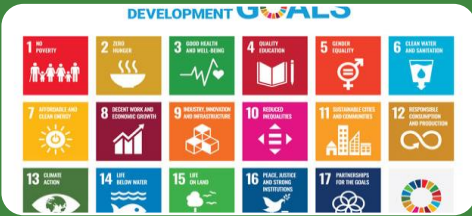
# MARKET FACTORS



Continuous increase in demand of dry bulk products



Urbanization of Ports



Continued increase of environmental, health and sustainability demands



Increasing costs related to operation & operators

# OUR SHIP UNLOADING SOLUTION

A Siwertell ship unloader with a jetty conveyor with IIoT and Service support.

Future proofing Dry bulk handling in European cities



**Health and environmental benefits**

**Economical benefits**

**Service benefits**

**Low noise levels**  
Minimizing the noise pollution



**Fully electric**  
All operation is powered by electricity



**Minimal bulk spillage**  
Loss of bulk products is minimal in our enclosed system



**Tailored services**  
To ensure up-time and longevity



**Minimal dust emissions**  
Totally enclosed transportation



**High efficiency and ev. high capacity**  
Meeting the ever increasing demand of bulk, up to 2300 t/h



**Low degradation**  
Moving the bulk product with sustained quality through low velocity



**User friendly and semi-automatic unloading**  
Simplifying competence allocation and ensure continuous usage



**Data management**  
IIoT, enabling actions for improvements and reporting





# CARGO FLOW THROUGH A SIWERTELL SHIP UNLOADER

Dust tight feeding box

The green dotted line show the totally enclosed conveyor line, from hatch to shore or even directly to truck.

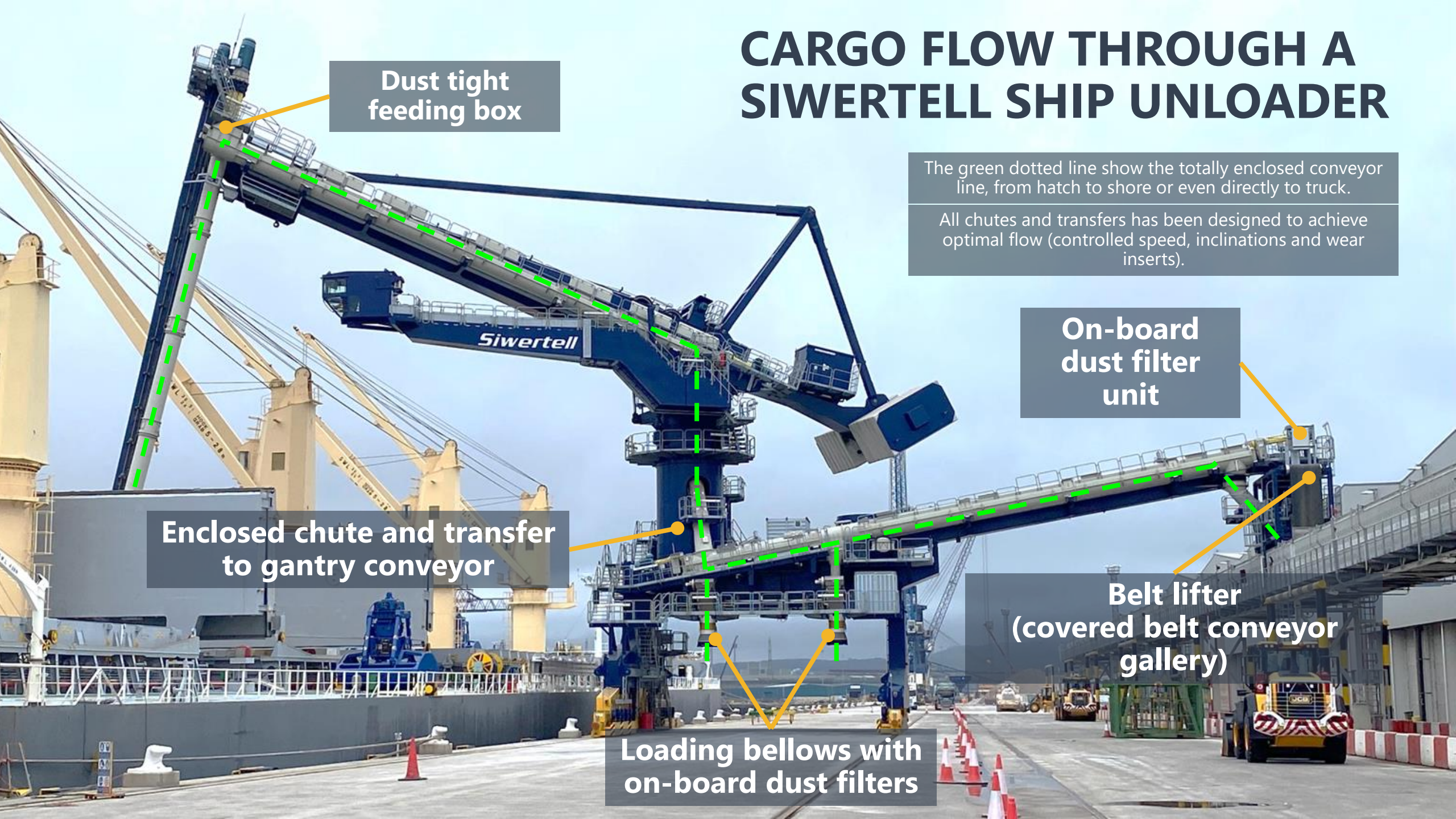
All chutes and transfers has been designed to achieve optimal flow (controlled speed, inclinations and wear inserts).

On-board dust filter unit

Enclosed chute and transfer to gantry conveyor

Belt lifter (covered belt conveyor gallery)

Loading bellows with on-board dust filters



# DUST EMISSION CONTROL IN TRANSFER POINTS

**Belt lifter** – travelling trolley that lifts the belt and enables a dust free discharge onto the jetty belt conveyor.

**Loading chute** – designed to control the material flow and load this in a controlled manner onto the conveyor belt.

**Loading carriage** – lifting the jetty belt up towards the loading point from the unloader. Including dust sealing along the entire carriage

**Cover belt** – covering the total length of the jetty conveyor. Enclosing the gallery and minimizing emissions.

**Dust filter** – managing the dusty atmosphere and returning collected material to the belt conveyor.

# POWER OF MOVEMENT BOOST BOTH DUST MITIGATION AND OPERATIONAL EFFICIENCY

Luffing movement

The ship unloaders movements enable the operator to unload the cargo with the "layer-by-layer" principle to avoid material avalanches and thus big dust clouds.

Movements also ensure reach within the hold including the outer and inner hatch coamings which by help of superior digging forces.

High operational efficiency means the ships can be unloaded faster.

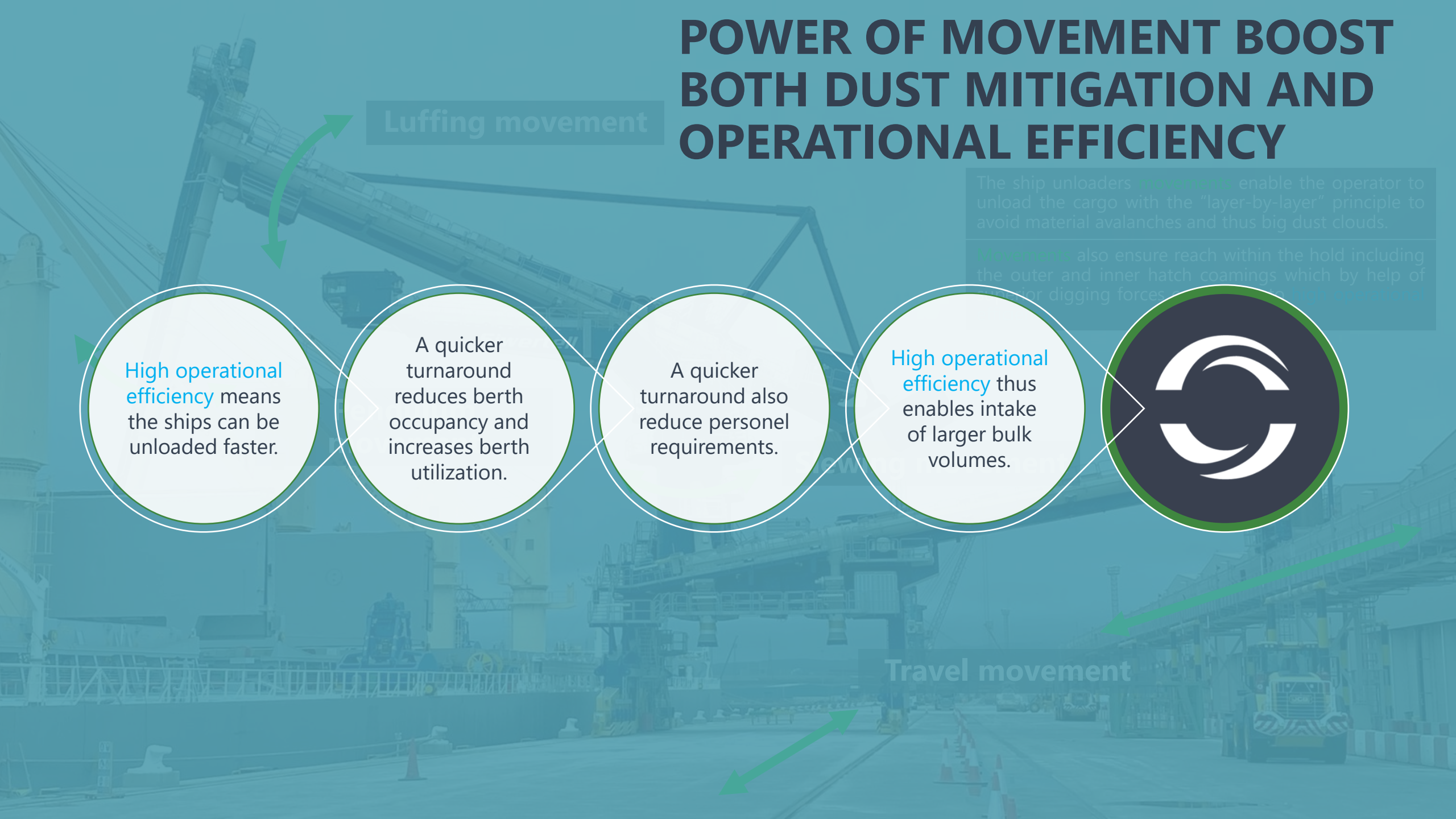
A quicker turnaround reduces berth occupancy and increases berth utilization.

A quicker turnaround also reduce personel requirements.

High operational efficiency thus enables intake of larger bulk volumes.



Travel movement



# PREDICTION OF OPERATIONAL EFFICIENCY

<b>Manufacturer</b>	SIWERTELL AB		<b>Ship Definition</b>		
<b>Type of Ship Unloader</b>	D-TYPE VST-790		- Ship Size	50000	DWT
<b>Unloading Capacity</b>			- Material to unload	40000	DWT
- Norminal Capacity	1200	t/h	- Number of Holds	5	Holds
- Peak Capacity	1450	t/h	- Number of Holds to unload	5	Holds
<b>Material</b>	Wood pellets, free flowing		- Moulded breadth	28	m
- Total Moisture	< 15	%	- Moulded depth	18	m
- Bulk Density	600	kg/m <sup>3</sup>	- Hatch opening (LxW)	23,0 x 13,5	m
- Angle of Repose	< 30	°	- Hold length	27	m
			<b>Customer quote number</b>		
			- Quote number	15225161	

**Expected Through ship rate, EMV handling Included**

Time includes movements of ship unloader

Total Working time	=	47,5 h
Overall Unloading Capacity	=	841 ton/h
Percent Rate	=	70,1 %

- Other values of high operational efficiency?
- Unload cargo faster and with less emissions from the vessel compared to conventional technology.
  - Ability to streamline your operation without investments downstream the unloading equipment.

**Guaranteed through ship rate as per Siwertell separate performance test procedure**

# DRY BULK HANDLING

## CASE CARD

### Handling bulk cargo with high environmental credentials

#### ■ Preconditions

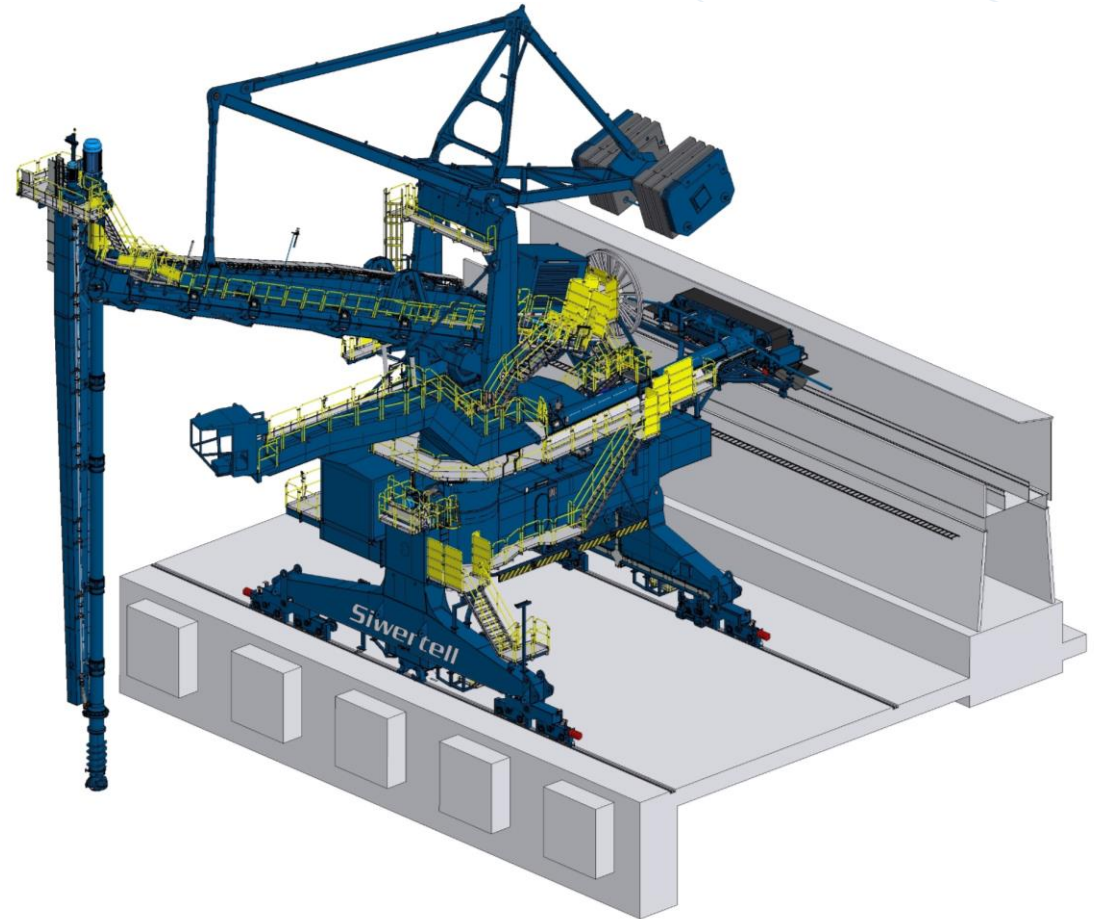
- Unloading nickel concentrate at **480 t/h** using **Stationary** ship unloader from Bruks Siwertell.

#### ■ Requirements

- **Increasing capacity and efficiency** while preserving the existing jetty conveyor and enclosing gallery.
- Need for an **environment-friendly solution to minimize dust, spillage, and, importantly, material degradation.**

#### ■ Solution

- Replacing the Stationary ship loader at capacity 480 t/h by a **Rail mounted ship unloader** at capacity of **800t/h** enabling travelling motion.
- **Radar based anti-collision system to enhance operational efficiency.**
- **Add integrated belt lifter** inside enclosed conveying gallery (with panel lifter and onboard dust filter unit)



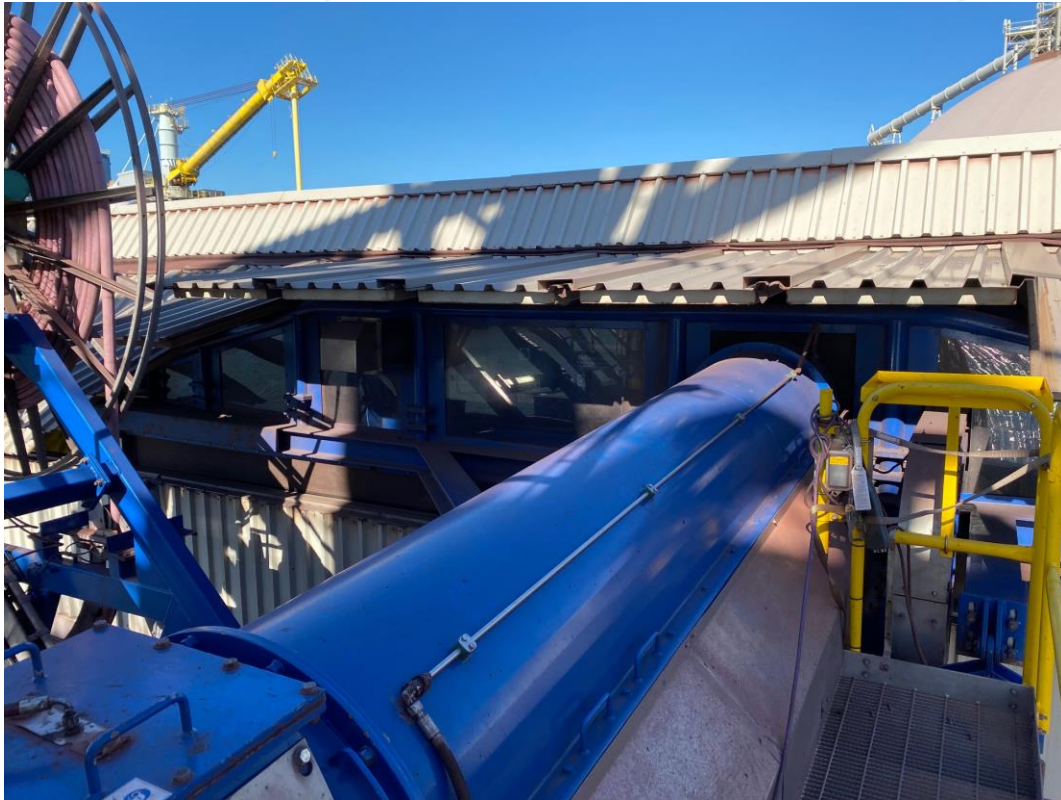
# DRY BULK HANDLING CASE CARD

*System with a continuous, enclosed, cargo flow from vessel to dome (yellow arrows).*

*Enabling movement over the full vessel/berth (green arrows)*

# DRY BULK HANDLING

## CASE CARD



The enclosed gallery with covered panel lifter creating protection from both wind and snow, and minimizing emissions.



Belt lifter with loading carriage inside enclosed gallery. Features onboard include both dust filter and sealing to further ensure minimal dusting.

# BULK HANDLING – SHIP UNLOADING

## CONTRIBUTION TO CHANGE AND IMPROVEMENTS

Unloading sulfur by STS cranes

Unloading sulfur with Siwertell CSU





# BULK HANDLING – SHIP UNLOADING

## CONTRIBUTION TO CHANGE AND IMPROVEMENTS

Unloading coal by STS cranes



Unloading coal with Siwertell CSU



# YOUR BULK, OUR PROMISE

# LET'S HANDLE THE FUTURE OF BULK TOGETHER

## Contacts

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