

# SMART AND GREEN PORTS FROM FINLAND

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BUSINESS  
FINLAND

#FINLANDWORKS



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BUSINESS  
FINLAND

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## FINNISH SOLUTIONS FOR SMART AND GREEN PORTS

1. Port design
2. Network infrastructure, connectivity and data management
3. Digital Platforms
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6. Automated and precisely tracked cargo and passenger flows
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# SMART AND GREEN PORTS

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BUSINESS  
FINLAND

Smart ports use innovative technologies and automation to optimize and improve their performance.

A well-built digital infrastructure helps ports optimize their physical infrastructure, predict and prepare for future investment and maintenance needs and improve their everyday operational efficiency.

Ports as a vital part of global supply chain urgently need to adjust to climate change. Zero-emission ports see their competitive advantage in providing their clients access to sustainable operation while at port.

This presentation showcases some of the leading Finnish companies and ports.



# FINNISH MARITIME RANKINGS

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BUSINESS  
FINLAND

#1

**IN AUTONOMOUS  
AND REMOTELY  
CONTROLLED FERRIES  
IN THE WORLD**

FINNFERRIES 2018

#1

**IN DIGITAL  
COMPETITIVENESS  
IN THE EU**

DIGITAL ECONOMY AND  
SOCIETY INDEX (DESI) 2019

#1

**1<sup>ST</sup> TEST AREA FOR  
THE AUTONOMOUS  
MARITIME ECOSYSTEM**

ONE SEA ECOSYSTEM

#1

**1<sup>ST</sup> EVER TO USE  
A 5G NETWORK FOR  
PORT OPERATIONS**

NOKIA

#1

**IN SUSTAINABLE  
DEVELOPMENT**

UN SUSTAINABLE  
DEVELOPMENT REPORT 2021

# WHERE CAN FINLAND ADD VALUE?

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**BUSINESS  
FINLAND**

## LEADING POSITIONS

- Terminal automation
- Port digitalization
- Digital and Electrical infrastructure
- Smart and Autonomous shipping
- Connectivity
- Port consulting and training

## MAIN OFFERINGS

- Port Infrastructure development
- Connectivity and Data management
- Port and cargo automation and machinery
- Smart Port and ship solutions
- Energy & Environmental solutions

**Turnover:** Approx. 16 billion €  
**Jobs:** 21 000  
**Gross investments:** 2 billion €  
**Exports:** 14 billion €

# DIGITAL FINLAND

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BUSINESS  
FINLAND

Finland is globally one of the leading countries in digitalization due to our strong tech expertise, high level of education and vibrant start-up scene.

## OUR STRONGHOLDS

- Intelligent Connectivity based on the combination of 5G, 6G, artificial intelligence (AI), Smart Platforms, and the Internet of Things (IoT).
- A wide variety of leading companies utilizing AI and analytics for example in autonomous traffic, customer service and Big Data processing.
- Smart platforms benefiting cybersecurity, privacy and data management.
- Numerous industrial IoT companies delivering manufacturing solutions globally and developing intelligent technologies for efficient energy production and monitoring, automating and optimizing energy streams in production.
- Public safety expertise from critical infrastructure to cutting-edge solutions and services.

# SUSTAINABLE FUTURE WITH FINLAND

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BUSINESS  
FINLAND

## ON A NATIONAL LEVEL

- Finland aims to be carbon-neutral by 2035
- Finland's EUR 2.1 billion recovery and resilience plan is strongly focused on the green transition
- The Europe Sustainable Development Report 2021 foresees Finland as the global pacemaker for sustainable development
- Finland is known for its social innovations, such as the maternity box, childcare nursing system and developing e-government services
- Finnish companies are at the forefront of censoring, indoor connectivity, artificial intelligence and 6G

## IN MARITIME

- The Zero Emission Marine 2030 ecosystem led by Wärtsilä develops technologies that will contribute to the emission reduction of different vessels and harbor operations. Themes contain:
  - Direct development of green fuel technologies and production,
  - Emission savings through optimized automated vessel operations
  - Business models based on energy efficiency
  - Lifecycle services
- Finnish shipyard Meyer Turku has launched the NEcOLEAP project. This Finnish ecosystem aims to build a climate-neutral cruise ship, and develop carbon-neutral and sustainable technological solutions for cruise ships through an extensive network of partners.

# LEADING RESEARCH AND INNOVATION ECOSYSTEMS IN FINLAND

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BUSINESS  
FINLAND

Finnish universities and research centers focus on the different aspects of maritime operations in close co-operation with both private and public sector stakeholders.



# AALTO UNIVERSITY

## RISK ANALYSIS OF AUTONOMOUS SHIPS

Aalto University actively works in the analysis of risks, safety, reliability, resilience, and security of autonomous ships and maritime systems. Together with stakeholders of the Finnish maritime cluster, Aalto has worked in the analysis of risks in critical components of autonomous navigation systems onboard ships in the Design for Value project. [Read more.](#)

## A STRONG SAFETY BASIS FOR SMART SHIPPING

Aalto University research focuses on supporting the design and foreseen operation of autonomous ships and smart maritime services. Aalto worked in the provision of systemic models and tools for the analysis of risks and the development of strategies for the management of safety and security of remote pilotage in the Sea for Value – Fairway project. [Read more.](#)

## SAFETY SPECIFICATIONS FOR AUTONOMOUS SHIPS

Aalto is currently working on the analysis and definition of safety technical requirements, including those for human-machine interfaces (HMI), and high-level ConOps, and the definition of performance and safety metrics to measure and control the resilience of technologies embedded in new autonomous ship concepts in the ECAMARIS project. [Read more.](#)

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# VTT TECHNICAL RESEARCH CENTRE OF FINLAND

VTT is an expert in automation and digitalization of logistics and transport systems, including maritime and ports. For example, we research how to improve logistics to be more sustainable, efficient and safe by adopting new technologies and operations.

VTT has been part of the following port related projects:

## CYBER-MAR EU PROJECT

In the Cyber-MAR project, the aim is to develop an innovative cybersecurity simulation environment for accommodating the peculiarities of the maritime sector while being easily applicable in other transport subsectors, with the view to fully unlocking the value of the use of cyber range in the maritime logistics value chain. During the project, the partners have tested the impacts of the blockage of the fairway to the port. [Read more.](#)

## COREALIS EU project

In COREALIS, many disruptive technology solutions, including IoT, data analytics, traffic management and 5G networks, were tested in five European cargo ports to handle upcoming capacity, traffic, efficiency and environmental challenges. VTT assessed the impact of all of the solutions. VTT also developed a simulation software to plan container yard operations and tested it with the Stevedore in Kotka Container Terminal. [Read more.](#)

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# MARITIME RESEARCH AT UNIVERSITY OF TURKU

## MARITIME@TSE – MARITIME RESEARCH COMMUNITY

Maritime@TSE studies business transformations in the maritime sector. Research builds on a long research collaboration with companies and other stakeholders. [Read more.](#)

Our areas of expertise include:

1. Digital & Autonomous Maritime Business
2. New Maritime Business Models
3. Maritime Sustainability
4. Maritime Economic Development
5. Logistics, Safety & Security

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UNIVERSITY  
OF TURKU



# ONE SEA – AUTONOMOUS MARITIME ECOSYSTEM

One Sea is an open alliance for global commercial organizations driving for an operation of a maritime ecosystem by 2025. The collaboration brings together marine experts of state-of-the-art information technology and business.

We seek to harmonize the regulations and standards necessary to deliver safe and commercially viable highly automated logistics systems. We do this by working together with international and national regulators.

Our Members include ABB, Cargotec, Finnpilot Pilotage, Fintraffic, Haltian, Kongsberg, Monohakobi Technology Institute (MTI), Sea Machines, TietoEVRY and Wärtsilä. One Sea is an open ecosystem that can be joined by those who intend to do business in autonomous shipping. The One Sea ecosystem is led by DIMECC.

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**ONE SEA**  
Autonomous maritime ecosystem



# COMPANIES & SOLUTIONS

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BUSINESS  
FINLAND



# 1. PORT DESIGN

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BUSINESS  
FINLAND

**Aker Arctic Technology** – Ice management in ports

**C2 SmartLight** – Intelligent lighting solutions for ports

**Fimpec** – Experts of project success

**Lohkoasennus** – Turnkey gangways and ramps



# ICE MANAGEMENT IN PORTS

## OUR SOLUTION

Aker Arctic provide tailored ice management solutions for harbor areas. Each location is studied for its port design identifying the associated ice challenges. Ice protection structures work, effectively preventing intensive loads on structures and vessels, and ice accumulation into basins, which causes difficulties for vessel maneuvering. Winterization solutions for harbor structures, onshore equipment and systems are effective against icing. In addition, we provide thermal energy circulation to ease the brash ice growth. Our simulation solutions enable the optimization of ship routes, define which kind of ships can be used and specify the technical and environmental limitations.

## COMPETITIVE ADVANTAGE

Aker Arctic's 50 years of experience solving the challenges of ice and winter enable us to provide cutting-edge solutions and engineering for port planning and improvement. Our references include port layouts, brash ice growth, ice collar in wharves, and icing of structures and equipment. Ice management fleet's needs are identified, and our ships are designed to fulfil maneuverability requirements in port areas. Technical solutions

developed together with our unique ice model test basin assure port operations under challenging winter conditions.

## COMPANY

Aker Arctic investigates wintertime possible challenges and measures them at an early stage of the project, which allows the development of cost-effective, optimal, safe and efficient solutions.

## REFERENCES

Aker Arctic has provided analysis, design and technical engineering services for the majority of the port projects in the arctic and freezing regions

## CONTACT

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# INTELLIGENT LIGHTING SOLUTIONS FOR PORTS

## OUR SOLUTION

Ports are large areas where the floodlights on the masts and the luminaires in the halls and warehouses in the area must be able to be brightened, dimmed and switched off on a luminaire-by-luminaire basis. SteraLux LED lights enhanced with the C2 SmartLight control solution and the whole smart infrastructure allow port staff to brighten, dim or illuminate required areas with a single click. Push buttons and motion sensors can be installed on the piers of the port to brighten the lights when needed.

## COMPETITIVE ADVANTAGE

Smart lighting is not just about dimming the lights. The area's alarm lights, warning sirens and gate controls can also be controlled with the lighting solution. If there is a vessel traffic management system in the port, lighting can be automatically adjusted accordingly. In addition to lighting, we provide energy supply systems for lighting as well as, e.g., weather stations, from which versatile measurement data is presented in the system and utilized in the lighting control. The end result is a smart port with modern energy-saving lighting.

## COMPANY

C2 SmartLight and SteraLux provide intelligent lighting solutions designed for Scandinavia's cold and humid climate. We offer LED luminaires, electrical cabinets, lighting control and sensors.

## REFERENCES

The ports of HaminaKotka, Hanko, Helsinki, Kemi, Loviisa, Naantali, Pori, Raahe, Rauma, Turku and Vaasa, the Finland Port of Helsingborg and Karlskrona, Sweden.

## CONTACT

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# FIMPEC – EXPERTS OF PROJECT SUCCESS

## OUR SOLUTION

Fimpec is a leading specialist in the field of project management and engineering. Fimpec provides project management, owner's engineering, and design services for industrial and infrastructure projects. Case: Montevideo Port terminal, Uruguay 2019–2022. In Montevideo, Fimpec started at the pre-engineering phase as the construction management expert. During the implementation phase, Fimpec handled construction and site management tasks as an integrated part of the customer's implementation organization.

Responsibilities: project and site management services, such as civil design management, civil work sourcing and contract management, time scheduling and progress follow-up, budgeting and cost management, assisting in permitting issues, site management and civil works supervision.

## COMPETITIVE ADVANTAGE

Fimpec is specialized in large scale projects worldwide. Our main references are from the forest industry, renewable energy, and port projects. Fimpec IPD method (Integrated Project Delivery) has a proven track record of successful investments

Where Fimpec is integrated as part of the client's project organization. Our staff consists of experienced engineers and designers of civil, mechanical, electrical and HSE disciplines. We are a visionary actor who can take the lead in any project.

## COMPANY

We act as project consultants in major investment projects in the industrial and energy industries, and as experts in the real estate and infrastructure sectors. In 2021, our turnover was EUR 30 million and we employ more than 350 top experts. Fimpec has offices in Finland, Sweden, Estonia, Germany, Uruguay and Chile.

## REFERENCES

The Montevideo Port deep-water terminal, Uruguay 2019–2022, the Kimola Canal, the Saimaa Canal, the Kuhankoski hydroplant, the Port of Jyväskylä, and fishways in Finland.

## CONTACT

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# TURNKEY GANGWAYS AND RAMPS

## OUR SOLUTION

Our main business comprises the manufacture, installation and maintenance of port equipment like gangways, customer passenger bridges, and car ramps delivered through turnkey solutions. Gangways and car ramps can also be a part of a smart port where automation is used to the extent permitted by local laws and regulations. Customer passenger bridges can be built to be either fixed or elevating. In addition, our made-to-order product selection includes steel and aluminium structures, such as hydraulic trapdoors and drivable glass canopies for vessels. We also deliver technically demanding space solutions, such as border control kiosks.

## COMPETITIVE ADVANTAGE

We have considerable experience of the delivery of reliable and safe port facilities. Our products are designed to withstand northern conditions, for example, wind and snow loads and other stresses caused by the environment. Planning and manufacturing of the equipment is based on the customer's initial data. In total deliveries, we are responsible for design, manufacture, installation, user training and maintenance.

We have the following standards in use:  
ISO 14001:2015, ISO9001:2015, ISO45001:2018;  
EN 1090-1: 2009 + A1: 2011 and ISO3834-2:2005.

## COMPANY

Lohkoasennus Ltd. Port equipment manufacturer founded in 1975 Headquarters in Naantali, Finland, Manufacturing in Rauma, Finland  
Personnel 2021: 15-20 Net sales 2021: 4 M€ .

## REFERENCES

2020: Mariehamn: 3 PBBs, 1 car ramp, 1 RO-RO car ramp 2021: Umeå: 2 PBBs and 1 walkway 2022: Helsinki: 1 lower/upper car ramp and Norvik: 1 upper car ramp.

## CONTACT

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# 2. NETWORK INFRASTRUCTURE, CONNECTIVITY AND DATA MANAGEMENT

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BUSINESS  
FINLAND

**Deal Comp** – Accurate RTK-navigation & 5G connection

**Goodmill Systems** – Seamless reliability for port connectivity

**Nokia** – LTE/5G private wireless network



## ACCURATE RTK-NAVIGATION & 5G CONNECTION

### OUR SOLUTION

Deal Comp provides authority-approved, wireless network connections and high accuracy GNSS positioning for vehicles (e1), marine (IEC60945) and railway (EN 50155) transport and for use in heavy work equipment and autonomous vehicles. Accurate GNSS+RTK and inertial positioning information combined with fast, secure and reliable 5G connections are vital for intelligent and efficient port operations.

### COMPETITIVE ADVANTAGE

Deal Comp's navigation solution uses comprehensive satellite technologies and provides high precision positioning data with RTK technology. The result is accuracy to within one centimetre outdoors. Inertial positioning is used to determine the exact location and heading of the vehicle, even while indoors. In this way, port operators have the most accurate location information available. The private network, security and speed brought by 5G is also available. Our router solution is able to take advantage of all 5G current and future network services.

### COMPANY

Deal Comp has been a supplier of durable and powerful computers and routers since the '90s. All of our solutions are reliable and secure, and meet the most stringent industry requirements.

### REFERENCES

Vehicle: Finnish rescue organizations – routers  
Railway: Virtual reality train fleet – multichannel routers. Work machine: Sandvik Mining – work machine computers.

### CONTACT

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# SEAMLESS RELIABILITY FOR PORT CONNECTIVITY

## OUR SOLUTION

Goodmill's multichannel broadband routers seamlessly provide each of the port's logical connections all of the combined coverage, availability, and throughput of the individual physical networks like Wi-Fi, satellite, and cellular. The connection from your cargo handling vehicle or a ship stays alive automatically even if one of the physical networks goes down or the user moves from the coverage area of one network to another.

## COMPETITIVE ADVANTAGE

Multichannel routers work with existing networks and do not require changes to the networks or the applications. This makes taking the solution into use fast and easy, offering significant cost savings over, for example, network investments. The solution is highly modular and customizable and, in addition to supporting the existing networks, can thus also support future networks as they emerge.

## COMPANY

Goodmill was founded in 2005 to secure communications of safety authorities such as the police. Thousands of our routers are providing broadband across 5G, Wi-Fi, and SATCOM in vessels and vehicles.

## REFERENCES

Our customer base includes several national police and defense organizations, among them navies, coast guards, and companies such as Thales.

## CONTACT

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# LTE/5G PRIVATE WIRELESS NETWORK

## OUR SOLUTION

Nokia Industrial-grade Private Wireless delivers resilient, secure connectivity for critical communications and operational applications on a dedicated network with coverage reaching every corner of the terminal. A reliable, high-performance network provides a seamless connection between the terminal operating system (TOS) and drivers and equipment anywhere in the container yard, helping increase moves per hour. Real-time situational awareness and greater visibility of many moving elements help enhance safety across the terminal. And because there's far less infrastructure to buy, install and maintain compared to existing wireless networks, it's easy and cost-effective to deploy LTE/5G.

## COMPETITIVE ADVANTAGE

The wireless networks (e.g., Wi-Fi) that most ports rely on simply weren't built for business-critical industrial use cases or modern terminal operations. They're characterized by unpredictable performance, patchy coverage and poor security. To make Industry 4.0 work for your organization, you need industrial-grade, pervasive wireless connectivity.

With a private LTE or 5G network, you can deliver real competitive advantage right now using your existing ecosystem of machines, sensors and systems.

## COMPANY

At Nokia, we create technology that helps the world act together.

## REFERENCES

The Nokia private wireless solution has been deployed by:

- SSA Terminal / Tideworks Technology
- Port of Zeebrugge
- Associated British Ports

## CONTACT

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# 3. DIGITAL PLATFORMS

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BUSINESS  
FINLAND

**Awake.AI** – Sustainable & intelligent maritime logistics

**BaseN Corporation** – Umbrella platform for all your data needs

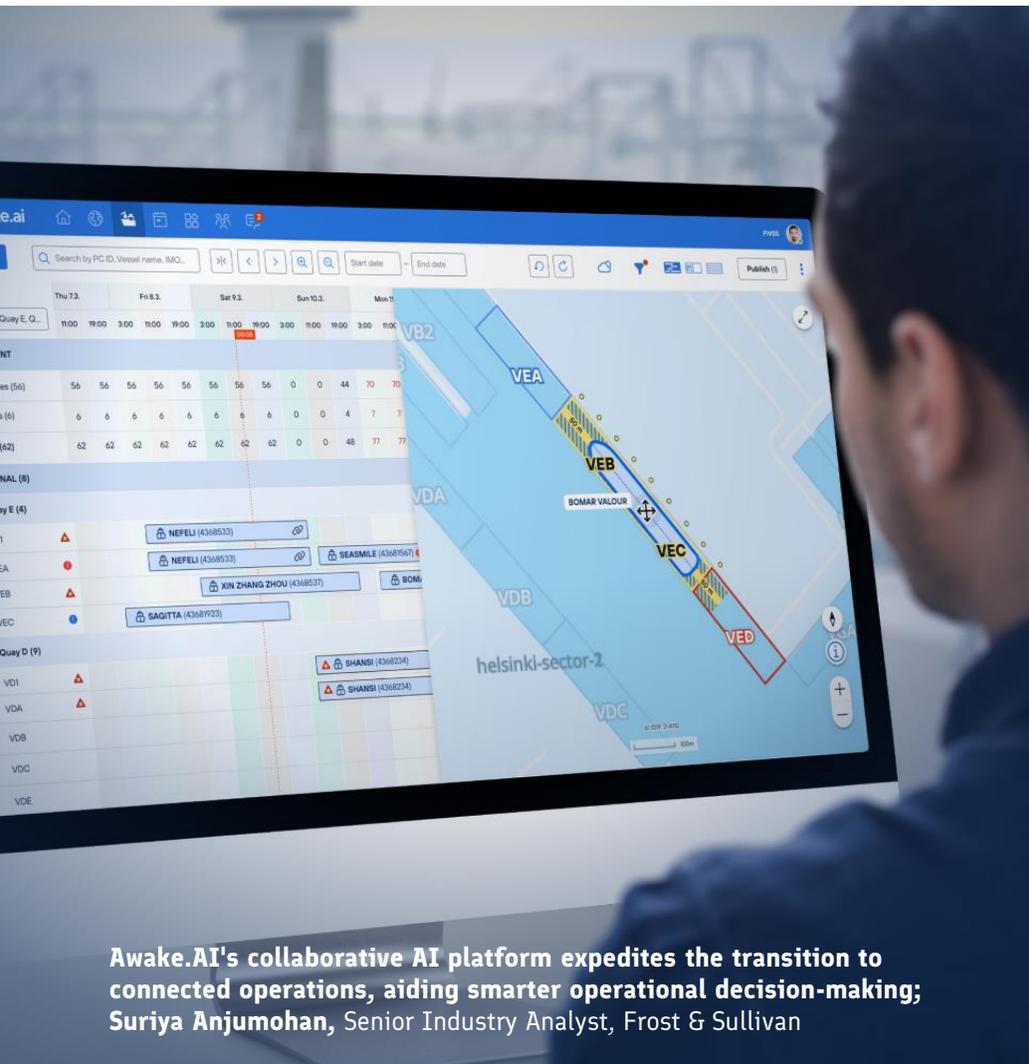
**BOXBOT** – Automated load planning

**Futurice** – Transforming ports and maritime operations

**Siili Solutions** – Partner in maritime single window solutions

**Unikie** – Improved efficiency for port operations

**Wärtsilä Voyage** – Enabling green ports with smart technology



Awake.AI's collaborative AI platform expedites the transition to connected operations, aiding smarter operational decision-making; Suriya Anjumohan, Senior Industry Analyst, Frost & Sullivan

# INTELLIGENT CARGO FLOW OPTIMIZATION PLATFORM

## OUR SOLUTION

Awake.AI is an optimization platform for port bound cargo flow. For **Terminal Operators** we optimize port calls with AI insights, for **Port Authorities** we maximize the use of their existing port capacity, for Ship Operators we enable just-in-time arrival and faster turnaround times and for **Cargo Owners** we bring full transparency to cargo flow in sea-port-land. Product portfolio includes (1) a modern microservices based AWS hosted platform for optimizing the cargo flow, (2) Port call event and platform general APIs, (3) AI based predictions (ETA/ETD) and optimization models (RTA/RTD), (4) Smart Port as a Service web & mobile applications for real-time situational awareness, (5) AI based Berth planning solution, (6) Tailored machine vision & ML solutions, (7) Digital twins & simulators for enabling autonomous ships to make port calls.

## COMPETITIVE ADVANTAGE

**AI-driven SaaS affordably & fast.** Customers don't need to invest years and millions in AI/ML-driven logistics SaaS, instead they can get it from us deployed in a few weeks as a service.

**Fully automated predictive analytics for whole logistic chains.** Industry leading optimisation platform for sea-port-land interactions, not just parts of it.

**Growing smart port ecosystem with network and learning effects.** Over 100 partners are already working together to solve the use cases fastest in the world.

## COMPANY

Awake.AI was selected as the Growth Engine platform company for smart ports and shipping by Business Finland 2019. The European Space Agency (ESA) has awarded funding to develop new ground-breaking functionalities on top of the platform in 2020. Awake.AI won the Frost & Sullivan's Entrepreneurial Company of the Year Award 2021 in maritime logistics. Company is listed as a key player in the Smart Port market by independent market research companies.

## REFERENCES

Fintraffic, Port of Helsinki, Port of Gothenburg, Port of Rotterdam, Port of Antwerp, Port of Valencia, Port of Livorno, Port of Hanko, Ports of Auckland and many more.

## CONTACT

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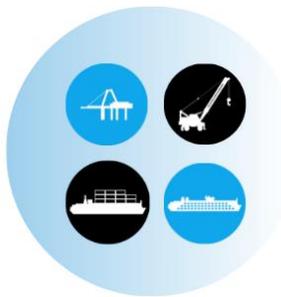
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maritime | on BaseN

Next Generation Digital Twins  
Full Situational Awareness  
Real-Time  
Secure  
Scalable  
Mission Critical



## UMBRELLA PLATFORM FOR ALL YOUR DATA NEEDS

### OUR SOLUTION

BaseN makes your smart port ecosystem a reality:

- a port's next generation digital twin
- intelligent communication hinterlands and to the seas
- terminal access control and automation
- digital infrastructure management
- port data lake
- workforce management and optimization

By hosting your port on the BaseN Platform, you will receive a digital twin of the port, which allows for precise forecasting and capacity planning and results in immense cost savings. Your digital twin will continuously send, store, and visualize the data, enabling you to always optimize processes. With its full-stack Platform, BaseN takes complete responsibility for all critical Internet of Things (IoT) components without relying on any third parties.

### COMPETITIVE ADVANTAGE

With 20 years of experience in data communication, monitoring, analysis and control, BaseN processes millions of measurements per minute with ease. Even in hard, open sea, conditions. We provide

the integration and connectivity of all legacy, contemporary hardware and software. Always know what is relevant to you and your stakeholders: BaseN provides real-time information to all involved parties with varying needs for different insights. Our platform brings you powerful analytics, enabling quick actions based on the processed data.

### COMPANY

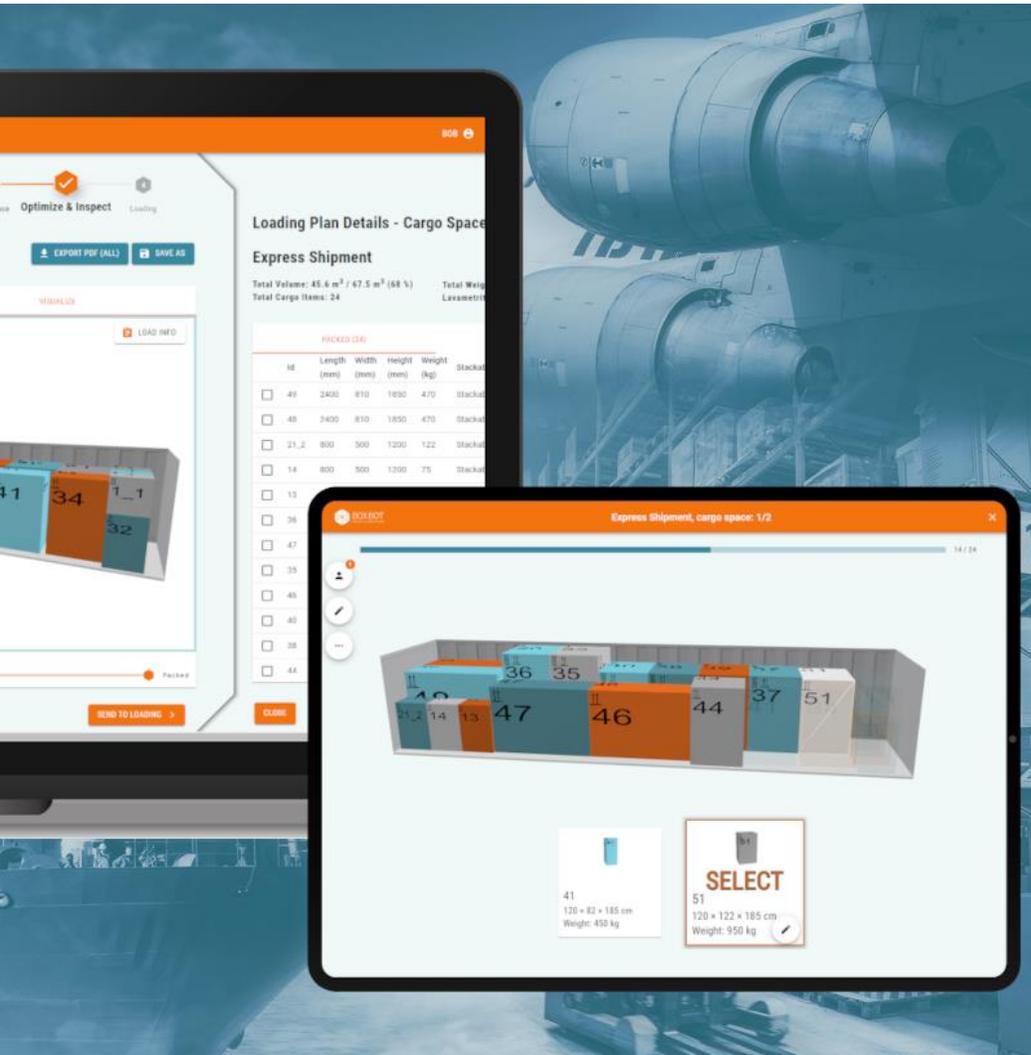
BaseN is a leading Software as a Service (SaaS) provider with 20 years of experience. We offer a real-time and extreme-scale monitoring, analysis and control platform for ICT, IoT and digital twins.

### REFERENCES

Norsepower Oy Ltd, Carbon Neutral Municipalities ([HINKU](#)) Project VolkerWessels, Trimble.

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# AUTOMATED LOAD PLANNING

## OUR SOLUTION

BOXBOT is a piece of software that combines automatic load planning and interactive loading guidance. The software is aimed at any cargo handler or operator, in several steps of the journey. From salesperson to forklift driver, BOXBOT minimizes human error and helps workers along the way for easier and quicker cargo loading. BOXBOT helps you with an accurate reading of the needed transportation capacity, from the first step of the sales process. You will get precise load plans, taking into consideration the weight distribution and transportation safety. The interactive loading guidance with 3D visualization will guide you through the loading process step by step.

## COMPETITIVE ADVANTAGE

BOXBOT load planning algorithms calculate the best arrangement of the cargo items into the given cargo space. The automatic load planning also optimizes the weight distribution and unloading/loading without sacrificing the optimal space utilization. Be it in containers, trailers, or even an onboard dry cargo vessel. With interactive

3D loading guidance, the cargo handlers get step by step instructions. They can react to unexpected last-minute changes on the fly with BOXBOT intelligent replanning.

## COMPANY

BOXBOT provides software and services which increases the profitability of our clients by optimizing their everyday logistics processes.

## REFERENCES

Logistics Providers, e.g., Freja Transport & Logistics Manufacturers, e.g., Daimler Future Transportation Forwarders & Carriers; e.g., PP-Logistiikka.

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# TRANSFORMING PORTS AND MARITIME OPERATIONS

## OUR SOLUTION

Ports and maritime companies can benefit from applying strategic design thinking and co-creation methodologies to create tangible business outcomes in the complex world of digital transformation. As an expert in modern digital service development, Futurice can complement companies with top-class expertise and insights from other industrial segments. We innovate, co-create and deliver new digital services and business models at scale, and fast. These activities help maritime companies serve their customers better. They improve the efficiency of their operations, enabling them to move toward a more carbon-neutral and sustainable way of doing business.

## COMPETITIVE ADVANTAGE

Futurice is an expert in digital services, from ship and port data analysis platforms to ecosystem portals and port automation. We are equipped to help clients chart their way to digital business. We have worked with shipping and shipbuilding firms, as well as companies in port logistics and cargo handling. We have built a wide selection of digital services and software, customer portals and platforms, and machine learning solutions

to analyze ship and port data. Additionally, we have helped our clients systematize the way they innovate.

## COMPANY

Founded in Helsinki in 2000, Futurice is an innovation and engineering agency with 750+ professionals. Our offices are in Berlin, Munich, Stuttgart, Helsinki, Tampere, Stockholm, and London.

## REFERENCES

Futurice has worked on strategic digital projects with many maritime clients. Our references are confidential. Please, contact us for further details.

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**futurice**



# PARTNER IN MARITIME SINGLE WINDOW SOLUTIONS

## OUR SOLUTION

The EU needs to harmonize complex port call notifications from maritime traffic across the continent via European Maritime Single Window (EMSW). Siili is designing and building the Finland's National Maritime Single Window of the EMSW system with an emphasis on creating a neutral and shared data platform that will optimize processes and workflows (of different stakeholders) in the field of maritime traffic and enable building services for added value. The solution is also compatible and customizable for other EU member countries. Siili provides application programming interfaces (APIs) for port call declarants to convert legacy port call notifications into new EU RIM compatible format.

## COMPETITIVE ADVANTAGE

Our solution will act as a shipping and logistics data platform, which enhances and streamlines the daily lives of maritime operators through shared situational picture, standardization and digitalization. Various commercial value-added services such as waste management, piloting, towage or ship repair and maintenance can also be built on the platform to expand opportunities

even further. Our long-term vision is to increase the productivity in the field of maritime logistics.

## COMPANY

Siili is a unique combination of a digital agency and a technology powerhouse. We believe in human-centricity in everything we deliver. We help you find what's essential. Then we build it.

## REFERENCES

Port operations National Maritime Single Window (part of EMSW) of Finland, Marine software Wärtsilä – consulting services, Fintraffic – consulting services. Fintraffic provides and develops traffic control and management services in all forms of traffic as well as ensures safe and smooth traffic in a responsible manner.

## CONTACT

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# IMPROVED EFFICIENCY FOR PORT OPERATIONS

## OUR SOLUTION

Unikie offers port digitalization solutions and technology based on comprehensive industry expertise and exceptional software and AI talent. Our solutions support port actors in centralized data collection, insight and knowledge sharing, common situational awareness, and collaboration and planning.

POLO: Port Activity App is a port community tool covering the end-to-end chain of operations related to a vessel visit. It is a user interface based on an open ecosystem, strengthening collaboration between port actors.

DWIN: Smart Space, a sensor and IoT-based solution enables data based process and operation optimization, situational awareness, and eventually automation and autonomous operations.

## COMPETITIVE ADVANTAGE

Unikie's solutions enable smart port operations by harnessing awareness, automation and autonomous operations. Industry collaboration is the starting point of our development. We enable data-driven operations and utilization of the latest AI and data analytics technologies.

Increased situational awareness, improved planning horizon and better collaboration are

key elements towards considerable savings in time and money and reduced emissions and carbon footprint. After all, we want to help ports improve the overall efficiency of port flow.

## COMPANY

Unikie is a Finnish software technology company developing technologies to secure real-time data management. We operate in global markets and harness the almost limitless potential of IoE, 5G and AI.

## REFERENCES

Our port digitalization solutions are used by over 20 ports and maritime organizations in Finland and Sweden. Contact us to hear about our use cases.

## CONTACT

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# ENABLING GREEN PORTS WITH SMART TECHNOLOGY

## OUR SOLUTION

Better ship-to-shore coordination, enabled by real-time data sharing to allow for Just-In-Time (JIT) arrivals, makes for more efficient voyages. Our software acts as a seamless data exchange platform that makes predictions and plans for a ship's JIT arrivals. Data is accessible to all stakeholders and, where necessary, links to third-party IT systems. This leads to better efficiency for vessels, and better planning of port and terminal operations, which can result in fuel savings and congestion reductions.

Smart port technology can also provide many benefits by working together with autonomous vessels, which helps decongest intra-port and inland cargo movements via short sea shipping.

## COMPETITIVE ADVANTAGE

Better ship-to-shore coordination, enabled by real-time data sharing to allow for Just-In-Time (JIT) arrivals, makes for more efficient voyages. Our software acts as a seamless data exchange platform that makes predictions and plans for a ship's JIT arrivals. Data is accessible to all stakeholders and, where necessary, links to third-party IT systems. This leads to better efficiency for vessels, and better

planning of port and terminal operations, which can result in fuel savings and congestion reductions. Smart port technology can also provide many benefits by working together with autonomous vessels, which helps decongest intra-port and inland cargo movements via short sea shipping.

## COMPANY

Wärtsilä Voyage transforms how vessels perform their voyage by leveraging the latest digital technologies to deliver a step-change in safety, efficiency, reliability, and emissions.

## REFERENCES

The Maritime & Port Authority of Singapore, The Tanger Med Port Authority, Port of Rotterdam, The Singapore Maritime Institute.

## CONTACT

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**WÄRTSILÄ**

# 4. SOFTWARE APPLICATIONS

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BUSINESS  
FINLAND

**Citynomadi** – Wayfinding for heavy traffic at ports

**Falcony** – Mobile auditing and incident reporting

**Gisgro** – A part of every smart port

**Hypercell** – Crowd stream data helps optimizing ports

**Mevea** – Port equipment operator training simulators

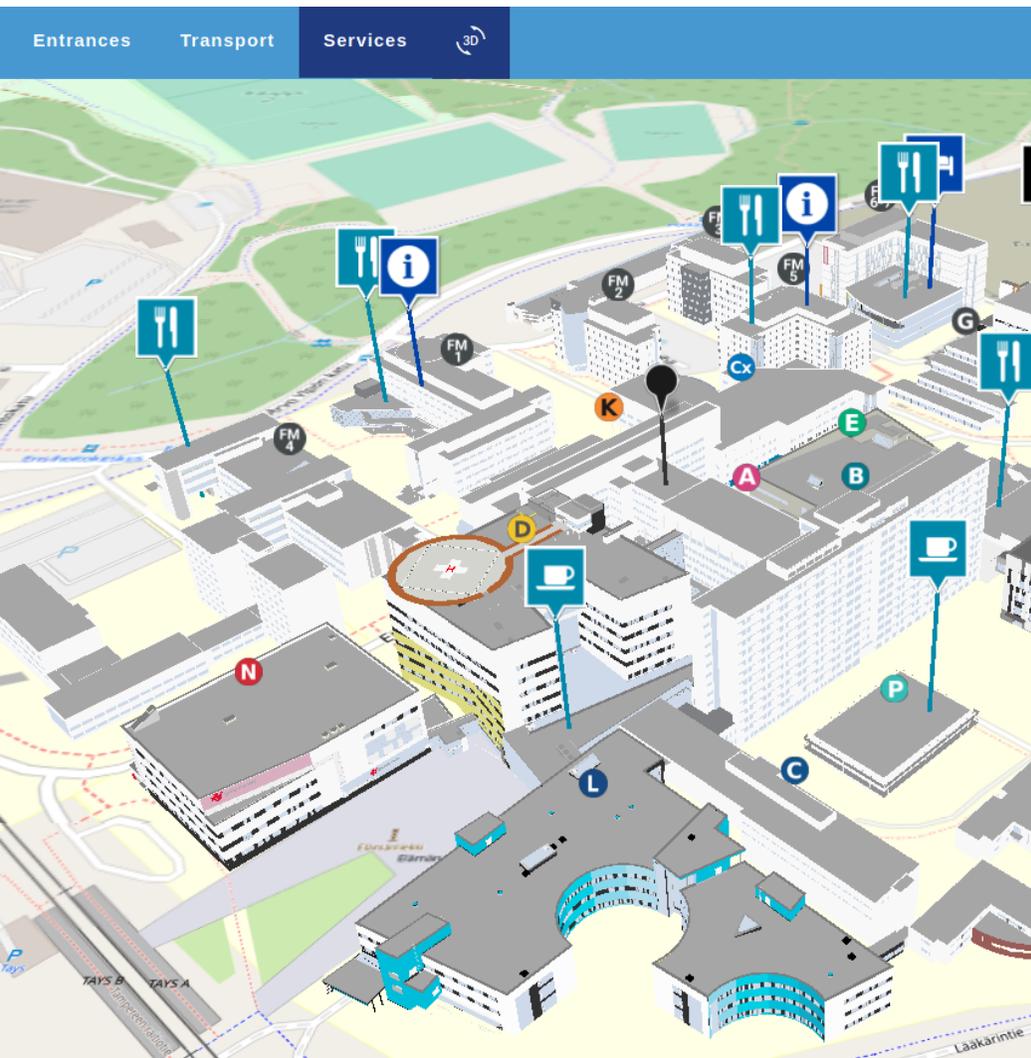
**Nsion** – When a second is a lifetime

**Remion** – Are you getting most out of your equipment?

**Scopesensor** – Smart IoT and digitalization

**Web Your Services** – Manage traffic and transport automatically

**Youredi** – Data connectivity for global supply chains



# WAYFINDING FOR HEAVY TRAFFIC AT PORTS

## OUR SOLUTION

Finding the right information, at the right time, in the right place. All information has a location, and often time depicting the accuracy of that location precisely is critical. API integrations enrich the map interface servicing the users of the application diversely. When reaching the destination from the gate, one can get lost. We developed a reliable, dialogic step-by-step guide for your smart phone. Citynomadi's wayfinding will guide you in places where the street addresses are unclear and physical signposts are not enough.

## COMPETITIVE ADVANTAGE

Our solution is global, multilingual and independent of any physical installations. The wayfinding can be adjusted according to the site and the maintaining of information will be done in real time.

## COMPANY

Citynomadi provides the reliable and trustworthy SaaS service for smart phone map solutions in business use. Our company was established in 2009 and is based in Tampere, Finland.

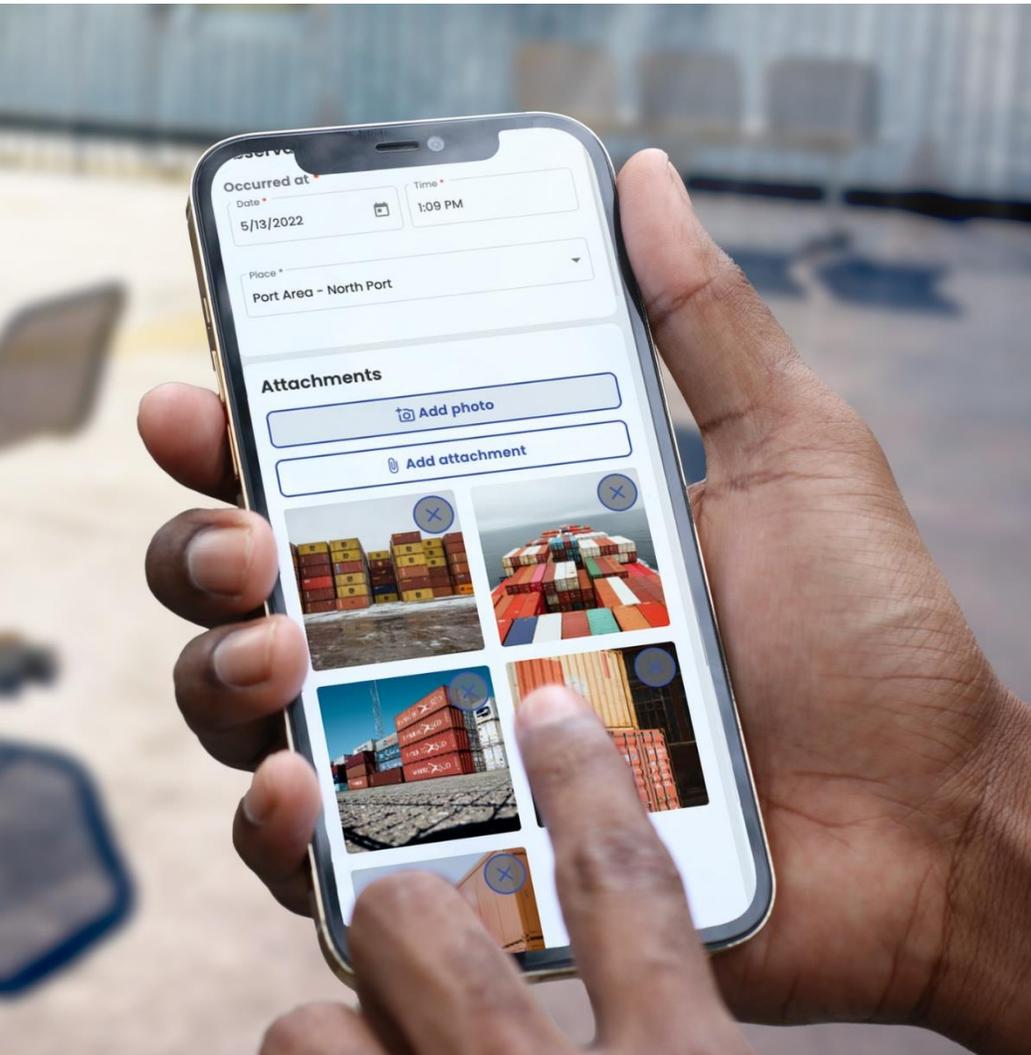
## REFERENCES

Suomen Erityisjärjestö Oy, circular economy area maintenance 2022.

250+ informative map references in various business use cases.

## CONTACT

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# MOBILE AUDITING AND INCIDENT REPORTING

## OUR SOLUTION

Falcony is a mobile platform involving all port actors to conduct audits and inspections, and report their reactive observations such as incidents and nonconformities from the field. It suits both land and maritime operations, and has offline functionalities to make sure network coverage doesn't become a blocker. Checklists and observation forms can be fully customized with a template editor, and automated workflows make sure relevant people get notified to carry out corrective actions more efficiently. Some of the most common use-cases include HSE, quality, security and facility management related reporting. Falcony also offers a separate module for anonymous whistleblowing.

## COMPETITIVE ADVANTAGE

Instead of focusing on an individual function such as safety, Falcony is a flexible platform for organizations to use for all of their field reporting needs. When there is a single platform for all reporting, end-users don't have to guess where they should report their findings. By doing that, we lower the threshold for reporting and multiply

the amount of observations (usually 10–50x). This leads to more actionable data to spot trends and mitigate leading indicators before they become severe problems.

## COMPANY

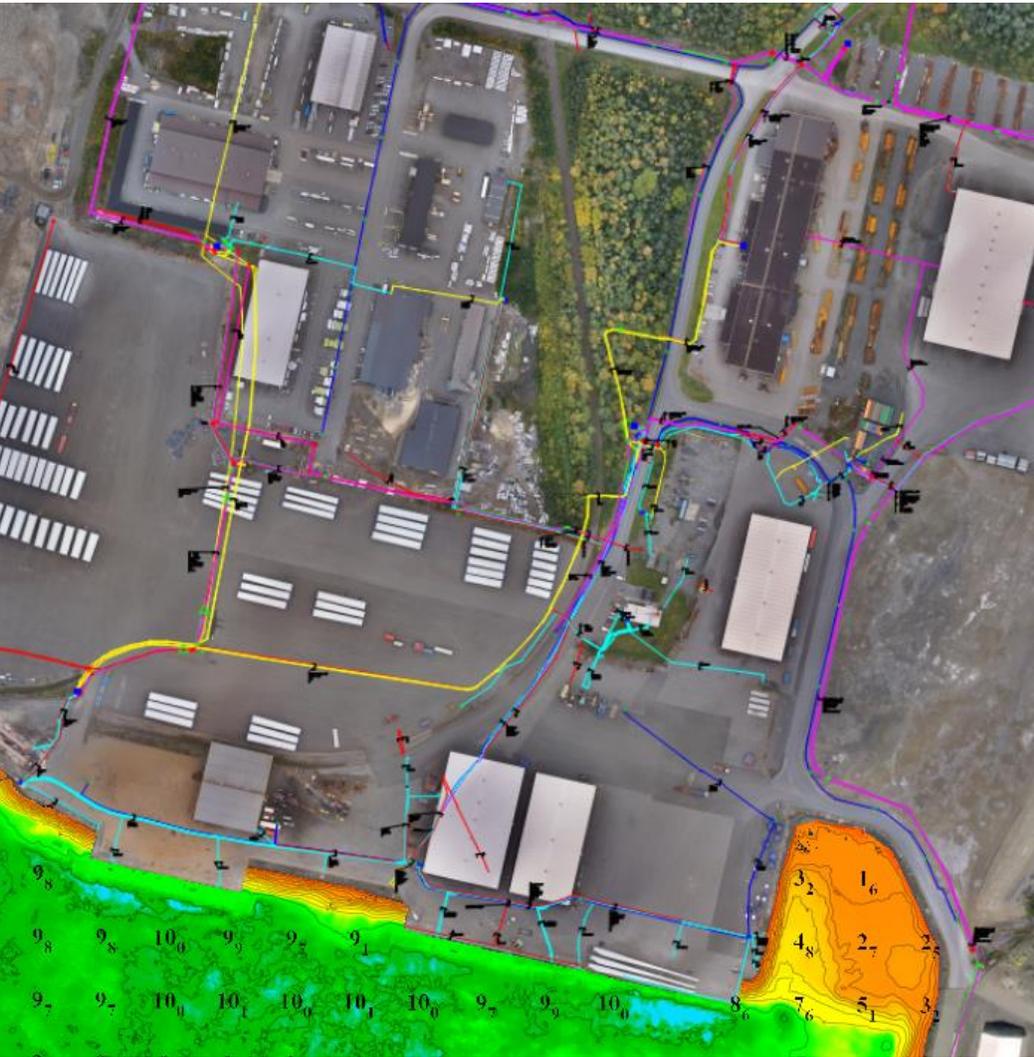
Falcony provides a leading involvement platform used by over 200,000 end-users in 80+ countries totaling over 5 million reported observations and more than 1 million conducted inspections.

## REFERENCES

Trelleborgs Hamn – Euroports Finland –  
Konecranes Port Solutions – Finnpilot Pilotage.  
Contact details can be provided upon request.

## CONTACT

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# GISGRO – A PART OF EVERY SMART PORT

## OUR SOLUTION

Traditionally, ports need several different software and even pens and paper in planning and operating in their fast-paced environment. GISGRO makes ports' transition to digital ways of working easier by providing a smart and easy-to-use solution to facilitate and optimize work in all parts of the port. GISGRO combines different information streams from port's assets, areas and operations, and provides actionable information for decision making within various functions of the port. From marine operations to asset management, from sales to financial department – everyone benefits from a centralized solution which improves the efficiency of the port remarkably.

## COMPETITIVE ADVANTAGE

The vast majority of ports throughout the world are shifting to more digital ways of working. But most of the digital solutions are developed for a totally different field of industry, such as the manufacturing industry or real estate. We look at the world from a port's perspective, which puts GISGRO in an ideal position to help ports overcome any barrier that blocks their passage to a safer and

more efficient digital work environment and all that it has to offer. We are proud of creating the most visual and easy-to-use solution on the market.

## COMPANY

GISGRO is developed by VRT Finland, the pioneering expert in 3D port surveys. We joined forces with Satamatieto Oy, strengthening our expertise in the port industry.

## REFERENCES

The Dublin Port Company, the Hamburg Port Authority, the Port of Uusikaupunki, the North Sea Port.

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# HYPERCELL CROWD STREAM DATA HELPS OPTIMIZING PORTS

## OUR SOLUTION

Hypercell's Crowd Stream service is already implemented by the Port of Helsinki in Finland. It produces data on peak hours, passenger dwell times and key interest points inside the passenger terminals in Helsinki. The data can be used to minimize queues and to allocate enough workforce to restaurants and port services at the right time as well as for security purposes in case of emergencies. By connecting the service with the citywide network of Hypercell sensors, it is possible to track people streams in and out of the terminal with our 100% GDPR compliant solution.

## COMPETITIVE ADVANTAGE

Hypercell makes measuring crowd movement and dwell times easy with their unique plug & play sensor technology and intuitive UI that provides data in near real-time. Additionally, the data can be accessed via REST API for further analysis or visualizations, making it an effective solution for port security purposes. Unlike most surveillance cameras Hypercell's hyperunit sensors are non-intrusive and the data is stored in IBM's cloud service which also many banks use to secure their data.

## COMPANY

Hypercell is a four-year-old Finnish company which is growing fast in the Smart City sector. They are driven by the goal of expanding their services to the global market and ensuring a sustainable future for Smart cities and their stakeholders.

## REFERENCES

Hypercell is already working with JCDecaux providing them real-life impressions of their digital screens. Furthermore, Hypercell provides the City of Helsinki and its stake holders data on a massive scale in areas such as passenger terminals and tourist attractions.

## CONTACT

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# PORT EQUIPMENT OPERATOR TRAINING SIMULATORS

## OUR SOLUTION

Mevea develops and manufactures port equipment operator training simulators, e.g., for STS, RTG/RMG & MHC cranes and various mobile equipment like ECH & RST. Simulators can be adapted to the port's actual handling solutions, layout and operating processes. Mevea simulators are also used for assistive and autonomous system development/ testing by equipment manufacturers and automation system providers. Furthermore, they can be integrated with real crane control systems for realistic support in automated crane operator training.

## COMPETITIVE ADVANTAGE

Mevea's state-of-the-art physics simulation together with customer adaptations and advanced training exercises ensure skills transfer which is far beyond the traditional training simulators available today in the marketplace.

## COMPANY

Mevea is helping organizations to accelerate innovation and achieve tangible business results by enabling physics-based "Digital Twins" of products, which can be used throughout the product's life cycle.

## REFERENCES

Crane and mobile equipment training simulators for Adani Hazira and Kattupalli Ports in India.

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# NSION – WHEN A SECOND IS A LIFETIME

## OUR SOLUTION

NSION mission-proven software is meant for the situations when a Second Is a Lifetime. One of the biggest challenges is to optimize data security and speed in video data transferring in complex life critical field operations. The number of data sources like video feed is growing all the time. E.g., drones enable an excellent overview from a helicopter's perspective. The challenge is to get that view to where it is needed. Another challenge is that different organizations need to work together, but they have their own tools and systems. NSION solves all of these problems with the fastest and most scalable video engine on the market.

## COMPETITIVE ADVANTAGE

NSION SaaS platform is the fastest and most scalable video engine with cool features including push-to-talk, chat, and joint operations between different organizations. You can get your situational awareness in the field and with real-time analytics. Our solution is hardware agnostic (works with any digital device), network agnostics (works in 2G...5G, wi-fi, satellite, any packet radio network), deployment agnostic (public or private cloud, on-premises installation), it works as standalone software or is easily embedded into any C2 system.

## COMPANY

NSION provides situational awareness and secure communications channels with live data transmission through encrypted management platforms while using their existing equipment.

## REFERENCES

Multiple customers through Erillisverkot in Finland (Special Networks Finland). Erillisverkot secures the critical leadership and information society services in all circumstances providing secure and reliable ICT services for public authorities and other critical operators of national security.

## CONTACT

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# ARE YOU GETTING MOST OUT OF YOUR EQUIPMENT?

## OUR SOLUTION

Remion is an industrial technology and data company. We design and implement industrial internet service solutions and relevant applications for machine data collection, analysis and information presentation.

We complement the solutions with a wide range of expert services, such as cloud development, artificial intelligence applications, and integration services. We enable machine manufacturers in the international data business by being the best technology partner in our own IoT software category.

We relive our customer promise every day by delivering, developing and maintaining critical software for your data business.

## COMPETITIVE ADVANTAGE

Our competitive advantage is based on the reduced ramp-up time and high quality of ready-to-use Regatta® solutions. We stand out with industry references that have emerged from partnerships that have lasted more than a decade. Experience and know-how go hand in hand. Our strengths are hardware-independent data collection from machines, data transfer, analysis and visualization

in a cloud-based environments as complete solutions tailored to your needs without the need for transfer of responsibilities between third parties.

## COMPANY

Remion is an industrial technology and data company. We are changing our way to produce and process industrial information, innovating companies and society with smart technology and strong expertise.

## REFERENCES

We are trusted by international brands like Hiab, Sandvik, Kongsberg, Konecranes.

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<https://www.remion.com>

# REMION



# SCOPESENSOR – SMART IOT AND DIGITALIZATION

## OUR SOLUTION

ScopeSensor Oy is a developer of Smart IoT system solutions which supports Marine IoT and Digitalization of Smart Ports. Solutions provide better communication between the ships and ports improving safety in the sea traffic and logistics in the ports. The system solutions consist of various hardware and system software components which work together to provide clever and more efficient digital platform.

## COMPETITIVE ADVANTAGE

Customers benefit from the improved safety and security, better and faster logistics and digitalization of the system solution, which also replaces the older systems for any growing future needs. Shorter and more efficient docking times and improved cargo handling with better safety is a valuable asset which provides cost savings for the customers.

## COMPANY

ScopeSensor Oy is a fast-growing systems solution provider with previous history in automotive and industrial IoT development. We have over 25 years of business experience in IoT.

## REFERENCES

ScopeSensor Oy have been involved in developing several system solutions for Marine IoT and industrial applications. We have customers primarily in the EU area, in addition a few overseas enterprises.

## CONTACT

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# MANAGE TRAFFIC AND TRANSPORT AUTOMATICALLY

## OUR SOLUTION

WYS Smart Port Platform is a multi-brand and multi-partner system automatically combining all of the systems and devices connected to it into one logical entity providing services for different partners using ports. Data exchange between systems is automatic and in real-time.

The WYS Platform helps ports to digitize, automate, and optimize their operative, technical and security processes. It provides data for system maintenance, decision-making and business development.

With the Platform the vehicle loading and unloading to and from a car ferry / a ship with vehicle decks, is significantly accelerated reducing waiting times in the port area and, hence, helping to reduce environmental load.

## COMPETITIVE ADVANTAGE

Automatic connectivity of the systems and devices to the Platform eliminates human errors, eases maintenance, and reduces deployment costs. Automatic monitoring is used to track and analyse events, alarms and statuses of the connected systems and devices in real time.

Any problems can be quickly identified and eliminated. With the help of Dashboards the data is freely combined and compared as needed. BI reports can be updated and shared automatically. The web-based Platform can be easily used by a browser and mobile phone.

## COMPANY

Web Your Services (founded 2010) develops SW solutions for demanding operational environments and has customers in over 10 countries. Our solutions handle over 1M vehicles, and 1000M events per month.

## REFERENCES

WYS Platforms designed for different verticals are used, e.g., by the major cities in Finland – Espoo, Helsinki and Vantaa – and ports in Estonia.

## CONTACT

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# DATA CONNECTIVITY FOR GLOBAL SUPPLY CHAINS

## OUR SOLUTION

The Youredi data connectivity portfolio of subscription-based, fully managed integration services aims to increase the efficiency of supply chain execution and visibility processes. Its focus is on connecting trading partners regardless of systems used and technical capabilities. The solutions cover information exchange for all logistics processes, from schedules, bookings, transport documents, tracking events, invoices, notifications, etc.

## COMPETITIVE ADVANTAGE

Youredi's unique service offering is based on its proprietary best-of-breed integration Platform as a Service technology – the Youredi iPaaS – combined with extensive logistics and global supply chain industry insight and experience. Being the trusted partner for major players of global supply chains, Youredi has the footprint and service-readiness needed to offer off-the-shelf logistics data connectivity services. At the same time, the Youredi iPaaS offers flexibility and efficiency to solve bespoke data and process integration use cases.

## COMPANY

Youredi is a leading provider of data integration solutions for logistics and global supply chains: quick connectivity between trading partners and systems, enabling seamless and accurate flow of data.

## REFERENCES

Youredi's customers range from logtech startups to Fortune500 companies. Among those: TradeLens, ZIM, Descartes Kontainers, and terminal operators.

## CONTACT

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# 5. AUTONOMOUS SYSTEMS

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BUSINESS  
FINLAND

**AILiveSim** – Simulator for autonomous ship and smart port

**Arctia** – Not just an ordinary buoy

**Kongsberg Maritime Finland** – Remote operations center

**Silo AI** – A trusted ai partner







# NOT JUST AN ORDINARY BUOY

## OUR SOLUTION

Arctia Ltd. has developed its solar panel–rechargeable lithium battery concept for spar buoys in EU's Innovation and Networks Executive Agency (INEA) funded Intelligent sea-project ([InSea](#)). Sparbuoy has good features to survive in winter conditions, in Finland we have 1,800 lighted sparbuoys in year-around use. At the moment, these buoys have disposable batteries that need to be changed every year. All buoys are in a remote monitor and control system.

## COMPETITIVE ADVANTAGE

Our spar buoys withstand better ice and wave impacts because solar panels are integrated into buoy body. Expected lifetime for rechargeable lithium battery is 10 years so it will spare at least 200 kg battery waste per buoy during its lifetime. Combined with SeaDatics remote monitoring and control system we get almost maintenance free lighted buoy solution for our navigation areas and lines. Our SPU-buoy solution with rechargeable lithium battery also provides an excellent floating platform for smart solutions offshore.

## COMPANY

Arctia safeguards winter navigation and produces marine survey and fairway maintenance services. We are the world's largest producer of buoys designed for year-round use.

## REFERENCES

Arctia has produced over 45 years of robust sparbuoys for challenging conditions, about 1,500 different buoys and navigational aids every year.

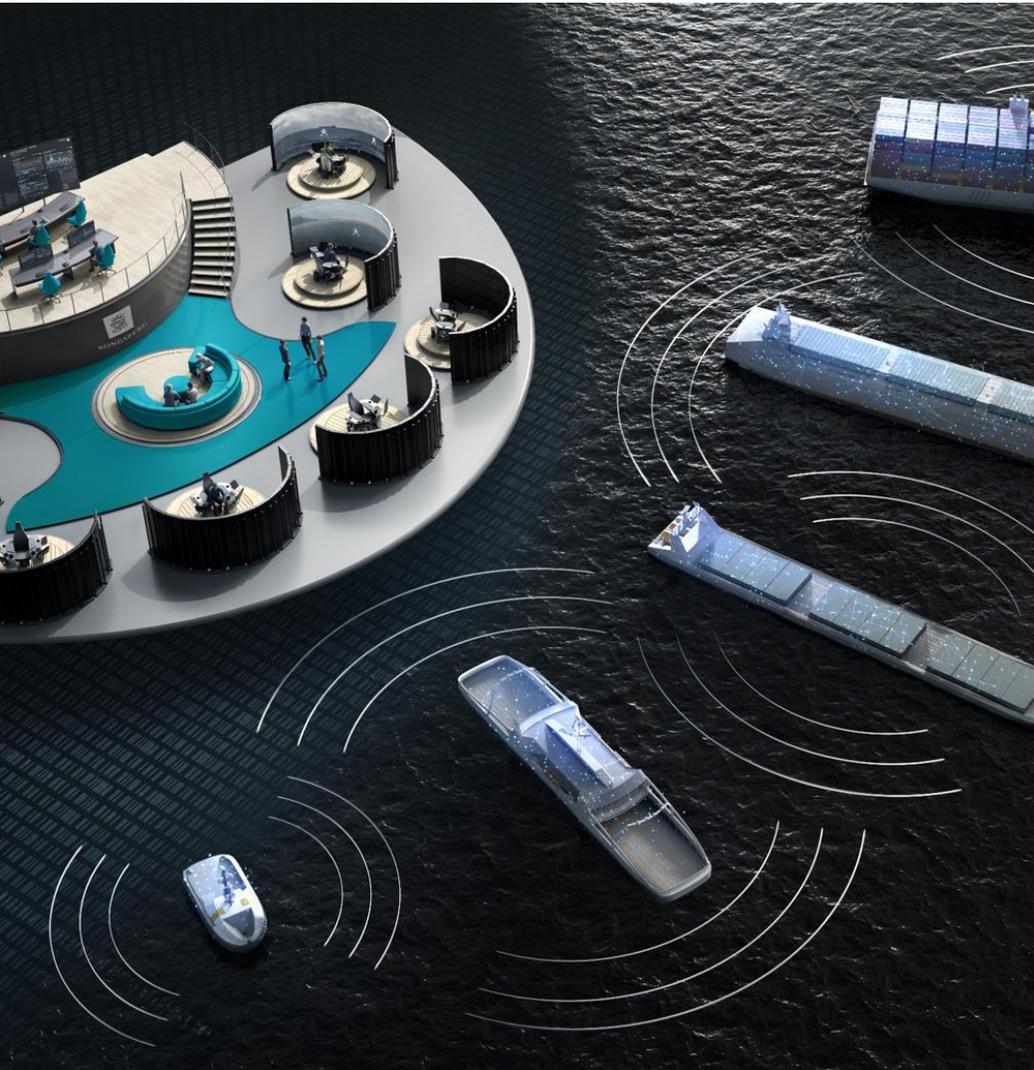
## CONTACT

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# REMOTE OPERATIONS CENTER

## OUR SOLUTION

Our solution, the Remote Operations Center (ROC) enables remote operation of vessels and other floating assets in a safe, efficient and secure manner. The assets in operation can be uncrewed, fully crewed or operated with a reduced crew. The ROC can facilitate an operation carried out at different autonomy levels by enabling a range of interaction levels towards the asset. Interactions levels typically spanning from monitoring, supervision, intervention and direct remote control. Kongsberg provides the connectivity system and integral onboard systems for the execution of the remote and autonomous maritime operation. Cyber security measures are present throughout the systems and solutions.

## COMPETITIVE ADVANTAGE

Key value adding drivers for entering a remote operation of vessels and other floating assets is focused on but not limited to increased business potential, improved safety, reduced operational cost, reduced risk and improved environmental footprint. The market for remote and autonomous maritime operations is in the development stage. Currently commercial operations are restricted by the lack of international rules.

## COMPANY

KONGSBERG is a leading global technology powerhouse with a 200-year history, operating in three business areas: Kongsberg Maritime, Kongsberg Digital and Kongsberg Defence and Aerospace.

## REFERENCES

The world's first commercial remote and autonomous shortsea shipping vessels in operation. The world's first remote and autonomous road ferry.

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**KONGSBERG**



# SILO AI – A TRUSTED AI PARTNER

## OUR SOLUTION

Silo AI is a trusted AI partner that brings cutting-edge AI into our clients' core business and products. We do this by providing world-class AI expertise and the Silo OS infrastructure to speed up AI development and deployment. Silo AI has a strong foothold in the automotive, maritime, manufacturing, heavy machinery and logistics industries which enables us to bring versatile experience to the development of smart ports. Our expertise can be widely applied, for example, in developing autonomous systems, sensor fusion for situational awareness, as well as automated tracking of cargo and passenger flows.

## COMPETITIVE ADVANTAGE

Silo AI is one of Europe's largest private AI labs and currently home to more than 240 AI experts, out of which approx. 50% hold a PhD in AI or other related fields such as computer vision, machine learning, natural language processing, and computer science. We have a track record of hundreds of production-grade deliveries and robust experience in building teams that deliver AI to production in challenging and complex real-life environments.

## COMPANY

Silo AI is one of Europe's largest private AI labs. Together with our clients, we build AI-driven solutions and products to enable smart devices, vehicles, industry and society.

## REFERENCES

Awake – intelligent port automation, Finnair – situational awareness, Posti – AI-driven logistics predictions, Groke – AI-driven awareness system for autonomous vessels.

## CONTACT

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# SILO<sub>AI</sub>

# 6. AUTOMATED AND PRECISELY TRACKED CARGO AND PASSENGER FLOWS

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**Connected inventions** – Smart fleet and asset tracking

**KONE** – People flow planning and consulting

**Konecranes** – Intelligent container handling

**Mantsinen** – Frontrunner in sustainable material handling

**Teleste** – Smart passenger flow

**Visy** – Empowers operations with AI and OCR

**Yepzon** – IoT Solutions in demanding conditions



## SMART FLEET AND ASSET TRACKING

### OUR SOLUTION

Connected Ranger, a smart fleet and asset tracker, is an industry-grade geolocation device for both in and outdoor usage – built for tracking assets or shipments, geo-fencing, warehouse inventory and equipment leasing.

The device scans the surrounding Wi-Fi APN:s and sends 2 MAC addresses to any data platform via the Sigfox network; world's leading IoT service provider with their 0G network. The data is then refined to correspond to the physical geolocation of the asset tracked.

The device fits onto many surfaces using screws or zip-ties and has an ultra long battery life. Natively, the device works with our IoT platform – FoverIoT, but is not limited in connectivity to other data management software.

### COMPETITIVE ADVANTAGE

Being part of a leading global IoT ecosystem with Sigfox, we deploy our inventions and complete services to more than 75 countries, touching the majority of ports worldwide. Independent of an electrical power supply, the Connected Ranger uses handheld batteries for a default ultra long life of up to 5 years.

Incredibly robust and affordable, it withstands the more challenging conditions in logistics. We bring ports a centralized data-management platform, global-coverage, and security while reducing costs radically, supporting mass digital transformation.

### COMPANY

We develop, manufacture and deliver high-quality IoT devices, software and complete solutions. We've unleashed the power of data for partners in over 50 countries with more than 250,000 devices deployed.

### REFERENCES

HELEN LeanHeat by Danfoss, Port of Tallinn, Tallink Maritime Transportation, Fortum.

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# PEOPLE FLOW PLANNING AND CONSULTING

## OUR SOLUTION

As business environments are being reinvented in real-time, we need to think and act differently when it comes to People Flow planning. Using KONE's expert knowledge, data, and simulation tools, we can provide an understanding of how physical distancing measures impact People Flow in a specific building or vessel, and what measures could help reduce crowding and bottlenecks.

- Get accurate information of viable and holistic flow design options
- Base decisions on facts – not guesswork
- Future proof building and vessel's circulation design
- Create the best People Flow experience

## COMPETITIVE ADVANTAGE

We offer three tiers of People Flow Services with customer deliverables to both deploy our existing People Flow capabilities, and to help our customers re-open their businesses.

These three are:

1. Segment specific best practices and People Flow examples
2. People Flow data into insights
3. People Flow Planning and Consulting where the End-result is bespoke recommendation for your needs

## COMPANY

KONE in brief: We are a global leader in the elevator and escalator industry, and our job is to make the world's cities better and more sustainable places to live.

## REFERENCES

Get familiar with our global references at [kone.com/references](https://www.kone.com/references)

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# INTELLIGENT CONTAINER HANDLING

## OUR SOLUTION

Konecranes provides the most eco-efficient, productive and reliable container handling equipment to container terminals, backed by port service that keeps the equipment working safely at peak efficiency. All over the world.

## COMPETITIVE ADVANTAGE

Konecranes' offering for container handling is the widest and deepest in the industry. It includes the path to port automation, which enables customers to improve productivity and safety with automation technology in manageable steps. From smart features up to full automation, the path can include supervised operation or remote operation to smoothly introduce the power of automation. It applies to all brands of container handling equipment. Non-Konecranes container handling equipment can be retrofitted with automation features from Konecranes.

## COMPANY

In 2021, the Konecranes Group's sales totalled EUR 3.2 billion. The Group has approximately 16,600 employees in around 50 countries. Konecranes shares are listed on the Nasdaq Helsinki (symbol: KCR).

## REFERENCES

Port of Savannah, USA: the single largest and fastest-growing container terminal in the USA. Operates 225 Konecranes RTG cranes and 42 STS cranes.

## CONTACT

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# FRONTRUNNER IN SUSTAINABLE MATERIAL HANDLING

## OUR SOLUTION

Mantsinen material handling machines handle hundreds of thousands of tons of cargo at ports around the world daily. Our machine design and innovations are providing energy savings and added efficiencies in material handling improving the overall performance of ports while helping them achieve their future sustainability goals. Mantsinen is the only manufacturer with a DualPower® material handling machine in their product offering with an electric motor and diesel engine combination in addition to our fully electric machine offering. Mantsinen has been the frontrunner in green solutions and sustainable material handling since introducing the HybriLift® energy recovery system in 2006.

## COMPETITIVE ADVANTAGE

The Mantsinen hydraulic material handling machines increase the throughput of port operations as the cycle times are significantly faster compared to traditional mobile harbour cranes, handling up to 1,300 tons of material per hour. In addition to the increased productivity the versatility of the machines provide an unrivalled benefit through the ease of changing the attachments, which can be done in only a matter of minutes. The same machine can

be used for varying applications ranging from bulk and break bulk materials to container handling.

## COMPANY

Mantsinen is a family-owned company with deep roots in material handling and logistics services. We thrive to be the best at what we do while operating in a sustainable and responsible manner.

## REFERENCES

Port of Kolding, Denmark operating a Mantsinen 140M HybriLift,  
<https://mantsinen.com/us/references/port-of-kolding-in-denmark/>

## CONTACT

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+358 40 729 6655  
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## SMART PASSENGER FLOW

### OUR SOLUTION

Teleste's situational awareness solution for the port authorities enable optimization of passenger traffic management, which results in major cost savings due to, for example, resource optimization enabled by a situational awareness and video surveillance system. The COVID-19 pandemic has shown that the control and management of passenger traffic will be even more challenging in the future and therefore innovative solutions for the management of passenger masses and the efficient use of resources are of paramount importance. Safety is an integral part of the system for optimizing passenger traffic.

### COMPETITIVE ADVANTAGE

Teleste has decades of experience as solution provider for public authorities. We provide professional video and information management applications, systems and services for public safety authorities and operators as well as public transport operators and rolling stock manufacturers. Our portfolio meets the highest international standards and requirements for demanding operational environments and large-scale, integrated implementations.

### COMPANY

Teleste offers an integrated product and service portfolio for broadband, security and information technologies and related services. Teleste was founded in 1954 and it is listed on Nasdaq Helsinki.

### REFERENCES

[See our website](#)

### CONTACT

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# VISY EMPOWERS OPERATIONS WITH AI AND OCR

## OUR SOLUTION

VISY'S artificial intelligence (AI) and vision technology solutions empower operators to automatically manage all cargo, personnel and asset movements in the yard and in or out of a terminal by road, rail or quay. The Visy Access Gate Operating System (GOS) with optical character recognition (OCR) enhances all types of port and terminal operations. From traditional marine terminals to intermodal sites to complex facilities, Visy technology saves operators time and money.

## COMPETITIVE ADVANTAGE

Visy solutions improve terminals' key performance indicators (KPIs) through process automation. Visy systems will create and manage repeatable, scalable, sustainable processes for your operation. Whether the system is a spreader OCR for cranes to increase the number of moves per hour, or a GOS with OCR to reduce truck turnaround times, our technology will create an environment for you to do consistent business.

## COMPANY

Visy specializes in vision technologies and gate automation with over 25 years of experience in providing process automation for industrial facilities and container terminals all over the world.

## REFERENCES

APM Terminal, Sweden – GOS with OCR, DB Netze, Germany – Rail OCR Portals, TPS, Indonesia – Gate OCR with automatic container damage detection.

## CONTACT

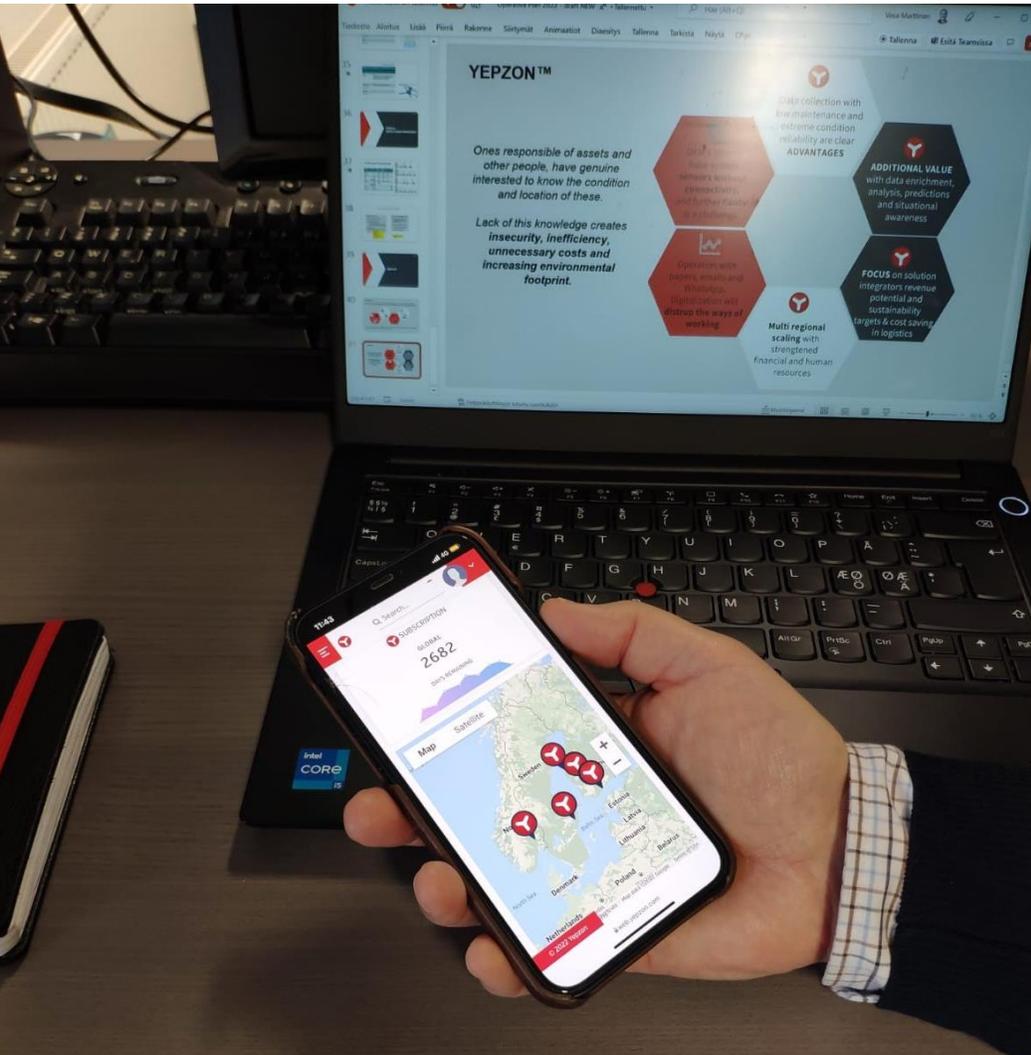
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# IoT SOLUTIONS IN DEMANDING CONDITIONS

## OUR SOLUTION

Yepzon logistic solutions provide business-critical real-time data based situational awareness for asset owners, cargo operators and cargo owners to improve safety, security, sustainability, revenues and cost structure.

Data on location, temperature, humidity, shock, etc. is collected with trackers and BLE connected external sensors. Connection to cloud with 2G, LTE and 5G, where data is then processed. Processed data can be brought to users existing ERP systems via an API interface. The situational awareness is shared with the Yepzon mobile APP and web-based user interfaces.

## COMPETITIVE ADVANTAGE

Yepzon provides an end-to-end data solution for multimodal transportation and for local operation in demanding conditions. We have easy-to-use and maintenance free data collection, e.g., solar powered location data for assets, wireless charging for ATEX zone 0 environment with reliability in harsh operational and ambient conditions.

Proven 2G/4G/5G connectivity and stable data transformation over API. Easy to use interface to multiple users with "as-a-Service" business model.

## COMPANY

Yepzon is a Finnish growth company that also has legal entities in the U.S., UK and India. The team consists of IoT, logistics and personal safety business professionals.

## REFERENCES

5,000 activated units in logistic, for example StoraEnso - condition of goods, ArctiaMeritaito - fairway buoy location, Finnlines – smart cargo loading gear and Valmet – LNG/Hydrogen transportation.

## CONTACT

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# 7. ENERGY INFRASTRUCTURE, NEW FUELS, MARINE MAINTENANCE AND ENVIRONMENTAL SOLUTIONS

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BUSINESS  
FINLAND

[3mar](#) – Shore charging & auto-mooring for EL-ferries

[Caproc](#) – Intelligent waste management at ports

[Elomatic](#) – Solutions to energy and shipping challenges

[Flexens](#) - Your partner in port decarbonization

[Helen](#) – Smart energy solution for harbors

[Kempower](#) – Fast charging for ports

[Savcor](#) – Corrosion prevention for wharf structures

[Vaisala](#) – Safer ports through weather observations

[Valmet](#) – Smart LNG operations and emission control

[Watermaster](#) – Smart solution for marina maintenance



# SHORE CHARGING & AUTO-MOORING FOR EL-FERRIES

## OUR SOLUTION

3mar Ltd. develops and produces novel, efficient shore connection and auto-mooring solutions. Auto-mooring is needed because ferries are kept in their position at berth using propulsion to push them against the ramp while loading and unloading. This consumes energy, often a significant amount. Auto-mooring allows the propellers to be stopped during their stays at ports, hence saving energy, money and environment.

Fast automatic charging connection is needed to extend the small-time window of charging the batteries at port. Then a bigger amount of energy can be transferred from the grid to the onboard batteries with the same charging power.

## COMPETITIVE ADVANTAGE

Our auto-mooring is located on the vessel side. It is based on permanent magnets that can be turned on and off and that do not need energy to maintain the force. Onboard it does not require communication between the vessel and the shore. The counterpart on the shore is just a steel plate leaving the whole pier area free for other use.

Our charging connector is installed on the side of the loading ramp where it follows the water level variations. A simple and compact device does not require a heavy foundation. This minimizes the costs of the civil works.

## COMPANY

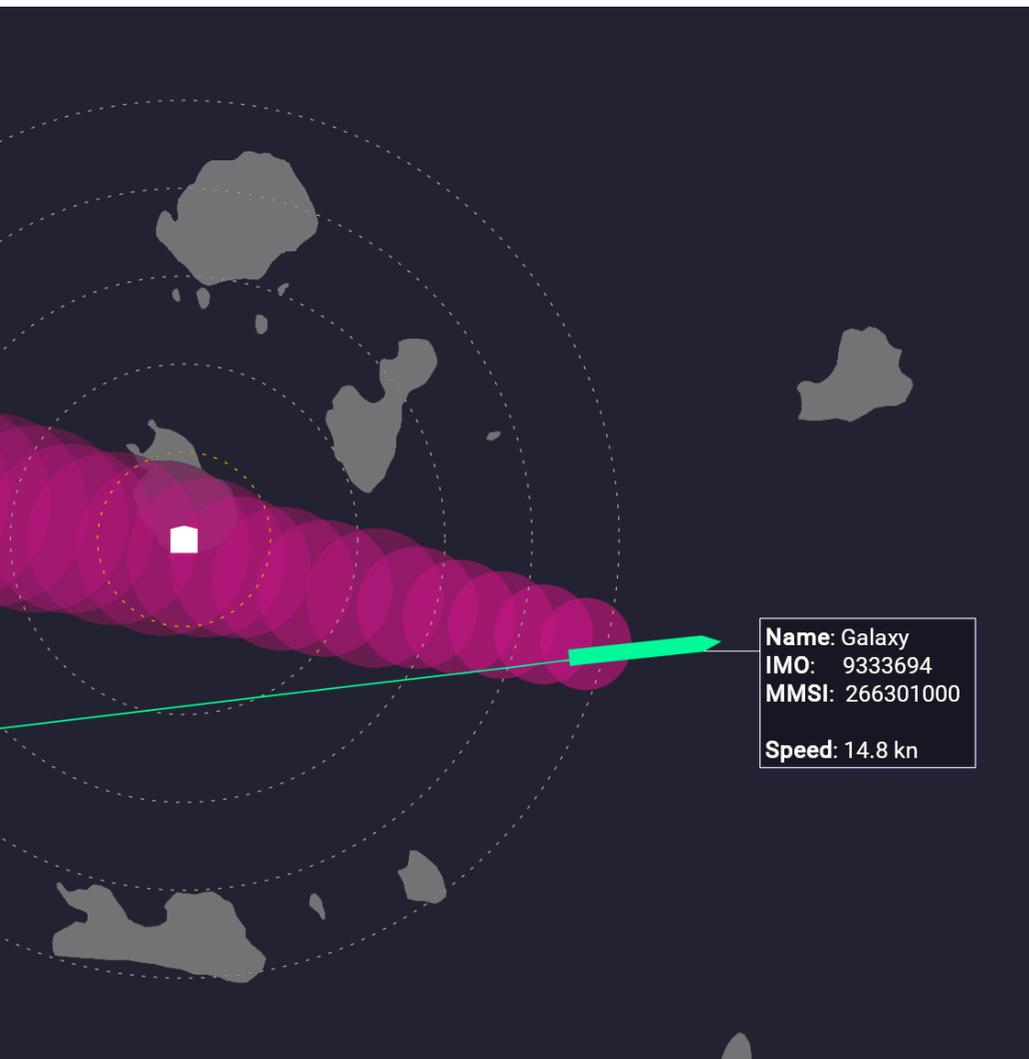
Established in 2020 when the shore charging business was demerged from Mobimar to a separate entity. Owns all IPR for its products. A solution provider delivering design, equipment and commissioning.

## REFERENCES

[Nector 4000 in use in DK since August 2019](#)  
[Nector 2000 for Färjerederiet, Sweden](#)

## CONTACT

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[www.3mar.fi](http://www.3mar.fi)



## REMOTE EMISSIONS MONITORING

### OUR SOLUTION

AirNow emission monitoring measures ship emissions in harbors and along ship fairways providing important information for authorities in charge of port state controls. Fully automatic sniffer stations record the emissions of passing sea vessels. The data gathered is processed and presented in our web-based user interface. Results are analyzed from measurements and other data, including SO<sub>2</sub>, CO<sub>2</sub>, NO+NO<sub>2</sub>+NO<sub>x</sub>, wind, humidity, temperature, ambient air pressure, station position and automatic vessel identification system (AIS). AirNow calculates the Fuel Sulfur Content (FSC%) and NO<sub>x</sub> emission tier of each vessel, which helps authorities to decide if there is a need for an onboard check.

### COMPETITIVE ADVANTAGE

The Fuel Sulfur Content (FSC%) limit of 0.5% went into force in maritime areas of the world on January 1, 2020. Using AirNow service in your maritime areas, there is no need for random spot-checking. Instead, you can target your control efforts on ships suspected of breaking the IMO regulations.

Green shipping can be achieved with state-of-the-art solutions. In addition to monitoring the compliance of IMO regulations, you can reduce the environmental impact of shipping in general in your areas with AirNow service.

### COMPANY

AirNow provides software and services for authorities involved in maritime operations as well as emission measurements and monitoring.

### REFERENCES

100,000+ remote measurements using several sniffer techniques in both fixed land-based and floating (Sniffer Buoy) installations.

### CONTACT

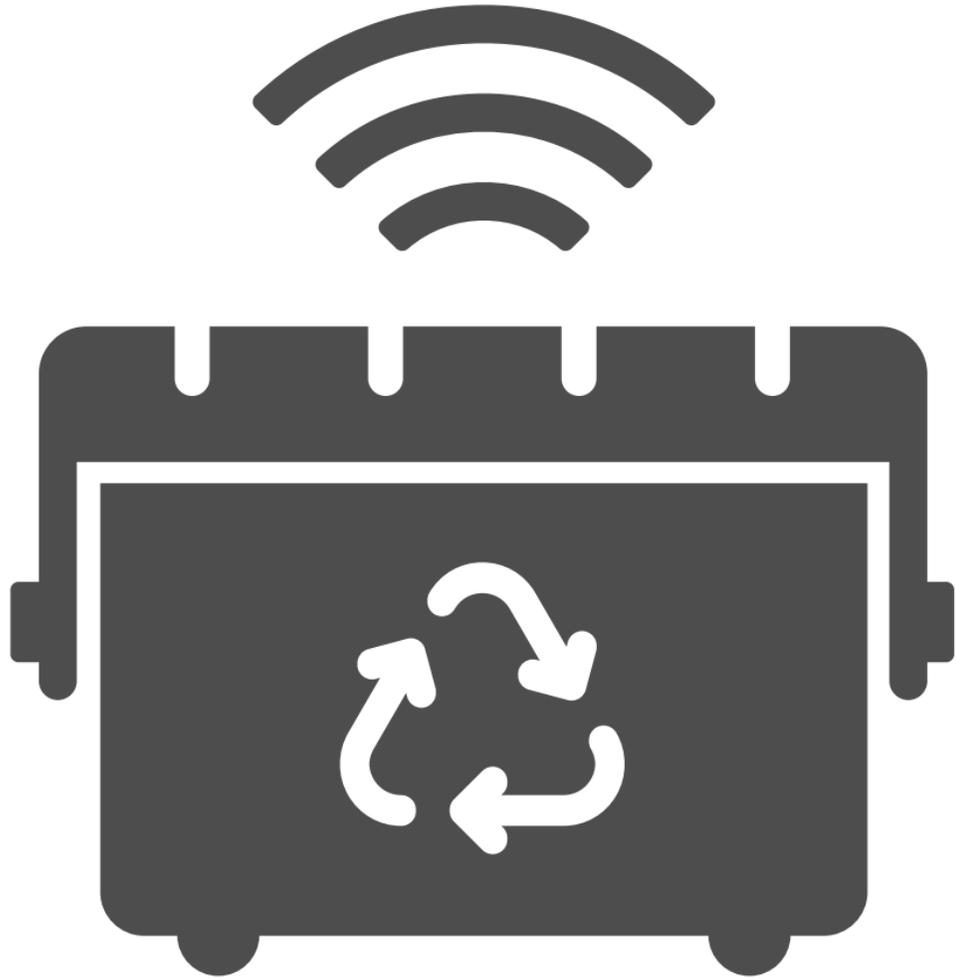
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## INTELLIGENT WASTE MANAGEMENT AT PORTS

### OUR SOLUTION

Caproc Oy offers intelligent end-to-end IoT-solutions for ports including software platform and our own wireless sensor products. Efficient, environmentally friendly and cost-effective waste management is an essential part of modern port operations.

Caproc wireless radar-based waste bin monitoring sensors offer real-time status of various waste and material bin filling degrees. The waste management operations have full visibility of bins requiring emptying. The optimized emptying process reduces carbon emissions as bins are collected only when needed. Also overfill problems are reduced as the filling degree is always visible for waste management operators.

### COMPETITIVE ADVANTAGE

Green and efficient ports require good visibility of all port operations. Good visibility helps to optimize operations and reduce unnecessary vehicle traffic at port. Caproc solution is part of your Digital Twin concept that provides tool for you to have smaller carbon footprint and less costs.

Our smart sensors are designed and manufactured in Finland. Own product range and in-house software development ensures the flexibility and great customer service for various needs at the port.

### COMPANY

Caproc is a technology company founded in 2019. We combine long experience in manufacturing industry and new modern technology into a powerful service. Your success is our success!

### REFERENCES

Lahti European Green Capital 2021, Everyday circular economy project (waste bin filling degree solution), Port of Hanko.

### CONTACT

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## SOLUTIONS TO ENERGY AND SHIPPING CHALLENGES

### OUR SOLUTION

We create future concepts and help our customers with the energy transition, among other things. Our focus is on continuous improvement, hybrid powering solutions, alternative fuels, and energy-saving solutions in general. Whether on board or harbour, our team can support seamlessly with their knowledge of novel fuel production and usage.

We also innovate new logistic solutions and foundation designs. For example, our Float Foundation enables the elimination of offshore lifting in offshore structures such as production facilities for novel fuels or windmill foundations.

Our other unique offering is Elogrid for vessels' thruster opening, which both improves thrust force and reduces drag.

### COMPETITIVE ADVANTAGE

Our expertise covers all engineering disciplines and all design phases. By combining our knowledge of different fields, energy sector, and marine industry, we can ensure competitive solutions especially in the field of novel fuels, where the integration of onshore facilities and use onboard is required to achieve a competitive advantage. We utilize the most

sophisticated methods and tools such as simulations and CFD calculations. We are known as a pioneer in the development of design methods and tools.

### COMPANY

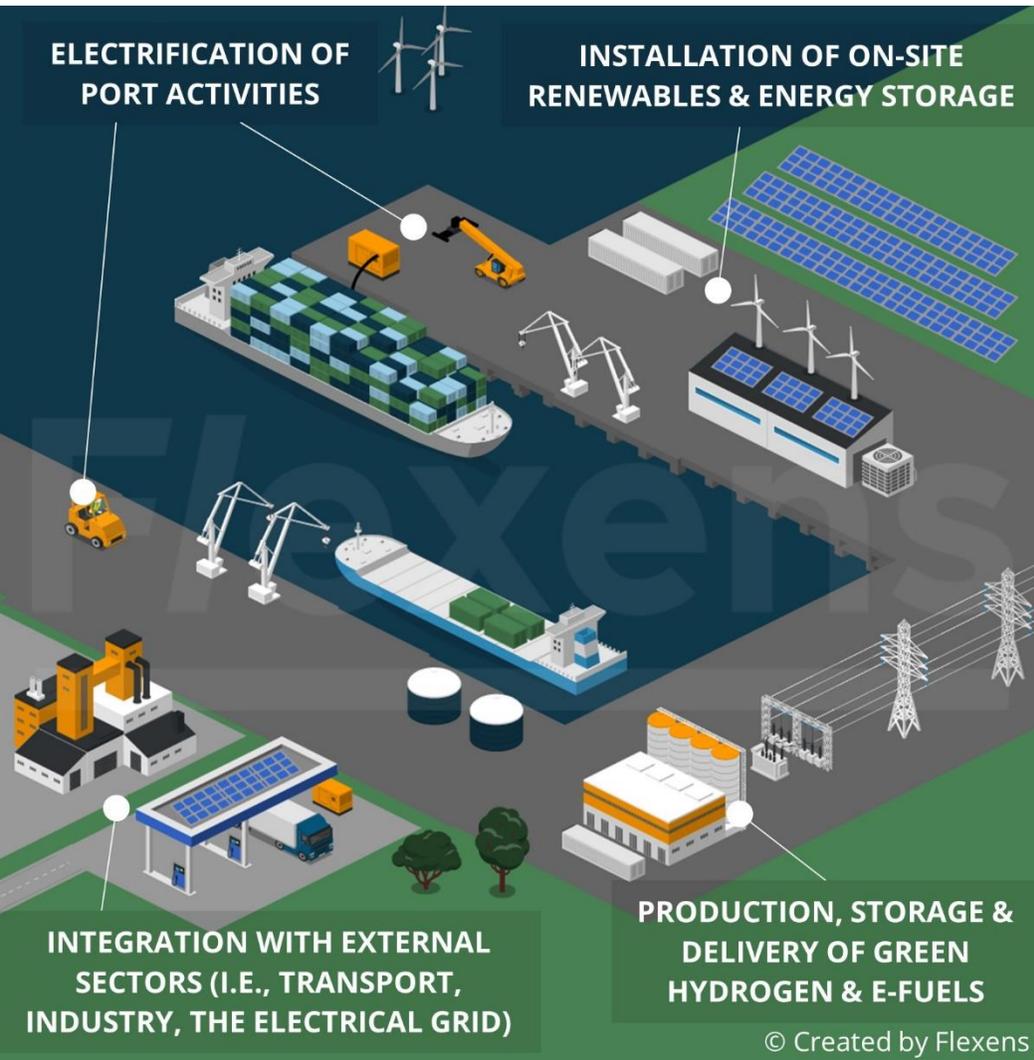
Elomatic is a global consulting and engineering company. We focus on solutions that improve the well-being of people and the environment. We have over 1,100 highly qualified professionals.

### REFERENCES

NYK Concept design for an Ammonia-Fuel Ready LNG-Fueled Vessel of PCC Viking Line – Elogrid Cadmatic 3D design and information management software tools.

### CONTACT

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# YOUR PARTNER IN PORT DECARBONIZATION

## OUR SOLUTION

We develop renewable energy projects to meet the electricity and fuel demands of ports, terminals and shipping companies alike. Our offerings include hydrogen, e-fuels and renewable power production, energy storage systems and port electrification. We select the most suitable offering(s) for each project to target the port stakeholders' specific needs. By doing so, we ensure that the technologies we procure are bankable and easily integrated into the existing energy system. Our systematic approach ensures competitiveness and attractiveness under the growing demands of the maritime industry decarbonization.

## COMPETITIVE ADVANTAGE

Flexens has first-hand experience decarbonizing the maritime sector. We have taken vital steps toward becoming a key partner in green e-fuels production worldwide. Flexens' multidisciplinary expert team is involved in the entire project development life cycle. We use advanced energy modelling to secure the bankability of the energy assets.

In addition, our international network of technology suppliers, subcontractors and partners allows for efficient execution and tailored solutions..

## COMPANY

Flexens is a project developer and investor rooted in Smart Energy Åland, a globally unique initiative demonstrating, that societies can be run solely on renewables.

## REFERENCES

Modelling the energy transition for a major Finnish port. Initial project assessment with several ports and a major port operators.

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<https://flexens.com>



## SMART ENERGY SOLUTION FOR HARBORS

### OUR SOLUTION

We are redesigning harbors' whole energy solution by improving efficiency and cutting costs and greenhouse gas emissions. Our new smart solutions, such as battery-operated electricity storage facilities, optimize the supply and demand. We are developing local heat and electricity production with geothermal heat, solar and wind production. Taking advantage of an electricity storage facility, it is possible to fully optimize energy production and consumption at the site, considering demand, production capacity, electricity prices and, of course, demand-side flexibility. This will also prepare harbors for future needs for electricity when it comes to electrifying marine traffic and harbor machinery.

### COMPETITIVE ADVANTAGE

We are redesigning harbors' entire energy solution by improving efficiency and cutting costs and greenhouse gas emissions. Our new smart solutions, such as battery-operated electricity storage facilities, optimize the supply and demand. We are developing local heat and electricity production with geothermal heat, solar and wind production. Taking advantage of an electricity storage facility, it is possible to fully optimize energy production

and consumption at the site, considering demand, production capacity, electricity prices and, of course, demand side flexibility. This will also prepare the harbor for future needs for electricity when it comes to electrifying marine traffic and harbor machinery.

### COMPANY

Helen Ltd. serves over 500,000 customers in Finland. In addition to heating, cooling and electricity, we offer solutions for regional and renewable energy, smart buildings and electric transport.

### REFERENCES

The Suvilahti district of smart energy systems – battery, V2G charging point and solar panels.

### CONTACT

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- 1 Passenger BUS charging
- 2 EV car charging for passengers
- 3 RTG charging
- 4 Forklift and other utility vehicle charging
- 5 Truck charging - opportunity and overnight charging
- 6 Pullers and AGVs - Fast charging
- 7 Tug charging



# KEMPOWER'S FAST CHARGING FOR PORTS

## OUR SOLUTION

Ports worldwide are supporting the transition towards zero-emission maritime transport. One key element is the electrification of ports and port vehicles. The Kempower charging solutions are modular and scalable for different kind of electric vehicles in the port, providing the same core design regardless of the vehicle type.

## COMPETITIVE ADVANTAGE

The Kempower Satellite charging system is built out of a scalable and modular Charging Power Unit (C-Series) and Charging Satellites (S-Series).

- Voltage 380-480V /50-60HZ
- Power 50-600kW
- Output voltage up to 800vdc –
- Up to 8 charging connectors

## COMPANY

Kempower designs, manufactures and commercializes charging solutions and services for electric vehicles and machines operating in the most demanding conditions. We are located in Lahti, Finland.

## REFERENCES

Fast charging systems for bus depots, Malmö and Jönköping, Sweden. Global supplier of Epiroc. Partnership with Gilbarco Veeder-Root.

## CONTACT

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# CORROSION PREVENTION FOR WHARF STRUCTURES

## OUR SOLUTION

Savcor technologies aim to save natural resources, the environment and money – with the help of electricity. Cathodic protection can stop corrosion in underwater steel structures and concrete reinforcement steel. Our protection system can be supplemented with structural health monitoring.

Extending or even multiplying the service life of a structure has a very large economic and environmental impact, as it postpones expensive investments, saves valuable materials and avoids downtime of production equipment. Extending the life of existing structure saves the environment. Savcor technologies are not only green, they are also productive.

## COMPETITIVE ADVANTAGE

Savcor has proprietary control electronics and software, enabling us to customize the system to match client requirements.

ICCP offers monitoring data of the system functionality according to the international standards, giving unambiguous verification of the system performance for the asset owner.

Impressed current cathodic protection (ICCP) with an insoluble anode is usually the more economical choice over sacrificial anodes when lifecycle costs are compared.

## COMPANY

Savcor is a pioneer in green technology. Since the beginning of the '80s, Savcor has provided electronic corrosion protection systems for customers. Our offices are in Finland, Canada and Brazil.

## REFERENCES

Savcor has delivered corrosion prevention systems worldwide for over 40 years. More information is available on our website: <https://savcor.com/cp-references>

## CONTACT

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[www.savcor.com](http://www.savcor.com)



# SAFER PORTS THROUGH WEATHER OBSERVATIONS

## OUR SOLUTION

Vaisala Maritime provides a portfolio of weather monitoring solutions to ports. Vaisala's modular, automatic weather stations can be equipped with robust wind sensors and expanded into full-scale systems with multiparameter support including visibility, precipitation, humidity, temperature, barometric pressure, and air quality.

For wind gust and storm challenges, Vaisala can support you by delivering a network of wind sensors, weather stations and wind lidars for remote wind alerts beyond 10 km. Vaisala Weather API and real-time lightning data provides actionable insights about approaching storms. Vaisala's X-Band Weather Radar ensures the awareness for approaching storms in the 100 km+ range.

## COMPETITIVE ADVANTAGE

With the help of accurate observations on wind and weather conditions combined with hyperlocal nowcasts, ports can better adapt to the effects of extreme weather events caused by the storms and climate change. Having accurate data on coastal weather and other marine conditions right when you need it most reduces costly disruptions, delays, and helps ports to optimize their just-in-time operations.

It allows ports to better plan ahead, react quicker to changing circumstances and drive operations in a more efficient, safe and sustainable way.

## COMPANY

Vaisala is a global leader in weather, environmental, and industrial measurements with over 85 years of experience working with the most accurate and dependable weather solutions.

## REFERENCES

Our weather systems and solutions are used by tens of ports around the globe to enhance their operational efficiency and safety.

## CONTACT

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<https://www.vaisala.com/en/industries-applications/maritime>

# VAISALA



# SMART LNG OPERATIONS AND EMISSION CONTROL

## OUR SOLUTION

Valmet DNA Integrated Operations is a cloud-based application developed to control all of the main processes in the terminal: ship unloading, bunkering, storage management, truck loading, gas send-out and the evaporator units.

Online connections make it possible to gather all real-time data in one place. The transmission of LNG energy becomes faster and more streamlined.

Valmet's Wet Electrostatic Precipitator (WESP) controls particulate matter emissions, such as black carbon. The innovative solution enables ship owners to efficiently remove harmful particulate matter from the exhaust gas of their fleet. Combining a scrubber and WESP can cut harmful emissions by up to 99%.

## COMPETITIVE ADVANTAGE

With years of experience working in the field, Valmet's experts behind DNA Integrated Operations know the challenges well that automation can resolve. The award-winning solution helps users better manage data, optimize sourcing and plan logistics more efficiently, saving time and costs.

Valmet was also the first supplier to introduce a hybrid scrubber to the market years ago. The

introduction of WESP is a continuation along this development path of innovative marine solutions that enable more sustainable ship transport.

## COMPANY

Valmet is a leading global developer of process technologies, automation and services. With over 220 years of history, the company has a strong track record in continuous development and innovations.

## REFERENCES

Gasum LNG, Scandinavia. Gasum Traffic, Tornio Manga LNG Terminal, Finland. Logistics companies, including Speed Logistics and others.

## CONTACT

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### Timo Lamminen

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# SMART SOLUTION FOR MARINE MAINTENANCE

## OUR SOLUTION

Watermaster amphibious multipurpose dredger excels alone in the marine maintenance tasks that are conventionally handled with multiple separate machines. With its wide selection of quickly changeable attachments, Watermaster can deepen and maintain marinas and waterways by suction dredging and excavating. It can remove invasive vegetation and trash by raking. Watermaster can build docks and strengthen shorelines by piling wooden or steel piles. Watermaster's reliability is result of over 35 years of continuous development, modern serial production facilities, world-class components, and comprehensive training and back-up.

## COMPETITIVE ADVANTAGE

With Watermaster, you need fewer machines for work. This saves the environment, costs, and time. Watermaster is quick and easy to transport between work sites with a standard trailer as a complete unit. It can load and unload itself without crane assistance. Watermaster is amphibious and can walk independently in and out of water.

Watermaster is self-propelled, and its four stabilizers and strong excavator arm enable steady and accurate anchoring and the use of heavy-duty attachments in the shallow-waters from 0 to 20 feet deep.

## COMPANY

Watermaster North America is the licensed manufacturing and distribution partner with Aquamec of Finland for the US and Canada. The Michigan-made Watermaster AMD 5000 is Jones Act compliant.

## REFERENCES

Watermaster is a proven concept. Over 350 machines operating in over 80 countries. It fits to all conditions from tropical heat to arctic coldness.

## CONTACT

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# 8. FINNISH SMART PORTS

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BUSINESS  
FINLAND

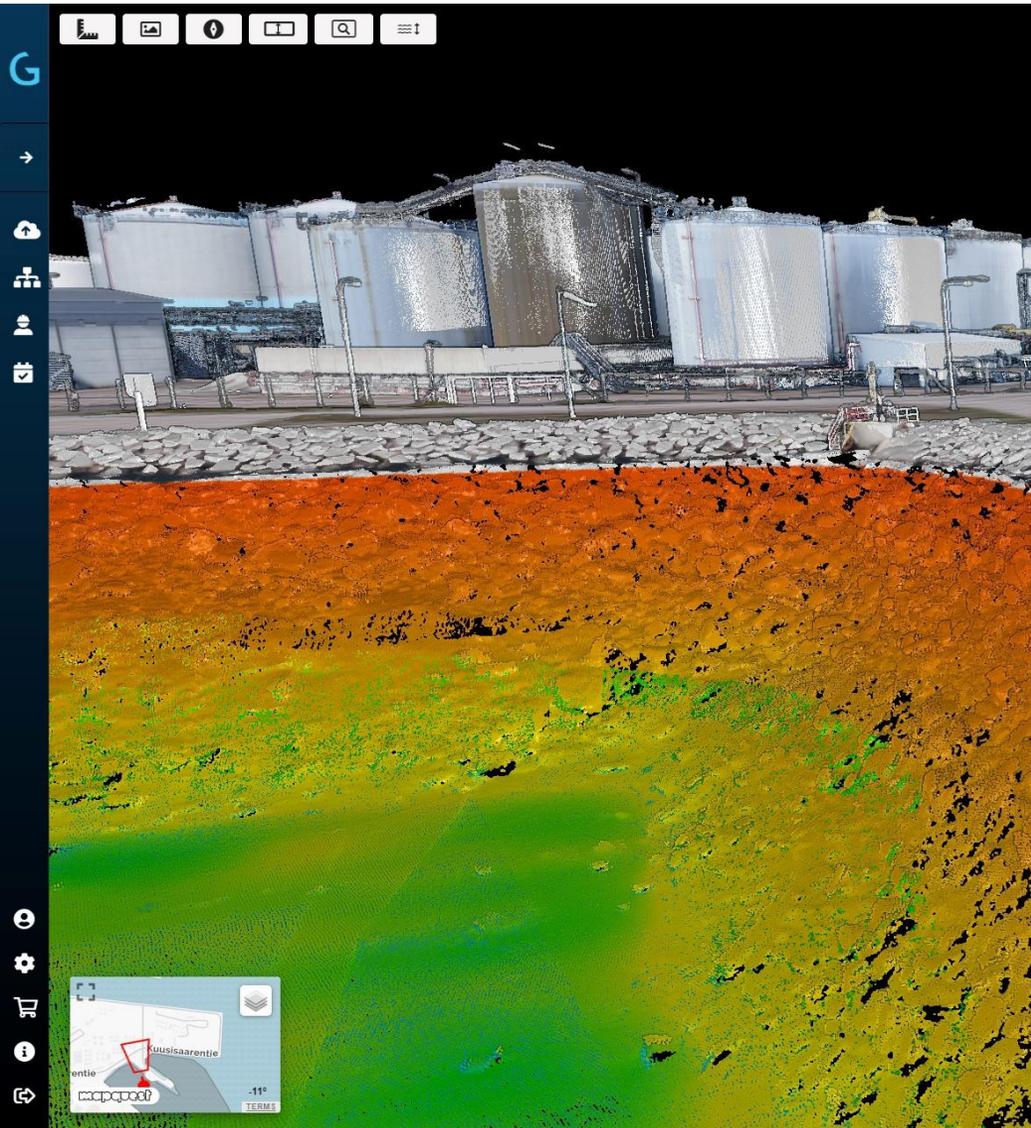
[Port of HaminaKotka](#)

[Port of Hanko](#)

[Port of Helsinki](#)

[Port of Naantali](#)

[Port of Oulu](#)



# PORT OF HAMINAKOTKA

## GENERAL

HaminaKotka is the largest export and universal port in Finland. We serve various industries with most modern facilities, operators, and infrastructure. Our port is the major hub for Finnish forestry exports and the home of Finland's largest container terminal. HaminaKotka has a large variety of industrial facilities especially in the field of chemicals industry.

## SMART AND GREEN TECHNOLOGIES

HaminaKotka is the first port in the world to use [GISGRO](#), a high-tech digital port management platform, developed in close cooperation with VRT Finland. Using the system, HaminaKotka maintains a full 3D digital twin of the port both above and below water. A user can, for example, enter the port from their desktop and show potential customers all of the possibilities the port has to offer. Additionally, the port uses GISGRO in vessel and berth planning and maintenance work. The aim is to develop the system to cater to all of the relevant needs the port has when it comes to port management systems – including environmental reporting.

Since the successful implementation of HaminaKotka, GISGRO has grown rapidly both in Finland and internationally.

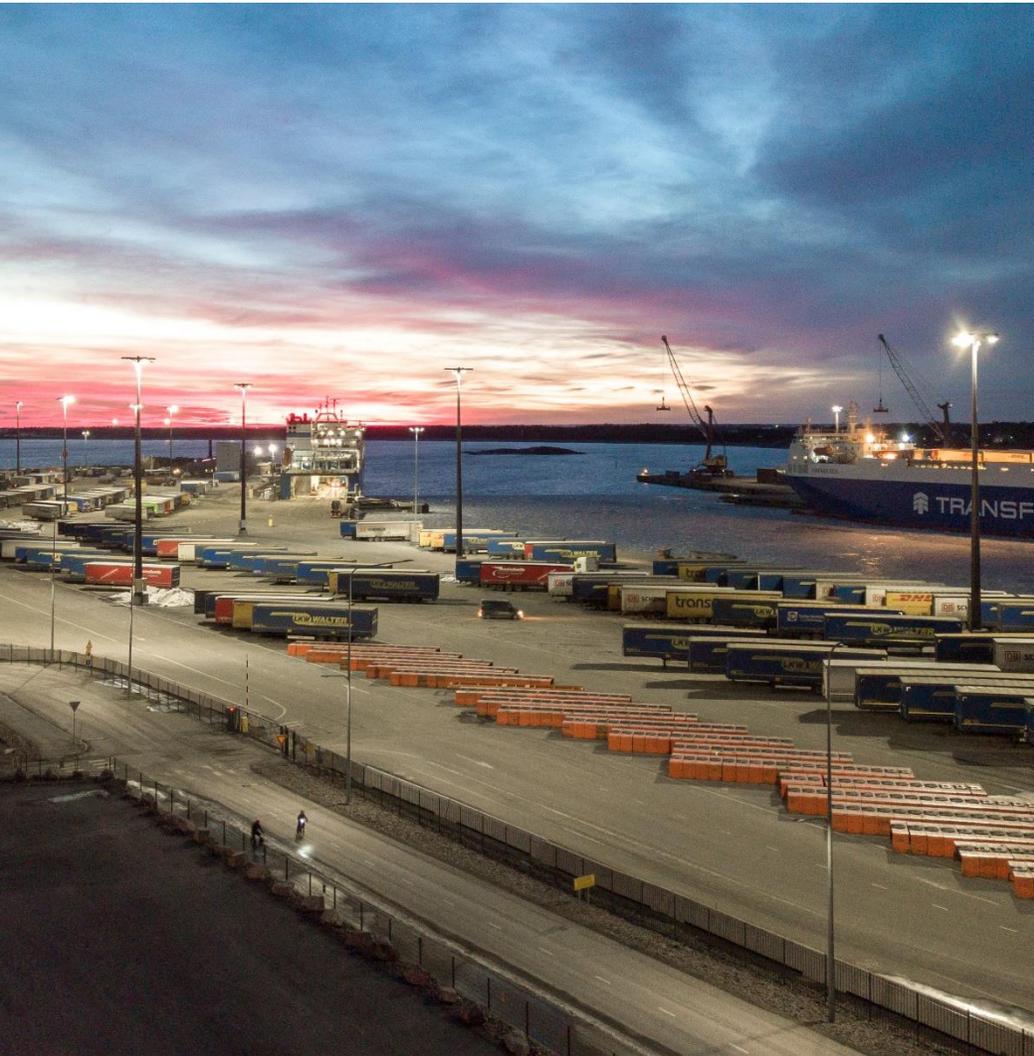
## CONTACT

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## TOWARDS A GREENER PORT

### SERVICE 24/7

Port of Hanko offers an extraordinary and easily reached service for international trade to and from Finland. Port of Hanko has become the leading port in fast liner traffic, offering around-the-clock service.

To develop the port's facilities and operations sustainably, the Port of Hanko has adopted a dynamic and targeted environmental policy for the years to come, with the high ambition of carbon neutrality by 2024.

### SMART AND GREEN TECHNOLOGIES

Situational awareness is the key to optimizing actions in a dynamic port environment. An iPaaS solution named "frends", developed by HiQ Finland Oy, has helped us build our situational awareness. With frends, for example, we converted a visual but static off-the-shelf resource planning tool to automatically, and real-time visualize all our incoming and outgoing vessel traffic, bringing situational awareness that helps us follow and optimize our berth usage.

Keeping areas tidy is a priority for all ports. To optimize a weekly, biweekly or monthly emptying cycle of waste containers is challenging and thus a not-so-sustainable solution. We have now installed wireless fill level sensors from Caproc Oy in all our waste containers. These sensors work over the LoRaWAN network and hourly transmit fill level, battery status, and temperature data. We can now monitor the use of our waste containers, optimize the emptying cycle basis the filling grade, and avoid costs and emissions connected to unnecessary emptyings.

### REFERENCES

HiQ Finland Oy – frends iPaaS

Caproc Oy – sensors for waste containers

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# STRIVING FOR THE BEST FUNCTIONALITY

## GENERAL

THE PORT OF HELSINKI'S goal is to be a trailblazer in sustainable port operations. Our objective is to make our own operations 100% carbon-neutral by 2030, and to achieve all goals in our carbon neutrality program by 2035. Our aim is to minimize the harmful environmental impacts of port and maritime operations. We have a certified operating system that meets the requirements of ISO 9001, ISO 14001 and ISO 45001 standards.

## EFFICIENCY IN PORT OPERATIONS AND PASSENGER FLOW

To improve the port community's productivity, we develop new digitalized services and implement new technologies. This means improving real-time data flow and enabling a wider supply chain integration between the operators and smart port systems for more efficient vehicle traffic and better predictability of vessel traffic. The port community makes gains in flexibility and efficiency.

With new technologies, the passengers' experience can also be improved. We are adopting the 5G network in our terminals. Helsinki is the busiest passenger port in Europe with a seamless framework for sea traffic to Tallinn and Stockholm.

In 2021, due to the coronavirus, the number of passengers went down to 3.7 million (2019: 12.2M). The Port of Helsinki is also Finland's leading general port for foreign trade. In 2021, the port's total cargo traffic went up to an all time high of 14.4 million tons. In 2021, the turnover of the Port of Helsinki was EUR 68.8 million.

## REFERENCES

Eckerö Line  
Finnlines Oyj  
Finnsteve Oy Ab  
Multi-Link Terminals Ltd Oy  
Oy M. Rauanheimo Ab  
StevecO Oy  
Tallink Silja Oy  
Viking Line Abp

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# SERVING TRADE AND INDUSTRY

## GENERAL

THE PORT OF NAANTALI is one of the crucial TENT-T core Ports in Finland. It has an excellent location along E18 and ScanMed traffic corridor. Rail connection, up to 15.3 meter-deep fairways and quays as well as versatile storage facilities and value-added logistics services result in the port of Naantali being one of the busiest RoRo/Ropax ports for trucks and trailers in Finland. It is also the quickest sea route for ferry cargo between Finland and Sweden via Långnäs (Åland).

## SMART AND GREEN TECHNOLOGIES

### Digital solutions for port operations

- Access control system with cargo unit measurement and IT integrations.
- Digital vessel list including ETA, ETD and, at the berth, information.

### Digital solutions for port infrastructure development and maintenance

- BIM (Building Information 3D Model & Digital Twins) for infrastructure planning, vessel/berth interface design and for predictive maintenance.
- GIS (Geographic Information System) for port facility planning by integrating technical and location data.

### Green and smart technologies

- Automoooring for Ropax vessels
- OPS (Onshore Power Supply) for Ropax vessels

### Energy-efficient LED lightning with a smart adjustment control system for the port area

- Implementation of green energy sources for terminal heating (geothermal heating and solar technologies)

### Green and Smart operations and development

- Solid knowledge of handling renewable solid fuels (i.e., woodchips)
- Continuous improvement towards carbon-neutral port operations
- Member of the **European Hydrogen Ports Network** community, which aims to promote and expand the construction and deployment of hydrogen infrastructure in ports

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## PORT OULU SMARTER.

### GENERAL

The Port of Oulu is the largest general port in the Bothnian Bay. It provides service in the most rapidly growing city in northern Europe. All three harbors of the Port of Oulu–Oritkari, Nuottasaari and Vihreäsaari–are open 24/7, all year round. The Port of Oulu is visited by about 550 ships every year. The most important categories handled are forest-industry products, liquid fuels and forest industry raw materials.

### SMART AND GREEN TECHNOLOGIES

Port of Oulu is developing a new type of data platform by using modern, agile and data-driven tools and techniques. Platform is utilized very dynamically and interactively for sharing port data. Data and information collected makes it possible to analyze operations and make predictions to enable more efficient and environmentally friendly operations in the future. The real-time digital situational picture of the Port of Oulu makes extensive use of both local and visiting transport and operational actors. In addition to area supervision and traffic control, the data generated is used in area planning and optimizing the use of storage fields and berths.

With digital development work, the Port of Oulu gets ready to welcome autonomous modes transport by sea, rail and road in the future.

### REFERENCES

PORT OULU Smarter is developed together with a cooperation network involving customers, operators, partners, authorities and digital developers.

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