Electrification in ports

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95,3 % of Finland's foreign trade is transported by sea through ports

Port Of Helsinki´s Traffic in 2024

One of the Busiest International Passenger Ports in Europe

Liner Traffic
9,4 million
2023: 8,9 million

International Cruise Traffic
139 000
2023: 163 000

Passenger Vehicles and buses
1,43 million
2023: 1,48 million

The Main Port for the Finnish Foreign Trade

Total Traffic
14,0 million tonnes
2023:13,9 million tonnes

Unitized Cargo
12,2 million tonnes
2023: 11,5 million tonnes

Biggest Port of Trucks and Trailers
672 000
2023: 695 000

Remarkable Container Port
444 000 TEU
2023: 452 000 TEU

Import
6,7 million tonnes
2023: 6,3 million tonnes

Export
5,5 million tonnes
2023: 5,2 million tonnes

Challenges of electrification in ports

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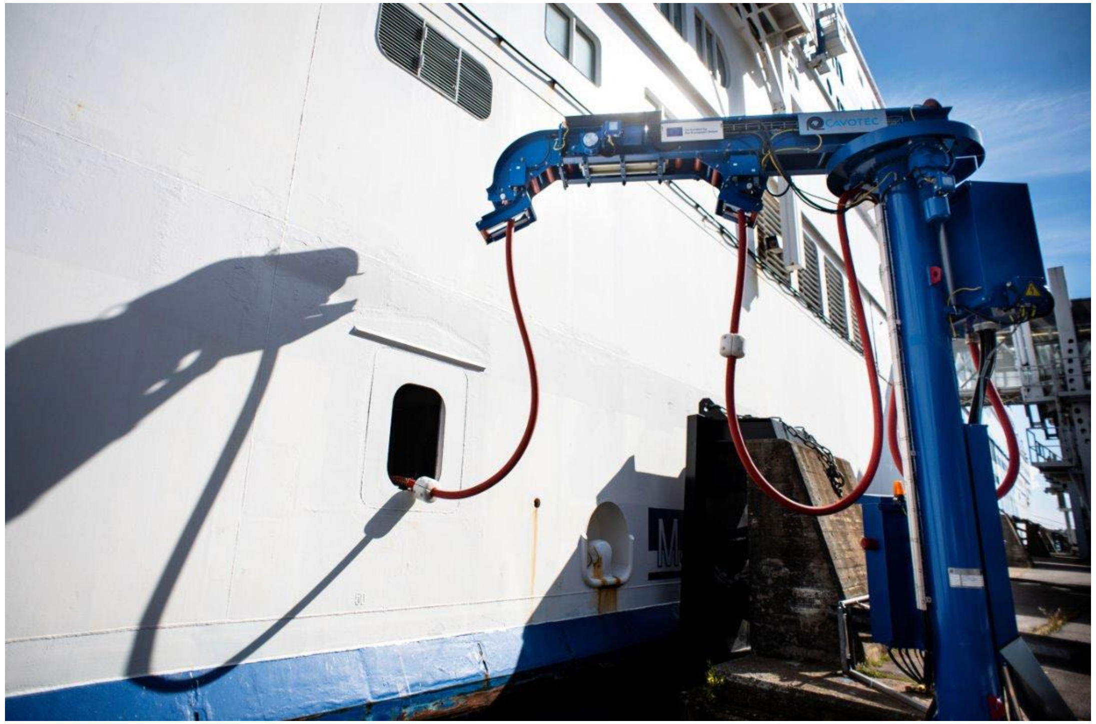
Regulation and market demand

- Fit-for-55
- FuelEU Maritime
- EU Emission Trading system (EU ETS)
- License to operate?



Funding

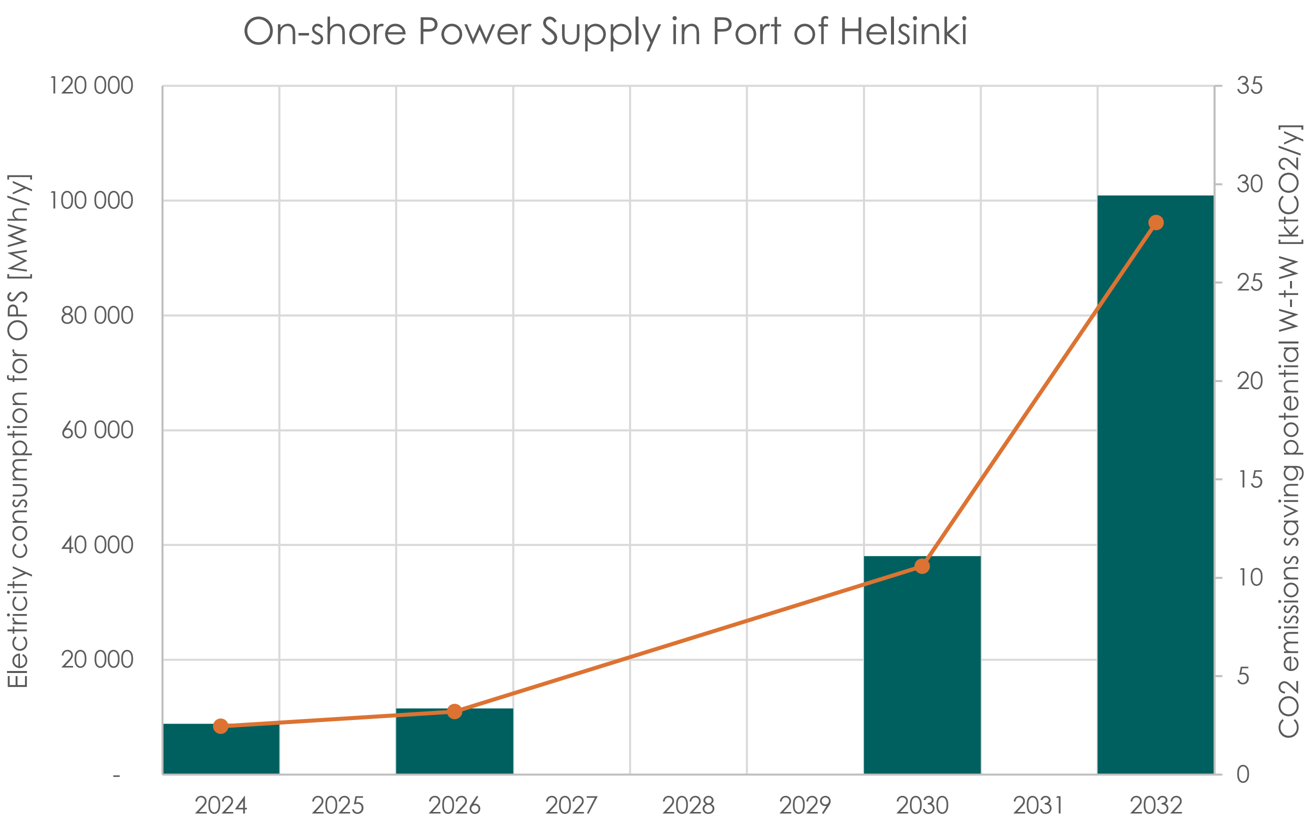
- Individual OPS (Onshore Power Supply for vessels) >1 m€
- OPS-systems serving multiple berths and vessels >10 m€
- EU-funding
- Environmental investment vs. commercial investment?

Operational and technical limitations

- Grid capacity
  - Smallest OPS-connections start from 1MW
- Vessel readiness?
- Standardization?
- Availability of electrified port machinery
  - Electric 4WD port tractors?
- The port sector lacks the flexibility to optimize the timing of electricity usage, making price optimization nearly impossible.

Will ports be energy hubs?

- Electricity consumption in ports will rise dramatically
- Estimated OPS figures:
  - 2024: Actual consumption
  - 2026: Estimate
  - 2030: Fit-for-55 regulation
  - 2032: Fully electric ferry on Helsinki-Tallinn route



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Charging of heavy-duty vehicles at Port of Helsinki

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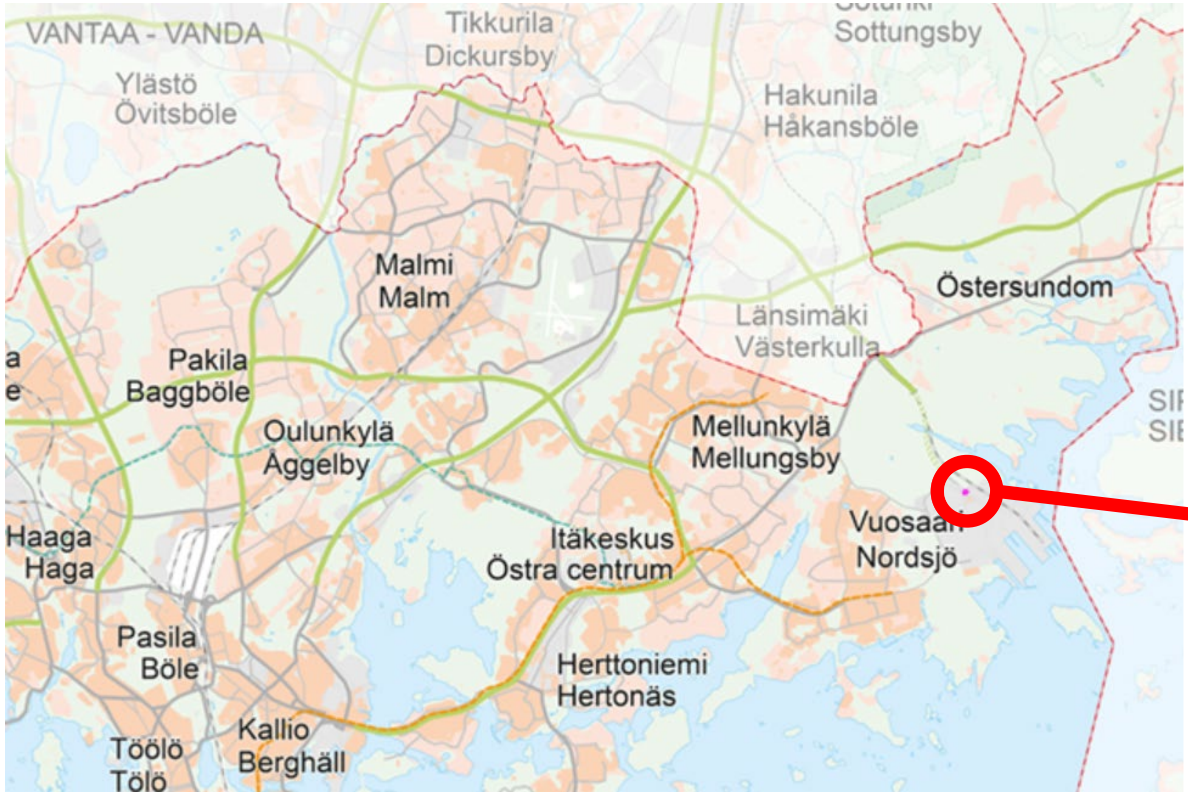
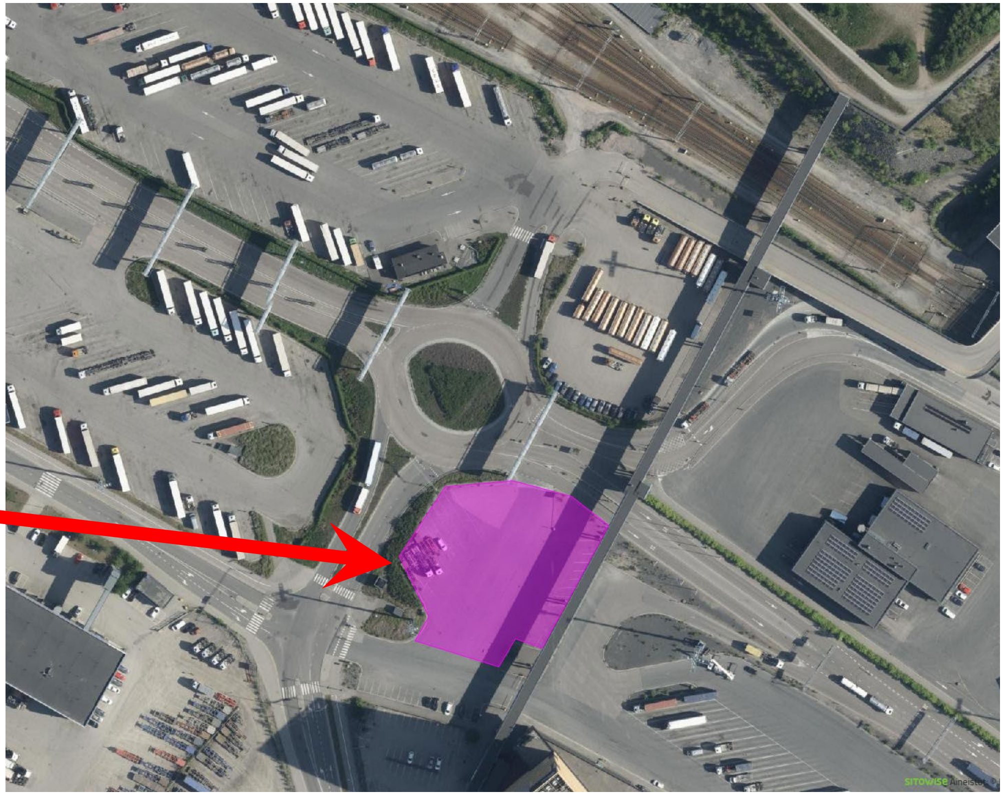
Charging infrastructure for heavy-duty vehicles at Port of Helsinki

- Port of Helsinki recognizes both, **responsibilities and business opportunities** in enabling the charging of heavy-duty vehicles, based on the following factors:
  1) **EU regulatory requirements** for public heavy-duty charging pools (AFIR, TEN-T)
  2) **Political and administrative climate** regarding the roles of different actors in the fulfillment of AFIR objectives
  3) **Port of Helsinki's carbon neutrality program** (Hiilineutraali Helsingin Satama)
  4) **Global and domestic electrification trends** in society, transportation, and port logistics
  5) **Zoning flexibility** → heavy-duty charging infrastructure does not require changes to existing port area zoning
- Port of Helsinki has **recently made a decision-in-principle to establish a heavy-duty charging pool at Vuosaari Harbour,** if at least one operator makes a contractual commitment to regularly charge their trucks at the facility
  - **The first contractually committing partners will be rewarded with special benefits (details provided on the following slides)**

The area reserved for the charging pool





The details on the charging pool

- The area reserved for the planned charging pool is ~3500m^2 and **fully accessible via the public road network**
  - The site can accommodate 3 HCT trucks + multiple truck units & eTrailers charging simultaneously
- A **new grid connection** is available for the charging pool (up to a **4 MW** grid)
- The preliminary roll-out plan for the charging pool is phased in the following way:
  1) **Initial phase:** tendering, permitting and construction of the charging pool
  2) **1st phase (operational):** Deployment of **2 x CCS2** power outputs
  3) **2nd phase (optional, demand-driven):** Expanding to **4 x CCS2** power outputs
  4) **Future phases**: Further expansion of the charging pool on market demand
  - **Option for MCS-charging:** The charging pool can be upgraded with a MCS power output and additional power units if needed

Our offer

- **We seek logistics operators and cargo owners looking for a strategically convenient location to charge electric heavy-duty vehicles in the Helsinki/Uusimaa region, offering reasonable OPEX and zero CAPEX for the charging infrastructure**
- **Benefits offered for the first committed partners include:**
  - Highly competitive kWh pricing (exact rates negotiated based on charging frequency and volume)
  - Option for guaranteed time slots for vehicle charging
  - MCS-charging option, if needed
- **If you are interested in our offer, don’t hesitate contact us!**
  - We are also open to discussing other forms of cooperation regarding heavy-duty vehicle charging within the port area
  - You can find our contact details on the last slide!

Conclusions

- Electrification poses challenges to ports, but it must be done
- Energy is already being sold by ports and within ports
  - Electricity sales will increase by order of magnitude
- Investments are mandatory
  - Ports, Shipping Lines, Port Operators, Hauliers
- Electrification is also an opportunity
- Port of Helsinki would be happy to continue the discussions around heavy-duty vehicle charging at Vuosaari

Thank you! Thoughts, questions?

Contact us:

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