





HOW EVEN MINOR CHANGES CAN INCREASE

ENERGY EFFICIENCY SIGNIFICANTLY



Company Overview



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HHLA - A Leading Port Logistics Company



- Founded in 1976 as subsidiary of HHLA Hamburger Hafen und Logistik AG
- Around 100 experts (incl. subsidiaries, w/o HPC Ukraina), annual turnover in 2011: approx. € 13.4 million
- · Reputation as one of the world's leading consultants in the port sector
- Since 1976 port and transport-related projects in more than 100 countries, both in the private and public sector
- Approx. 1100 projects world-wide with extensive experience in container terminal planning
- Subsidiaries for port training & management (HPTI) and transport solutions (Uniconsult), HPC Ukraina as terminal operator in Odessa (Ukraine)

HPC

Contact





Energy Efficiency



Three main levels to increase energy efficiency







Organisational





Behavioural IDLE-FREE ZONE **TURN ENGINE OFF**

Substitution of diesel powered machines through electrified ones Decreasing CO₂ emissions and air pollution



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What steps have been taken?



Quay Cranes



Horizontal transport



Yard



Few conventional cranes are non-electric

Battery powered automated guided vehicles

LNG powered tractors

Rise of automated stacking cranes Electrification of rubber

tyre gantries (RTGs)

Increase in electrification presently the way operators choose to become greener







- 10 battery powered automated guided vehicles (AGVs) in operation
- Highly efficient
- Powered by green electricity
- Battery weight: 12 tons
- Ready for use in all weather

Biggest fleet of Electric vehicles in European harbours

> 60 Electric vehicles on all harbour terminals in operation



Purely electric driven

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- Speed limited to 30 km/h
- Charge station for every electric vehicle
- Highly efficient
- Powered by green electricity



Solar Energy Container Terminal Tollerort



- On the roof of the maintenance center of Container Terminal Tollerort
- Production of CO₂ free electricity 2014: 116.600 kWh

Technical energy efficiency measures



Modal shift from street to rail

Joint development of specially designed energy efficient rail cars



Technical energy efficiency measures

Efficiency improvement with own rail cars

Lightweight railcars, specially developed for maritime traffic



 More than 10% additional containers on one train, decreasing air pollution, noise and GHG emissions.

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- Less shunting in harbour areas through hub and shuttle system
- 30% lesser weight than traditional railcars

Technical energy efficiency measures

Energy efficient Hybrid straddle carriers 30% less Diesel in last decade



 During last decade reduction of specific diesel consumption by 30% through hybrid technology

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 Diesel/Electric Power train

Seven Levers of Energy Management



Strategic planning

Renewable energy

Diversification of energy sources

Process optimisation

Investment in new technologies Incentives for

employees

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Energy balances

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Conventional

Process optimisation to reduce emissions

Combined loading and discharging improves the energy efficiency





• No move in vain:

Unnecessary empty moves are obsolete

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Current principle:

four moves of quay crane for two boxes

• Future principle:

two moves of quay crane for two boxes

Advantage:

noticeably more throughput in the same amount of time

Process optimisation to reduce emissions

Combined loading and discharging improves the energy efficiency



Process improvement reduces the environmental footprint of operations substantially, but also operational expenditures!

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Process optimisation to reduce movements Optimisation of logistical process – Twin Operation



 Simultaneous transport of two 20' containers reduces the number of empty drives and therefore the diesel consumption and the noise emissions

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• More than 100,000 I diesel saving annually

Reduced light emissions at automated terminals

E.g. Retrofit Automatic Stacking cranes with LED Annual savings > 1.5 GWh by default settings and reduced power consumption

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Strategic planning



- Prioritise risks and opportunities
- Define actions at a strategic level



- Focus resources
- Improve environmental performance

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 Improve environmental efficiency in operations

Energy management system: plan, do, check, act

Plan

- ⇒ Input of energy
- ⇒ Energy performance indicators
- ⇒ Action plans

Do

⇒ Measurements and action plans

Check

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Supervision and measurements of energy consumption processes in conjunction with energy policy

Act

⇒ Continuous improvement

Behavioural energy efficiency measures

Behavioural improvements in cooperation with employees and clients

Rules and regulations

⇒ Idle-free zones for cars, trucks and any kind of equipment

Incentives

⇒ …for employees using carpools, public transport or bicycles





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Vorstandsmitolied

Vorstands mitolied

Commitment by the management

Official commitment paper by the management

Deployment of an sustainability commissioner

- ⇒ Counsellor for environmental questions
- \Rightarrow Appraisal of energy balances for all operational processes
- ⇒ Promotion of sustainability awareness
- ⇒ Behavioural training for employees and interested clients who have an impact on energy consumption

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Adoption of 'green' principles



- Cost reduction
 - Energy reduction
 - Whole life sustainability
 - Operational improvements
- Legislation
 - Compliance
 - Enforcement and fines
- Stakeholder relationships
 - Public image
 - Good neighbours
 - Improvement of clients' energy balances



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Thank You for Your Attention!

