



Good Practices

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Energy management software

1.0 Energy management software

1.1 Description

Intelligent software supports energy consumers (such as port operators) to avoid energy consumption and reduce energy peaks by visualising their consumption. Visualising energy consumption makes it easier to identify (unusually) high consumption levels and helps to find ways to reduce consumption. Subsequently, the impact of these measures can be monitored and controlled. An example of such software used in practice is DashPORT, which can make it possible for ports to reduce energy costs and CO₂ emissions (Niedersachsen Ports, n.d.). Peaks in energy consumption are a main driver of energy costs, so when energy peaks can be prevented, both a significant amount of energy can be saved, and the corresponding energy costs reduced saved (Wuczkowski, M., 2023).

Another initiative which has started is called SHARC (Smart Harbor-Application Renewable Integration Concept). The SHARC project looks at an entire port region with the aim of mapping the energetic landscape of the area to analyse the largest energy consumers within the port area (SHARC Project, n.d.). This project is initiated by Bremenports, together with Bremen University, DFKI (German Research Center for Artificial Intelligence), SIEMENS and the Berlin Technical University.

The second survey which has been disseminated amongst inland port stakeholders shows that most inland port authorities do not yet monitor their own energy consumption. However, the ports that already do this mostly use smart electricity meters to measure energy consumptions on different stations and thus identify the main consumers.

1.2 Specific aim/goal of the energy management software

Avoiding unnecessary energy consumption is an important part of inland ports' journeys to becoming carbon neutral. The overlapping goals of the types of software mentioned above are to search for unnecessary energy consumption and to prevent or at least reduce it. In order to achieve this, all processes and data need to be mapped and collected.

Within Niedersachsen Ports, meters needed to be implemented in the right places within a port's infrastructure and at companies within the port (Wuczkowski, M., 2023). Within the SHARC project, the project team gathers all relevant energy consumption from participants within the port area. The data is not solely limited to electricity consumption, but also heat,

cold and fuel consumption. Two independently developed simulation tools (one by SIEMENS and one by TU Berlin) have been developed to project future scenarios. Certain parameters and assumptions have been made prior to simulating, such as cargo handling numbers and the development of CO₂ prices etc (SHARC Project, n.d.). A few inland port authorities have let us know that the goal is to comply with ISO 50001 regarding energy management.

Parties that have implemented energy management software

- Niedersachsen Ports
- Bremerhaven
- Port of Andernach
- Port of Hamm
- Port of Giurgiulesti
- Port of Seville
- Port of Venlo
- Van Berkel Logistics

Stakeholders

- The port authority decides whether or not to acquire/develop/implement software to track and analyse energy consumption within the port area. They are also responsible for persuading port (handling) companies to implement metres so that their energy consumption can be tracked. Lower energy consumption and lower peaks of energy consumption would decrease the negative external effects, such as CO₂-emissions, and the energy costs.
- Port companies are energy consumers within the port area. To get the complete picture of energy consumption within the port area, (handling) companies within the port area should also install metres that can track their energy consumption.

Voluntary or mandatory measure?

Currently, the DashPORT project phase has been finished. For the inland port, it is voluntary to acquire energy consumption software. However, when a port authority wants to implement a software to measure energy consumption, it would be mandatory for port authority personnel

to use the software to track unusually high energy consumption and avoid/decrease energy consumption where possible.

1.3 Realised/potential impact

Niedersachsen Ports made an estimation based on the DashPORT pilot that around 20% of energy consumption could be saved by tracking it with a system such as DashPORT.

1.4 Possible obstacles when implementing sustainable measures

- Implementing energy management software is an intensive and relatively expensive process at the start. For example, in the case of Niedersachsen Ports, around 400 energy consumption metres needed to be installed to collect data. When installed, the metres need to be finetuned so that errors generated from the infrastructure are resolved.
- To have a large effect on a port level, ideally all organisations active within the port should participate in an initiative which helps to manage the energy usage. It requires quite some effort to participate, and not every company will be willing or able to implement nor join such an initiative.
- All inland ports that have implemented this good practice agreed that it is a difficult measure to implement, as all surveyed ports rate the difficulty of this measure between 7 and 9 and an average of 8 on a scale of 1 (very easy) to 10 (very difficult). The opinions on whether inland ports that have not yet implemented this good practice should make use of it differs greatly and most likely depends on the size of the port and energy consumption.

1.5 Key learnings

- By reducing energy consumption within the port area, the costs related to energy consumption are also being decreased. This way, two aspects are addressed simultaneously.
- As many port companies as possible should join this project and install meters to decrease the energy consumption. It is almost impossible to force all port companies to join a project, so the chances are very high that if a company does not have sustainability high on their agenda, that they would decline to join this project.

• Even if companies do not value sustainability very much, this good practice could reduce energy costs, which can be an incentive for companies to join the good practice.

1.6 Further reading

More information about digital energy management tools will soon be available in one of the published reports of the study: Inventory of digital tools, Task 3.

1.7 Sources

Niedersachsen Ports.n.d.DashPORT, https://www.nports.de/en/sustainability/projects/dashport/. SHARC Project.n.d.Smart Harbor-Application Renewable-Integration Concept, https://sharc-project.de/en/projekt/. Wuczkowski, M., 2023. Interview Niedersachsen Ports 20-11-2023

