

Executive summary

For transitioning to a cleaner and low emission maritime sector, it is essential to increase the number of ships and harbors equipped with shore power installations. With shore power connections, ships can turn off their diesel generators during harbor calls, and instead supply their on-board power demands by renewable shore power. There is also an increasing need to implement shore power connections due to the EU Fit-for-55 package, which will require shore power to be installed by 2030 for certain large vessels. Ports, shipping companies and shipbuilders are very aware of the steps that need to be taken to facilitate a sustainable, reliable and affordable energy supply in their sector as well. However, for certain type of vessels there is a clear need in the market for standardization of ship to shore power connections.

In order to speed up the implementation of shore power connections in the Netherlands, the Dutch Ministry for Infrastructure and Water Management is financing a range of projects, managed by a consortium of the Port Authorities of Rotterdam and Amsterdam, Stena Line, and the Royal Association of Netherlands Shipowners (KNVR). This report entails the results of phase 1 of deelproject 1: an inventory of the existing and missing standards for shore power connections. Besides desk research, the findings are based on 33 expert interviews with stakeholders from port authorities, shipping companies and ship yards, as well as standardization experts.

The results show that for some segments the standardization is already well developed and accepted in the market. For vessels with a power demand above 1 MVA, with high voltage connections, the existing IEC standard is sufficient and made mandatory within the EU. This counts for container vessels, Roll-on-Roll-off (RoRo) vessels, and cruise ships. However, for tankers and LNG carriers, further specification is needed. For inland shipping most stakeholders agree that with the Powerlock a common connection standard is used for connection above 125A. Similarly, for vessels with a small power demand, with connections of less than 125 A, most stakeholders do not see any issues with the standards for shore power connection. Here, simple CEE plugs are used and the installation is not very complex..

However, for vessels that require a low voltage (LV) connection of more than 125 A (but with power demand below 1 MVA), the standards are not clear. While for this segment a IEC pre-standard exists that is currently being developed into a standard, as of now, many stakeholders are unsure what kind of specifications to use for shore power installations in this segment. This results in the fact that for example shipping companies are waiting to install connections, until either a standard is developed, or until the harbors decide on certain specifications. There is also a potential risk of proliferation of various non-compatible solutions. Shore power connections that have been installed in this segment so far are usually implemented at dedicated terminals.

In order to accelerate the uptake of shore power connections, it is essential to speed up and facilitate the process of standardization, especially in the LV segment (>1 MVA). This includes to support and influence the work of the IEC working group, as well as to strengthen the national Dutch IEC commission (NEN NEC 18). Furthermore, large harbors such as the Port of Rotterdam can take a leading role by moving ahead with the development of shore power projects that are in line with the already known aspects of the new IEC standard. This way, they can influence and manifest the most relevant aspects of the standard.

At the same time, there are also limitations as to what standardization can achieve. There is always an analysis needed of the fleet of vessels that moor at a certain terminal, based on which decisions on voltage levels and power supply can be made. Finally, it is very important to note that implementing a standard for LV connections is not just a matter of making technical choices. Important decisions of a strategic-political nature also need to be taken. These decisions concern, among other things, who is going to make which investments for the connections on both shore and ship side.