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Shore-to-ship power supply integrating conventional and distributed generators along with storage

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The need for reduction of pollution when ships are in port requires the use of a shore-to-ship power system for supplying energy to the onboard grid. The latter is normally fed at 60Hz, so a frequency conversion is needed. Power can be taken from the public power grid available on shore. In order to reduce the environmental impact, this power system can be integrated with local, distributed generators that produce energy from renewable sources. Energy storage can also be added in order to smooth power peak demand and production from not programmable generators. The paper shows a system built around an Energy Box that manages the duty of all the power source in parallel and provides the frequency conversion. A parallel on dc or on ac side is considered, according to the power installed in a wide range from few MW up to 20 MW. The Energy Box is controlled by its own Power and Energy Management system in order to get the best efficiency and lower energy cost, along with a strong reduction of emissions. An example of this technology is also shown.

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