Clean Maritime Policy Unit

POLICY BULLETIN

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Floating Solar Power for Maritime Decarbonisation

Decarbonisation at seaports is constrained by limited land availability, grid capacity, and infrastructure. This bulletin summarises research assessing the potential for floating solar power (FSP) systems to provide renewable electricity for port operations and vessel charging.

FSP systems e.g. Floating Photovoltaic (FPV) offer potential by utilising underused marine space while generating low-carbon electricity close to demand. In this study several deployment scenarios of FPV were analysed considering energy generation, storage requirements, lifecycle emissions, and economic performance and across different system configurations for a UK ferry port.

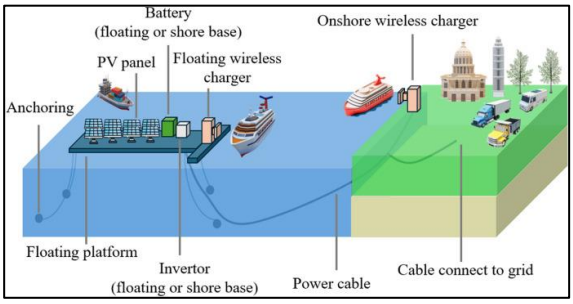

Figure. Illustration of the FPV plant, onshore and floating wireless charging station in a ferry port

KEY FINDINGS

Installing FSP systems at seaports:

- Can reduce reliance on grid electricity and fossil-based fuels
- Lower energy storage requirements and improve system efficiency, supporting more stable energy supply
- Payback periods are relatively short c.3–4 years under favourable conditions
- Emissions reductions are significant compared to conventional diesel-based energy systems (on a whole life cycle basis)
- With wireless charging infrastructure FSP provides a scalable pathway to electrifying vessels, particularly ferries and short-sea shipping.

Overall, floating solar can provide a viable, port-based renewable energy solution, contributing to maritime decarbonisation while overcoming land and infrastructure constraints.

POLICY IMPLICATIONS

Deploying FSP systems such as FPV require coordinated policy support across energy and transport systems.

Key suggestions for Department of Transport and Department of Energy Security & Net Zero include:

- Financial support and long-term policy certainty to encourage pilot and large-scale deployment of floating solar in ports and nearshore environments.
- Financial support for the integration of renewable generation with vessel charging infrastructure, including batteries and emerging charging technologies.
- Address regulatory and planning frameworks for offshore and port-based FPV deployment, including marine spatial planning and environmental assessment.

Financial support and policy mechanisms can accelerate the adoption of FSP technologies, wider electrification of the maritime sector and contribute to the UK's net zero emissions target.

RESEARCH PUBLICATIONS

Qin, Q., Adeboye, L., Aliyu Ibrahim, K., Luk, P., Xie, Y., Verdin, P., Luo, Z., Huang, L. (2025). *Techno-economic and environmental assessment of floating solar power with innovative charging systems for decarbonizing maritime operations in the UK*. Renewable Energy. https://doi.org/10.1016/j.renene.2025.124398

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