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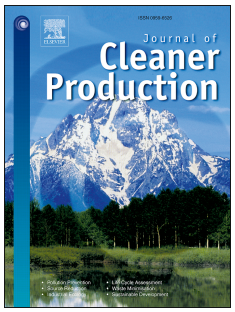

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Socio-ecological transitions toward low-carbon port cities: trends, changes and adaptation processes in Asia and Europe

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Abstract: Industrial port cities are essential components in a society dependant on fossil fuels and low cost energy. In the global move towards a low-carbon society, industrial port cities are emblematic of complex and integrated socio-ecological systems, which are experiencing transition processes related to interactions between bio-geo-physical components and governance. Using a socio-ecological system framework, this article provides insights into innovative regional eco-industrial development strategies for moving toward a low-carbon future in industrial port areas. Based on three case studies (Marseille-Fos in France, Ningbo in China, and Ulsan in South Korea), our analysis focuses on the changing relationships between energy, land cover, time use, and governance. The historical socio-ecological transition of industrial port cities is described as a stepwise process of spatial and functional disconnection/connection of port industrial complexes, which decouple/combine the port city's metabolism from local resources. We highlight the impacts of globalization on port-city socio-ecological trends, describing the effects of the integration of port cities into global economic processes, the impact of global awareness on global environmental changes, and the accelerating pace of change. We compare low-carbon strategies, revealing similarities in terms of conversion toward low carbon sources and growing connectedness and functional diversity of port-industrial systems.

Key-words: Industrial ecology; industrial symbiosis; energy; port-city interface; socio-ecological transition; Asia-Europe comparison

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