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## Systemic weaknesses in the European offshore innovation system- Opportunities for policy and strategy

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### Abstract

One of the challenges for EU in reducing the threat of climate change is to transform the energy sector into a 'low carbon' one in less than three decades. This is an immense challenge. One of the technologies that may contribute to realizing this challenge is offshore wind energy. The technological advantage of offshore wind energy is the large potential due to high wind speeds, large available area, and much higher societal acceptance than onshore wind. Technological disadvantages are the current high costs of offshore wind, significant technological barriers that need to be overcome in order to increase reliability and bring down the costs and additional infrastructures that need to be put in place to connect the offshore wind parks to onshore electricity grids. To overcome these technological bottlenecks and to live up to the technological potential, a well functioning innovation system is necessary. The *purpose* of this paper is to analyse the current state of the European Technological Innovation System (TIS) for offshore wind power and specify current and anticipated system weaknesses, weaknesses that may guide policy intervention and business strategy. Tentatively, the processes 'influence on the direction of search', 'entrepreneurial experimentation' and 'knowledge development and diffusion' are well advanced; there are powerful factors directing firms' attention to the system, many actors are entering along the whole value chain conducting numerous experiments with different designs, and many universities/research institutes are working with development/diffusion of new knowledge. However, several barriers remain and must be overcome in order to realize the potential of offshore wind power. These system weaknesses are primarily related to three relatively weak functions; legitimation, market formation and resource mobilization where the latter includes not only access to specialized competences but also financial capital and grid infrastructure. Policy intervention must be guided towards removing the system weaknesses that make these processes weak. The paper identifies these weaknesses and discusses the associated policy and strategy challenges.