

Doctoral Thesis Review – *Anmeldelse av doktoravhandling*

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Afewerki Samson. 2019. *Global Production Networks and Industrial Restructuring: Unpacking the Emerging Offshore Wind Industry*. Doctoral theses at NTNU, 2019: 214. Norwegian University of Science and Technology, Faculty of Social Sciences and Teacher Education, Department of Geography, Trondheim. 109 pp. + Articles. ISBN 978-82-326-4024-9 (printed version), ISBN 978-82-326-4025-6 (electronic version).

The thesis investigates global production networks and industrial restructuring, focusing on the offshore wind industry. It consists of two main parts. The first is a summarizing part (Part 1) consisting of five chapters: (1) Introduction, (2) Theoretical background, (3) Research design and methodology, (4) Empirical background, and (5) Contributions, conclusions and outlook. It provides a comprehensive overview and documents the coherence of the thesis. Part 2 consists of three papers:

Paper 1: Afewerki, S., Karlsen, A. & MacKinnon, D. 2018. Configuration floating production networks: A case study of a new offshore wind technology across two oil and gas economies. *Norsk Geografisk Tidsskrift–Norwegian Journal of Geography* 73, 4–15.

Paper 2. Afewerki, S. 2019. Firm agency and global production network dynamics. *European Planning Studies* 27, 1483–1502.

Paper 3. Afewerki, S. From production to innovation networks? New path creation through strategic coupling: towards the role of technological innovation networks. (under review)

The introduction to Part 1 of Afewerki's thesis effectively sets the scene for the reader by outlining the central premises of the research, especially in terms of its conceptual scope. The aim is to develop a deeper understanding of industrial organization in the context of global production networks (GPNs) and their transformations over time. This main research objective is then broken down into three more specific research questions that each address important and interlinked aspects of renewable energy industry evolution, its main drivers and actors, and implications

for economic and spatial development. To achieve this, Afewerki draws on and brings together two influential bodies of work on evolutionary economic geography (EEG) and GPNs. To these concepts, he adds the literature on materiality of natural resources and its role for the geographies and organizational configurations of resource-based GPNs.

The most novel aspect of Afewerki's theoretical framework is the integration of materiality into the political-economic EEG-GPN approaches. This is not easy to achieve, given the epistemological (and potentially ontological) differences between these approaches, and while there are clear signs of how such an integration might work in Afewerki's discussion, more reflection on this would have improved the development of the conceptual framework.

Throughout the highly competently developed theoretical discussion, Afewerki shows a great awareness of extant and relevant literatures, as well as their respective strengths and weaknesses, in explaining transformation and change of industrial systems such as renewable energy production in the form of offshore wind farms. In particular, the role played by the state as an important actor in developing the offshore wind industry is rightly highlighted.

The research philosophy adopted for the thesis is critical realism. This seems apt in the context of the topic and the methods used to investigate global production networks, industrial restructuring and regional development. More specifically, the aim of the thesis, which is to understand organization and change over time, lends itself to a research philosophy that puts emphasis on causal explanation and the mechanisms that create observed outcomes.

Afewerki conducted semi-structured interviews with relevant stakeholders, a strategy that is useful and commonly applied to uncover the strategies of actors and their interpretations of industrial structure, development and change. He is clearly familiar with the possibilities and limits of interviewing elites to generate new knowledge, and overall his method is well justified. Lastly, Part 1 of the thesis provides an overview of the offshore wind industry, in order to contextualize the chosen case studies in Norway, the UK (Scotland) and France (Brittany).

In sum, Part 1 of the thesis is a coherent piece of work that succeeds in framing and contextualizing the three

subsequent academic journal articles. It demonstrates a high academic standard and makes a welcome contribution to knowledge in the field of research on renewable energy, industrial restructuring and spatial development.

The first article in Part 2 of the thesis (Paper 1) is a case study of the development of the Hywind floating offshore wind project off the coast of Scotland. The global production network (GPN) approach is used as the theoretical framework and the aim of the article is to shed light on key drivers and core GPN actors for the successful implementation of the technology project. The authors investigate both an ‘inside-out’ and an ‘outside-in’ perspective, the former referring to the efforts of a lead firm (i.e. the Norwegian company Statoil, now Equinor) in expanding into overseas markets and the latter referring to the efforts of the host country (i.e. Scotland) to attract this investment.

The authors observe that Statoil was attracted to developing the floating wind park off Scotland’s coast due to the availability of generous public financial support from Scottish authorities and the access to a national grid system. The benefit for the host country has been relatively minor, due to a weak Scottish supply sector and the fact that the use of a floating technology (compared with fixed-bottom technology) reduces the significance of physical proximity between technology testing and development and the deployment site for the floating wind park. It is clear that the lead firm (Statoil) has had the upper hand in the development process and this is explained by characteristics of the industry structure of the host country. Theoretically, the article adds to the literature with its focus on the materiality-spatiality nexus and by illustrating how the distinct materiality of floating wind park technology can play an enabling role in fostering spatially extensive production networks.

Paper 2 presents an in-depth analysis of Ørsted, a Danish multinational energy company, as a lead firm in the offshore wind industry. Theoretically, it draws on Global production network (GPN) 2.0, the dynamic capabilities view (DCV) and EEG perspectives. Empirically, it investigates Ørsted’s diversification from a solely oil and gas oriented company to include offshore wind. Afewerki argues that this development is driven by both extra-firm dynamics and intra-firm practices and strategies. The extra-firm dynamics are linked to both the Danish government support schemes for the introduction of renewable energy and unfavourable business conditions within the oil and gas sector. Intra-firm dynamics are how the lead firm Ørsted enhances its capabilities and minimizes costs through recombination of organizational assets and reconfiguration of its network and strategic alliances. The transformation of the firm has been successful, and in 2018 Ørsted was officially a global leader in the offshore wind industry, with 26% installed global capacity.


Afewerki argues that his analyses respond to GPN 2.0’s call for opening the ‘black box’ of firms and further conceptualizing of the intra-firm practices of lead firms. His analyses also give a more convincing understanding of the capabilities, strategies and strengths of the lead firm than in Paper 1. A further novelty of this well-structured article is how the author includes the DVC perspective in order to capture the evolutionary dynamics of lead firm development.


In Paper 3, Afewerki investigates floating wind power technology development in Brittany, France. He focuses specifically on one pilot park (Groix & Belle-Ile), a floating wind power park that will be commissioned in 2020. Theoretically, the paper is based on the geographical political economic (GPE) approach and analyses how the multiscalar, heterogeneous economic and non-economic actor networks and materiality shape the development of a new regional technological path in the studied region. How this plays out in a specific territorial context is approached through the concept of technological innovation network (TIN).

Paper 3 is an interesting analysis of how a new technology path is situated in a multiscalar and multi-agency context. It also gives a detailed insight into the interdependency of the national and regional policy levels in processes of green technology development and implementation. Theoretically, it is ambitious and is intended to contribute to different streams of literature. Paper 3’s originality lies in how Afewerki uses GPN as an ontological basis to develop the context-specific concept of TIN (i.e. production and/or the generation (innovation) of a specific technology).

In sum, Afewerki has produced an interesting and relevant thesis of good quality. The results and conclusions are clear and make interesting contributions to the academic field of economic geography.

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