# Potentials of the Sharing Economy for the Electricity Sector regarding Private Capital Involvement and Decarbonisation

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## Overview

The political and societal will to limit the increase of the global average temperature has induced massive changes to the European electricity sector. Although the first steps towards the decarbonisation of the sector have been implemented and led to promising results, further efforts are needed to achieve the central objective of the Paris Agreement. In order to succeed in the long term expansive and additional strategies are required that support the necessary change of the fundamental structures of the European electricity sector.

A major pillar of the decarbonisation of the electricity sector is the steep increase of the share of renewable energies in gross final electricity consumption. In contrast to the so far predominant central and mostly fossil power plants, many renewable technologies implicate a shift to decentral structures.

The trend to decentralise economic activities can be observed in other sectors as well and there often belongs to approaches form the sharing economy. Besides rather strict definitions of the term that limit sharing economy to peer-to-peer, platform based, non-profit transactions, many profitable business models have emerged (e.g. AirBnB in the hospitality sector and Uber in the transportation sector). These business models incorporate a high involvement of private capital by exploiting idle capacities (e.g. cars) owned by private citizens. Many authors argue that the utilization of idle capacities is furthermore the major reason for environmental benefits associated with sharing economy. Nevertheless, the actual environmental benefits achieved by approaches from the sharing economy are still subject to research (amongst others due to rebound effects).

Our analyses address approaches from the sharing economy in the electricity sector and contribute to the following questions:

- What are main drivers and barriers for increased private capital involvement through approaches from the sharing economy in the electricity sector?
- Which of these drivers and barriers are important for a simultaneous reduction of carbon emissions?

## Methods

Due to the hype of the sharing economy a quick increase of commercial and non-commercial sharing activities in practice have been observed. Many of these practical activities widened the scope of the definitions for sharing economy developed by scholars. Recent scientific works thus focused on the development of frameworks instead of strict definitions for sharing economy in different contexts (see e.g. (Nußholz, 2017) and (Ritter and Schanz, 2019)). With regard to sustainability and especially the environmental impacts of sharing approaches the works of (Heinrichs, 2013), (Daunorienė *et al.*, 2015), (Martin *et al.*, 2017), (Acquier *et al.*, 2017), (Plewnia and Guenther, 2018) and (Curtis and Lehner, 2019) are of importance. In addition, (Butenko, 2016), (Plewnia, 2019) and (Tietze, 2019) address conceptual questions of sharing approaches in the energy respectively electricity sector.

Drawing on these and further works, we analyse selected cases of sharing economy in the electricity sector to derive our results. In a first step we determine to which extend successful sharing approaches with significant involvement of private capital in the electricity sector fit into the frameworks developed by scholars. Secondly, we use these results, the developed frameworks and the works concerning sharing economy in the electricity sector to derive drivers and barriers for increased private capital involvement. During the third step we deepen the analyses regarding increased private capital involvement with regard to impacts on carbon emissions.

## Results

First findings concern the fit of sharing economy frameworks and the specific characteristic of the electricity sector and electricity itself. The collaborative use of capacities represents the traditional pattern of central power plants supplying numerous customers - but this can hardly be considered as approach belonging to the sharing economy. Furthermore, electricity cannot be shared itself as it is consumed indirectly via energy services. Due to individual consumption patterns for these services rather the energy appliance than the electricity use itself will be shared (and thus the amount of electricity used remains the same). A solution to this is to apply the sharing approach at an earlier stage of the value chain, as for example generation capacities to produce electricity can be the item shared.

Sharing approaches within the electricity sector involving private capital often focus on renewable energies. The fit of the decentralised structure of renewable electricity generation to the principles of the sharing economy is one of the drivers for private capital involvement we derive from our analyses. An exemplary driver with regard to reduced carbon emissions is an increased exploitation of the renewable capacities by shared consumption. The possibility of smoothening individual load patterns by aggregating the demand of several consumers constitutes furthermore an example for a driver to reduce carbon emissions. By sharing the supply from a decentralised generation unit less total capacity is needed and the emissions in the production phase are reduced. Electricity storages and especially their sharing thus are of major importance with regard to the reduction of carbon emissions.

## Conclusions

Sharing approaches within the electricity sector assist the increase of private capital involvement. Sharing approaches comprising renewable electricity generation technologies are of special interest as they fit well to the general ideas of the sharing economy and in addition support the reduction of carbon emissions.
Policy implications of the above findings will be further discussed in the presentation.

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