Design of grid tariffs in electricity systems with variable renewable energy and power to heat - DTU Orbit (09/11/2017)

Design of grid tariffs in electricity systems with variable renewable energy and power to heat

Large shares of variable renewable energy (VRE), requires flexibility solutions are developed. Considerable flexibility potentials exist from large consumers, e.g. power-to-heat (P2H) in district heating (DH). However, the existing grid tariffs obliterate the price signals from the wholesale electricity market and diminish the business cases for these technologies by increasing the costs of their electricity consumption. With the present tariff structure, only a very small part of the flexibility potential is deployed or operated flexible. In this paper we compare two different grid tariff designs that facilitate more flexible energy demand of DH operators. This is illustrated by a case study of Denmark that clearly demonstrates that the introduction of innovative tariffs will improve the business case for flexible P2H technologies and increase the value of VRE. In this way larger flexibility potentials can be induced and larger shares of VRE become integrated in the energy systems.

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