

Track 2 - The smart energy system transition in cities and regions

Title of the proposed paper

Energy autarchy vs. power neutrality - differences and main implications for municipalities planning their future energy supply and infrastructure

Name author

Dr. Stefan Nykamp

Affiliation author

Westnetz GmbH, Germany

E-mail address author

stefan.nykamp@westnetz.de

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Text abstract (max. 300 words)

In recent years, several municipalities and administrative districts have introduced political initiatives to reach "energy autarchy", often supported through public funding. However, usually not the entire energy system is taken into account but only the introduction of power generation out of renewable energy systems is fostered. A further important fact is that "autarchy" in this context is not appropriately used. The "time" aspect is not considered in such initiatives so that further local power generation is fostered, but adaption of power consumption or introduction and operation of storage is not taken into account and the so called fit-and-forget approach for fluctuating power generation is still implemented. Hence, only the sum of power generation and consumption over a long time interval (usually one year) is considered for calculating the autarchy fraction.

This paper focuses on the practical implications resulting from such an approach. For this, a German administrative district is analyzed with respect to the power consumption/generation profiles given at the connected high-voltage power lines leading in/out of that district. Based on these real-world data and the aspired energy objectives, the future requirements for such high-voltage lines can be projected. It is shown that such an understanding of autarchy leads to significantly increased needs for corresponding high voltage lines to other regions - contradicting with the origin definition of autarchy. This paper highlights the need for considering storage and adaption of consumption for the increase of the fraction of renewable power generation, also on a local level. Otherwise and when not taken these "time aspects" into account, an increase of the autarchy of regions (here with the focus on the power section) is not possible and even deceptive.