

Climate Protection Potentials of Digitalized Production Processes: Microeconomic Evidence?

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Abstract

Although information and communication technologies (ICT) consume energy themselves, they are considered to have the potential to improve overall energy efficiency within economic sectors. While previous empirical evidence is based on aggregated data, this is the first large-scale empirical study on the relationship between ICT and energy efficiency at the firm level. For this purpose, we employ administrative panel data on 28,734 manufacturing firms from German Statistical Offices of the Federation and the Federal States collected between 2009 and 2017. Using software capital intensity as an indicator for the firm-level degree of digitalization, we analyze whether an increase thereof relates to energy efficiency improvements. Results confirm the statistically significant negative link between software capital and energy use. However, the relationship is highly inelastic and does not suggest economic relevance. Therefore, we conclude that effects of ICT on energy use are not large enough to substantially improve energy efficiency.

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