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Adaption of the Danish Farm Sector to a GHG-tax

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Abstract

This analysis investigates how a carbon tax of DKK 750 per tonne CO2e will contribute to the transition of the Danish agricultural sector towards more climate friendly activities. The analysis is based on farm-level account financial data and calculations of greenhouse gas emissions for about 1,400 Danish farms in combination with known technical abatement measures for reducing greenhouse gas emissions. Results shows that a tax of DKK 750 per tonne of CO2e reduces 2030 emissions by around 45 percent compared to 1990 levels when existing technical abatement measures are considered. Around half of the reductions are expected to be achieved through increased carbon sequestration and storage. The analysis further demonstrates that, after the introduction of a carbon tax, the number of farms with negative net income increases from around 25 percent to 45 percent. Especially, cattle farms are affected by the tax. The emissions reduction is, not sufficient to meet the sector's 2030 target of 55-65 percent emissions reductions. This indicate that structural changes and innovation will be necessary for the sector's long-term transition. However, a tax of DKK 750 per tonne of CO_2e will encourage structural changes in agriculture and accelerate innovation and implementation of new low-carbon technologies and farming practices, which implies that the carbon tax might ensure that the expected reductions can be achieved in 2030. Increasing the tax level to DKK 1,500 per tonne CO2e will not lead to a significant increase in the implementation of technical abatement measures, since there are few cost-attractive options available, but will accelerate incentives for structural changes and innovation. Supplementary policies such as subsidies can be introduced to mitigate the negative effects on farm income. Such policies, however, risk lowering the incentive to mitigate emissions or creating lock-in effects.