Taxation as an instrument to reach the EU 2020 Target within Agriculture ?

Jacobsen, Brian Højland; Dubgaard, Alex; Nissen, Carsten Junker

Publication date:
2009

Document version
Publisher's PDF, also known as Version of record

Citation for published version (APA):
Jacobsen, B. H., Dubgaard, A., & Nissen, C. J. (2009). *Taxation as an instrument to reach the EU 2020 Target within Agriculture ?*. Poster session presented at IARU International Scientific Conference on Climate Change, København, Denmark.

Will Danish Agriculture be able to reduce CO₂ emissions by 20% before 2020?

By Senior Researcher Brian H. Jacobsen (brian@foi.dk), Head of Division Alex Dubgaard (adu@life.ku.dk) and Research Assistant Carsten J. Nissen (cjun@foi.dk)

Abstract

The EU target requires a reduction of CO₂ emissions by 20% before 2020 and that will be a difficult task for Danish Agriculture. The main measures for achieving this are likely to be more wetlands, increased use of biogas and change in the feeding of dairy cows. The instruments used could include a levy on the emissions at the farm level in order to obtain the most cost-efficient reduction.

Introduction

In January 2008 the EU commission presented a Climate Package which intends to reduce CO₂ emissions from the non quota areas by at least 20% in by 2020 compared to 2005.

Denmark

The total emissions in Denmark are 68 million tonne CO₂ equivalents. The reduction target under the Kyoto protocol is 21% from 1990 to 2010, but the likely reduction is only 4%.

Today 44% of the emissions are regulated through the EU quota system. Transport and Agriculture are the largest sectors outside the quota system with 21% and 17% of the total emissions.

CO₂ emissions in Denmark in 2010

Agriculture

Agriculture is the main emitter of nitrous gasses and methane. Most of the emissions are related to animals. The emissions of CO₂ through direct energy use is limited (10%). The total emission in 2010 is expected to be 10 million tonne CO₂ equivalents.

CO₂ emissions from Danish Agriculture are expected to decrease by 25% from 1990 to 2010.

The EU proposal requires a 13 million tonne CO₂ reduction in Denmark. If Agriculture has to reduce the same share as other non-quota sectors, like housing and transport, they have to reduce emissions by 3 million tonne CO₂.

Type of Green House Gas emissions in Danish Agriculture in 2010

A tax per cow is not cost-efficient

Can it be done?

The possible measures are :

- Energy related measures
- Area related measures
- Livestock related measures

Energy

Agriculture contributes through biomass, 3% of the total Danish energy use. The share could be closer to 10% if products like straw and slurry were utilised more.

Production of biogas reduces the emissions of methane from manure storage and the energy produced replaces fossil fuels. At present , 4% of the animal manure is used in Biogas plants. Utilising the economic potential would reduce emissions by 0.8 million tonne CO₂.

An alternative is to grow energy crops like willow which can be used in combined power and heating plants. This is especially relevant on marginal land. The economic potential for this is 1.2 million tonne CO₂.

Area related measures

The creation of wetlands will have a potential of 0.3 million tonne CO₂. Also, the fulfillment of the EU Water Framework Directive might require 50.000 ha (2%) taken out of production. The area could then serve a dual purpose.

Removing carbon dioxide from the atmosphere is known as carbon sequestration. It is included in the Kyoto calculations, but not yet in the EU target principle. Without this effect , many of the area related measures will not be as cost-effective.

Livestock measures

Increasing the use of fat in the feed ration to dairy cows will reduce the emissions of methane by 15%. The reduction could be 0.3 million tonne CO₂. Combined with biogas this will reduce the emissions considerably.

Also reduced tillage or zero tillage is a way forward and the costs are low, as shown below.

TAX on CO₂ emissions from the farm

A tax per cow (a burp and farting tax ☹️) is not a very cost-efficient instrument as this will not provide incentives to a cost efficient adaptation. It is more efficient to impose a tax on the emissions at the farm level allowing individual adaptations.

The calculation of emissions could be based on standard emissions per cow based on the farm system and the feeding practice used. The tax should not be higher than the benchmark. The benchmark price used in Denmark is 30 € per tonne CO₂ for the 2013-2020 period.

Future

A cost effective implementation implies that the cheapest measures are implemented.

It is not clear where the cheapest measures are in the non-quota sectors. The results will direct the reduction required in Agriculture.

Much is gained from implementing measures which have a dual purpose as is the case with the creation of wetlands.

A large effort is required if Danish Agriculture are to reduce CO₂ emissions by 3 million tonne by 2020.

References

Dubgaard, Alex, Kurt Hjort-Gregersen, Carsten J. Nissen, Hanne L. Jespersen og Morten Gylling (2008). Cost of measures to reduce Greenhouse Gas Emissions from Danish Agriculture, Agriculture and Climate – Part II, pp. 61-146. Ministry of Agriculture, December 2008. (in Danish)

IPCC (2007). Climate Change Impacts, Adaptation and Vulnerability. Working Group II and III.

Olesen, Jørgen E. (2008): Measures to reduce Greenhouse Gas Emissions from Danish Agriculture, Agriculture and Climate - Part I, pp. 31-59. Ministry of Agriculture, December 2008. (in Danish)