Emissions trading for agriculture

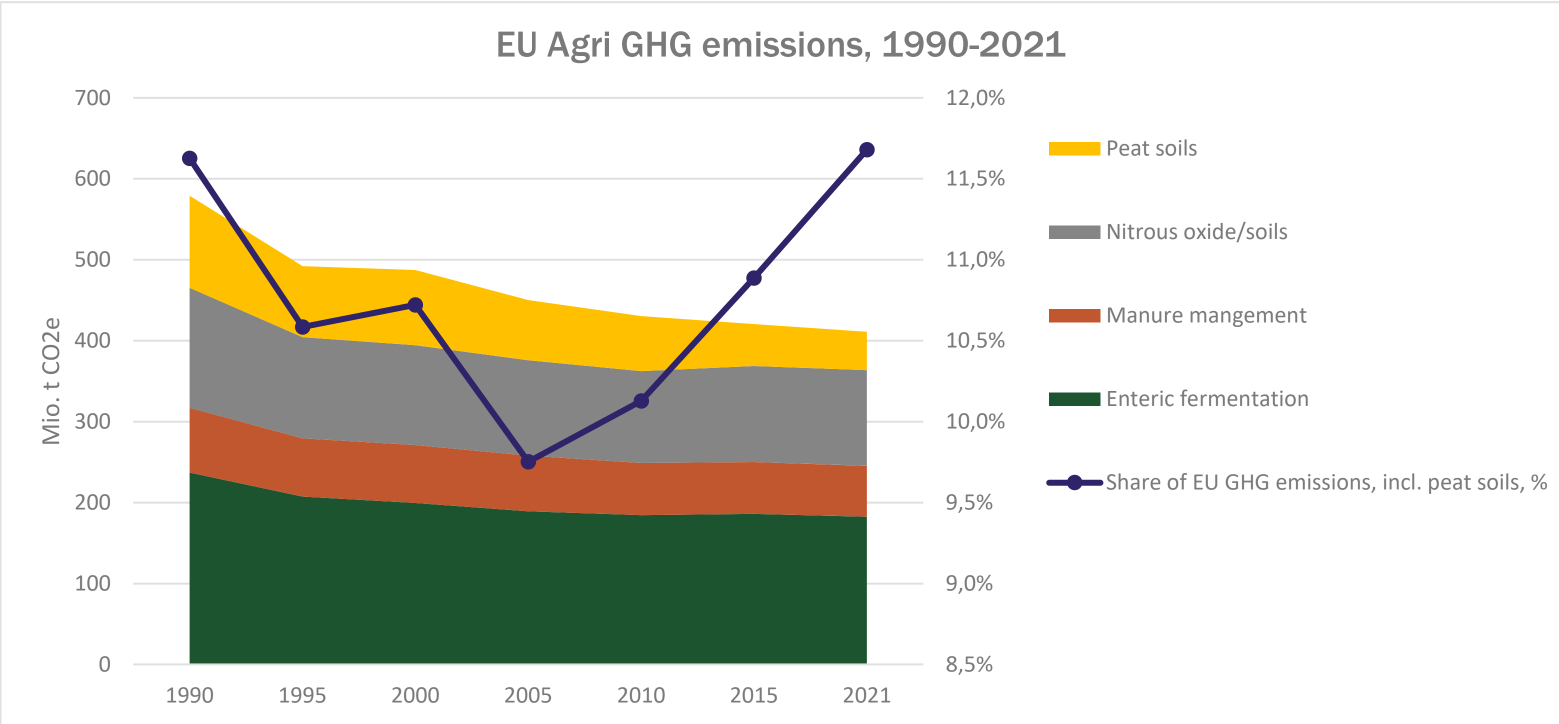
Green Transition Denmark – Position paper

Problem & context:

EU emissions from primary agriculture comprise around 12 % of total EU Greenhouse Gas (GHG) emissions - including emissions from drained organic soils, of which a large majority is an integral part agricultural land and production. Most agricultural products are standard commodities facing stiff price competition. Yet, there are no joint sectoral EU regulations of these emissions in the EU, and they have only been regulated by national reduction obligations under the Effort Sharing and LULUCF Regulations. But Member States have only adopted very few national climate regulations for emissions from the sector – reportedly, most have even exempted the sector from the EU minimum tax on oil. Member States normally justify this by referring to risks of carbon leakage in the very competitive markets for agricultural products.

Consequently, non-CO_2 emissions from enteric fermentation, manure management and nitrous oxide formation from nitrogen applied to soils have remained almost stable since 2005, whereas emissions from peat soils kept declining. The situation is illustrated by figure 1. The figure does not contain emissions from fossil energy use in agriculture, as precise figures are hard to find. These emissions could amount to additional 50 Mio. t CO_2e in 2021. Moreover, Member State projections for 2030 expect no reductions in agricultural emissions from present levels.[i]

Figure 1: EU agricultural emissions 1990-2021



Note: "Peat soil" emissions are net of removals in mineral soils

Source: EEA Greenhouse gas data viewer

Green Transition Denmark
Address: Kompagnistræde 22, 1208 Copenhagen

Convincing case for extending emissions trading to agricultural emissions in the EU

Green Transition Denmark (GTD) think the high agricultural GHG emissions is unsustainable – all sectors must reduce emissions significantly, if the EU net-zero target for 2050 shall stand any chance of being met. There are significant cheap reduction potentials in agriculture, which remain unused due to the lack of economic incentives and other regulation. [ii] [iii] [iv] [v]

Clearly, there is a convincing case for common EU regulation of agricultural GHG emissions: National regulations of such competitive sectors will remain timid and sub-optimal in the context of Internal Market bans on national trade barriers, which previously were used to shield domestic industries subject to strict environmental regulation. This insight has been the key reason for the establishment of common EU environmental regulation since adoption of the Internal Market.

Hence, GTD welcomes the report from the European Court of Auditors criticizing the lack of Polluter-Pays-Principle (PPP) in climate regulation of European agriculture. Everything considered, GTD think extension of ambitious emissions trading to the sector will be the most effective and cost-efficient way to implement the PP-principle – and to reduce agricultural GHG emissions.

Belatedly, this note will comment on Commission work on different models for emission trading in agriculture presented in the stakeholder survey this summer. Below the three models presented in the survey will be discussed, showing a justification of GTD's clear preference for the On-farm-ETS model.

Stakeholder survey on three ETS models for agriculture

The stakeholder survey on various policy options to price GHG emissions from the agriculture sector via an EU-wide Emission Trading System presented three models:

- On-farm ETS covering on-farm GHG emissions
- Upstream ETS covering GHG emissions associated with the use of feed and inorganic fertilizer.
- Downstream ETS covering GHG emissions associated with farm products processed.

The survey and the stakeholder workshop did not present many details on the different models. GTD comments are consequently based on general knowledge on similar ETS models discussed elsewhere. Yet, during the workshop it became clear that the up- and downstream models mainly are seen as ways to limit administrative complexity of emissions trading for farmers. Implicitly, the On-Farm ETS model is deemed too complex and costly for farmers – some of which are either old or poorly educated, have small emissions and/or could struggle participating in detailed Monitoring, Reporting and Verification schemes (MRV).

In addition, the survey presented five different models for linking an agricultural ETS with a reward system for carbon removals. These proposals will be discussed after the discussion of the three ETS models listed above.

GTD has a clear preference for the On-farm ETS model with opt-outs for small farms

GTD's preference is based on the following main reasons:

- Primary agriculture has the largest and cheapest reduction potential, as most emissions from upstream and downstream suppliers and industries long have been covered by EU emissions trading.[vi]
- The On-farm ETS model will be best to provide farmers with direct price signals on all relevant farm emissions. This will maximize cost-effective mitigation measures at farm level and incentivize development of new mitigation technologies.

- MRV can be simplified using IT-platforms with prefilling of emissions factors and many relevant activity-level data from public databases.
- Small farms may be exempted from emissions trading altogether leaving their emissions as a national responsibility. Or public authorities may undertake MRV for small farms opting out from this and deduct GHG-payments from CAP-subsidies for these farms.

Up-stream and downstream ETS models have less scope and cost-efficiency than the On-Farm model

It seems hard for the two other ETS models to ensure uniform price signals on all agricultural emissions. A few examples may illustrate this:

The Up-stream ETS model will calculate emissions using specific emission factors for different types of feed and mineral fertilizers. The firms supplying these goods to farmers will have to buy and surrender allowances matching calculated emissions, while passing on the costs in the prices of feed and fertilizers. Farmers will then be forced to pass on cost increases to consumers.

This model could potentially leave farms with few reduction options – apart from reduced use of feed and fertilizers. If interpreted correctly, it seems incapable of putting a price signal on emissions from peatlands plus methane and nitrous oxide emissions from manure management and use on soils, as these emissions have very little relation to the use of feed and mineral fertilizers. Such non-covered emissions could possibly approach 40 % of total agricultural emissions in the EU excl. fossil energy. Likewise, this model will barely be able to incentivize measures undertaken by individual farms to reduce emissions from enteric fermentation by other means than change of feed – e.g. by selecting cattle with low-methane genes and by using longer lactation periods.[vii] [viii] Quite likely, the up-stream ETS model will tend to benefit farms producing the majority of their feed compared to farms buying a large share of their feed, as the model most likely only will be able to cover commercially traded feed.

The Downstream ETS model could be structured in different ways and two extremes are discussed here:

An administratively simple model would mandate downstream industries to calculate farm emissions based on average emissions generated per type of product delivered from farms to downstream industries. The downstream industries would then buy and surrender allowances equaling total emissions embodied in their products and pass on the cost to consumers. But in such a simple system individual farms get no incentive to reduce emissions and the most cost-effective reduction potentials remain unused.

A Downstream ETS could alternatively cover all on-farm emissions in detail and reward farmers for reduction efforts. But this would require that farms deliver detailed emission accounts to the downstream industries. This would largely amount to a privatization of the On-Farm model - with one important drawback: Farmers and downstream industries would share a concurrent interest in minimizing reported emissions. Even if Member States prove able to extract trustworthy emission figures from down-stream industries, such private undertakings would struggle ensuring and controlling honest emission reports from the farms supplying them. Furthermore, small downstream firms could struggle to cope with the administrative complexity. In addition, problems will arise for the many farms delivering inputs to different down-stream firms and industries – e.g. milk to dairies, cattle and/or pigs to slaughterhouses and surplus grain to feed companies. There are no obvious and simple ways to split responsibilities for on-farm emissions in such very common situations. It also seems unlikely that a downstream system could reward numerous farms for their mitigation efforts, if they sell all their produce to other farms and no downstream industries are involved in these transactions. Unrewarded mitigation activities by such farms could be rewetting of peat-soils or for good manure management in the production of piglets and calves.

Managing administrative complexity and costs of an On-farm ETS

Clearly, the prospect of complex and costly MRV-schemes forced upon millions of small farmers with minimal GHG-emissions - and well-known political activism and clout - is the main objection towards the On-Farm ETS model. Yet, preparatory projects in Denmark[ix] [x] points at simple ways to minimize administrative complexity of MRV for farms:

- Large farms: Establish user friendly IT-platforms for MRV with prefilling of emissions factors and many relevant activity-level data from public databases. A trial scheme in Denmark enables farms to rely largely on standard emissions factors and activity data downloaded from public databases, while more sophisticated reporting is optional. Large farms responsible for a majority of agricultural GHG emissions are capable of using such platforms.

- Small farms: Two options seem relevant:
    - Small farms could be exempted from emissions trading and their emissions left as a national responsibility under the Effort Sharing Regulation.
    - Or:
    - Agricultural authorities could create simplified GHG-accounts for small farms based on public databases, if they have opted out of detailed MRV. The authorities buy and surrender allowances and pass on the costs to farmers e.g., by deducting from CAP-payments. A simplified system will barely be able to register all mitigation efforts of farms included. But some mitigation activities like rewetting of peat-soils may be registered and translated into lower ETS-payments for such farms.

Activity level data main constraint for on farm GHG-accounting

The main problem for farm GHG-accounts is the present lack of relevant activity data used to calculate emissions. In principle, farm GHG emissions should be calculated the same way as done for fossil fuel emissions – by multiplying a standard emission factor by an activity level – e.g., amounts of coal or gas combusted. But unlike fossil fuels, relevant activity levels in agriculture are not traded goods and seldom precisely quantified by farmers. E.g., in Denmark farmers may not know their exact area of peat soils and/or the carbon content of these soils, which dictate the emission factors to use. In other Member States farmers may not be aware of the amounts of manure applied to farm soils and its nitrogen content – both factors are needed to estimate nitrous oxide formation from this source. But IT-based standard accounting schemes with pre-filling of data from public databases on nutrients, animal numbers, type, and size of slurry systems a.o. can greatly diminish administrative complexity for individual farms[xi]. In Member States with less developed databases the necessary activity level data may be derived using standard factors, as often done in national emissions inventories for agricultural emissions. This could also incentivize setting up more comprehensive data collecting in some Member States in order to increase accuracy of emission factors.

Verification key – but costs in an agricultural ETS system may be minimized

Emission reports and farm GHG-accounts must be verified independently to ensure against cheating – as always practiced for each installation in the EU ETS for large installations (ETS1). Initially, many installations in the ETS1 complained about being forced to pay relatively high verification costs. But modifications of the verification process and experience gained have brought down costs.

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In comparison with the large variety of installations presently in the ETS1, agricultural emissions stem from relatively few processes with moderate variations in emissions. This could potentially be used to reduce verification costs: Instead of verifying each single farm GHG-accounts by hiring accredited verifiers, an IT-based MRV system run by a public authority could potentially identify out-layers, which then should be subject to individual control by an accredited verifier. The verifier should be paid for by the farm in question, if accounts prove faulty. This could both bring down verification costs and hassle for most farms in an On-Farm ETS system significantly, and act as an incentive to deliver honest GHG-accounts.

Linking agricultural ETS with a reward system for carbon removals

GTD remains sceptic against including most natural carbon removals in any ETS system as a measure to balance GHG emissions with long atmospheric lifetimes. The skepticism is based on numerous factors:

- Natural carbon stores are all non-permanent and reversible. Forests can burn in a few days or be felled in weeks. In contrast, increasing natural carbon storage has long timescales - hence lost carbon stores cannot be replenished swiftly.
- Increments or declines in carbon stores are costly to measure with precision, which fits badly with their non-permanence. Authorities and buyers must know if issued carbon credits are indeed backed by physical carbon stores.
- Proving additionality of natural carbon increments compared to business-as-usual has proven hard. The legacy of LULUCF-regulation under the Kyoto Protocol and in the EU has amply demonstrated the difficulties of agreeing on honest baselines against which additionality may be measured. Issuing credits for all additional carbon storage identified risk rewarding activities with positive carbon increment like young forests, whereas older forests with decreasing carbon stores due to felling will stay outside the scheme. Potential indirect land use change (ILUC) must also be taken into account: Afforestation in the EU will usually replace agricultural production. This may be substituted by increased production outside the EU, which in turn may lead to deforestation or cultivation of high-carbon savannahs.
- The European Scientific Advisory Board on Climate Change recently cited estimates that up to 250 Mio. t CO_2 of the net-sink in EU forests may be the result of higher CO_2 content in the atmosphere (CO_2-fertilization) and higher temperatures due to climate change. [xii] It would be absurd to allow forest growth induced by climate change as its main driver to balance agricultural GHG emissions, which would allow emissions to remain high.
- Planned use of natural carbon storage to balance other GHG emissions on an extensive scale could create significant risks of non-compliance with climate targets: The recently adopted LULUCF Regulation has set a minimum target of 310 Mio. ton CO_2e EU net-sink by 2030. This target is an integral part of meeting the EU 55 % reduction target by 2030. Yet, the latest EU net-sink reported for 2021 has diminished from around 275 Mio. t on average 2016-18 to around 230 Mio. ton CO_2e – mainly due to decreasing carbon removals in EU forests. According to a recent assessment there seems little hope that the 310 Mio. t net-sink target can be achieved without significant reductions in wood harvests for end-uses with short lifetimes – like wood-energy use and packaging.[xiii]
- Finally, it seems difficult to ensure against double counting of the same removals in case carbon removal credits are both used to offset other emissions and by their nature are counted as part of ordinary LULUCF accounts.

Based on these considerations GTD is against including natural carbon removals in any ETS-system for agricultural emissions.

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Separate ETS system for agriculture or part of a unified ETS?

The Commission survey seemed to presume that an agricultural ETS should remain separate from other EU ETS systems. Overall, cost-efficiency of the EU mitigation effort will be maximized if all remaining emissions face the same allowance price. This may only be achieved by merging existing ETS-systems and integrating new sectors into the unified ETS-system.

Pending unification, there are no valid reasons to keep agricultural emissions trading separate from the existing ETS1 and ETS2 systems. The ETS1 now harbors very disparate industries like aviation and shipping with MRV-schemes widely different from the MRV-scheme established for the stationary installations in the original scope of the ETS1. Agricultural use of fossil fuels may temporarily be integrated into ETS2 along with other transport and heating fuels.

Therefore, GTD is in favor of integrating agricultural emissions trading into a unified ETS. Pending unification, it should start with non-CO_2 and organic soils in the ETS1 and fossil fuels in the ETS2.

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[xi] Danish project to develop an IT-based emissions reporting system for farms: Klimalandmand værktøj til klimahandling på bedriften (okologi.dk)
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