 Received: 2019-12-18

Title Levy on nitrogen in mineral fertilizer
Submitted by: BONUS TOOLS2SEA; https://projects.au.dk/bonus-tools2sea/; msa@envs.au.dk (Mikael Skou ANDERSEN)
Description of measure By introducing a levy there will be an incentive to make better use of nitrogen available in manure and other organic fertilizers, thus reducing mineral fertilizer use and nitrogen leaching to the Baltic Sea. It will also help curb excess 'insurance' fertilization and prospective increases in mineral fertilizers. Levy revenues can be used to finance the costs of transport and spreading of organic fertilizers and manure and/or to reduce other farmland taxes. Levy can create more flexibility for farmers in choosing measures, so that command-and-control efforts can be scaled down. Levy base is the production and/or import of nitrogen in mineral fertilizers for use by agriculture.
Activity: Agriculture
Pressure: *Input of nitrogen*
State: Nutrients
Extent of impact: Coastal waters/sub basins/Baltic scale
Effectiveness of measure According to previous estimates from Sweden's National Board of Agriculture, a levy will lower the optimal fertilizer dose for various crops, e.g. by 10 kgN/ha for wheat. Sweden's National Institute of Economic Research (NIER) has identified a long run demand elasticity of minus 0.4 for mineral fertilizer N (Konjunkturinstitutet, 2014). With a levy rate at SEK 1.80 (EUR 0.18) per kg N, it was shown in Sweden to lead to an annual reduction of 10,000 tonnes of mineral fertilizer nitrogen use, amounting to 6% less total use. As it might represent excess use, assuming an average retention rate of 67-80% is probably too pessimistic, but it would translate into a reduction in short-term annual leaching by Sweden of 2,000-3,333 tonnes of N. At basin scale a similar 6% reduction in the 2 million tonnes of fertilizer N applied in BSR countries corresponds to a reduction in mineral fertilizer use of 120,000 tonnes N, which on the same terms can be predicted to yield a reduction in short-term annual leaching of 24,000-40,000 tonnes N.
Cost, cost-effectiveness of measure: For a levy rate of €0.18 per kgN the NIER analysis finds that abatement costs per kg of N would be as low as €0.09 per kg N and competitive with most other measures. For higher abatement levels, the analysis shows that unit costs will increase but remain relatively low (up to €0.6 per kg N).
Feasibility: With full recycling of revenues back to farmers to support better use of manure and organic fertilizers and to lower other taxes (e.g. farm land taxes) the measure should be entirely feasible.

Levy needs implementation in national law, but HELCOM could provide a standardized framework and guidance on levy rates for countries to adopt. Levy rate to be subject to adjustment with the EU correction coefficients for differences in price levels (purchasing power parities), whereby it would be lower in Poland and the Baltics and higher in Nordic countries (e.g. PL: €0.10; LT: €0.12; LV: €0.13; EE: €0.15; DE: €0.18; SE: €0.20; FI: €0.21; DK: €0.24) For comparison the current market price for CO2 allowances of €25/tCO2 translates into a cost of €0.10 per kg mineral fertilizer-N, as the ratio of GHG:N is 5:1 (for CAN/AN fertilizers) (Hasler et al 2017). Still, most mineral fertilizers are imported from non-EU countries. Monetary benefits to local recreation and property owners were found to be in the range of €2.5-32 per kg N reduced leaching, corresponding to €0.5-10 per kg N in reduced rootzone loss for eight coastal water bodies to the Baltic Sea(Andersen et al, 2019).
Follow-up of measure: Nitrogen levy would complement other and targeted measures for improving local water quality.
Background material: Agrifood Economics Centre, 2015. Skatt på handelsgödsel – ett billigt sätt att minska övergödningen? Policy Brief no 6. http://www.agrifood.se/Files/AgriFood_PB20156.pdf Fertilizer tax in Sweden (Study for European Commission) https://ieep.eu/uploads/articles/attachments/cd57d2c2-6c74-4244-8201-10c8fff4b7f6/SE%20Fertilizer%20Tax%20final.pdf?v=63680923242
References Konjunkturinstitutet/NIER, 2014. Miljö, ekonomi och politik 2014. Stockholm. http://www.konj.se/download/18.42684e214e71a39d0722ed0/1436516834703/Milj%C3%B6+ekonomi+och+politik+2014.pdf Andersen, Mikael Skou; Levin, Gregor; Odgaard, Mette Vestergaard, 2019. Economic benefits of reducing agricultural N losses to coastal waters for seaside recreation and real estate value in Denmark. Marine Pollution Bulletin, 140, pp. 146-156. https://www.sciencedirect.com/science/article/abs/pii/S0025326X19300104?via%3Dihub Hasler, K., Bröring, S., Omta, O., and olfs, H., 2017. Eco-innovations in the German fertilizer supply chain: Impact on the carbon footprint of fertilizers, Plant Soil Environ. Vol. 63, 2017, No. 12: 531–544. https://www.agriculturejournals.cz/web/pse.htm?volume=63&firstPage=531&type=publishedArticle