



ENSURING THAT POLLUTERS PAY

Denmark

Denmark's revenue from environmentally relevant taxes is higher than the EU average. Environmental taxes stood at 3.27% of GDP in 2019 (EU-27 average: 2.37 %). The largest portion of the environmental taxes were the energy taxes at 1.69% of GDP, against an EU average of 1.84 %. Transport taxes constituted a relatively high proportion of 1.42% of GDP (EU average being 0.45%), while taxes on pollution and resources represented only 0.16%. In the same year, the environmental tax came to 6.98% of total revenues from taxes and social security contributions (above the EU average of 5.76 %).¹

Further options

Livestock rights to decrease ammonia emissions

Denmark could consider introducing a system of (tradable) livestock rights to combat ammonia emissions. The country continues to have a relatively high nutrient surplus which causes pollution of drinking water aquifers and surface waters. The European Commission has established that “for coastal water bodies the main impact was nutrient pollution affecting 98% of water bodies” (Environmental Implementation Review of Denmark). OECD observes that “In spite of strong nitrogen pollution management policies over the past decade, Denmark still faces excessive levels

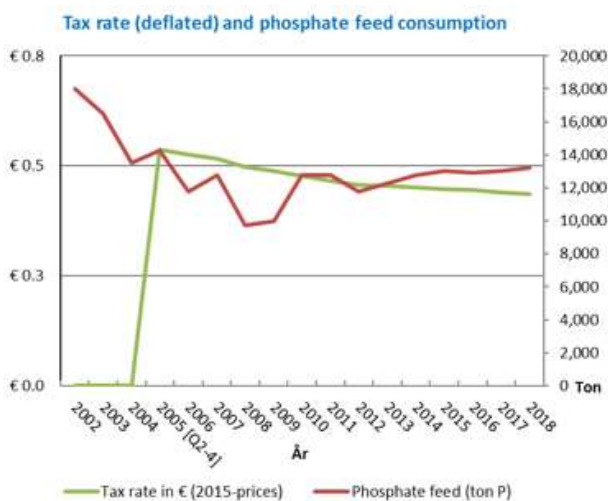
of nitrogen discharges into its coastal waters, of which only 1.7% are in good ecological status” (Environmental performance review of Denmark).

For Denmark, the share of agriculture in total ammonia emissions is 94.61% and a large part of these stem from livestock manure management. A system of livestock permit trading has shown to be working to reduce emissions in other countries and could be a very helpful instrument in Denmark too.

PHOSPHORUS TAX

The Danish tax on mineral phosphorus in animal feed agreed in 2004 and introduced in 2005 addresses the contents of raw phosphate in animal fodder. The tax rate of DKK 4/kgP corresponds to €0.54/kgP. The justification for the tax is the high loss rate of up to 90% associated with animal feed phosphorus supplied to large livestock installations, mainly of pork and poultry, and the subsequent flows of phosphorus from manure spread on croplands to water bodies, triggering eutrophication (algae growth and polluted water). Much better use of phosphorus contents in domestic plant feed can substitute the need for imported animal feed, stimulated by adding enzymes (fytase), for which the tax provides an economic incentive. With substitutions caused by the tax, imports of animal feed raw phosphorus declined by 25%², however due to lack of tax rate indexation there has been a slight rebound in later years.

Prior to its adoption consultations took place with the national interest organizations of farmers. In exchange for the phosphorus tax they obtained a lowering of their property tax rate. In December 2019 the phosphorus tax was suddenly abolished without any public consultations, and the property tax rate was not restored to its initial rate, reflecting presumably lobbying from farmers. NGOs are now making the case for its reintroduction.



Key stakeholders

Academics and research

Aarhus University (Dept. of Agroecology and Dept. of Environmental Science) and University of Copenhagen (IFRO).

SEGES – national advisory service for farmers <https://en.seges.dk/>

NGOs

Main environmental NGO: The Danish Society for Nature Conservation: <https://www.dn.dk/home/english-page/>

Other environmental NGO: Green Transition Denmark: <https://rgo.dk/frontpage-english/>

Main agricultural NGO: Danish Agriculture and Food Council: <https://agricultureandfood.dk/>

Water related issues: Dansk Vand- og Spildevandsforening: <https://www.danva.dk/>

Other links

The act (in Danish): <https://www.retsinformation.dk/eli/ft/200313L00238>

OECD Environmental Performance Review – Denmark 2019: https://www.oecd-ilibrary.org/environment/oecd-environmental-performance-reviews-denmark-2019_1eeec492-en



PESTICIDE TAX

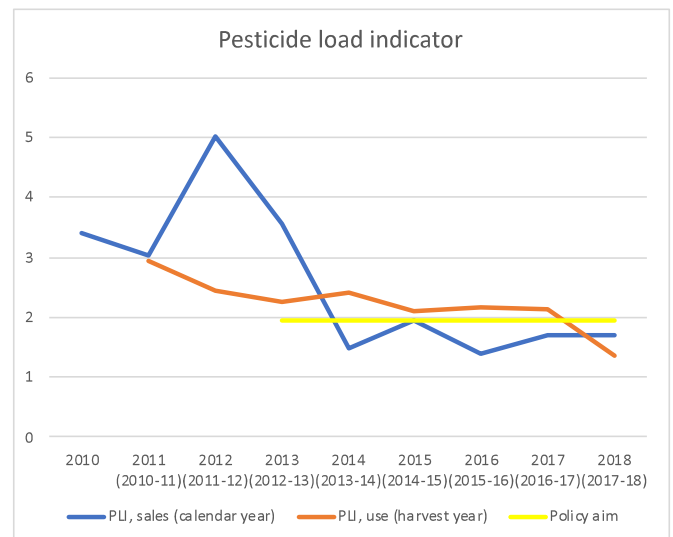
Since 1972, different types of pesticide fees and taxes have been introduced in Denmark. Continued challenges in meeting the aims of Danish pesticide action plans gave rise to a 2013 reform of the tax, which was designed as a more 'true' environmental tax reflecting the load of the pesticides. Organized by the Environmental Protection Agency, a new complex pesticide load indicator – based on human health risks, toxicity to non-target organisms and environmental fate of the pesticide – was constructed and calculated for each pesticide product and new tax levels corresponding to the load were calculated for each pesticide. Additionally, average tax levels were more than doubled compared to the former pesticide tax.

Ex ante calculations indicated a 40% reduction in load due to the tax. Following a tradition of reimbursing the pesticide tax revenue to the agricultural sector, farmers were compensated for the DKK150 million difference between former annual revenue from the tax and expected future annual revenue through a reduction in land taxes. Annual revenue of DKK650 million was expected (€87 million). As a consequence of the reform, some pesticides have experienced very large price increases, while others have seen prices decrease³. Some products have been taken off the market due to very high load and correspondingly high tax.

Basically, Danish pesticide use is registered both through sales statistics (per calendar year) and through farmers' mandatory registration of use in electronic spray journals (per harvest year). Since farmers can buy pesticides and not use them immediately, and due to the difference between calendar year and harvest year there are some differences between these indexes (see figure below). The pesticide load indicator is calculated by multiplying load (per kilo/litre) with the used/sold amounts and dividing with the conventionally farmed area in Denmark in 2007⁴.

The table shows that the PLI for both sales and registered use were around 3 in the calendar year 2011 and harvest year 2010-11. In 2012 and 2013 hoarding effects before the tax implementation in the summer of 2013 are observable through a substantial increase in PLI sales. In 2014 PLI sales decreased dramatically, since farmers could use pesticides stored in the years before the tax implementation, before load based on sales started increasing a bit again in 2017 and 2018 (probably because most stored pesticides

were used around that time). Pesticide load based on the registered use of pesticides is, not surprisingly, a bit more steady. However, PLI use has also decreased substantially. For three subsequent harvest years (2014-15, 2015-16, 2016-17), PLI use seemed to stabilize just above 2,1 and a bit above the policy aim of 1,96, however, in 2017-18 PLI use dived to 1,35. This can be explained though with unusual Danish weather conditions in 2018 due to a long period with very hot weather and severe drought in Denmark (PLI sale does not see the same drop, since farmers could not anticipate the drought when buying pesticides that year). More detailed data further indicates that the tax in particular has decreased the load from insecticides⁵.



Danish Pesticide Load Indicator (PLI) and policy aim (2010-2018)⁶

The tax has primarily led to these substantial load reductions due to a comprehensive substitution towards less harmful products, which is also one of the 8 integrated pesticide management principles in the Directive 2009/128/EC. Indications are that for registered use of pesticides it might be difficult entirely to reach the policy aim of 1,96 though, since PLI use was around 2,1 for three subsequent years before the drought in 2018.

Stakeholder engagement

Over the years, stakeholders have been involved when pesticide tax changes have been planned. In 2012, there was a consultation phase and a hearing phase prior to the 2013 tax reform with many hearing responses from interest organisations e.g. representing commercial interests (farmers, producers, importers

etc.), but also from organisations advocating reduced pesticide use (e.g. the Danish Water and Wastewater Association (DANVA) and the Danish Ecological Council). A common fear in the agricultural sector is that the pesticide tax will cause more pest resistance problems. The Danish parliament's Tax Committee received written comments and held meetings with e.g. main organisations from the agricultural sector and the largest environmental NGO. Concerns were raised in the consultation phase over economic consequences of the tax for Danish potato growers. As a compensation, another tax (tax on pickling agents) was reduced, and as a further compensation, part of the revenue from the pesticide tax was directed to the so-called Potato Tax Fund⁷. However, in general many farmers feel that pesticide taxes are unfair despite the reimbursement mechanism through the land tax. Before the tax introduction, the agricultural sector feared that in particular some specialty and high value crops could be flagged out of Denmark due to the tax. However, in 2018 the Danish Ministry of Environment concluded in an evaluation of the effects of the tax that this had not been the case. Some of these crops had experienced increased pesticide costs, but pesticide costs measured as a share of gross dividend remained constant. After the tax implementation there has been a decrease in sugar beet production, eating potatoes, cherries and black currants, but here the decrease can be explained by other factors (e.g. for sugar beets: EU regulation, for cherries and black currants: a large drop in market prices, for eating potatoes: maybe a switch towards starch potatoes)⁸.

Academics

Aarhus University (e.g. Dept. of Agroecology, Dept. of Environmental Science, Dept. of Bioscience) and University of Copenhagen (e.g. Dept. of Food and Resource Economics). Some of them are referred to above.

SEGES – national advisory service for farmers <https://en.seges.dk/>

NGOs

Some of the most important NGOs regarding these types of taxes are:

Main environmental NGO: The Danish Society for Nature Conservation: <https://www.dn.dk/home/english-page/>

Other environmental NGO: Green Transition Denmark: <https://rgo.dk/frontpage-english/>

Main agricultural NGO: Danish Agriculture and Food Council: <https://agricultureandfood.dk/>

Water related issues: Dansk Vand- og Spildevandsforening: <https://www.danva.dk/>

Other links

The Environmental Protection Agency's database listing all approved pesticides, load, tax levels etc (only in Danish): <https://middeldatabasen.dk/>

Journal article analysing farmer heterogeneity and farmer responses to Danish pesticide taxes: Pedersen, A.B., Nielsen, H.Ø., Daugbjerg, C., 2020. Environmental policy mixes and target group heterogeneity: analysing Danish farmers' responses to the pesticide taxes. *Journal of Environmental Policy and Planning* 22:5, 608-619.

TV clip on Youtube with Professor Philippe Grandjean on the negative effects of pesticides (in Danish): <https://www.youtube.com/watch?v=p8bfcFIT4iA>

Presentation on the effects of risk-based pesticide taxation on Youtube with Senior Researcher Anders Branth Pedersen: <https://www.youtube.com/watch?v=Smir6v-43x4>

OECD Environmental Performance Review – Denmark 2019: https://www.oecd-ilibrary.org/environment/oecd-environmental-performance-reviews-denmark-2019_1eeec492-en



¹ https://ec.europa.eu/eurostat/databrowser/view/env_ac_tax/default/table?lang=en

² Poulsen, H.D., et al., 2019. Videnskabelig rapport nr. 325, Aarhus Universitet: DCE – Nationalt Center for Miljø og Energi <http://dce2.au.dk/pub/SR325.pdf>

³ Nielsen, H.Ø., et al., 2020. Evaluering af den omlagte pesticidafgift. Betydningen af beslutningsadfærd for pesticidanvendelsen. Danish Environmental Protection Agency. <https://www2.mst.dk/Udgiv/publikationer/2019/10/978-87-7038-116-1.pdf>.

^{4 5 6} Danish Environmental Protection Agency, 2020. Bekæmpelsesmiddelstatistik 2018. Behandlingshyppighed og pesticidbelastning baseret på salg og forbrug. <https://www2.mst.dk/Udgiv/publikationer/2020/09/978-87-7038-233-5.pdf>

⁷ Ministry of Food, Agriculture and Fishery, 02.05.2012. Svar på spm. 225 (af 02.04.2012) fra fødevareministeren. <https://www.ft.dk/samling/20111/almdel/ff/spm/225/svar/880058/1113553/index.htm>

⁸ Environmental Protection Agency, 2018, Evaluering af den differentierede pesticidafgift. Miljø- og Fødevareministeriet. <https://www2.mst.dk/Udgiv/publikationer/2018/05/978-87-93710-28-3.pdf>

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