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Jørgensen, Michael Søgaard

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Innovative criteria for modulating the Danish waste fees for electrical and electronic products – but can they have an environmental effect?

Associate professor, PhD, Dr hc Michael Søgaard Jørgensen, Department of Planning, Aalborg University, msjo@plan.aau.dk

Introduction

The Danish Executive Order on Electronic Waste (also called "Executive Order on placing electrical and electronic equipment on the market and handling waste from electrical and electronic equipment") (The Danish Executive Order on Electronic Waste 2022) was in consultation during the summer 2022 and was published 19 December 2022. The Executive Order introduces a modulation of the Danish waste fees for electrical and electronic products. This working paper describes the criteria of the modulation scheme and discusses whether and how the modulation could have an environmental effect.

A long-awaited announcement of a new Executive Order

The 2022 Danish Executive Order on Electronic Waste was waited for some years because it should enable the Ministry of the Environment to lay down rules for how companies other than collective schemes can be approved to handle electrical and electronic products that consumers no longer need. Likewise, the authority to set modulated waste fees had to be implemented. Both changes are mentioned in The Danish Action Plan for Circular Economy for 2020-2032, which was issued in 2020, and The Danish Strategy for Circular Economy from 2018 as basically the only national measures proposed to prevent waste from electrical and electronic products in Denmark.

However, it appeared from the consultation letter from summer 2022 that the draft Executive Order did not contain new rules for producer responsibility for electronic waste. It was announced that a stakeholder dialogue would be organized later about this topic (Consultation letter for Electronic Waste on Executive Order 2022):

"The Ministry of the Environment is working in parallel to implement an initiative in the political agreement on Strategy for Circular Economy from 2018 on a change to the rules for producer responsibility for electronic waste. The rules for this were adopted in the Parliament in the spring of 2020, and there will be a separate process with stakeholder involvement for this change." (own translation)

This working paper describes the draft Executive Order on Electronic waste and its proposal for the modulation of waste fees for waste from electrical and electronic products. Furthermore, the paper discusses the changes in the final version of the Executive Order and discusses whether and how the proposed - and implemented - modulations of the waste fees may have an environmental effect. The

modulation criteria are innovative, but the modulation is financially very limited. In the final section of the working paper a proposal for how the modulation might have an environmental effect is presented.

Modulation only for companies connected to collective schemes

First of all, it should be made clear that this modulation of waste fees in Denmark only applies to producers and importers who are connected to a collective scheme, cf. The Guidance on determining and calculating modulated fees according to the Executive Order on Electronic Waste from the Danish Environmental Protection Agency (Guidance on modulated fees 2022):

"The EU's waste directive from 2018 sets a number of minimum requirements for schemes for extended producer responsibility, including requirements in Article 8a on modulation of the producers' financial contribution to fulfilling their obligations in the event of collective fulfillment of the obligations regarding extended producer responsibility, such that the financial contribution is modulated in proportion to the products' environmental impact." (own translation)

A company thus does not need to join a collective scheme, but can take back discarded products itself, but in that case the company must document how it handles electronic waste.

According to the Executive Order on Electronic Waste 2022), the company must disclose *".....how producer responsibility is intended to be fulfilled, including whether the company is connected to a collective scheme or has established an individual collection and handling scheme. Information on which of the categories of equipment mentioned in Appendix 1 are handled respectively within collective arrangements and individually by the individual company, as well as how the company has organized the fulfillment of its obligation for return handling and separate handling of waste of electrical and electronic equipment."* (own translation)

The EU Waste Directive as background for the modulation of fees

The background for developing the proposal for the modulation of the waste fees for electrical and electronic products is described by the Environmental Protection Agency in its Guidance on the modulated fees as follows (Guidance on modulated fees 2022): *"The EU's waste directive from 2018 sets a number of minimum requirements for schemes for extended producer responsibility, including requirements in Article 8a on modulation of producers' financial contributions to fulfill their obligations in the case of collective fulfillment of the obligations regarding extended producer responsibility, such that the financial contribution is modulated in relation to the environmental impact of the products."* (own translation)

Furthermore, the Danish Environmental Protection Agency highlights the environmental issues that the EU Waste Directive points to as the background for the modulation of the waste fees (Guidance on modulated fees 2022): *"In order to increase the incentive for manufacturers to take greater account of repairability, reusability, reusability and reduce the presence of hazardous substances in the design of their products, the 2018 Waste Directive requires Member States to ensure that the financial contributions that producers and importers pay to the collective schemes to meet their obligations are, as far as possible, modulated according to the above environmental parameters."* (own translation)

The EU sees modulation of waste fees as part of preventing waste by, among other things, ensuring a longer product lifetime through repairability and reusability, but also as a strategy for recycling and avoiding dangerous substances in products.

The Danish proposal for modulation of waste fees

In the draft for the Danish Executive Order, three issues were described as the concerns behind the modulation of the Danish waste fees - i.e. the payment to the collective scheme to which a company is affiliated (Consultation letter 2022):

- Provision of product warranty
- Content of recycled material
- The content of lead

Annex 10 in the draft for the Executive Order on Electronic Waste contained the following seven proposals for criteria for modulation of waste fees for various product groups, which were new regulations compared to the previous version of the Executive Order (Draft for the Executive Order on Electronic Waste 2022):

1. Equipment for temperature exchange. Criterion: The product is marketed with a product warranty in addition to a two-year claim period.

2. Screens, monitors and equipment containing screens with a surface area greater than 100 cm². Criterion: The product is marketed with a product warranty in addition to a two-year claim period.

3. Light sources. Criterion: The manufacturer can provide documentation that the product contains at least 10% recycled material.

4. Large equipment (an external dimension of more than 50 cm). Criterion: The product is marketed with a product warranty in addition to a two-year claim period.

5. Small equipment (no external dimension of more than 50 cm). Criterion: The product is marketed with a product warranty in addition to a two-year claim period.

6. Small IT and telecommunications equipment (no outer dimension of more than 50 cm). Criterion: The product is marketed with a product warranty in addition to a two-year claim period.

7. Photovoltaic panels. Criterion: The product does not contain lead.

In an assessment of whether the waste fees can prevent waste and contribute to longer product lifetimes, criteria 1, 2, 4, 5 and 6 are innovative and interesting by separating waste fees for products within the five product categories based on whether *"the product is marketed with a product warranty beyond a two-year claim period"*. That a manufacturer or importer is willing to offer a two-year warranty after the two-year claim period could be interpreted as an indication that the manufacturer or importer trusts that the product has a lifetime of at least 2+2 = 4 years, which could mean that the product has a technically good quality or can be repaired.

What is also interesting is that the criterion focuses on a product warranty and not only claim right. This puts the consumer in a stronger position than a right to complain, as a warranty requires a greater burden of proof from the manufacturer and retailer to show that a non-functioning product is due to the consumer's practice and not the product quality.

It was mentioned in the draft Executive Order (2022) that products that do not meet the above criteria must pay 20% more of the costs for waste management of the relevant product group in a collective scheme in the form of *"a malus (extra cost) in the form of 20 percent of the individual producers' calculated operational costs, cf. § 3, subsection 1, no. 40, for waste management of these products added to the*

individual manufacturer's calculated operational costs for waste management of these products within each category of marketed electrical and electronic equipment." (own translation)

The final Executive Order and a new Guidance

In the final version of the Executive Order, the proposal for modulating the waste fees was clarified and supplemented with a Guidance, which explains and exemplifies the principles behind the modulated contributions, cf. the Consultation note (2022): *"On the basis of consultation responses, the Ministry of the Environment has clarified the criteria in Annex 10, just as the Danish Environmental Protection Agency has prepared guidance for various aspects regarding the modulated contributions, including for warranties and examples of calculation."* (own translation)

It appears from the Executive Order that the above modulation of the waste fees came into force on 5 January 2023, cf. §59 of the Executive Order:

§ 59. Collective schemes must grade manufacturers' financial contributions to cover operational costs relating to the handling of waste from electrical and electronic equipment in the collective scheme in accordance with Annex 10.

Stk. 2. Modulation must first take place at collective schemes' next calculation of financial contributions after 5 January 2023.

Stk. 3. The Ministry of the Environment revises Annex 10 every 3 years. Appendix 10 will be revised for the first time before 1 January 2026. (own translation)

In the Consultation note, the Ministry of the Environment justifies the proposal to focus on product lifetime as follows (Consultation note 2022): *"The Ministry of the Environment has chosen a product warranty as a criterion, as a product warranty can provide an incentive for manufacturers to market products with better durability and repairability."* (own translation)

The requirement for the product warranty, which can ensure a producer or importer a lower waste fee, is described in details in the Guidance (and the Executive Order) and gives the consumer some rights:

"Criterion 1: The product is marketed with a commercial warranty for durability, cf. Section 86 a of the Sales Act, of a minimum of 2 years in addition to the two-year claim right that follows from Section 83 of the Sales Act. The warranty must meet the requirements of Section 17 of the Marketing Act, apply to the entire product and must not be an option for extra payment. The warranty must be provided without a counterclaim for a registration scheme or subsequent registration and must apply at the time of purchase of the product. The manufacturer may not set conditions for the warranty which are intended to prevent or restrict the consumer's access to the warranty." (own translation)

I think the essential elements of the proposed product warranty are:

- The warranty must apply to the entire product
- The warranty must not be an option demanding extra payment.
- The warranty must be provided without a counterclaim for a registration scheme or subsequent registration and must apply at the time of purchase of the product
- The manufacturer may not set conditions for the warranty or restrict the consumer's access to the warranty

Can the proposed modulation of the waste fees have an environmental effect?

With a requirement for a product as a two-year product warranty after the two-year mandatory claim period, it is important to analyze whether and how this requirement will have an environmental effect. That is, will this option affect competition between different manufacturers and their products – and thus perhaps encourage manufacturers to improve their products or encourage retailers to change their product assortment?

First of all, it is important to analyze what a 20% extra waste fee or a 20% lower waste fee could conceivably mean for the prices of the products and thus the price competition.

It is not possible to find specific waste fees on the websites of the collective schemes in Denmark, even though §60 in the Executive Order should be interpreted so that this information must be available:

"§ 60. Collective schemes must publish information on their website about: ownership, producers in the scheme, indicative financial contributions to cover operational costs in the scheme from producers per ton of marketed product as well as parameters for any discounts, and the collective scheme's selection procedure for waste management operators. " (own translation)

Typically, the collective schemes write on their website that the members of the scheme pay a variable environmental contribution, which partly depends on what and how much the company sells, partly on the development of the commodity market for the recycled materials.

The fee paid by a manufacturer or importer for waste management of a laptop has earlier been indicated to be approx. DKK 50 (approx. 7 Euro). If this is correct, the low waste fee with a 20% discount will be 80% of DKK 50 = DKK 40 (around 5.7 Euros) and the high waste fee with +20% extra fee will be 120% of DKK 50 = DKK 60 (approx. 8 Euros) That is. under these conditions, there will be a difference in the waste fees of DKK 20 (around 2.5 Euros) for a laptop!

It must be assumed that this difference in waste fees in itself will not have any impact whatsoever on the prices on the market for laptops – and the same will probably be the case for other types of electrical and electronic products sold on the Danish market.

Lack of economic incentive from small differences in the waste fees

The conclusion about the lack of economic incentive from the small differences in the waste fees on electrical and electronic products in Denmark is in line with the analyzes in the report "Differentiated payment". The report was written by NIRAS in 2015 as part of "The voluntary agreement on WEEE" (NIRAS 2015), where the Minister of the Environment, a number of business organizations and three collective schemes in 2013 had agreed to *"focus on the opportunities to promote eco-design of electrical and electronic products and create incentives for better and increased sorting, reuse and recycling of used electronics"*. (own translation)

In the report "Differentiated payment" it is concluded, based on examples of modulation of waste fees on electrical and electronic products, that these modulations have had no effect on competition and consumption preferences, because the differences in the fees are small and the products are not particularly price sensitive. Reference is made, among other things, to a French differentiation of waste fees, which for some product groups also has a +/-20% differentiation and for mobile phones, which cannot be connected to a charger of a common standard, a +100% modulation in waste fees. Even this additional fee of +100% is in France as small as 0.02 Euro or 0.003% of the price of the product. The NIRAS report

concludes that even this difference will not have any significant impact on the competition between different mobile phones or on the consumers' preferences for one or the other mobile phone.

When do modulated fees influence competition?

When the differences in the modulated waste fees are so small, it is because the EU Waste Directive stipulates that the differentiation must only reflect the differences in the costs of handling the waste from different products within the collective scheme.

The NIRAS report on differentiated (modulated) waste fees refers to a study, which shows that consumers are willing to pay up to 30% more for a more expensive but more energy-efficient washing machine – even if the additional price is not offset by corresponding financial savings in the use phase (NIRAS 2015). If this conclusion is transferred to the necessary modulation of waste fees to ensure that it affects consumer preferences, the price difference must apparently correspond to 30% of the price of the product, which is very far from the modulations referred to in the NIRAS report and the possible modulation calculated for a laptop.

An option: Fees based on differences in climate impact?

Instead of only modulating the waste fees according to the waste management costs, fees could reflect differences in the climate impact of the products. When calculating the expected quantities of electronic waste, the EU prescribes that the average of the previous three years' sales of electrical and electronic products should be calculated. This indicates an expected product lifetime as low as three years for electrical and electronic products. In any case, the three-year expected lifetime seems to be considered realistic by actors within electrical and electronic products in Denmark, since lower Danish waste volumes than the average of the last three years of sales are used as an argument that theft occurs of discarded electrical and electronic products – although it could also be a sign of longer product lifetime than three years for at least some electrical and electronic products.

A warranty of two years in addition to the two-year claim period thus corresponds to four years of expected product lifetime and thus 1/3 additional product life than the three-year product lifetime. A modulation of waste fees could reflect the corresponding difference in the climate impact and converted using the proposed CO₂ tax of DKK 1500 per ton (approx. 200 Euros) CO₂, which the Danish Climate Council on Climate Change believes Denmark should have in 2030 (The Danish Council on Climate Change 2020).

Such a CO₂ tax would imply that a product without a warranty and an expected lifetime of only three years must be charged a CO₂ tax corresponding to 4/3 of the CO₂ emissions during the production of a product, while a product with a warranty and an expected lifetime of at least four years must only be charged a CO₂ tax corresponding to the CO₂ emissions from one product.

At Aalborg University, we have calculated the climate impact from the production of a television (including a deduction of approx. 3% climate credit from the recycling of the same television) to be approx. 330 kg CO₂e (Lindeburg 2022). With a CO₂ tax of DKK 1500 per ton, the CO₂ tax for a television without a two-year warranty should be $\frac{4}{3} \times 0.330 \times \text{DKK } 1,500 = \text{DKK } 660$ (approx. 88 Euros). For the television with an additional two-year warranty, the tax would be $\text{DKK } 0.330 \times 1500 = \text{DKK } 495$ (approx. 66 Euros). I.e. there will be a difference in the waste fees of approx. 22 Euros, which for a television at a price of for example 400 Euros would correspond to a difference in the price of approx. 5% (if the difference in waste fees was 100% reflected in the price).

This is a bigger difference than the 0.003% price difference in the tax for a mobile phone in France. On the other hand, it is probably still such a small difference that it would probably “drown” in price changes during sales and other types of retail campaigns, and in any case the potential price difference of 5% is a lot smaller than the 30% difference that, according to the mentioned experiences with energy-saving washing machines (NIRAS 2015) seems to be the price difference that can influence the consumer choice of product within a product group.

For a vacuum cleaner with a climate impact of approx. 46 kg/CO₂e, the two waste fees would be respectively $4/3 \times 0.046 \times 1500 \text{ DKK} = 92 \text{ DKK}$ (approx. 12 Euros) and $0.046 \times 1500 \text{ DKK} = 69 \text{ DKK}$ (approx. 9 Euros) - i.e. a difference in the fees of approx. 3 Euros, which cannot be expected to affect the price competition for vacuum cleaners either.

These calculations have shown waste fees using differences in climate impact calculated on the basis of an expected difference in product lifetime of one year and a CO₂ tax of DKK 1500/ton (approx. 200 Euros) is hardly sufficient to create a market for products with a longer product lifetime.

Visible waste fees as an effective strategy?

The NIRAS report on differentiated fees (NIRAS 2015) describes another possible strategy that may have a greater influence on consumer preference in the purchase situation: Making the charges and their basis visible to the consumers in the purchase situation. This strategy is used according to the NIRAS report in France, where an environmental tax of a product and the background of the tax must be visible to the consumer, like the energy label and the repair index must be visible.

A corresponding Danish rule would imply that the waste fee and its basis must be visible to the Danish consumer. It seems likely that products marketed with a two-year product warranty (in addition to the mandatory right to complain within two years) - and if it is also mandatory to show the basis for the waste fee - can influence the consumer choice in the purchase situation. The requirement for a visible tax and its background will also mean that products with a higher fee and without a visible two-year product warranty will appear as a worse choice for the consumer - and thus the competition could be influenced in the direction of products with a (potentially) longer product lifetime.

The Executive Order does not mention that the waste fee and its background must be visible. But the criterion for only having to pay the low waste fee requires, according to the Executive Order, that the product must be marketed with a warranty of two years, cf. the quote shown earlier, which must be interpreted so that the product warranty must be visible to the consumer in the purchase situation (The Danish Executive Order on Electronic Waste 2022):

"The product is marketed with a commercial warranty for durability, cf. § 86a of the Sales Act, of a minimum of 2 years in addition to the two-year right claim right that follows from § 83 of the Purchase Act. The warranty must meet the requirements of § 17 of the Marketing Act, apply to the entire product and must not be an option for extra payment." (own translation)

§17 in the Danish Marketing Act (n.a.) thus requires that "A trader who markets a commercial warranty must hand over a declaration of the warranty to the consumer on a durable medium at the latest when the product is delivered." (own translation)

A prerequisite for success: Companies competing on the length of the warranty period

There is, however, still a condition that must be met for the criterion for modulated waste fees to have an impact on the competition: Some manufacturers and importers should start offering the two-year product warranty.

If no manufacturers and importers choose to offer the warranty, the possibility of a 20% lower waste fee and show its background, the two-year warranty will not influence the market for electrical and electronic products.

At the end of the 1990s, when Denmark had just joined the Nordic Swan environmental label scheme, the authorities were afraid that the Nordic Swan label would be a failure. The label was, according to an assessment from the former Danish Consumer Authority in 1998, "*...far too invisible in the shops, because the large producers of e.g. washing powder and detergents boycott the Swan.*" (Mølsted 1998). However, the competition changed when the first detergent producer started to ecolabel its products with the Nordic Swan.

Hopefully, manufacturers and importers will start competing on the length of product warranty and offer two-year warranties on electrical and electronic products, besides the two-year claim period. Consumer organizations and environmental organizations could put pressure on manufacturers and importers to offer this warranty, and the Ministry of the Environment could - just like in France - demand that environmental fees and their background must be visible in the purchase situation.

It is not the modulation of the waste fee itself that matters economically – it is the requirement to provide a two-year warranty that potentially could change the market for electrical and electronic products. Furthermore, this impact on the market could happen now – without having to wait for EU-appointed product-specific working groups to agree on eco-design requirements for the many specific groups of electrical and electronic products. It might take 10-15 years until eco-design criteria for all major electrical and electronic household product groups have been developed. An example of the time-consuming development of eco-design criteria is the four years that the negotiations for eco-design criteria for electrical household kettles seem have taken so far – without reaching an agreement about eco-design criteria.

References

Consultation letter for the Executive Order on Electronic Waste. (2022). Available at:

<https://prodstoragehoeringspo.blob.core.windows.net/24a7c512-20be-4a07-8594-394b9b08d0b2/H%C3%B8ringsbrev%20WEEE-bkg.pdf>

Consultation note. (2022). Consultation note regarding amendment of the Executive Order on placing electrical and electronic equipment on the market as well as the handling of waste from such equipment (electronic waste Executive Order/WEEE Executive Order). (In Danish: Høringsnotat vedr. ændring af bekendtgørelse om at bringe elektrisk og elektronisk udstyr i omsætning samt håndtering af affald af sådant udstyr (elektronikaffaldsbekendtgørelsen/ WEEE-bekendtgørelsen). Available at:

<https://prodstoragehoeringspo.blob.core.windows.net/24a7c512-20be-4a07-8594-394b9b08d0b2/H%C3%B8ringsnotat.pdf>

The Danish Action Plan for Circular Economy 2020-2032. (2022). Available at:

<https://mim.dk/media/224184/handlingsplan-for-cirkulaer-oekonomi.pdf>

The Danish Council on Climate Change. (2020). Taxes on CO₂ need neither cost jobs nor a large bill for the poorest (In Danish: Klimarådet: Afgifter på CO₂ behøver hverken koste jobs eller en stor regning til de fattigste). Available at: https://klimaraadet.dk/da/nyhedThe_er/klimaraadet-afgifter-paa-co2-behoever-hverken-koste-jobs-eller-en-stor-regning-til-de

The Danish Executive Order on Electronic Waste. (2022). (In Danish: Elektronikaffaldsbekendtgørelsen). Available at: <https://www.retsinformation.dk/eli/Ita/2022/1566>

The Danish Law on Marketing, §17. (n.a.). (In Danish: Markedsføringslovens §17). Available at: <https://danskelove.dk/markedsf%C3%B8ringsloven/17>

The Danish Strategy for Circular Economy. (2018). Available at: https://www.regeringen.dk/media/5626/strategi-for-cirkulaer-oekonomi_web.pdf

Draft for the Executive Order on Electronic Waste. (2022). Available at: <https://prodstoragehoeringspo.blob.core.windows.net/24a7c512-20be-4a07-8594-394b9b08d0b2/Udkast%20til%20WEEE-bkg%20ekstern%20h%C3%B8ring..pdf>

Guidance on modulated fees. (2022). Guidance on determining and calculating modulated contributions according to the electronic waste executive Executive Order (In Danish: Vejledning om fastsættelse og beregning af graduerede bidrag efter elektronikaffaldsbekendtgørelsen) Available at: <https://mst.dk/media/250953/vejledning-om-kollektive-ordningers-graduering-af-bidrag.pdf>

Lindeburg, A. (2022). Environmental calculator. Repair Café Denmark. Aalborg University (In Danish: Miljøberegner. Repair Cafe Denmark. Aalborg Universitet, Department of Planning, Aalborg University, 90 p. Available at: <https://repaircafedenmark.dk/wp-content/uploads/2023/05/Miljoeberegner-RepairCafeDanmark-AAU.pdf>

Mølsted, H. (1998). The detergent industry boycotts The Swan (In Danish: Vaskeindustri boykotter Svanen) Available at: https://ing.dk/artikel/vaskeindustri-boykotter-svanen?check_logged_in=1

NIRAS. (2015): Differentiated waste fees. Available at: <https://www.danskindustri.dk/siteassets/miljo/analyser/weee/differentiated-payment.pdf>