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## **Chemical Taxation Contributes to a Non-Toxic Environment**

People and the environment are continuously exposed to mixtures of many different chemicals. For instance, effluents from sewage treatment plants in Stockholm contain more than 137 different organic pollutants. Moreover, studies in Unites States have shown that the blood of newborn babies contains an average of 200 chemicals from a wide variety of chemical classes. These are alarming figures if one considers that research has shown that the combined effect of a chemical mixture (cocktail effect) may be significantly greater than the individual components' toxicity alone. Current chemical regulation in Sweden and all around the world evaluates the risk from each chemical separately, underestimating the total risk of chemical contamination.

Since 2007 the regulation of chemicals in Sweden is determined at the EU level and it is common with all EU member states. The EU's chemicals legislation called REACH, aims to "ensure a high level of protection for human health and the environment". However, REACH does not take into account cocktail effects. Moreover, REACH is based on the idea that the chemical industry themselves should ensure that the chemicals they put on the market will not have any adverse effects on human health or the environment. Though restrictions may be imposed preventing the commercialization of substances of very high concern that might pose an unacceptable risk to health or the environment, these restrictions would only apply to those substances exceeding a threshold of toxicity (or no effect concentration threshold). Yet, the fact that a substance does not exceed such threshold does not mean that it is innocuous. It is feasible that under that threshold negative effects might be present but undetected. Furthermore, scientific evidence has shown that for some substances (for instance, endocrine disrupters) the mixture effect of substances whose level of toxicity is below the "no effect concentration threshold" exceed such a threshold. This is to say, substances that - when assessed in isolation- might be judged to be innocuous by REACH are no longer innocuous when combined with other substances that were also judged to be innocuous. If we are to protect human health and the environment, we should definitely consider cocktail effects in chemical risk assessments and regulation.

Reduced climate impact and a non-toxic environment have been said to be the two most important environmental targets of the current Swedish government. One of the current strategies to achieve a non-toxic environment is to promote a revision of REACH, namely REACH II, which is expected to promote a more holistic approach to the assessment, evaluation and regulation of substances and to speed up the phase out of particularly hazardous substances. Among the potentials modifications to REACH is that substances should be assessed and evaluated in groups based on common characteristics such as chemical structure, chemical properties or area of use. This could make the assessment less time-consuming and could reduce the well-known problem of the industry replacing banned substances with other substances with very similar chemical characteristics. A second modification is to reinforce the substitution principle. This principle currently implies that substances of very high concern should be replaced with suitable alternative substances or techniques where it is economically and technically feasible. Currently the substitution principle only covers substances of very high concern and some areas of use. The proposal considers expanding this principle to a broader group of substances. A reinforced substitution principle could promote innovation and strengthen the incentives for the industry to accelerate the removal and substitution of hazardous substances.

We believe that the suggestions under discussion go in the right direction. However, the current proposal for REACH II has still a fundamental problem: as a regulatory instrument REACH is too weak. As is clear from its name, REACH is just a framework for the registration, evaluation, authorization and restriction of chemicals without a clear target concerning chemical pollution. Emissions of toxic and long-lived substances can have potentially irreversible effects on living organisms and on the physical environment. At present, we have been unable to implement chemical pollution boundaries that ensure that humanity and ecosystems can continue to develop and thrive for generations to come.

To achieve a reduction of the use of chemical and its hazardous effects we need much more than REACH. We need first a chemical pollution boundary (that might differ across ecosystems). Consistent with the achievement of such a boundary, we need to bring the environmental costs caused by the use of hazardous inputs into the prices of goods produced in the economy. When the environmental costs are not included in the price, the market provides incorrect signals which encourage an excessive use of chemicals. The internalization of the environmental costs caused by hazardous substances by a tax will create incentives for producers to reduce the use of hazardous substances by using less or substituting towards other less hazardous inputs. Moreover, since prices are expected to increase after the tax is imposed, consumers get incentives to use less of the taxed products. More importantly, a distinct feature of a tax is that by raising the price of using hazardous substances it can encourage innovation and development of less hazardous substances and thus a transition towards a more sustainable economy. Furthermore, the revenues raised by the tax can be used to subsidize environmental activities intended to reduce the chemical pollution, as for instance, improved technologies for chemical removal by sewage treatment.

A tax on hazardous substances would provide consumers and producers with a price signal that would lead to a reduction in the use of chemicals. The behavioral response would be voluntary in the sense that each consumer is encouraged to react as they see fit in the light of market prices. However, to promote economic efficiency it is important that the taxes are known by all market's actors (otherwise, there is no signal embedded in the price) and that the tax payments reflect variations in the level of the damage caused. The tax must vary so the most hazardous substances pay the most.

The tax on chemicals recently proposed by the government is a move in the right direction, yet it only applies on certain consumer products containing chemicals (for example, a tax on certain electronic devices and a tax on floor coverings, wall coverings and ceiling coverings of polymers of vinyl chloride). Within each distinct product group, the tax will vary with the hazard level. The taxes would apply to all firms that commercially produce the taxable products in Sweden, those that commercially bring in taxable products from another EU country and those that commercially import taxable products. However, products that are bought directly from another country (e.g. via e-commerce or mail order) will not be taxable. Each taxpayer should be responsible to report and pay the correct tax and claim a partial/full tax deduction in cases where the taxes products do not occur in their products.

The proposal considers a tax of 8 SEK per kg for household appliances and 120 SEK per kg for other electronic products (further, a maximum tax of 320 SEK per kg is proposed in order not to impose disproportionately high taxes on some heavy products). In the case of phthalates (found in floors, wall, and ceiling coverings of PVC) it is proposed that the tax should be 10 SEK per kg of the product. The proposed tax rates are relatively very low when compared with the new and successful taxes on pesticides in Denmark or in comparison with other instruments aimed at controlling the use of substances and products is far less dangerous. For example, the Swedish CO<sub>2</sub> tax € 105 / tonne and the charge on nitrogen oxides (NO<sub>x</sub>) SEK 50/ kg. Moreover, the proposed chemicals taxes are not directly

related to the overall toxicity of the chemicals present in a particular product, and are therefore not sufficiently ruling in terms of production and substitution between different inputs but hopefully the tax nuanced more in the future.

The implementation of a tax on chemicals could certainly generate some administrative costs both to producers and to the government. For instance, the Swedish Tax Authority (Skatteverket) argues that the proposal is complex, meaning that it will be difficult for the taxpayers to compute and pay the correct tax. Furthermore Skatteverket must develop new expert knowledge, routines and tools for measurement and analyses of substances in the products. Thereby the administrative costs will be high both for the taxpayers and for Skatteverket. Furthermore Skatteverket rightly thinks this will not become a really large tax base. It is obviously good if the tax is designed so that it contributes to government revenues and the tax applied a little wider and not just on a few products that will give it more). But if the main purpose is to reduce environmental damage, an environmental tax is one of the best policy instruments available, even if the administrative costs are higher than tax revenues. We have to somehow deal with the problem of hazardous chemicals and chemical taxation can be cheaper and more efficient than direct regulation. A prerequisite is that the tax is designed and controlled in a legally secure manner. Most importantly, however, is that the cost of the tax will be considerably lower than the cost of the damage caused by chemical pollution. If a tax is perceived as an unsuitable instrument, it may instead better to introduce a fee paid to the Chemicals Agency, or EPA, and where revenues are used for example to support technology development, cleaner alternatives or research.

In order to achieve the goal of a non-toxic environment we need strong action and a clear change of the overarching principles of the chemicals policy. Chemical issues are very complex, but it must not lead us to paralysis. It is better to try a simple instrument than wait forever on a perfect system. There are inspiring examples of both Denmark and Norway, and there is no real reason to limit ourselves to a few products when mixtures of toxic chemicals are so common in many consumer products.

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