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THE IMPACT OF TECHNOLOGICAL INNOVATION ON SUSTAINABILITY IN EUROPE

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EXECUTIVE SUMMARY

Various economic sectors in Europe, such as the automotive industry, the energy sector or the consumer goods industry, have observed an increased consumer demand for products that aim to have a less negative impact on the environment or on public health. Against this backdrop, this paper analyzes the degree of impact changing consumption behavior can have on product innovation. In addition, it focuses on the role of government policy in incentivizing consumer switching towards more sustainable products, in particular through the use of differential taxation.

With this aim in mind, the text goes on to explain the roles that businesses, consumers and governments have in a market-based innovation process. To do so, the theoretical concepts of technology-push, i.e. businesses linking innovative technologies to the market, and demand-pull, i.e. consumers developing new demands over time and thereby forcing companies to innovate, are explained. Furthermore, it is outlined, that the government must design policy in such a manner, that barriers to innovation are lifted and that consumers and businesses are free to play their respective roles in the innovation process.

Based on this theoretical foundation, this paper analyzes the role of consumers, businesses and the government in the transformation processes of the automotive industry and the consumer goods industry. Regarding the latter, we put a particular focus on novel, risk-reduced alternatives to sugar-sweetened beverages, alcoholic beverages and tobacco products.

In the case of the automotive industry, it is explained how electric vehicles (EVs) have been developed as a reaction to changing consumer demands for more environmentally friendly alternatives to traditional cars that rely on combustion engines. While EVs represent a breakthrough innovation and offer the opportunity to decarbonize road transport in the long run, the novel technology is still struggling to achieve mainstream acceptance amongst consumers. Based on this observation, it is explained how government policy can help to remove some of the barriers to the successful commercialization of EVs. One important tool for policy innovation is differential taxation, which would allow to reflect more, even in the retail price, negative externalities of traditional cars (e.g. CO2 emissions) and thereby widen the price difference between EVs and cars relying on combustion engines.

The concept of differential taxation is further explained in relation to the case of consumer goods. In the section on the case of the consumer goods industry, the focus is on government policies which encourage consumer switching to products that reduce the risk of negative health impacts compared to conventional products. As an example, the consumption of risk-reduced products such as sugar-sweetened beverages (SSBs) with low sugar content may lower the long-term risk of developing Non-Communicable Disease such as diabetes and obesity compared to SSBs with a high sugar content. As such, the overall negative externalities associated with more harmful products to public health may be lower. This can be achieved, through the national excise tax system where products that have high risk for an individual's health are taxed higher than products that have low risk. An excise tax system that is designed according to the risk profile of the products could incentivize sustainable consumption behavior amongst consumers and a sustainable reformulation of products amongst producers.

Finally, the paper closes with some key recommendations on how to apply differentiated taxation and how this can be beneficial to consumers, producers and society at large. It presents differentiated taxation as a policy instrument that provides incentives to innovate and to adopt innovations in order to drive Europe towards a more sustainable economic system.

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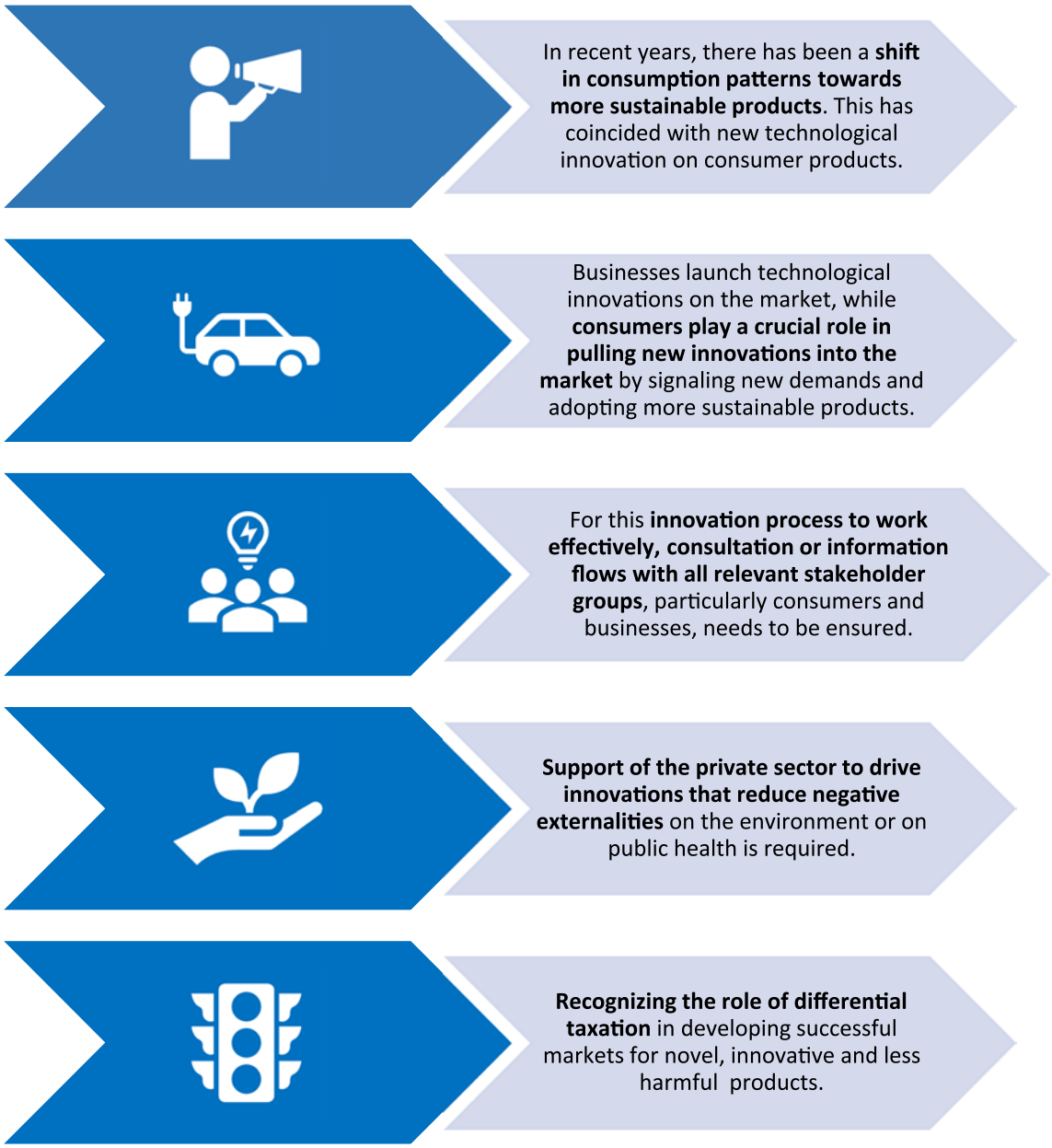
THE FIVE CORE ELEMENTS OF SUSTAINABILITY POLICY CHANGE

The report aims to highlight five core elements to consider for a sustainability policy change (see picture below) and recognizes the impact of technological innovation on sustainability. The objective is to explain the process through which the transition toward a more Sustainable Europe could be driven by innovative policies. In details, what to consider innovative products for sustainability; the need for multi-stakeholder involvement; how to drive and reward innovation; and how to shape an effective regulatory framework through taxation to incentivize supply and demand side of different industries toward sustainability objectives.



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INTRODUCTION

In recent years, conventional consumption patterns in the purchase of goods and services are being re-shaped and challenged by the requirement for environmentally friendly, sustainable and ecological consumption. This has coincided with increased technological innovation on the side of producers who aim to cater to the new consumption demands. This has equipped consumers with new ways of purchasing and consuming, thereby enhancing their ability to choose products and services that suit their lifestyle and, at the same time, are more sustainable or less harmful to their health.

Sustainability as a term has a multidisciplinary meaning. In general, it refers to the ability of a system to endure and maintain itself. In today`s political discourse, the term is used mainly in the sense of human sustainability, i.e. how humans can live and develop their societies sustainably on planet Earth. This was noted in the Brundtland Commission of the United Nations (March 20, 1987) which defined the concept of sustainable development as follows: "Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs."[1]

This definition has provided the intellectual basis for the design of the UN Sustainable Development Goals (SDGs) which has been adopted by the United Nations General Assembly on 25 September 2015 in a resolution entitled "Transforming our world: the 2030 Agenda for Sustainable Development".

Sustainable development may be fostered through many different agents in society, including governments, business and consumers. In a market-based economy, businesses push technological innovations on the market, while consumers play a crucial role in pulling new innovations into the market by signaling new demands and adopting more sustainable products. However, the successful introduction and adoption of technological innovations often fails due to barriers such as high levels of investment, lack of consumer acceptance or a low willingness to pay for a new, unknown products. It is here that the government can play an important role to intervene and help the market actors to overcome such barriers with the aim of steering the economic development into the desired, more sustainable direction.

This paper will now review the important roles that the three actors (i.e. government, business and consumer) have played in two case studies, which have been identified as especially relevant for fostering sustainable development. The first case study is on E-vehicles (EVs) which, as a technological innovation, have the potential to significantly reduce carbon emissions from road transportation. In the second case study the focus is on risk-reduced consumer products such as alcohol-free beer and E-cigarettes or heated tobacco products which both may have the potential to reduce non-communicable diseases.

1 Brundtland, Gro Harlem, et al. "Our common future." New York (1987): 8.

THEORY: TECHNOLOGY-PUSH AND MARKET-PULL

Businesses, governments and consumers are all important agents in transforming the overall economy onto a more sustainable base. Businesses make up the supply side of the economy and have the function of bringing new innovations to the market. Consumers on the demand side of the economy signal new preferences which can trigger new innovative processes.[2] Governments on the other hand often intervene when either businesses or consumers face barriers in performing their market function. One important policy tool for this type of market intervention can be taxation, which has proven to be a powerful tool in incentivizing commitment to change behavior on both sides of the economy. This chapter will explain the role the three agents play in the transformation process in more detail, before exemplifying them in connection to the cases of EVs, alcohol-free beverages and E-cigarettes or heated tobacco products.

Business & technology-push

In any process of industry transformation and technological innovation, businesses have a prominent role to play. They foster innovation from the supply-side of the economy as entrepreneurs enter a market with new products and challenge the incumbent products and the technological status-quo. Businesses that develop new innovative products and production processes provide the basis for a transformation process as they fulfill the important function of linking a new innovation to the new market demand. In effect, they push a new technology onto the market. This, in a nutshell, is the famous concept of Schumpeter's creative destruction, i.e. the continuous process of product innovation in which new technologies replace outdated ones. That being said, business often face challenges when trying to perform their technology-push function. For example, businesses may fail if demand for a new product is initially low. Or, when initial investment costs for product development and market introduction are high, businesses will refrain from developing new innovative products, and instead continue with the existing business line rather than risk the capital investment in the new product category.

Consumers & market-pull

Consumers also have an important role to play and new business opportunities can arise when consumer preferences change, effectively pulling new innovations into the market. Consumers can signal new areas of demand through their purchases and this will encourage or incentivize firms to invest to meet these new demands. However, consumers too face barriers in performing their market-pull function. Low demand for innovative products is often due to asymmetric information on the benefits of these new products. Consumers are often not fully aware of the significant risk reduction potential certain new products offer to the environment or to human health, or can the fully believe or trust the manufacturers claim. Since markets often fail to price in negative externalities, existing products that may be more harmful may be cheaper compared to innovative and less harmful alternatives, for which innovators initially set higher prices in order to recoup investment costs. This can result in the demand for more harmful product remaining high, as their price do not reflect the negative externalities.

Government

The government has the important task to create a level playing field, and thereby defines the conditions under which transformation can take place. Beyond that, governments can actively help businesses and consumers to overcome barriers which may stop them from performing their respective innovative functions, i.e. market-pull and technology-push. One example for such a policy intervention is excise taxation. If businesses are reluctant to invest in the development of innovative products due to concerns regarding low demand, governments may reduce taxes on the innovative products to lower price and increase demand. Likewise, if consumers are poorly informed about the risk potential of products, maybe due to the fact that prices fail to fully account for the negative externalities of the products, governments can make use of differentiated taxation to reflect the risk profile of the different products. This means taxing conventional, more harmful products at a higher rate than novel, less harmful ones.

2 Horbach, Jens, Christian Rammer, and Klaus Rennings. "Determinants of eco-innovations by type of environmental impact—The role of regulatory push/pull, technology push and market pull." Ecological economics 78 (2012): 112-122.

SUSTAINABLE CONSUMER BEHAVIOR AND THE IMPACT ON TECHNOLOGICAL INNOVATIONS IN THE AUTOMOTIVE INDUSTRY

Societies across Europe want to adapt a more sustainable lifestyle, and this transformation has already started. This new drive for a more conscious, healthy and sustainable way of life, that limits the impact on the environment and improves the quality of life, challenges the conventional consumption behavior. The shift towards sustainable consumption behavior is one of the main drivers to foster sustainability efforts in Europe. As such, sustainable consumption can reduce the burden on the environment, for example if consumers increasingly purchase battery powered electric vehicles, this opens up the opportunity to reduce carbon emissions significantly. Likewise, sustainable consumption can ease the burden on public health if consumers purchase risk-reduced consumer goods.

The case of e-mobility and changing consumer behavior

Regarding the environment, the impact of sustainable consumption behavior on technological innovations can be demonstrated through the automotive industry. This sector reacted to the sustainable behavioral change on the demand side of the economy by introducing battery powered electric vehicles (EVs). EVs offer the possibility to decarbonize road transport, thereby tackling climate change and its impact on the environment by significantly reducing CO2 emissions that are attributable to conventional combustible car engines.

However, for EVs to become an economic and an environmental success, certain policy instruments were required to overcome barriers to innovation. In case of EVs, investments will be needed in many different areas, including charging infrastructure in rural areas, and relatively high initial EV purchase price, to make the green choice cheaper. So far, EVs are still lacking broad acceptance among the majority of car drivers mainly because the usability of the new technology is still lagging behind that of traditional cars. Public investments in a stronger network of charging stations could be a solution to this problem. In addition, EVs are still generally high priced compared to their conventional alternatives. To provide further incentives to consumers for purchasing an EV, differentiated taxation can be a tool to encourage consumer switching to more sustainable mobility options. In Norway for example, internal combustion engine (ICE) vehicles are heavily taxed based on curb weight, engine power CO2 and NOx emissions. EVs on the other hand, are fully exempt from such taxes. This taxation system is aimed to correct the market price for the negative externalities of combustion engines and to make EVs cost competitive. In Norway, this form of differentiated taxation increased EV sales significantly.[3] Hence, differentiated taxation gives important incentives to consumers bring innovative, less harmful products into the marketplace. For this reason, this paper will analyze the concept of differentiated taxation and consumer switching in more detail in the next chapter.

3 Mock, Peter, and Zifei Yang. “Driving electrification: A global comparison of fiscal incentive policy for electric vehicles.” ICCT, the international council on clean transportation (2014).

THE CASE OF THE CONSUMER GOODS INDUSTRY: TRIGGERING PRODUCT DEVELOPMENT AND CONSUMER SWITCHING THROUGH TAXATION

It is not enough to rely on sustainable consumption behavior alone. For the successful commercialization of innovative ideas market-based instruments are needed, to promote the consumption of novel, more sustainable products. The price of a product is a decisive element when it comes to purchasing a good or service. Therefore, a price adjustment is often required to trigger the choice to purchase products that limit the negative impact to the environment or to public health.

The market-based instruments are crucial to stimulate the purchase of novel risk-reduced consumer products, especially in relation to public health. In particular, the decision by consumers to purchase risk-reduced products, can be encouraged by a differential tax that is proportional to the risk and harm potential of a given consumer good. Examples of reduced products are alcohol-free or low-alcohol beer; novel nicotine (e-cigarettes, modern oral nicotine pouches) or tobacco (heated tobacco) products or sugar-free soft drinks.

Consumer switching triggers sustainability

Consumer switching that triggers more sustainable consumption patterns in order to reduce the environmental impact and to improve the wellbeing of individuals is an important means to foster sustainable development. Nevertheless, oftentimes consumer switching comes not by itself, it needs to be triggered by incentives. The use of fiscal policies, such as taxation and subsidies, have proven to be an important policy measure to promote healthy lifestyles as outlined in the WHO Global Non-Communicable Diseases Action Plan.[4]

Taxation of sugar-sweetened beverages

A tax system that aims to incentivize consumer switching must tax consumer goods based on their risk profile. If this is not the case and comparable risk consumer goods are taxed differently, consumers may end up switching from risky products to another, which is not the desired outcome. A taxation system should steer consumers towards more sustainable, risk-reduced options and away from riskier once. When it comes to sugar-sweetened products or other sugary products, if the taxation system is correctly designed, meaning that it takes into account the risk profiles of products and applies differentiated tax rates, it can indeed have a positive impact on the reduction of overall sugar consumption in society. For example, the UK is one of the countries that has managed to implement a tax system which takes the risk profile of sugary drinks into account. In the UK, the system operates differently to most, as it has differential rates of tax according to how much sugar the drink contains. This offers a financial incentive for the industry to reformulate their beverages to bring them below the tax threshold[5]. The UK model seems to be a workable method to stimulate the production of innovative products that promote a reduction in health risks to consumers.

However the policies adopted to reduce sugar consumption through taxation on sugar-sweetened beverages not all leaded to the desired outcome. The first sugar tax on soft drinks was implemented in Hungary in 2011, as part of a wider tax on pre-packed sweetened products, salty snacks and condiments, followed by France in 2012, charging manufacturers the equivalent of an extra 6 eurocents per liter for any beverage containing added sugar or artificial sweeteners.

The most high-profile country has been Mexico, which introduced its tax on sugar-sweetened beverages (SSBs) in January 2014 to combat its huge obesity crisis – with more than 70% of the population overweight or obese. It placed one peso (0,037 eurocent) a liter on all SSBs, as well as an 8% tax on foods high in sugar, salt and fat.

Thus in Mexico, there is only one dimension to the tax, a flat rate equally applied on all products, which only aims to deter overall consumption, rather than encourage switching form more harmful products to less harmful one. As can be seen above, a differential excise tax system is of particular interest, not only to trigger consumer switching towards risk-reduced products, but also as an incentivize for product reformulation. Against this backdrop, differential taxation can also improve public health outcomes when it is applied on other substances such as salt or alcohol. According to the WHO report on how to tackle Non-Communicable Diseases, the Best buys' effective intervention policy to reduce unhealthy diet is to reduce salt intake through different policy instruments and actions. It is the most cost-effective and feasible

4 World Health Organization (WHO). 2013. Global action plan for the prevention and control of noncommunicable diseases 2013-2020. World Health Organization.

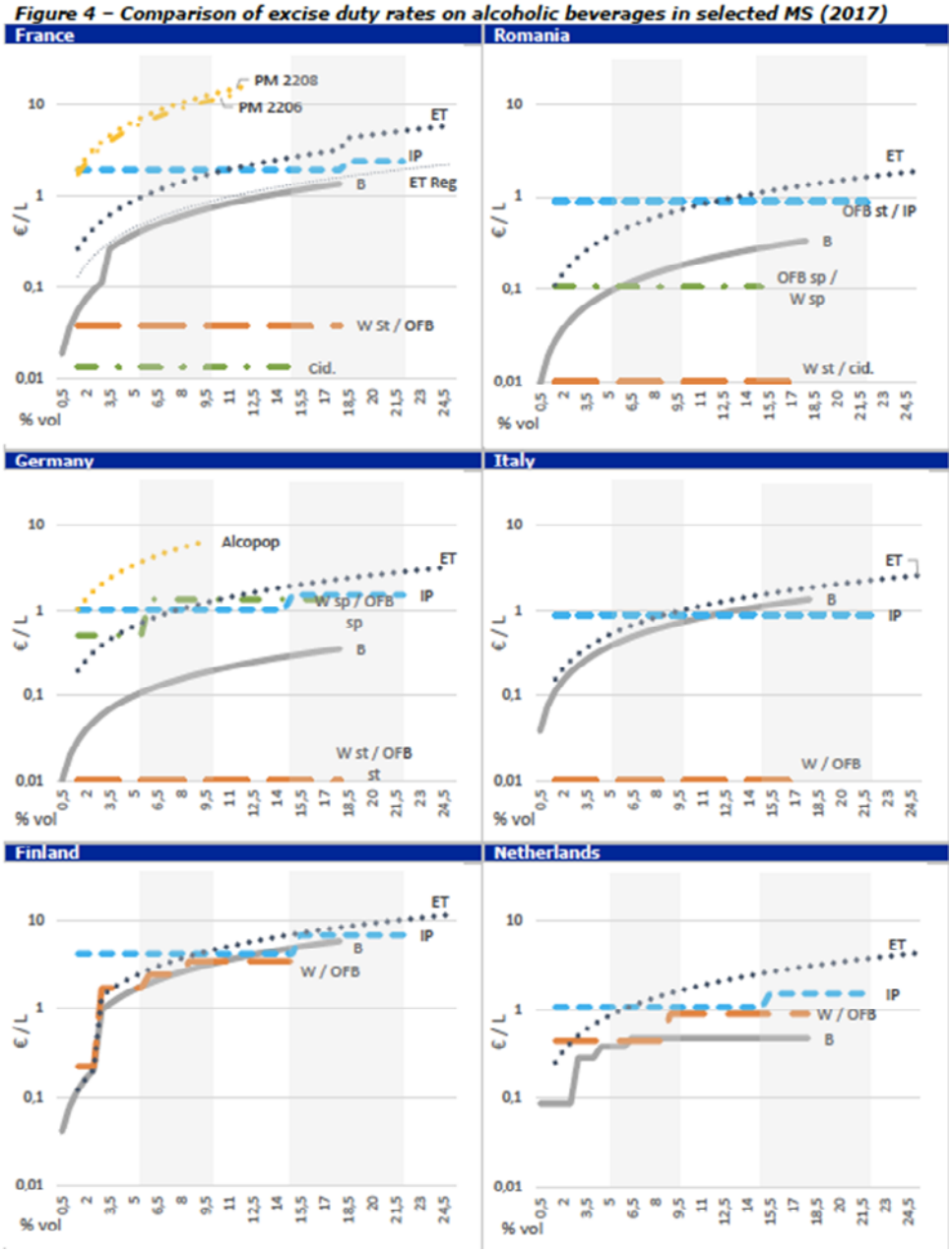
5 Thornton, J. (2018). The UK has introduced a sugar tax, but will it work. London School of Hygiene and Tropical Medicine'June www. ishtm. ac. uk Accessed November 15, 2018.

for implementation (WHO, 2017, p. 11)[6]. In this report, the WHO stresses, that the policy to reduce salt intake has to address the reformulation of food products in a way that they contain less salt and the setting of target levels for the amount of salt in foods and meals. Differential taxation could incentivize producers to reformulate their food products and reduce the share of salty ingredients.

Taxation of alcoholic beverages

A differential tax rate on alcohol can craft an incentive to produce risk and harm reduction products. If we analyze the taxation of alcohol more closely, Finland and the Netherlands provide the case for an alcohol degree tax.

Figure 4 – Comparison of excise duty rates on alcoholic beverages in selected MS (2017)



Note: *The vertical axis is represented on a logarithmic scale to facilitate the representation of quantities of incomparable magnitude. Certain special regimes like reduced rates or different rates for sparkling products are not displayed to help readability. Plato degrees have been converted into ABV using a conventional factor of 2.4.*

Legend: *B: beer; W: wine; OFB: other fermented beverages; cid: cider; IP: intermediate products; ET: ethyl alcohol; ET Reg: reduced rate for ethyl alcohol from particular regions; PM2206: fermented-base pre-mix; PM2208: spirit-base pre-mix; st: still; sp: sparkling*

Source: European Commission[7]

6 World Health Organization. (2017). Tackling NCDs:'best buys' and other recommended interventions for the prevention and control of noncommunicable diseases (No. WHO/NMH/NVI/17.9). World Health Organization.

7 Grassi, T., Kuehnemund, M., Luchetta, G., & Simonelli, F. (2018). Study on Council Directive 92/83/EEC on the structures of excise duty on alcohol and alcoholic beverages. Final Report Volume 1–Main Text June. (p. 70)

For the same alcohol degree (axis x) all product types have the same tax (axis y) – while in other countries the difference are still high among product categories, regardless of the alcohol content. This implies that Finland and the Netherlands decided to implement a taxation system for alcoholic beverages that takes their risk profiles into account. Essentially, all alcoholic beverages are taxed at more or less the same rate, and the rate increases with rising alcohol content. Hence, this taxation system takes into account that the risky substance in alcoholic beverages is alcohol itself and the more alcohol a drink contains the higher it should be taxed, regardless of which product category, beer, wine or spirits). As such, the Finnish tax system gives consumers an important incentive to switch to alcoholic beverages that contain lower alcohol concentration. A completely different approach has been taken instead from the other countries represented in the figures that tax some product types regardless the alcohol degree (i.e. wine).

Differential taxation explained

As said, consumer switching that triggers sustainability is a form of "lifestyle" that can be induced by differential taxation. The government should support consumer switching by promoting innovative products that trigger sustainable lifestyles. Innovative products such as beverages with non-caloric sweeteners, smoke-free products and organic foods are all examples of innovative consumer goods that encourage harm reducing consumer behavior. Traditionally, policy makers have two leverages of taxation to encourage a sustainable product development as well consumption behavior:

Tax base: The tax base should be selected in a way that excludes product components that foster innovation. To be more precise, taxation should not be levied on innovation components of the products that can reduce the negative externalities: substances that replicate sugar or alcohol taste, or for novel tobacco products the product components that use the tobacco in an innovative way (heating instead of burning it) or for E-cigarettes allow the nicotine to be consumed by vaping. All other product components, apart from tobacco mixture and liquid for E-cigarettes, such as at the electronic device but also filters and papers for those innovative products foster innovation and have a potential to reduce negative externalities, therefore should be excluded from the tax base[8].

Tax level: The tax level should be adjusted to the risk and harm potential of the product and heritage of differentiated taxation between products with the same level of high risk or harmfulness should be eliminated not to jeopardize the role of differentiated taxation to reduce externalities. Therefore, it is recommended that if the product produces more negative externalities it can be taxed more but if the risk is lower, and the negative externalities are low it shall be taxed less. Specifically, on a controversial behavior such as smoking, governments can aim to reduce the harm from tobacco smoking by nudging smokers to switch from cigarettes to safer alternatives. Differential taxation can encourage consumers to migrate from highly taxed cigarettes to less risky products that are heated rather than burned or vaping a nicotine liquid if they carry a lower tax rate. However, as an heritage from the past, countries often tax other smoking tobacco and pipe tobacco at lower rates than cigarettes. Today there is little justification for treating heated tobacco the same as combustible forms of tobacco when the risk is potentially less.

Similarly, tax differentiation was discussed in EU debate on Energy Directive and Alcohol Directive. In detail, the Council Conclusions for Energy Tax state that:

> CONSIDERS that energy taxation as a fiscal instrument can be an important part of the economic incentives that steer successful energy transition, driving low greenhouse gas emissions and energy savings investments while contributing to sustainable growth (para. 3)[9]

> ACKNOWLEDGES that the current directive does not reflect coherence with other objectives of the EU climate and energy policies, development of the EU legal framework and its international commitments, changing energy mix and technological development (para. 5)[10]

The Council Conclusions for Energy Tax show that a differential tax can have a positive effect to increase the private rate of return of investments in clean technologies and be meaningful revenue of tax earnings for the state. At the end such kind of tax can minimize externalities and create a societal benefit.

In a similar manner, the U.K. House of Commons' Science and Technology Committee recently recommended the government to take action on the taxation of e-cigarettes and heated tobacco. The committee suggested that:

> the level of taxation on smoking-related products should directly correspond to the health risks that they present, to encourage less harmful consumption. Applying that logic, e-cigarettes should remain the least taxed and conventional cigarettes the most, with heat-not-burn products falling between the two (p. 34)[11]

8 UK experience on Heated Tobacco taxation is a meaningful case: Gov't firstly taxed the full product weight but later they changed the tax base to the tobacco mixture weight
9 Council conclusions on the EU energy taxation framework (2019)
10 Council conclusions on the EU energy taxation framework (2019)
11 U.K. House of Commons Science and Technology Committee, "ECigarettes: Seventh Report of Session 2017-19," HC 505 (Aug. 17, 2018).

Fostering innovation through differential taxation

Both statements above show that, fostering innovation through differential taxation is an important part in developing sustainable policies that drive harm reduction in the long term. A differential tax system with new excise tax categories for energy, alcohol and novel nicotine and tobacco products can allow innovations to flourish.

Taxes are more efficient than regulations from an economic point of view and give more flexibility to households and firms to adapt. These market-based instruments also raise revenues that can be used to offset other taxes (on labor or capital) or for environmental and social purposes (OECD, 2006)[12]. By raising prices on less sustainable products, taxes and charges can be effective in influencing consumer behavior towards sustainability (OECD, 2008, p. 13)[13]. Taxes and charges will influence consumers only if the financial stimulus is strong enough to influence the decision-making process. Taxes on motor fuels, for example are applied in all OECD countries and often form the bulk of environmental tax revenues. In Europe, taxes on motor fuels are 40-60% of the sales price, as compared to 20-25% in the United States. The European car fleet is more energy efficient, with up to 2-3 times lower unit emissions of CO2 from transport than the United States (EEA, 2006).[14]

This shows that taxes have a certain effect on sustainable consumption behavior and also stimulate the purchase of harm reduction and risk reduction products like fuel efficient vehicles. This means that taxes and charges should be set relative to the risk of the product. In other words, harm reduction and risk reduction products should be taxed accordingly to the level of risk to more effectively influence consumption patterns. The establishment of appropriate product regulations based on quality and safety standards is instrumental to put in place fiscal policies (such as taxation) that are proportionate to the reduced-risk potential of these products and to enable communications to consumers on the potential for these products to be a less risky way to consume.

For example for heated tobacco products, the majority of EU MS apply a specific tax based on the weight of the tobacco mixture and set the rate at or below the lowest tax on combustible tobacco. This tax differential reflects the general acceptance of the difference in physical product characteristics, cost profile, and a harm-reduction approach to tobacco taxation (Gambaccini, 2008, p. 510)[15].

In the energy sector, for example, providing tax relief through R&D tax incentives for subsidizing abatement and expenditures on environmentally clean technologies may address market failure where inadequate recognition is given by R&D performers of positive spillover effects[16].

Some European markets adopted policies on tobacco and e-cigarettes that fully recognize the role, here discussed, of differential taxation in implementing a harm-reduction policy. The Czech Republic decided to create a new excise tax category for heated tobacco and adopted a tax plan to increase the tax on cigarettes to further widen the tax gap vs. novel tobacco and nicotine based products. Denmark withdrew heated tobacco from the “other smoking tobacco” basket and created a new excise tax category: “Tobacco intended to produce vapor without combustion.” Similar action went into effect in Lithuania as of March 1, 2019. Currently 16 EU member states[17] have a special tax category for heated tobacco up and running, the few remaining markets, will tax heated tobacco products as other smoking tobacco, as some of them they (reportedly) await guidance from Brussels[18]. The same way 14 EU MSs levied a consistently lower tax on e-cigarettes than cigarettes and the remaining markets decided not to tax those products at all (Germany, UK, France).

In conclusion, creating a new excise tax category for heated tobacco and e-cigarettes would be an adequate measure to ensure the adjustment of the taxation scheme that is proportionate to the reduced-risk potential of these products.

12 OECD. (2006). The Political Economy of Environmentally Related Taxes.
13 OECD. (2008). Promoting sustainable consumption: good practices in OECD countries
14 European Environment Agency (EEA) (2006), Using the Market for Cost-Effective Environmental Policy
15 Gambaccini, P. (2018). Taxing Heated Tobacco in Europe and Beyond. Reprinted from Tax Notes International, October 29, 2018, p. 507
16 Palazzi, P. (2011). “Taxation and Innovation”, OECD Taxation Working Papers, No. 9, OECD Publishing, Paris, https://doi.org/10.1787/5kg3h0sf1336-en.
17 Italy, Portu
18 Gambaccini, P. (2018). Taxing Heated Tobacco in Europe and Beyond. Reprinted from Tax Notes International, October 29, 2018, p. 507

POLICY RECOMMENDATION

Policy makers should contemplate proactive approaches to policy innovation, such as differentiated taxation, in order to incentivize the development and consumption of more sustainable technologies and products. The recent progress made in the automotive sector with the development of EVs and the consumer goods sector with the commercialization of risk-reduced products demonstrates that adequate policy making has the power to promote behavioral or social change. Currently, technological development out-paces policy making, thus, impeding innovation in numerous areas. If innovation has the potential to bring a positive societal and environmental impact, policy interventions should be designed to encourage the adoption of such innovative technologies.

Drive and reward innovations towards a more sustainable Europe

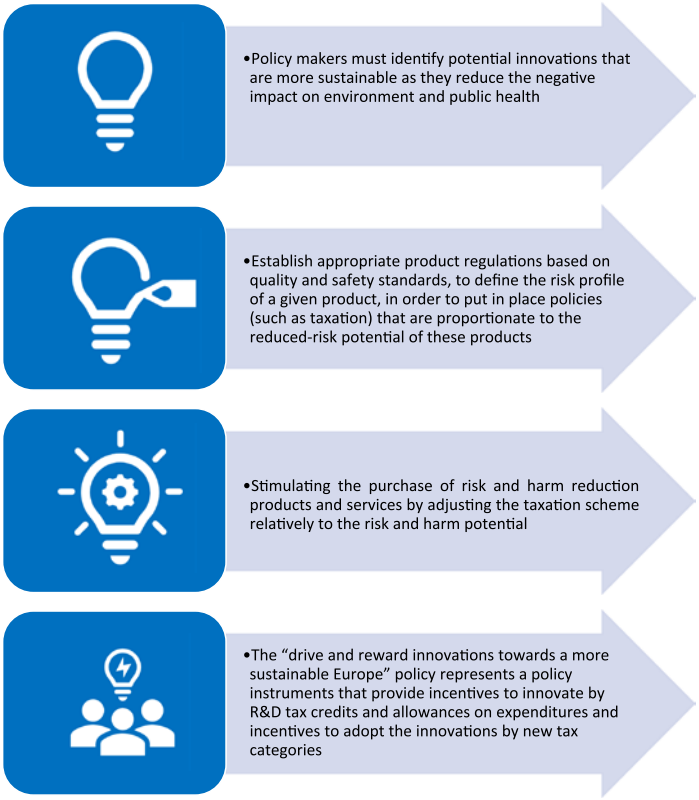
The ambition to "drive and reward innovations towards a more sustainable Europe" must be translated into a step by step policy approach that drives and supports sustainability efforts. The first step of the policy should be to identify potential innovations that are more sustainable because they reduce the negative impact on environment and public health.

The second step of the policy should be to support innovations that have the potential to limit harm to the environment or public health through targeted policy measures. For this to be possible, it is necessary to establish appropriate product regulations based on quality and safety standards, to define the risk profile of a given product, in order to put in place policies (such as differentiated taxation) that are proportionate to the reduced-risk potential of these products.

The third step is to reward such innovations by incentivizing their consumption. A stimulus by the government can be realized in the form of Research and Development tax credits and allowances on expenditures, which would reduce the cost of undertaking R&D activities and it encourages innovation. However, it does little to address adoption by consumers.

Thus, as a fourth and final step, there is a need for a different tax scheme, which results in changing prices for consumers, to promote the adoption of the innovative products. In this regard, differentiated taxation can be a powerful policy tool. What is needed, is a different tax scheme which applies differentiated tax rates on products according to their risk profile. Such a tax system would result in a widening price gap between high-risk and low-risk products. This price difference would send a powerful signal to consumers and would support the adoption of innovative products. The creation, for example, of a new excise tax category for heated tobacco or e-cigarettes allows policymakers to address the special circumstances and cost profile of this novel product. In the energy sector, for example, a new excise tax category can be an external cost from the polluted activities.

The "drive and reward innovations towards a more sustainable Europe" policy represents a policy instruments that provide incentives to innovate by R&D tax credits and allowances on expenditures and incentives to adopt the innovations by new excise tax schemes.



CONCLUSION

Consumer policy has traditionally concentrated on the economic interests of consumers: price, quality and choice. In recent times, the consumers have become increasingly interested in the impact a product may have on the environment or on their health. Policy makers need to take this behavioral change into account as this presents an important opportunity to steer consumer behavior and product innovation into a more sustainable direction. Taxation can be a powerful policy tool in this regard. Future consumption tax systems should take into account the risk profile of a product. The more risk a product poses to the environment or to public health, the higher it should be taxed. On the other hand, risk-reduced products should be rewarded through lower tax rates. This form of differentiated taxation offers to steer the economies of Europe into a more sustainable direction in two ways: first, it aims to incentivize consumer switching towards more sustainable products and secondly, it seeks to reward companies that are willing to reformulate their products.

What's next?

Consumer-oriented policies are especially important. Understanding the social and economic aspects of sustainable consumer behavior is central to designing effective approaches for consumer switching. These policies, moreover, should have direct links to market behavior in dealing with regulations, standardization and codes of conduct as well as maintaining basic access to goods and services. These consumer-oriented policies should stimulate the purchase of risk and harm reduction products and services by adjusting the taxation scheme relatively to the risk and harm potential.

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