Incorporating Sustainability into an Effects-Analysis of Horizontal Agreements

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Incorporating Sustainability into an Effects-Analysis of Horizontal Agreements

Expert advice on the assessment of sustainability benefits in the context of the review of the Commission Guidelines on horizontal cooperation agreements

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Executive Summary

The Commission's ongoing evaluation of the HBER and the Horizontal Guidelines has identified as a key topic the consideration of sustainability benefits. With this background, the Commission has posed the following question:

> *When and how can sustainability benefits deriving from an agreement that restricts competition be measured and possibly outweigh the harm on competition deriving from the same agreement?*

In this report, I make two key presumptions in answering this question. First, I restrict consideration to the balancing of costs and benefits under Article 101(3) TFEU. Second, for the major part of this report, I restrict such an assessment to the welfare of consumers in the relevant market. In what follows, I briefly summarize some of the key conclusions that I have reached in this report.

Defining sustainability benefits

While various policy statements by both the Commission and international bodies as well as passages of the TFEU refer to broad notions of sustainability, presently it seems impossible to develop an all-encompassing definition or even categorization of the associated sustainability benefits, let alone a single metric. In the case of environmental sustainability, instead, there exists a long tradition of making this concept operationalisable. Such a definition of environmental sustainability may, however, neither square up fully with societal preferences as expressed, for instance, in existing norms nor, in particular, with individual ecological preferences, simply as the latter may be non-consequentialist. This should be borne in mind when potentially expanding admissible sustainability benefits. With this caveat, in the main part of this report, benefits are defined solely from the perspective of consumer welfare.

Sustainability benefits as expressed by consumer choice

My starting point is thus the measurement of consumer welfare from expressed or revealed preferences. I discuss various tools, such as contingent valuation and conjoint analysis, that are also applicable to the measurement of sustainability benefits, albeit various specificities of sustainable benefits need to be considered.

Sustainability benefits are typically non-use values, e.g., motivated by altruism or ethical principles. Their experience and measurement are thus particularly sensitive to outside factors, such as social norms or the (choice) context in which they are expressed. I acknowledge that this generates well-known problems in their measurement but I also point to the additional scope that this generates. For instance, consumers' preferences can be elicited under a different information provision or a different expectation about the behaviour of other consumers. This could allow, for instance, to take into account increased future willingness-to-pay when an agreement increases market penetration of a more sustainable product variant. Or, it may correct for limited information or awareness regarding sustainability features, thereby expanding the scope for the appreciation of sustainability benefits.

I express, however, scepticism regarding an overextension of such sustainability benefits in at least two ways. First, it should be respected that the relevant willingness-to-pay still refers to that of consumers in the market and should thus not

be equated to consumers' preferences in other roles, such as that of a (voting) citizen. Care should thus be taken so as not to elicit preferences in a choice context that imposes on consumers excessive responsibility. Second, I also express reservations against super-imposing supposedly "true" preferences in the light of supposed biases in consumers' choices. I propose as an alternative the elicitation of preferences in modified contexts.

Externalities

I separately consider externalities. Under a restriction to consumer welfare in the relevant market, this is limited to externalities that the production and consumption of these products have on (potential) buyers of these products, including on future cohorts of consumers. In principle, such externalities comprise more generally consumers' preferences over the choices of others. Under a broad definition of sustainability this could include preferences over other consumers' purchases of, for instance, meat from animals raised under different standards or of clothes satisfying a fair-trade standard.

I extend standard methods of eliciting willingness-to-pay to capture such preferences but I express reservations regarding such an expansion in the case of non-environmental externalities. Assessing an agreement under such a collective consumer welfare analysis, which includes preferences over the choices of others, may lead to particularly large distributional implications. It also risks interfering in the market and reducing individual consumer sovereignty based on an expression of preferences over the choice of others that is typically legitimized by a political process and decision-making but that is not typical of market interactions. Such reservations are of less relevance with respect to environmental externalities, for which I therefore discuss additional tools as the benefits from a reduction of such externalities typically cannot be measured by consumers' choices within the market. As these tools borrow from environmental and resource economics, care must be taken, however, so as not to apply the welfare (or total economic value) standard that is common for such cost-benefit analysis when one wants or needs to restrict consideration to consumer welfare. For environmental externalities I briefly discuss specific reasons for why their consideration may be warranted even when firms' agreements go beyond prevailing standards and legal obligations.

Indispensability

While I also acknowledge certain particularities of sustainability benefits, such as their relation to non-use values, I note that sustainability benefits that consumers derive from their own choice are akin to those derived from improved quality. My reading of the literature suggests that, even in relation to broader claims of CSR, prima facie competition rather than cooperation fosters such improvements in perceived quality. Still, the literature as well as the guidelines recognize cases where an agreement leads to a more efficient outcome, e.g., when network effects, spill-overs and potential coordination failures are important. I recognize that these may apply as well to the realization of sustainability benefits, notably the reduction of externalities, and I identify additional scope, e.g., when an agreement increases consumer awareness or shifts social norms.

When (environmental) externalities on other consumers are recognized as sustainability benefits, the applicable standard of indispensability may need to be reconsidered. In this case, it may not always be sufficient to point to a potential market failure since production and consumption without the agreement already satisfy the norms set by society. Such norms, for instance, may already impose limits or taxes on emissions as an expression of a trade-off of diverse preferences and principles, including individual liberties. I acknowledge that this raises difficult issues regarding the general scope of competition law and the mandate and role of competition authorities, as well as regarding the effectiveness and efficiency of the overall political process. Still, in terms of an extended indispensability test, it should be analyzed why the issues addressed by an agreement are not sufficiently solved through (existing) policies. I finally stress the danger that acknowledging potentially large environmental benefits, which seemingly swamp price increases, could give rise to large type-II errors (of erroneously accepting an agreement), unless a quantification is undertaken. Without at least an estimate, claims that certain environmental benefits trump higher prices are not open to scrutiny.

Out-of-market benefits

I acknowledge the debate about whether competition law and its enforcement should pursue a sustainability objective independently or whether they should apply a broader welfare standard for this purpose. I do not take a stance in this report. Still, in the final part of this report, I first discuss how sustainability benefits can be enlarged under a citizen welfare standard, expanding the potentially included externalities. I also describe how specific, well-defined policy objectives can be included in a single metric, e.g., through an abatement cost approach. I thereby focus exclusively on environmental sustainability. But I also point out that when such benefits are considered under a broader welfare standard, the various reservations and caveats that I have expressed under a consumer welfare standard should typically all apply a fortiori.

I Task and Organization of the Report

The European Commission is in the process of revising its horizontal block exemption regulation (HBER) and its guidelines on the assessment of horizontal cooperative agreements (Horizontal Guidelines). This relates to the cooperation between actual or potential competitors in areas such as R&D, production or standardization, which may cause a restriction to competition but give rise to efficiencies. Article 101(3) TFEU allows agreements restricting competition to be exempted from the prohibition of Article 101(1) if certain conditions, which I subsequently describe, are met.

The Commission's ongoing evaluation of the HBER and the Horizontal Guidelines has identified as a key topic the consideration of sustainability.[1] With this background, this report intends to answer the following question:

> *When and how can sustainability benefits deriving from an agreement that restricts competition be measured and possibly outweigh the harm of competition deriving from the same agreement?*

I intend to answer this question in such a way that the report is comprehensible to readers with no background in economics. Therefore, I will avoid formal notation, as well as the use of terminology that is not self-explanatory, acknowledging that this may entail a loss of precision. I now describe how I proceed to answer the question posed in this report. For this, based on the provisions in Article 101(3), I first break down the task into several steps. As part of this exercise, I also narrow down my task. In doing so, I already provide some substance on how I proceed in the different steps. This introduction does not, however, provide a full account of my results, for which I refer to the preceding summary.

Article 101(3) TFEU allows agreements that restrict competition to be exempted from prohibition if four cumulative conditions are met: 1) the agreement contributes to improving the production or distribution of goods or to promoting technical and economic progress; 2) consumers receive a fair share of the benefits; 3) the agreement is indispensable for achieving the benefits; and 4) competition is not eliminated with respect of a substantial part of the products in question.

Taking up the first of these four provisions, Section II looks into various possible definitions of "sustainability benefits", drawing on concepts and insights from welfare economics and environmental economics. In this section, I acknowledge that

[1] *European Commission (2021, p. 19): "The topic of sustainability was raised by many respondents to the public consultation and the NCA consultation as a significant development over the last 10 years." Respondents to the Commission's questionnaire identified the Commission's climate policy as the policy area that is deemed least coherent with the present HBERs and Horizontal Guidelines (p. 99). At the same time, individual competition authorities of the European Union have started initiatives. The Netherlands' NCA has published its own guidelines (ACM 2021), the Hellenic Competition Commission has launched a dialogue on competition law and sustainability (available at https://www.epant.gr/en/enimerosi/competition-law-sustainability.html), and Austria's reform of its competition law foresees that economic efficiencies may be equated with greater sustainability, independent of consumer welfare: "Consumers shall also be considered to be allowed a fair share of the resulting benefit if the improvement of the production or distribution of goods or the promotion of technical or economic progress contributes to an ecologically sustainable or climate-neutral economy" (original text: "Die Verbraucher sind auch dann angemessen beteiligt, wenn die Verbesserung der Warenerzeugung oder -verteilung oder die Förderung des technischen oder wirtschaftlichen Fortschritts zu einer ökologisch nachhaltigen oder klimaneutralen Wirtschaft beiträgt", https://www.bmj.gv.at/dam/jcr:fae4ab6e-1876-41dd-ada0-0fa156ca584d/KaWeR%C3%84G_2021_Gesetzestext.pdf).*

sustainability can have very broad interpretations, including, for instance, concerns for fair trade or animal welfare. Still, a particular emphasis of the report is on environmental/ecological sustainability. There are various reasons for this emphasis, which I spell out throughout the report.

I turn now to the second provision, that of consumers receiving "a fair share". I acknowledge that the direct purchasers of affected products may not be final consumers. Still, the cost-benefit analysis that I consider in this report will always be conducted at the level of final consumers. This also clarifies the use of the subsequently used term "consumer welfare". Also, consumers are those in the relevant market, though I also discuss the possibility that sustainability benefits enjoyed by these consumers may not arise directly from their consumption of the concerned products.[2]

Throughout the main part of this report, my interpretation of the provision that consumers receive a "fair share" is that consumers must not be worse off. While this clearly need not apply to each individual consumer, the aggregation, including over different cohorts of consumers over time, is not trivial and will be addressed separately.[3] I thus work under the presumption that the "fair share" provision implies that a shortcoming of consumer welfare cannot be made up by benefits for other parties – neither firm profits (as could be the case with a general welfare standard), nor the achievement of another public policy goal (as could be the case with a public interest provision), nor the welfare of other citizens who are not active in the market in question (e.g., by a reduction of externalities).[4] I discuss issues that arise with a broadening of the (welfare) standard at the end of this report.

Based on these clarifications and restrictions, Section III provides a detailed account of how sustainability enters a consumer welfare standard. For this, I develop a classification of consumer welfare analysis that seems particularly suitable to the consideration of concerns for sustainability. Its main part rests on the definition and elicitation of consumer willingness-to-pay, for which I also discuss the respective measurement tools. I discuss several ways for how a careful elicitation of preferences may provide additional scope for the integration of sustainability, including the elicitation of more reflective preferences, the consideration of a counterfactual change in norms, or a possible prospective analysis of changes in preferences. Elicited sustainability preferences should be particularly susceptible to the context of such measurement and its changes, as they are influenced by social norms and derived from a so-called "non-use value", which is not based on an immediate physical sensation obtained upon consumption of the good.

Section III also extends the elicitation of preferences from hypothetical choices in a different direction, allowing consumers to choose between (counterfactual) scenarios

[2] I acknowledge that consumers in other markets could also be affected by the agreement not only indirectly through externalities but through a market-intermediated link, e.g., as they consume a by-product or as the agreement leads to a change of conduct that spills over into other markets in which these firms operate. I do not discuss whether such intermediated effects are part of the legal definition of consumer welfare.

[3] As stated in the Guidelines (para 87): "(T)he decisive factor is the overall impact on consumers of the products within the relevant market and not the impact on individual members of this group of consumers".

[4] Consequently, I also do not offer a discussion of whether and when sustainability agreements may fall outside Article 101(1) as ancillary regulatory constraints or if they may fall under the objective necessity doctrine.

in which, akin to a social choice rule, the behaviour of other consumers also changes. This makes an important difference in the presence of externalities. While the metric is still that of consumer welfare, preferences then refer mainly to the consumption choices of others. In addition, with a focus on environmental externalities, I discuss the use of "objective", e.g., health-related measures of such externalities and tools for their measurement. Under the chosen consumer-welfare approach, such considered externalities are however restricted only to consumers in the relevant market (who also bear the potential costs in terms of higher prices).

This discussion takes as given that all other conditions of Article 101(3) TFEU are met, thus focussing on the quantification. I turn to the third provision of Article 101(3) TFEU in Section IV. Here, I first describe how existing provisions already provide scope to support claims of indispensability, especially given the extended view on consumer welfare laid out in the first sections. However, I also note that when the focus lies on consumer welfare derived mainly or exclusively from directly appreciated gains, often competition and not cooperation should enhance sustainability. I devote a special discussion to externalities, where in the case of a failure of internalization, market forces do not achieve efficiency. Still, I challenge the view that an agreement should then quasi automatically be considered indispensable. With regards to externalities, indispensability may need to be assessed not only in light of a potential market failure alone, but in light of already existing norms and regulatory standards as these should prima facie be interpreted as an expression of societal preferences, which comprises a potential trade-off between the internalization of such externalities and individual liberties, including consumer sovereignty. This does however not generally preclude the consideration of such externalities, and I also acknowledge arguments about the general effectiveness and efficiency of the political process that leads to such norms, including existing environmental laws. As a potential solution I therefore discuss an extended indispensability test.

Section V briefly extends the analysis to out-of-market benefits.

I finally note that I do not specifically discuss provision 4) of Article 101(3) TFEU, always taking it thus as granted that competition is not eliminated in respect to a substantial part of the products in question. Still, I note that there may be a tension between this provision and agreements that need to cover most or all of the market in order to achieve a substantial reduction in externalities.

I conclude in Section VI. Before proceeding with the analysis, I note that much of the subsequent discussion is taken from various recent contributions co-authored with Eftichios Sartzetakis, Stefan Thomas and Anastasios Xepapadeas

II Sustainability Benefits and Welfare

In Section II.1, I first provide a broad view on the concept of sustainability. It should not be surprising that there does not exist an accepted definition, let alone a categorization of various types of sustainability (benefits). I also note that individual concerns for sustainability may be non-consequentialist, such that, when viewed from outside, the realization of specific preferences may have non-intended consequences that seem to defy their very purpose. In Section II.2, I narrow the view with a focus on environmental sustainability. Here, decades of research in environmental economics have shaped our understanding of this term, albeit individual ecological preferences may still differ from, say, the priorities or valuations derived from calibrated models of sustainable development. From these observations I derive inter alia some caveats regarding the consideration of sustainability benefits in a balancing of costs and benefits.

In the rest of this section, I proceed by providing some general background on the treatment of individual preferences and their aggregation. Section II.3 introduces the most basic concepts of welfare economics. There, I also discuss what may be specific when considering sustainability preferences. This is important for the more detailed discussion of consumer welfare in the subsequent section. In Section II.4, I digress from the classic welfare approach, drawing, inter alia, on behavioural welfare economics. Again, I take this up in the subsequent detailed discussion of consumer welfare.

II.1 Broad View on Sustainability

The notion of sustainability certainly does not yet have a recognized definition within the antitrust debate, let alone the respective legal order. Generally, the term is not limited to ecological or environmental sustainability but it refers to a broader range of societal goals and individual preferences. In what follows, I first discuss various formulations of sustainability as a societal goal. I then discuss how this may be reflected in individual preferences and where there may be important differences.

II.1.1 Sustainability as a Societal Goal

The 2012 UN Resolution 66/288 defines sustainable development very broadly, aimed at securing "*an economically, socially and environmentally sustainable future for our planet and for present and future generations*".[5] Or, in the statement of UNESCO: "*There are four dimensions to sustainable development – society, environment, culture and economy – which are intertwined, not separate. Sustainability is a paradigm for thinking about the future in which environmental, societal and economic considerations are balanced in the pursuit of an improved quality of life*".[6] Also the

[5] *UN General Assembly, Resolution A/Res/66/288 of 27 July 2012, RIO +20. Such a broad perspective is also visible in the draft paper of the Dutch competition and markets agency Autoriteit Consumer & Markt (ACM) on sustainability agreements (ACM 2021), which also contains examples of agreements on "animal-friendly products" or products whose production guarantee "a fair income". However, special emphasis is also put on environmental sustainability (termed "environmental-damage agreements"). In other regulatory contexts, such as (green) finance, wider ecological, social and governance (ESG) criteria are applied.*

[6] *UNESCO: https://en.unesco.org/themes/education-sustainable-development/what-is-esd/sd. The famous Brundtland Commission defined sustainability as meeting "the needs of the present without compromising the ability of future generations to meet their own needs" (Chapter 1, No. 27, p. 16). While this resembles the definition of environmental sustainability, as introduced below, the report then broadens the view, e.g.,*

European Union pursues such broad (sustainability) objectives: "*The Union shall establish an internal market. It shall work for the sustainable development of Europe based on balanced economic growth and price stability, a highly competitive social market economy, aiming at full employment and social progress, and a high level of protection and improvement of the quality of the environment. It shall promote scientific and technological advance*" (TFEU Art. 3(3)).[7]

None of these definitions are such that they provide clear delineations of what would fall inside or outside such a broad definition of sustainability benefits.[8] And typically there is no single metric of measurement.[9] As I subsequently discuss, this is somewhat different with respect to environmental sustainability.

With this background, it presently seems infeasible or unconducive to provide a comprehensive list of potential benefits under such a broad concept of sustainability. The respective societal goals would presently also lack sufficient operationalization, let alone a metric. Without a metric, however, an analysis of the costs and benefits is not possible. It seems that a possible solution is to instead start directly from individual preferences for sustainability rather than from societal goals. This indeed has the advantage of directly leading to a metric—that of (consumer) willingness-to-pay for such benefits—but it does not fully solve various other issues, as I discuss next.

II.1.2 Individual Sustainability Preferences

Individual consumers may express a clear preference for animal welfare and the preservation of a wild species. Such preferences may show up in their actual choices, e.g., when purchasing meat that satisfies a certified standard far exceeding minimum statutory requirements. Other consumers may purchase fair trade products that guarantee a minimum income to the respective farmers. The subsequently discussed main method to measure consumer (sustainability) preferences and thereby ultimately consumers' incremental welfare from an agreement indeed builds on such revealed individual preferences. As with any other improvement of (perceived) quality, this makes such changes to welfare measurable.

Taking such a practical turn to define sustainability does not, however, answer the question about the difference between what actually constitutes or limits "sustainability" preferences and benefits in comparison to other preferences and

to distributional equity: "But physical sustainability cannot be secured unless development policies pay attention to such considerations as changes in access to resources and in the distribution of costs and benefits even the narrow notion of physical sustainability implies a concern for social equity between generations, a concern that must logically be extended to equity within each generation" (Chapter 2, No. 3, p. 41).

[7] In various other documents, this is repeated and further developed, for instance in the Commission's reflection paper on a more sustainable Europe (EC 2019): "Sustainable development in the EU is understood as having three interlinked and equal dimensions – economic, social, and environmental. Underlying this view […] is the belief that it is not possible to achieve a desired level of ecological or social or economic sustainability (separately) without achieving at least a basic level of all three forms of sustainability, simultaneously" (p. 66).

[8] For instance, the UN framework on sustainability recognizes that "[…] there is no equivalent compilation of guidance for social issues in development as there is for environmental considerations" (UN 2012, p. 53). The framework then notes "five cross-cutting programming principles that include gender and a human rights-based approach, and a range of thematic issues".

[9] I acknowledge that there are various attempts to broaden measures of sustainable development (e.g., United Nations 2007, UNECE 2013). However, these measures provide different indications for different components and notably not a single metric.

benefits. As I discuss later, sustainability benefits certainly share particular features, such as the importance of non-use value, as these benefits do not derive from an immediate physical sensation. They may often, as in the case of ecological sustainability but also in the case of fair trade, relate to the well-being of others. But another consumer may want to save certain species whatever the implications for the well-being of people living in the affected area. What is more, individual preferences may simply be far from consequentialist: A consumer may want to boycott products made with child labour regardless of the actual implications on the local economy, the children's families and ultimately the well-being of the affected children.[10] I already point out here that absent externalities as well as other, subsequently identified sources of potential market failure, competition rather than an agreement would best serve such different individual preferences.

II.1.3 Way Forward

The preceding discussion has pointed to various problems associated with a broad concept of sustainability and sustainability benefits. Here, I do not want to repeat these issues, but instead lay out how I proceed in what follows.

In the next section, I zoom in on environmental or ecological sustainability. Indeed, throughout this report, I frequently single out this notion of sustainability for various reasons. I briefly list some of them. There exists a large body of academic and practical work that defines and operationalizes this concept, albeit in a way that is not based on the welfare of current consumers. Even though my subsequent focus lies on consumer preferences, such operationalizations should provide important input for the future development of the concept of environmental sustainability benefits in an antitrust analysis. Furthermore, for many potential agreements, the reduction of externalities caused by emissions in the production or during the use of the concerned products may constitute the main determinant of claimed potential sustainability benefits. A change in such emissions should be measurable and, as I discuss, it may be linked to objective measures of well-being, such as those related to health and life expectancy. These measures can be used along with consumers' stated or revealed preferences, providing additional checks and scope to scrutinize presented evidence. Furthermore, as I discuss in much detail below, a consumer's expressed preferences for the choice of other consumers may, in the case of such externalities, represent a potentially much more tolerable restriction of other consumers' freedom of choice compared to, for example, when a consumer had a high willingness-to-pay to also restrict other consumers' choice to fair-trade products. These are some reasons for why I subsequently often focus on environmental sustainability benefits.

Still, I do not limit the subsequent discussion to environmental sustainability alone. In fact, as I already noted, much of the discussion about how to elicit and assess consumer preferences applies more broadly. But I note again that based on the preceding discussion, without additional restrictions imposed on the concept of sustainability, there is little scope to provide a classification of such broad benefits that would be both comprehensive and sufficiently concrete.

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[10] Such non-consequentialist preferences are sometimes referred to as "impure altruism" or "selfish altruism". While I need not make such a distinction, I will still take up the difference between personal sustainability preferences and (more consequentialist) societal preferences below.

II.2 Ecological/Environmental Sustainability

Above, I have referred to various sources that speak to the European Commission's commitment to sustainability. In the specific area of environmental sustainability, such a commitment has been enshrined in the TFEU at various occasions. Article 11 TFEU foresees the integration of environmental protection obligations: "*Environmental protection requirements must be integrated into the definition and implementation of the Union's policies and activities, in particular with a view to promoting sustainable development.*" Article 191 TFEU states that Union Policy on the environment shall contribute to: preserving, protecting and improving the quality of the environment; protecting human health; prudent and rational utilization of natural resources, promoting measures at the international level to deal with regional or worldwide environmental problems and, in particular, combating climate change. Recently, such commitments have been made more specific. For instance, according to the Green Deal, the EU should become climate-neutral (net-zero greenhouse gas emissions) by 2050.[11]

Ecological sustainability thus has a firm foundation in the legal framework of the European Union and the policy of the European Commission. As I already pointed out, environmental economics contributes a large body of work towards the definition and operationalization of this concept as a societal goal. I first turn to this before discussing again differences to individual ecological preferences.

II.2.1 Environmental Sustainability as a Societal Goal

In the words of the World Commission on Environment and Development, sustainable development is described as the "*development that meets the needs of the present without compromising the ability of future generations to meet their own needs*" (WCED 1987, p. 35). Environmental economists have given this various interpretations so as to make this term operable.

Classic contributions to the literature require the maintenance of a specified value of aggregate capital, which hence includes both natural and human-made capital.[12] Such an approach is frequently referred to as "weak sustainability". More recent approaches, instead, put additional environmental constraints on such a (permitted) substitutability between natural and human-made capital. The corresponding criterion is typically referred to as "strong sustainability".[13] This also imposes more constraints on the economic system. As changes to the ecosystem may prove irreversible and given the associated great uncertainty, there seems to be a broad consensus to also apply a precautionary principle to sustainability.[14]

These different concepts of environmental sustainability have a precise and operable definition, which can inform policies when such a concept is used as a societal goal. For instance, the objective to keep global warming within certain bounds could be seen as one, albeit specific and certainly not all-encompassing, operationalization of

[11] *See also the statement by President von der Leyen on delivering the European Green Deal on 14th July 2021, available at: https://ec.europa.eu/commission/presscorner/detail/en/STATEMENT_21_3701 (last accessed 29 July 2021).*

[12] *Cf. Solow (1974) or Hartwick (1977).*

[13] *Cf. Constanza (1991) or Daly (1991).*

[14] *Such a principle is also enshrined in Article 101 of the TFEU.*

environmental sustainability. Here, the objective could be derived from expectations about when a change would become irreversible, combined with a precautionary principle. Also, these concepts are all consequentialist.

Policies that may look sustainable at first sight but fail to have a true impact or that may even lead to unintended consequences would thus not be truly sustainable under such concepts. [15] Also, when a given standard of sustainability is not achieved, this may either reflect society's true preferences or it may be due to obstacles in the political process.[16] I return to these issues at various points below as I regard them as important to determine which claimed sustainability benefits should be taken into account. Finally, as in the case of a broader notion of sustainability, individual ecological preferences may also differ from such a (consequentialist, model-based) concept of sustainability for various reasons. I turn to this next.

II.2.2 Ecological Preferences

Consider the case of an endangered species. Economists may put on it a "value" as an exploitable resource, including for an aesthetical or recreational experience. Individuals may instead place a high "existence value" on its preservation regardless of whether the animal could (still) play a role in the overall preservation of an ecosystem. Individual preferences may simply be non-consequentialist, as already discussed above in a more general context. Still others may argue that such a purely anthropocentric view is ethically misguided as the existence of the animal has some intrinsic value, which should place hard constraints on, say, economic activity.[17] As already discussed, they may be willing to sacrifice human welfare for the realization of certain ecological objectives. Also, individuals may not perfectly understand the repercussions of their choices on ecological sustainability. This is another possibility where ecological preferences and their aggregation may lead to a different choice compared to when we followed the "output" obtained from a calibrated, consequentialist model of environmental sustainability.

As I already discussed, in what follows, consumers' expressed preferences for their own choice still form the basis of consumer welfare analysis, also in the case of environmental sustainability benefits. For this reason, I next turn to welfare economics and discuss some basic concepts regarding preferences and their aggregation into a metric, such as consumer welfare. That said, later I also discuss objective measures relating to emissions with, for instance, a potential impact on health. This is necessary as we can not deduce their benefits alone from a consumer's own choice, as these benefits follow from the externalities that other consumers have on her.

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[15] Possibly the best known example is that of carbon leakage. For instance, Steckel et al. (2015) show that a restriction on the use of coal in developed economies increased carbon intensity elsewhere as coal-fired electricity generation became more attractive with lower prices of coal. Still, it needs to be acknowledged that unilateral carbon reductions may have positive effects through other channels, such as through spurring innovation.

[16] These may in turn derive from informational frictions and political economy constraints, which could make it difficult to apply, for instance, Pigouvian taxes or ban dirty production (see, e.g., Tirole 2012).

[17] In the popular literature, such thoughts go back at least to Carson (1963) and have also influenced the well-known "Limits to Growth" by Meadows et al. (1972).

II.3 Welfare

II.3.1 Individual Preferences and Aggregation

II.3.1.1 Aggregation by a (Standard) Compensated Pareto Criterion

In this report, I cannot provide a thorough introduction to welfare economics.[18] In classical welfare economics, individuals are assumed to be endowed with well-defined, consistent and stable preferences. In abstract terminology, such preferences are defined over bundles of "commodities", which could include environmental goods (e.g., the quality of the environment). When individuals have the possibility to choose, their choices are assumed to represent their preferences. As I discuss in detail below, a key part of the toolkit is to extract the underlying preferences from choices. To the extent that their choices affect others and to the extent that this is not internalized, choices have externalities.[19] I return to externalities below.

Social choice theory is concerned with the question of how to aggregate individual preferences. Economists typically resort to the criterion of potential or compensated Pareto optimality. In essence, an outcome is preferable if it yields positive aggregate benefits and if transfers could be made between the considered individuals such that no individual is worse off but at least one individual is better off. As a particularly simple illustration, suppose that all individuals place the same value on money, so that a transfer of money would not change the sum of all utilities. Then, the potential Pareto optimal social choice, including individual consumption decisions, would be the one which maximizes the sum of individual utilities.

Various comments are expedient with respect to this aggregation procedure. It treats all considered individuals equally, i.e., placing the same weight on each of them.[20] As I frequently discuss subsequently, also in the context of an agreement this may create winners and losers. The standard justification of the principle of compensated Pareto optimality is that when this criterion is followed, winners could potentially compensate such losers. If, for some reasons, society would care about the distribution, other instruments could thus be used so as to induce a certain (re-)distribution. Such a presumption may indeed be reasonable for a cost-benefit analysis, where the respective policymaker has access to instruments that resemble such transfers, such as imposing (heterogeneous) levies or providing subsidies. This is, however, not part of the enforcement practice in antitrust.[21] I subsequently acknowledge that even when considering only consumer welfare, also absent sustainability benefits agreements can have distributional implications, as, for instance, some consumers benefit more from the realized efficiencies. Still, the preceding observation is important because various

[18] *In Inderst et al. (2021a), more formal details are provided.*

[19] *There are various definitions of externalities in the literature. Following Arrow (1969), one frequently refers to externalities as "non-priced effects" of choices, implying thereby that certain markets are missing (including those where trade could take place with future cohorts of individuals).*

[20] *There are also other aggregations, some of which place greater emphasis on concepts of equity or fairness (e.g., Varian 1974 or Feldman and Kirman 1974).*

[21] *In the context of cost-benefit analysis, Atkinson et al. (2018, Chapter 11) discuss various practical approaches to consider distributional implications (such as exploring under which weighting a decision would change). See also Adler (2016) for a non-technical overview of the use of distributional weights in cost-benefit analysis.*

subsequently discussed proposals to incorporate sustainability concerns could have considerably larger distributional implications.[22]

The abstract notion of such an aggregation of preferences also leaves open the question of which individuals shall be considered. In this report, I mainly restrict consideration to consumer welfare, meaning individuals in the respective jurisdiction who are (potential) buyers of the considered products. Only their preferences are considered (or aggregated) in what follows, albeit, depending on the applied concept of consumer welfare, this may include externalities that other consumers in the respective markets have on them. I address separately how to deal with future cohorts of consumers.

The principle of potential or compensated Pareto optimality, including also the dimension of time, provides a single metric. While it may be tempting to "enrich" this metric by appealing to additional goals or principles, this would necessarily provide a conflict. That is, an assessment that is not purely welfarist but constrained by additional principles or guided by other objectives must violate the Pareto principle: In some cases, welfare will end up being sacrificed for other principles or goals.[23] This comment should not, however, suggest that the use of the described welfare criterion (or an adjustment of it that involves, for instance, different weights for different groups of affected individuals) is not contentious. In the next section, I discuss a particular criticism that subsequently plays a prominent role when contrasting consumer welfare with consumer sovereignty.

II.3.1.2 The (Intrinsic) Value of Opportunity

The described welfare criterion is consequentialist as it judges different outcomes by their impact on individual welfare. The aggregation procedure involves a potential trade-off of different preferences. This report is certainly not the best place to discuss decades of literature in social choice theory that criticizes, modifies or expands this procedure. Still, I want to briefly point to one strand of such criticism as this should be of particular importance for the objective of this report.

I acknowledge that some sustainable agreements, notably those related to new product development and introduction, may enlarge the set of possible choices for consumers. Still, other agreements may lead to the opposite outcome, reducing consumers' choice set, e.g., by leading to a joint phase-out of particularly polluting or energy-consuming products. Under a consumer welfare standard, such a restriction of choice must still benefit consumers in the relevant market (rather than society as a whole). As I discuss later, when the respective product is consumed by many consumers, aggregate externalities may be non-negligible and an individual consumer may derive measurable benefits from such reduced externalities. If one wants to take such benefits into account, on aggregate, the restriction of choice may benefit consumers who may have low demand and are thus only little affected by higher

[22] *It should be noted that when applying the subsequently discussed methods to measure willingness-to-pay, the subsequent aggregation already takes into account that consumers value price changes differently, e.g., due to differences in income. While such differences (in what could be interpreted as consumers' marginal utility of income) thus influence the decision whether an agreement that increases prices shall be cleared, once this decision has been made, the respective price increase affects consumers' utility differently (without compensation).*

[23] *For a general (formal) proof of this, see Kaplow and Shavell (2001). In environmental economics, still, such procedures have been proposed; cf. Common and Stagl (2005).*

prices, while other consumers with high demand may be even considerably worse off. To provide another example outside environmental sustainability, individual consumers may derive benefits when other consumers also purchase meat from animals that are raised and slaughtered according to higher standards of animal welfare. Taking such benefits into account may again imply that a restriction of choice, as made possible under an agreement, can lead to higher aggregate consumer welfare while it considerably constrains the preferred choices of at least some consumers.

In contrast to the thereby applied utilitarian criterion, various contributors to social choice theory have also advanced alternative, opportunity-based concepts. In such opportunity-based theories, value is attached (also) to the size and richness of the opportunity set that individuals face.[24] In the specific context of this report, this can be given an expression in terms of consumer sovereignty. I return later to this concept.

II.3.2 Sustainability and Welfare: What is Special?

As a point of reference the subsequent discussion, I take a consumption decision that is, at least in the example, void of sustainability concerns. I suppose that this is the case for the purchase of a razor. If two models differ only in their functionality but not in other aspects, such as the material required for their production, a consumer's choice between these two models has no environmental externalities. A consumer's choice should then be based primarily or even fully on the immediately derived use value. The consumer can judge this value by herself or himself based on an immediate physical sensation.

Choices with a significant sustainability dimension are different, however, at least in the following dimensions that I discuss in turn:

- Potential externalities, including on future cohorts/generations
- Importance of non-use value
- Complexity of choice, including potential lack of information

II.3.2.1 Externalities

As discussed above, formal definitions of environmental sustainability derive from a notion of intergenerational balancing, with the objective of preserving resources (notably natural capital) also for future generations. Future generations do not, however, (yet) possess property rights over these resources and they cannot enter into respective trades. This also applies to persistent or even irreversible changes to the environment. For economists, such "missing markets" are at the heart of the problem of non-internalized externalities (and the resulting inefficiencies). Consumers may wish, however, to internalize such externalities on others, including future generations, for various reasons. Such a (non-use) value may derive from a bequest motive as they care for their own offspring, at least to some extent, or more universally for all members of the next generation.

Clearly, externalities of individual choices on others are not limited to the environmental dimension. Other consumers or citizens may find products that a particular consumer buys aesthetically unpleasant or morally dubious – even to the

[24] *E.g., Sen (1992), Arrow (1995) or, with a special focus on consumer sovereignty, Sugden (2004).*

extent that they have a positive willingness-to-pay to change her consumption behaviour. They may also care about the consequences of another consumer's choice on animals or on farmers in other countries. These cases represent further examples where individual choices have an externality on the well-being of others even though this does not relate to the physical well-being, as in the case where this is affected by emissions of hazardous substances. I discuss below whether one should still appreciate and incorporate such externalities.

As the definition of externalities implies, however, their presence rests on the lack of full internalization and thus, first and foremost, on the institutional framework as shaped by policy and regulation. Here, the following observations are important for what follows. Existing norms should prima facie be seen as the outcome of a political process, representing notably a trade-off between different preferences in society. Existing norms also represent a trade-off between a maximization of welfare, i.e., a utilitarian perspective, and respect for individual liberties. Such considerations, to which I return, should impose limits on recognizable sustainability benefits that arise precisely from the discussed externalities, i.e., even when an agreement may be judged positively in terms of aggregate consumer welfare. As I also discuss, however, this does not preclude the consideration of such benefits, though notably an argument of the indispensability of an agreement may not exhaust itself in pointing to a market failure alone.

II.3.2.2 Non-Use Values

Returning to the razor example, consumer preferences for one razor over the other should depend largely or even exclusively on the respective use value. Consumers have a higher willingness-to-pay when, ceteris paribus, a razor offers a cleaner shave or has a more powerful rechargeable battery. As I already discussed, concerns for sustainability typically lie instead outside the scope of such use value, since there is no direct corresponding (physical) benefit for the consumer of the product. In line with the literature, I refer to such product characteristics or attributes as "non-use benefits" or "non-use value". [25]

Non-use value may have various origins as I already pointed out in my brief discussion of, in particular, ecological preferences in Section II.2. In the case of avoided externalities or saved resources, such value may be motivated by altruism or bequest motives with respect to future generations. Or, it may simply represent the appreciation of the existence of a wild animal or some preserved natural habitat even though the respective consumer does not expect to make direct "use" of it (so-called "existence value").

For certain aspects of sustainability, such as animal welfare, a consumer's individual choice may have, in some sense, a direct impact. For instance, a consumer buying chicken meat that satisfies a particular animal welfare standard may attribute the avoided suffering directly to her own choice. Notably, with respect to environmental sustainability, however, consumers' individual choices will only have a very small impact. The positive sensation that they may still perceive is sometimes referred to as a "warm glow" effect.

[25] *More precisely, non-use value refers to a valuation not based on actual, planned, or possible use by oneself (though possibly by others); see, for instance, Pearce et al. (2006).*

As I already noted above, one cannot expect that consumers' sustainability preferences are always consequentialist, so that they may derive personal benefits from a particular choice even though the overall impact is either negligible or possibly even counterproductive.[26] The "warm glow" effect poses, however, methodological problems when one wants to elicit consumer sustainability preferences from hypothetical choices. Subjects in such a choice situation may then wrongly attribute a far greater importance to the particular choice than it actually has, in particular when their choice or statement of preferences remain inconsequential for them (i.e., leading not to an actual purchase). Compared to the (physical) sensation associated with use value, willingness-to-pay derived from such non-use value should be more susceptible to outer influences, including perceived social norms. Likewise, their measurement should depend much more on the specific context, e.g., on the time that is given to reflect on the choice or on circumstantial information that is provided. I discuss later that this not only poses a considerable challenge for its measurement but also provides scope for a wider consideration of sustainability concerns. In addition, the appreciation of such non-use values may change faster and more profoundly between cohorts of consumers or even for a given consumer over time, which needs to be accounted for in a consumer welfare analysis.

II.3.2.3 Complexity of Choices

Returning once again to the razor example, the immediate sensation by which a consumer judges the functionality of different models certainly makes the consumer the best judge of the respective (use) value. A consumer who wants to limit her CO2 footprint when purchasing different food, for example, must instead rely on information compiled and provided by others. How much toxic legacy will an electric car leave to future generations and how does this compare with the environmental impact of a new car with a combustion engine that satisfies the highest standards? Which environmental standards are employed in the foreign production of the solar panels that I wish to install, and is the environmental balance potentially worse than relying on electricity from gas-fired power plants? When consumers make (more) sustainable choices, they have to collect and digest various information, also potentially requiring background checks on the labels that a consumer wishes to trust.[27]

The potential impact of their choice as well as that of other likeminded consumers may also be highly uncertain. Less sustainable choices may potentially have negative effects only with a very low probability, albeit the respective impact could then be large. The need to deal with probabilities and potentially widely diverging scenarios adds to the complexity of consumers' more or less sustainable choices.

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[26] To recall: For instance, a consumer may not want to purchase clothes that involve labour of children under a certain age, irrespective of whether this indeed has an impact (e.g., as it just leads to a reallocation of productive resources in the country) or an impact that defies the possible purpose, making the life of these children worse and not better.

[27] There is a vast literature on how different kinds of information provision and labelling can provide adequate information to consumers, also with respect to ecological sustainability, such as in the case of energy efficiency (e.g., Newell and Siikamäki 2014). As I briefly mention below, industry agreements on such labelling often do not restrain competition.

II.4 When Choices (Supposedly) Do Not Represent Individual Preferences

The described classical perspective on preferences, choices and welfare presumes that for a given individual, such preferences are well-defined and stable as well as reflected in the individual's choices. This presumption is also seen as essential to (unambiguously) extract preferences from observed choices.

As I discuss in what follows, various research has, however, shown that both real as well as hypothetical choices may not exhibit such properties. Choices may depend on circumstances or context that "should" be irrelevant for preferences. Also, choices may seem to not conform with a person's own best interest. These insights are obviously of importance for the subsequent measurement of (consumer) preferences. But, as I show, they also offer scope for a greater consideration of sustainability benefits.

In the present chapter I briefly discuss the respective issues in a more general context. I organize the discussion as follows. First, I discuss potential errors and even systematic biases in decision-making. Second, I focus on cases of context-specificity where an ambiguity of (revealed) preferences may still remain.

II.4.1 Errors and Systematic Biases

The subsequent discussion is informed by various sources, both from social psychology and behavioural economics. I start with the most obvious observation. When people are generally inattentive to choices, e.g., as these have limited consequences, they may make errors that insufficiently reflect, for instance, the likelihood of certain outcomes. Or, wrong choices may be based on an insufficient consideration of all available information. Also inattention to particular aspects of a purchase decision will lead to errors. For instance, when purchasing electric appliances, consumers may be more attentive to the immediate sales price and less attentive to the costs of operation, such as energy costs.[28] When real or hypothetical choices, as used to elicit preferences (cf. Section III.1), are prone to such errors, they can only reflect preferences with some "noise".

The field of behavioural economics has pointed to various instances where choices may supposedly differ systematically from individuals' preferences. In what follows, I need not provide a full account of such biases. If one starts from the classic presumption of preferences as reflected in choices, one may want to consider as a bias any systematic deviation from the choice decisions that individuals would make "*if they had complete information, unlimited cognitive abilities and no lack of self-control*".[29] As subsequently discussed, however, such a view may miss preference and choice ambiguities that should not be classified as biases. Presently, I can, however, confine myself to a particular selection of behavioural biases that will subsequently

[28] *There is substantial evidence that consumers are relatively inattentive to particular (implicit) costs (e.g., sales taxes, as in Chetty et al. 2009). If these are indeed only random errors, then from a purely descriptive view this does not pose fundamental problems. Indeed, empirical choice models typically contain such a "noise" parameter (reflecting, for instance, the effect of unobserved determinants). If a subject's preferences are indeed to some extent stochastic (or unstable), from a normative perspective this raises the question about which preferences should be taken into account as a measure of well-being, e.g., the "average" preferences.*

[29] *Sunstein and Thaler (2003).*

prove potentially relevant for the discussion of how to elicit and measure sustainability preferences of consumers.[30]

II.4.2 (Systematic) Misjudgements

Particularly when making choices under large uncertainty, walking through the different scenarios with their respective likelihoods and outcomes may prove quite challenging. The literature has observed various systematic errors that arise at each step of such a decision process: the use of ex-ante ("prior") probabilities, the processing of new information ("updating") and the application of the resulting (posterior) probabilities to the respective outcomes.

Potential systematic misjudgements that arise when certain outcomes have low probability (though they may have important consequences) seem particularly relevant for decisions related to sustainability.[31] Individuals may also make a priori misjudgements in the overall likelihood of certain outcomes when their beliefs are too much anchored by their own (recent) history.[32] For instance, consumers may evaluate energy efficiency and cost savings of more sustainable products based on the wrong expectations about future fuel prices.[33]

II.4.3 Heuristics and Inertia

Rather than going through the full decision process each time a consumer faces the same or a similar choice situation, she may simply rely on a (proven) simplified procedure, possibly only reacting to certain, sufficiently prominent and novel cues. Or she may apply the same simple heuristic to different purchasing decisions. While such a seemingly boundedly rational behaviour may be optimal in the view of cognitive and time constraints, it can lead to decision-making that does not conform with the consumer's "true" preferences. For instance, it may lead to excessive inertia: When the consumer is forced to give up her simple heuristic, e.g., as products were displayed differently, she may make a different choice. Varying the choice architecture is another prominent way to break inertia and force active choices, thereby possibly better aligning purchases to consumers' "true" preferences.[34] Such insights are obviously of relevance when one wants to measure sustainability benefits based on observed market choices alone.

II.4.4 Time Preferences

The issue of displayed time preferences that (seemingly) contradict rationality has a long tradition in various strands of the (economic and business) literature – and it has various aspects. For one, consumers sometimes seem to exhibit (too) large implicit discount rates, e.g., as they forgo large future cost savings to realize a relatively low

[30] This organization and choice draws inter alia on Chater et al. (2010), which again borrowed from DellaVigna (2009).

[31] Errors in expectation formation with low-probability events are predicted by Prospect Theory, going back to Kahnemann and Tversky (1979).

[32] Kahnemann and Tversky (1974) refer to this as "availability bias".

[33] There is a substantial literature that analyses both consumers' perceptions about future fuel prices and how potential misperceptions can distort purchases of more or less energy efficient products, such as automobiles (e.g., Alcott 2011, 2013).

[34] To mention just one example that is related to sustainability, in a field experiment, the take-up of a carbon offsetting program for bus tickets was much higher when consumers had to actively make a yes-or-no decision (Kesternich et al. 2019).

but immediate price cut.[35] Notably, when such cost savings are long-term, such behaviour seems more consistent with consumers demanding a "pay-back" over a short time horizon, thereby fully discounting future benefits that lie beyond a certain date. Another aspect concerns inconsistency in time preferences, which may lead to so-called "procrastination": Discounted benefits from an action may be higher than its immediate costs, but an individual may experience a particularly large disutility from incurring these costs "now", thus postponing the respective decision or choice until "tomorrow", where, however, she is trapped in the same logic again.[36]

There is an obvious and much explored relationship between such potential biases and the question of (greater) sustainability. For instance, when products that save energy come at higher initial costs, preferences that are supposedly not rational may inhibit a change towards greater sustainability. Absent subsidies, a concerted phasing-out of the cheaper, less energy efficient variant may then seem necessary, not only to increase sustainability but also to supposedly help consumers realize their "true" preferences. I return to such a possible superimposition of seemingly objective preferences below when analysing the extraction of willingness-to-pay and the measurement of consumer welfare in more detail.

II.4.5 Context- and Reference-Dependency

One of the most persistent findings in the experimental literature is that choices depend on circumstances or context that, at least in the eyes of the observing economist, should not affect decision-making as it should not enter the subject's welfare function.[37] In such situations, one may still suppose that by correcting for the influence of these "ancillary conditions", the thereby adjusted choices would then conform more to an individual's "true" preferences. I now provide some more specific examples.

There is a large literature that has studied, both in the laboratory and in the field, how often small changes in information provision, such as the order of appearance, can have large effects. Also, alternatives that are irrelevant, per se, for the consumer may still affect her choice. A consumer may routinely shy away from buying the cheapest or the most expensive variant, for instance. Then, the addition of still more expensive options or the exclusion of the cheapest options may affect her behaviour even though these alternatives are not directly relevant. More concretely, at the act of purchasing, a consumer may tend to follow a procedure that is termed "relative thinking", her assessment is relative to some reference point that is determined by current alternatives or past choices. I provide a simple illustration. For this, I suppose hypothetically that a product's sustainability was measured by a simple metric and that this attribute and the price were the only ones relevant for a given consumer.

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[35] In a classic study, Hausman (1979) extracted average discount rates in excess of 20 percent from consumers' choices of energy-using durable goods. As with many other studies, however, alternative explanations for seemingly paradoxical or irrational behaviour cannot be fully ruled out (here, for instance, that consumers place little trust in the longevity of the respective good).

[36] Such preferences go back at least to Strotz (1956) and have been formalized with so-called "hyperbolic discounting". Cohen et al. (2020) provide a recent, very exhaustive overview over the theoretical and empirical literature on time preferences.

[37] For instance, Bernheim and Rangel (2008) have termed these "ancilliary conditions", defined as follows: "a feature of the choice environment that may affect behaviour but that is not taken to be a welfare-relevant characteristic of the chosen object".

Which attribute receives greater weight in the consumer's decision shall now depend on the context as follows: The importance of an attribute depends on how different the manifestation of this attribute is relative to that of other, comparable offers in the market. To be specific, suppose the average price in the market was 5 Euro and that (according to the given metric) the average sustainability is 10. Suppose also a less sustainable product had a price of 4 Euro and a more sustainable product a price of 9 Euro, so that its price was 20% lower than the market average, but its sustainability, by the used metric, only 10 % lower. According to the theory of "relative thinking", the larger relative price discount would weigh more compared to the differences in sustainability. Moreover, a given price advantage of 1 Euro would be given more weight the lower the average price level was, e.g., when the respective product category was heavily discounted as a "loss leader" to pull in consumers.[38]

Note that in this example, there is still the presumption of some "true" preferences, which are, however, not sufficiently expressed in the consumer's choice. As I already noted, there are surely some clear-cut cases where consumers make errors in their decisions, which they regret when they are given more time to reflect or when they are given additional information. Consumers may also indeed be distracted at the time of purchase and regret their choice almost immediately. Apart from such clear-cut cases, however, the decision of an outside observer about which choice was "correct" becomes questionable: That choices depend on context is an empirical concept, but the question of the correctness of choice (and thereby also that of a bias) is not (or much less so). This is why some voices in the literature question the presumption of "true preferences" or so-called "latent utility" even in the aforementioned example of salient or relevant thinking.[39] The nature of this criticism, which proves important for the subsequent measurement of consumer willingness-to-pay for sustainability, becomes more evident in the subsequent discussion.

II.4.6 Contextuality and (Remaining) Ambiguity of Preferences

As I have pointed out, the recognition that choices depend on the context in which they are made often leads to the conclusion that corrections are needed so as to uncover individuals' true preferences. This presumes the existence of such "true" preferences, when then need to be uncovered from choices in the right context or the must be super-imposed from outside if biases or cognitive limitations are deemed to be too severe. In the latter case, they supposedly have to be established from some seemingly objective alternative measure. I return to this in detail below when turning to the measurement of consumer welfare. As I already noted, there are undoubtedly instances when consumers make errors that they almost instantaneously regret[40] – or at least after providing them with some missing piece of information. Decisions made under the pressure of time provide another example. Outside such cases, however, the notion that choices do not reflect "true" preferences is much less clear-cut, as I now explain.

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[38] Typically, staple products, such as milk or meat but also olive oil and flour (depending on the national cuisine), are used as such "loss leaders". This discussion follows Inderst and Obradovits (2020). One formalization of such relative thinking is the theory of salience advanced by Bordalo et al. (2013).

[39] In fact, Lyons and Sugden (2021) choose this particular example for their general criticism.

[40] Another trivial example with which we may all be familiar is shopping for food when hungry, which may lead to impulsive behaviour even when the respective products are not consumed immediately. Shortly later and still even without having consumed these products, one may regret this choice.

When discussing the elicitation of preferences below, I also refer to hypothetical choice experiments where individuals are faced with a series of binary choices in which prices and other product attributes are varied. This allows to extract individual willingness-to-pay for different attributes, including those referring to sustainability. Such choices could be made in an environment that is as close as possible to an actual purchase situation. Clearly, this would be appropriate when a firm wanted to establish demand or a competition authority the substitutability between products of rival firms that want to merge. Suppose now instead that the choice situation is preceded by much more information about the environmental impact of different products than would be typical in the marketplace. And subjects in the choice experiment would be given considerably more time than it usually takes them to grab the particular product when filling their shopping basket. Thereby, even information that an individual may already possess can be made more salient and relevant for decision-making. I acknowledge that there is always the danger that such hypothetical choices may be distorted when they remain inconsequential, other than in a true purchasing decision. I return to this issue below when discussing in more detail the respective methods to elicit preferences. Still, observed choices may vary according to the aforementioned changes in context. Which of these choices should then better reflect an individual's "true" preferences?

An alternative view to that of some hidden "true" preferences is that preferences are constructed, not merely revealed, during the specific decision-making process. In my examples, the context may not only influence which information is activated and becomes most salient for the decision but also which norms an individual applies.[41] Does an individual see herself only in the role of a consumer whose social obligation in terms of avoided externalities, for example, is already satisfied by purchasing legal products and paying taxes or does she transcend this role and make her choices more value-oriented than interest-oriented? I return to this distinction shortly.

Different contexts leading to different choices would then reveal, for instance, different willingness-to-pay to avoid externalities. And, the respective measurements would coexist as such ambiguity may not be resolved by trying to appeal to some notion of "true" preferences. The social choice literature has proposed different ways for how to deal with this ambiguity without superimposing "true" preferences from outside, albeit it seems fair to say that no single approach has become a standard point of reference.[42] In particular, one may be tempted to construct a meta-ranking of revealed preferences, giving priority to choices that are made with greater reflection and possibly also in recognition of one's less reflected day-to-day behaviour. [43] Societal choices that lead to norms to which everyone must adhere regardless of one's current predisposition may be interpreted as an expression of such a meta-ranking,

[41] The notion of such constructed preferences has been made prominent by Slovic (1995). Lately, in response to the paternalistic use of the concepts of "true" preferences or latent utility, a broader critical literature has developed (cf. the references in Infante et al. 2016).

[42] Various such proposals are, however, limited to offering descriptive theories rather than trying to integrate the different revealed preferences in a welfare analysis (e.g., the theory of multiple selves proposed, inter alia, by Strotz 1956 in the already discussed context of dynamic inconsistencies).

[43] Various Nobel laureates have made such distinctions, e.g., between "interests" and "values" (Arrow 1963), between "subjective preferences" and "ethical preferences" (Harsanyi 1955), or between individual vs. social preferences, where the latter would arise from self-commitment of individuals (Sen 1970, 1977).

e.g., as a self-commitment by individuals to follow these rules in their everyday behaviour.

I acknowledge that these observations seem at first far from the practical objective of the report. But they are not as they are notably intertwined with the extraction of willingness-to-pay and thus the measurement of consumer welfare. In this report I accept such an ambiguity of choices and preferences, related to different contexts. Specifically, I return later to the question of whether, in practice, an agreement that deprives consumers of choices may be justified by appealing to such a meta-ranking of preferences, namely by choosing willingness-to-pay that is elicited from subjects within a specific context. But I also provide an argument by which the discussed ambiguity of preferences may be resolved differently, namely by appealing to societal goals as enshrined in the legal framework.

III Capturing Sustainability Benefits Through Consumer Welfare

As I pointed out above, for the main part of this report the "fair share" requirement is meant to essentially impose a consumer welfare standard on horizontal agreements that may restrict competition. In this section, I discuss in detail the measurement of sustainability benefits under such a standard.

I again note that this excludes sustainability benefits captured by other citizens to the extent that they are not internalized by consumers. A consumer may, however, also suffer from the externalities that the production and consumption of products in the relevant market impose on her. As the respective benefits do not derive from a consumer's own consumption, other tools of measurement may be required. With this potential caveat, however, the elicitation of consumers' preferences regarding their own choice of a particular good form the starting point for the following discussion. In fact, I first organize my discussion of how sustainability benefits are captured in consumer welfare according to how such preferences are elicited. Note that I thereby take it as a given that consumers' preferences—other than for lower prices—are generally respected as sufficient benefits.[44]

For this, I first review in Section III.1 the main methods of eliciting such preferences either from statements or from choices. I argue that, with the necessary caveats, hypothetical choices may often represent an important and suitable way to extract preferences. A major distinction that I make is that between an individual and a collective consumer welfare analysis. In an individual approach (Section III.2), a consumer's preferences are elicited ceteris paribus. In a collective approach (Section III.3), the consumer compares scenarios or alternatives in which, following the likely outcome of an agreement, other consumers also change their behaviour. I dedicate Section III.4 to the required standard of proof and Section III.5 to the measurement and aggregation of consumer welfare over time. Throughout the discussion, I also provide a critical reflection on the different approaches, drawing on the broader discussion in the preceding section.

Before I proceed to the measurement of preferences, I note that this should typically not exhaust the quantitative analysis that may be required for a comprehensive assessment. If an agreement consists in jointly replacing a less sustainable product with a more sustainable variant, it is important to estimate the potential subsequent price increase. This could require, inter alia, information about the potentially higher costs as well as an estimation of the pass-on to consumers. To sharpen the focus of this report, I do not discuss the respective concepts and tools.[45]

[44] *Broadly speaking, such perceived benefits could fall under the notion of improved quality. Quality improvements are a recognized benefit to consumers; see, for instance, the European Commission's statement in OECD (2013, p. 80): "irrespective of how the exact boundaries between product quality, product variety and innovation are defined, all three form part of a wider category of dynamic effects on competition – effects that are recognized as relevant for the analysis of competitive effects under EU competition law."*

[45] *See, however, Inderst et al. (2021b) for a short description.*

III.1 Eliciting Consumer Preferences

Take the following purely hypothetical example. Suppose firms jointly consider introducing a new car fuel that would reduce harmful emissions without improving performance or providing other use value. At the same time, they may want to agree to stop selling a less sustainable variant.[46] Also, a driver's direct benefits from a reduction in her own emissions is completely negligible. Next, we may suppose that the product was already introduced by one firm but without much success, such that observations of prices and purchases in the market exist. Alternatively, we may suppose that any elicitation of preferences must remain hypothetical as the fuel is yet to be introduced. It should be noted that in this particular example, a very substantial proportion of all citizens should be actual or potential consumers. In other words, when we only consider citizens of the respective jurisdiction, a large part of at least the current cohort of such affected citizens are also potential consumers. I frequently return to this example in what follows.

The subsequent discussion focuses on the extraction of individual preferences. The respective methodology typically allows to estimate preferences for the considered sample of subjects. To the extent that this sample is representative of the current and of considered future cohorts of consumers, the respective preferences can then be aggregated to a metric of consumer welfare. I discuss such aggregation over different cohorts of consumers over time separately. At this point I should note that the step of measuring benefits and costs would have to be preceded by that of showing indispensability of an agreement. I have changed this order as the discussion of the measurement of sustainability benefits helps sharpen our understanding of the origin and scope of such benefits.

III.1.1 Data Generation

As already noted, I presently restrict myself to the extraction of stated or revealed preferences in real or hypothetical choice situation related directly to the relevant market. Notably, when an individual is affected by the externalities of the consumption of others, the respective welfare consequences are thereby not typically elicited. For instance, if in my fuel example a consumer would not have a preference for internalizing her externalities on others, given that her own emissions have a negligible impact on her own health, her willingness-to-pay for more sustainable fuel could not reflect preferences for clean air. I thus subsequently turn to alternative methods, such as drawing on surrogate markets.

In a first step, I discuss how data is generated under different methods. In a second step I discuss the (econometric) analysis of such data. The discussion is kept short and non-technical throughout.

III.1.1.1 Data Generation for Contingent Valuation Analysis

In my fuel example, consumers could be asked directly about their willingness-to-pay for different, more or less sustainable fuel variants. In addition, various (socio-

[46] *The joint introduction of a new fuel itself may arguably not (much) restrict competition under 101(1) in the first place if it did not coincide with the joint decision to stop selling the cheaper, less sustainable variant.*

economic) information on the individual consumers could be elicited, which can then be used to make results representative.

The most common method based on stated preferences is the contingent valuation method.[47] It is applicable whenever the respective benefits that shall be measured are sufficiently understood and appreciated by the consumer regardless of whether they refer to use value or non-use value. Also, the respective products or services to which the attributes of interest, such as features relating to sustainability, pertain need not (yet) be traded in the market.

Data is generated by a questionnaire. This contains the description of the good(s) under consideration. If the good is still hypothetical, then additional information would describe its future availability, for instance. In a so-called open ended type of elicitation, a consumer would simply be asked a question as follows: What is the maximum incremental amount that you would be prepared to pay to obtain the new fuel type X (as described above) instead of fuel type Y?[48] Alternative elicitation methods could stage a hypothetical "bidding game", for instance, in which the interviewer would start with a low price increment, which is then increased until the particular subject no longer chooses the new variant. Also, instead of eliciting a direct response, subjects may be asked yes/no questions with a different (randomized and varied) increment.[49]

It is well known that subjects' answers to such hypothetical questions may involve not only (random) errors but also systematic biases. In particular, they may overstate their actual willingness-to-pay because such an overstatement is inconsequential for participants. Such biases are of particular relevance when a higher valuation conforms to social norms. This should be the case with virtually all aspects of sustainability. Consequently, elicited values need to be carefully scrutinized and, what is more, measures should be undertaken to mitigate such biases, such as avoiding direct contact with interviewers.

As these potential problems also arise with the subsequently considered format of choice modelling/conjoint analysis, where preferences are extracted from observed (hypothetical) choices, and because these can be particularly serious with respect to sustainability benefits, it is expedient to add some additional comments.[50] For example, the literature has pointed out that elicited willingness-to-pay for a sustainability attribute may fail a so-called "scope test" or "adding-up" test. The already described "warm glow" effect, possibly combined with the inconsequentiality of stated preferences, may lead to an outcome where willingness-to-pay becomes

[47] See, for instance, Bateman et al. (2002) and, with a particular emphasis on environmental issues, the overview in the OECD report by Pearce et al. (2006).

[48] It should be noted that prices for existing fuel types do not represent willingness-to-pay, but rather the market outcome. Eliciting only the willingness-to-pay for the new, more sustainable type of fuel would thus not be informative enough for an assessment of an agreement.

[49] Such alternative formats may reduce the immediate (cognitive) burden on subjects and possibly give them space to "learn" about their preferences; cf. Bateman et al. (2008) for various proposals (and "practical fixes").

[50] In an OECD report, Atkinson and Mourato (2015, p.9) summarize this as follows: "Given the advances in contingent valuation more generally, it is surprising that so little progress has been made in developing new and robust ways to uncovering non-use values. Accurate estimation of non-use values remains to this day a frontier of knowledge and as such it is a crucial gap in present knowledge, given the likely policy significance of such values".

relatively insensitive to the scope or size of the attribute: Subjects exhibit a high willingness-to-pay even when, say, the environmental impact is miniscule, whereas their willingness-to-pay does not increase substantially when the impact, i.e., the "scope", is much larger.[51] Another issue that has received considerable attention in the literature is the often enormous gap between willingness-to-pay to obtain a particular good (or service) and the minimum compensation that is required so that an individual voluntarily renounces.[52] Again, this has obvious implications for the context of this report if, for instance, an agreement leads to the introduction of a new, more sustainable variant and, at the same time, to a phase-out of a less sustainable variant.[53]

The hypothetical nature of the posed questions represents, however, also an advantage of the described approach as compared to relying only on data from market transactions (when this is at all feasible). Varying the posed questions allows to analyse how consumers' preferences depend on the respective context, such as available information or expectation about the behaviour of others. These are issues that I take up subsequently. Clearly, such variations and counterfactual exercises are not possible given a fixed set of realized market transactions. Participants of the contingent valuation analysis could be provided with more or less information about the different types of fuel in my example. In addition, the key question regarding willingness-to-pay can be phrased differently. I discuss below how this can be used to overcome possible biases, such as with respect to subjects' (supposedly inconsistent) time preferences, or used to elicit preferences for a change of behaviour of other consumers and thus a reduction of externalities (in case this shall be included in a consumer welfare analysis). Finally, through direct elicitation or more indirect techniques, other determinants of a consumer's potential choice can also be separately elicited, such as her belief about the reliability of the (new) product's claims or her beliefs about the actual sustainability impact.[54]

III.1.1.2 Data Generation for Choice Modelling/Conjoint Analysis

In choice experiments, subjects are presented with a series of alternatives to choose from, e.g., in my example, different types of fuels. In the simplest case, the different

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[51] A recognition of this potential problem goes back at least to Kahnemann et al. (1992), albeit there is a dispute in the literature about both how serious this problem is and what therefore constitutes an appropriate response (cf. Desvousges et al. 2012) for a more critical view and Whitehead (2016) for a less critical view. For an application outside notably environmental sustainability, see, with regards to animal welfare, for instance, Bennett (1997) or Bennett and Blaney (2003).

[52] See, for instance, Horowitz and McConnell (2003). There is also a vast literature in experimental economics that documents an endowment effect. More generally, there has been a fertile interaction between experimental and behavioural economics, on the one hand, and the development of practical methods to extract preferences notably in environmental economics (cf. the special editions of the Journal of Environmental an Resource Economics, Volume 32(1) in September 2005 and Volume 46(2) in June 2010), even though many so-called biases made popular by behavioural economics already had a long history in the various fields where the extraction of preferences is of practical importance (e.g., for cost-benefit analysis); cf. Atkinson and Mourato (2015, p. 13).

[53] It should be noted that experimental studies have documented such ambiguity also outside sustainability, e.g., with regards to individual privacy concerns. There, preferences have been found to depend, for instance, on the provided information (Benndorf et al. 2015), on whether choices relate to willingness-to-pay or willingness-to-avoid (Acquisti et al. 2013), on the ordering of attributes (Flender 2013), or whether privacy is measured as an ancillary feature of another product (Regner and Riener 2017).

[54] With market observations, instead, separately identifying beliefs and preferences is obviously quite challenging, so that typically strong assumptions are made (notably about beliefs). For an approach that first elicits beliefs to then recover preferences, see, for instance, Manski (2004).

types of fuel would be explained and their prices would be varied. Subjects would then be faced with a series of pairwise choices, for instance, and they would always be asked to indicate their preferred alternative (including possibly the option not to buy). An advantage of such a conjoint analysis is, however, that more attributes of the considered product(s) can be independently varied. In a common marketing application this would be, for instance, a product's flavour, packaging, or even name. The objective of a conjoint analysis is then to separately extract consumers' willingness-to-pay for these different attributes.[55]

As will become clear in what follows, even when (as in the fuel example) the products under consideration may differ in only one attribute besides the price, there may still be scope for such additional variations across individual choices, notably as the respective context that is provided to consumers can change. For instance, for each alternative, the subject may be given (mutually consistent) information about the fraction of other consumers that, in a hypothetical scenario, are supposed to make this particular choice. I discuss this particular case in more detail below.

As the preceding discussion already suggests, a key first stage in the construction of a choice experiment is the specification of the respective alternatives together with the identification of their key attributes, such as sustainability features, availability, price and various contextual variables. This presupposes, of course, that the respective products that are offered under an agreement are already well-known, such that their attributes can be described appropriately. Clearly, which attributes are taken into account and how these are varied between choice alternatives ultimately depends not only on the concerned products but also on the question of interest. A more sustainable fuel may also have other advantages or even disadvantages. Varying each attribute separately would then allow to not only extract the willingness-to-pay for the analysed sustainability feature but also other attributes, such as fuel efficiency and performance, which may help to scrutinize the validity of the obtained results.

As I already mentioned, the hypothetical nature of conjoint analyses leads to similar issues as are present with contingent valuation analysis. For instance, respondents' choices typically remain inconsequential to them, which may lead to a lack of attention or even systematic biases as discussed above. Economists instead typically prefer incentivized choices so that respondents' choices have actual consequences to them. For instance, where this is feasible, respondents may (with some probability) have to purchase one of the chosen products. This is, of course, not feasible when a more sustainable alternative is not yet in the market.[56] Furthermore, as with contingent valuation, subjects' behaviour may depend on a number of supposedly irrelevant circumstances, notably the provided context.[57] I have already discussed the potential drawbacks as well as the potential of this.

[55] *The conceptual framework thus assumes that utilities can be decomposed into such partial values derived from different characteristics of the respective products.*

[56] *Even where this seems feasible, incentivized conjoint analyses seem still to be rare in practice. Where such incentive-aligned choice experiments have been conducted, subjects seem to exhibit higher price sensitivity. See, for instance, in the context of animal welfare, Norwood and Lusk (2011), and for a comparison of different methods, Miller et al. (2011).*

[57] *Overloading the context, notably with unfamiliar information, as well as the choices subjects face, should be avoided, however, as this reduces so-called respondent efficiency.*

III.1.2 Data Analysis: Extracting Willingness-to-Pay

III.1.2.1 Simple (Descriptive) Methods

Data from a contingent valuation exercise, in particular, lends itself to simple descriptive analysis, calculating, for instance, the mean or median values of stated (incremental) willingness-to-pay. This is obvious when willingness-to-pay was elicited directly, such as with open-ended responses. Even for other formats, such as those involving only dichotomous (yes/no) questions, various (parametric and non-parametric) techniques exist.

It should be noted that all such estimated parameters pertain only to the group of participating consumers, which entails two key restrictions. First, if this group is not sufficiently representative of the whole consumer population, there may be systematic biases. Using information about the characteristics of both the sample and the whole population of potential consumers, in principle such a bias can be corrected. Second, even when there is no systematic selection bias (and even when elicited preferences are not biased), there will be (random) deviations between the respective parameters obtained from the sample and the unknown parameter for the whole population. Reporting statistical information on the reliability of the obtained estimates is thus key.

III.1.2.2 Econometric Modelling and Analysis

I turn now to the use of econometric models and techniques to extract information from the gathered data. For brevity's sake, I confine myself to a short description for the case of a conjoint analysis.

Recall that in this case, willingness-to-pay is not asked directly, but it needs to be extracted from subjects' choices. For this, the standard point of reference is a so-called discrete choice model. Here, "discrete choice" refers to the fact that subjects have to choose between two or more discernible alternatives (rather than, say, choosing the number of packages they want to purchase). So as to extract willingness-to-pay, as I already noted, an underlying choice model typically presumes that a subject's utility can be expressed as a (typically linear) function of each alternative's feature, including the price.[58] The importance of these attributes for an individual consumer, as well for the whole sample, is expressed by the size of respective coefficients in the choice model. These coefficients can be estimated by different statistical methods. Setting the coefficient of a non-price attribute that is of interest in relation to the coefficient for price allows "monetizing" the former.[59] In other words, we thereby obtain a ceteris paribus change in WTP when changing the (sustainability) attribute accordingly.

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[58] *Such an assumption is clearly not innocuous, as subjects simply may not "construct" utility in this way. For instance, subjects may instead have lexicographic preferences so that choices are made according to a strict order of attributes. They may also be non-responsive to particular attributes (called "attribute non-attendance"). Or they may evaluate attributes according to some unknown reference point. Variations in the specification of the choice experiment may help to uncover such preferences.*

[59] *When the price coefficient is estimated with considerable noise so that also very low values arise, the division by the price coefficient obtains unreasonable monetary values. In much of the applied work, the price coefficient is therefore either normalized to a particular value or made homogeneous across individuals. Alternatively, there exist methods to directly estimate willingness-to-pay for a particular attribute (e.g., Sonnier et al. 2007).*

Such analysis is possible at an individual level, though often only an aggregate measure of willingness-to-pay is reported.[60] The extracted coefficients and thereby obtained willingness-to-pay can be related to other observable parameters, such as socioeconomic characteristics of the participating subjects. I return to this later when dealing with potential forecasting for future cohorts of consumers.

III.2 Scope for Sustainability Benefits in (Individualistic) Consumer Welfare Analysis

My use of the term "individualistic consumer welfare analysis" is not standard. With it, I intend to clarify a key distinction between the present discussion and the "collective consumer welfare analysis" that I subsequently discuss.

In marketing science and practice, where the aforementioned techniques to extract willingness-to-pay have potentially received the most widespread application, only the presently discussed type of analysis is relevant. The objective is to conduct a ceteris paribus analysis so that a subject only selects and varies her own choice. Consequently, the thereby extracted willingness-to-pay refers only to the value that the subject poses on her own consumption (benefits). As I subsequently describe, this is typically different in a cost-benefit analysis as notably applied in environmental and resource economics. In such a context, the respective alternatives from which a subject can choose typically also alter the consumption of other individuals. For instance, if the cost-benefit analysis refers to public transportation, other individuals will also be able to use a new road and will have to contribute to its costs. The changed consumption of others may also have an impact on the expected externalities. Hence, then the ceteris paribus assumption no longer applies.

In the preceding discussion, I have already made reference to possible applications where willingness-to-pay for sustainability attributes can be extracted, and I described particular methods. Hence, consumers' (individualistic) preferences for sustainability benefits can be measured just like preferences for other quality attributes. I also referred to potential pitfalls of the described methods in light of, in particular, the non-use value associated with sustainability benefits, but I noted the potential of such hypothetical (choice) analyses. In the following sections, I elaborate on the latter. I first take up again the possibility to adjust the context in which willingness-to-pay is elicited (Sections III.2.1 to III.2.3). In Section III.2.4, I return to the discussion about potential biases and suggestions to super-impose preferences other than those elicited from consumers.

III.2.1 Enlarging the Potential Scope for (Appreciated) Sustainability Benefits

III.2.1.1 More Informed Willingness-to-Pay

As a starting point, suppose that in the fuel example at least one firm had already tried to offer the more sustainable variant but without much success. Economists

[60] *In marketing science, Bayesian models are typically used, which derive for each individual a (posterior) distribution of the respective coefficients. In economics, (random coefficient) models typically deliver point estimates for the whole population. Methods also differ with respect to the stochastic assumptions imposed on the so-called error term, which captures, in particular, the influence of unobserved variables on the respective choice.*

could now collect data about actual fuel purchases of a sample of drivers and from this infer a very low willingness-to-pay for the more sustainable variant. Such a low willingness to switch fuel consumption may hinge, inter alia, on consumers' lack of information. They may not know much about the various sustainability benefits, e.g., about the respective reduction in certain emissions and, in turn, how harmful these are for the environment. Such information can instead be provided in a hypothetical choice analysis.

I have already mentioned other instances where consumers may lack information that is, however, necessary to assess the full implications of their purchases. And even when they possess such information, it may not be salient at the time of purchase. In what follows, I discuss this issue separately under the heading of a (more) reflective willingness-to-pay.

The possibility to obtain different, context-sensitive willingness-to-pay depending on, for instance, the amount (or ordering) of information that is provided to subjects, raises the question of which values to take into account in a consumer welfare analysis so as to ultimately assess the proposed agreement. I turn to this in detail below after first elaborating on the (context-sensitive) scope for expanding sustainability benefits.

III.2.1.2 (More) Reflective Willingness-to-Pay

I can now draw on the discussion in Section II.4.6. As I have demonstrated, choices may depend on circumstantial factors that prima facie should not affect an individual's welfare. Following up on the preceding discussion, information that a subject already possesses may not be activated at the time of her decision or its activation may depend on particular cues or on the time within which she must make her decision. Also, decisions may follow particular heuristics and may be subject to inertia until the subject is virtually forced to reconsider her choices, e.g., as a status-quo alternative is no longer available. In this respect, I also discussed the importance of so-called choice architecture.

Though this does not exploit all instances of such context dependency, a particular context may not only provide more information but it may also be more conducive to deliberation. The respective choice may then be regarded as more reflected upon than, say, a routine grocery purchase decision at the weekly shopping trip. Analysing choices in such hypothetical context may not, as I already discussed, provide the best prediction of consumer behaviour at the point of sale, notably in the factual scenario without the agreement. Still, with all the discussed caveats relating to hypothetical choices, such a (more) reflective willingness-to-pay can provide additional information for an assessment of incremental consumer welfare under an agreement.[61] But this requires to deal with a possible range of seemingly contradicting choices and thereby different willingness-to-pay for a single consumer.

III.2.2 Selecting from Different Willingness-to-Pay

As I observed in Section II.4.6, the described potential ambiguity of choices and extracted willingness-to-pay can still be made compatible with the presumption of a subject's "true" preferences when one is willing to select a particular context and choice, treating other choices as random errors, e.g., due to insufficient attention or

[61] *This relies on Inderst and Thomas (2021a).*

as the results of systematic biases. Consumer welfare analysis would then have to be based on the correct selection of willingness-to-pay even if this implied to super-impose such preferences from the outside, as I subsequently discuss. I already acknowledged that there is indeed some scope to discard certain choices as they are obviously erroneous, e.g., the consumer almost immediately regrets the choice. The current focus is instead on those choices where this is not obvious.

III.2.2.1 Meta-Ranking of Preferences and Willingness-to-Pay

An alternative view, which I also discussed, is that preferences are, at least to some extent, constructed in the act of decision-making so that the respective context forms an integral part. I also noted that this may be of particular relevance for non-use values and thus sustainability benefits. To go beyond a purely descriptive theory of such decision-making, I noted that social choice theory has proposed to take a meta-perspective. Somewhat loosely speaking, from such a meta-perspective, an individual may reflect on her everyday decisions and impose priorities. Such greater deliberation may then lead to an outcome that is closer to the discussed (more) reflective willingness-to-pay.

Proposals for such a meta-ranking, which would mitigate or solve the described ambiguity of preferences or willingness-to-pay, however go beyond such a more reflective approach. As I already noted, various eminent scholars in social choice theory have drawn a distinction between different principles that guide individuals' choices, such as that between "interests" and "values" or that between "subjective preferences" and "ethical preferences". For instance, the previously discussed approach proposed by Amartya Sen would distinguish between individual preferences and social preferences, with the latter arising from possible self-commitment of individuals.[62] When elicited willingness-to-pay corresponds to such values, given the provided context and the formulation of choice alternatives, this far transcends the pure consumption decision for which willingness-to-pay shall be elicited. In my view, this no longer represents a gradual change, such as when giving the subject in a choice experiment more time to deliberate or more "hard" information, but a qualitative change since the subject is basically no longer making a consumption decision in isolation. Transcending self-interest or self-commitment through a (social choice) rule instead seem to be the defining features of a political process rather than the market. One should thus be careful to base competition analysis on elicited willingness-to-pay that in this way transcends choices made in the market.[63] I return to this discussion in my analysis of collective consumer welfare analysis.[64]

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[62] In Inderst and Thomas (2021a), we relate this to the possibly wider known philosophical notion of John Rawls' "veil of ignorance" (Rawls 1971). An individual's actual preferences will depend on what economists call her "endowment", which may also put her in the position of being a consumer of a particular good rather than only the recipient of the respective emissions. If this conforms to her ethical principles, under a "veil of ignorance" about her endowment, an individual may exhibit different preferences and commit to different choices, compared to what is optimal given her actual endowment.

[63] I recognize that for an agreement the very nature of an efficiency defence lies in the recognition that such efficiencies cannot be realized by decentralized, market-based interactions alone. Arguably, the discussed difference between an individual's felt responsibility in the role of a consumer or in that of a citizen needs to be distinguished from the difference in outcomes that are achieved when firms, in the pursuit of their profit interest, choose different technologies when the investment costs can be shared or not.

[64] In the context of cost-benefit analysis, Sudgen (2005) has made a distinction between frames that put the subject in the role of a consumer and those that put her into a citizen's role; see also below.

For the moment, I draw two conclusions from the preceding discussion. First, selecting from an individual's willingness-to-pay through such a meta-ranking based on some higher-order preferences of the same individual risks overburdening consumption decisions and leaving the framework of market interactions. Second, the discussion also shows limits for both the context and the framing of choices to elicit willingness-to-pay for a consumer welfare analysis.

III.2.2.2 Appealing to Societal and Legal Norms

Within the described bounds, a given individual may thus exhibit different willingness-to-pay for a more sustainable product as, depending on the provided context. For instance, she may (more or less) internalize the externalities on other citizens, for example. I now discuss another proposal for how to possibly select among these values in a competitive assessment.

As discussed in Section II.2, notably the goal of environmental sustainability is enshrined in various ways in the legal framework governing the European Union and has been explicitly confirmed by various statements of the Commission. It could thus be argued that for an overall assessment of an agreement that would lead to environmental benefits, the (aggregate) willingness-to-pay shall be used that most conforms with this objective. I note that then consumer welfare remains the metric by which the "fair-share" provision is operationalized.[65] In particular, it is not compromised by appealing to other objectives or norms, as the latter only resolves the remaining ambiguity. In this report, I need not and cannot provide a discussion of whether such a proposal conforms to existing legal standards and, notably, whether such an appraisal would fall under the mandate of DG Competition. This is why I confine myself to a conceptual discussion.

The proposed procedure essentially sidesteps the unresolved issues discussed above. The remaining ambiguity with respect to willingness-to-pay is not resolved by either trying to construct meta-preferences that the individual supposedly has or by super-imposing preferences from outside based on a supposedly better judgement of the individual's "true" preferences. Its applicability seems, however, to be constrained by the following observations. First, it is unclear whether, for the wide range of sustainability benefits that transcend environmental sustainability, existing legal norms are sufficiently explicit to make such a selection. For instance, with respect to animal welfare, it may have to be decided whether such statements of policy priorities or broad norms would allow to deduce a societal preferences for granting animal more space than what is legally required. Second, societal preferences for a particular type of sustainability may very well differ from individuals' ecological preferences. I have already extensively discussed such a dissonance in Section II.1.2. With respect to environmental sustainability, for instance, consumers' non-consequentialist preferences may lead to a high willingness-to-pay for an agreement that, when judged in a consequentialist way, does very little to contribute to the sustainability of natural resources (or its net impact may even be negative), for example.

The final discussion suggests that care should be exerted when resolving some remaining ambiguity with regard to consumers' willingness-to-pay by appealing to other norms, even when this represents a feasible approach. This obviously applies as

[65] *For such a proposal see Inderst and Thomas (2021b).*

well to the first step of data generation and with it the construction of the context in which willingness-to-pay is elicited.

III.2.3 (Counterfactual) Changes in Norms

The non-use value character of concerns for sustainability should make the respective willingness-to-pay particularly susceptible to norms. This should apply, for instance, to (altruistic) concerns to avoid externalities on others or to preserve scarce resources.

In this report, I cannot provide a sufficient account of how (social) norms are formed, how they affect individual behaviour and how this is mediated by various circumstantial factors. Instead, it is possibly particularly helpful to refer to the (by now) large literature that has empirically analysed how social norms and their changes can be harnessed to affect behaviour in such different contexts as recycling and littering or eco-friendly consumer behaviour. What is also important in the current context is that, potentially through affecting norm perceptions, feedback on the behaviour of others affects individual behaviour.[66] Likewise, observed changes in the behaviour of others can thus affect norm perception with a respective repercussion on individual behaviour. Experimental economics has also confirmed how expectations of the behaviour of others (or their observation) affects individual choices even when there is no direct strategic interaction. Rather than free-riding, individuals may contribute more to a public good when they expect others to do the same (or have observed such behaviour), which can also be attributed to notions of fairness and reciprocity.[67]

In short, (perceived) greater sustainability concerns by others as expressed by their observed purchase decisions can thus positively affect individual sustainability concerns. Such networks effects through norms have also been recognized in environmental economics.[68] I now elaborate on their potential importance for measuring willingness-to-pay for sustainability.

Again taking up the fuel example, a consumer may be more willing to make a personal sacrifice in terms of paying a higher price if she observes that other consumers make the same sustainable choice. If this is currently not the case, she may instead be less inclined to do so. Extracting her willingness-to-pay for the more sustainable variant from observed behaviour will thus lead to a low value. Given a greater availability of the more sustainable variant, her willingness-to-pay may change when the agreement leads to a change in behaviour of other consumers. She may then exhibit a (relatively)

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[66] For instance, recycling behaviour correlates with beliefs about recycling in the community and can thus be affected by respective feedback (e.g., Cialdini 2003, 2005; cf. also Cialdini et al. 1990 for an early contribution on how to exploit "normative conduct" for public policy).

[67] As expressed in an early contribution to the literature, individuals may thus follow a conditional moral rule of "contributing of what I wish others to contribute, but not needing to contribute more than the person who contributes the least" (Sudgen 1984). Various theoretical foundations for considerations of equity and reciprocity have been proposed in the economics literature, e.g., Bolton and Ockenfels (2000). There is also additional support in the area of psychological game theory, e.g., Geanakoplos et al. (1989) or Battigalli and Dufwenberg (2009), though there the disutility experienced with "letting down others" may relate more to interpersonal interactions.

[68] Nyborg et al. (2006). See also the discussion of socially embedded preferences in the context of environmental preferences in Annex 9.1 in Dasgupta (2021).

Empirically, these may be difficult to disentangle from other network effects, however, arising from imitation or learning about the existence of the respective products or from complementary investments in required infrastructure, for instance (e.g., Sartzetakis and Tsigaris 2005).

larger willingness-to-pay for the more sustainable variant in such a counterfactual scenario.[69]

In a hypothetical choice scenario, one may want to take into account such changes in the counterfactual scenario by providing the consumer with information about the (hypothetical) choices of other consumers. For instance, when presented with alternatives that are either more or less sustainable, information on the respective market shares could also be provided. As with other attributes, such as the price, market shares can be varied across different choice situations.[70] It should be noted that in such an analysis, the calculation of an individual consumer's willingness-to-pay for the more sustainable product is still conducted ceteris paribus because the behaviour of other consumers is held fixed when an individual makes her choice.

I acknowledge that particularly in a hypothetical choice scenario, regardless of the context, an individual may be tempted to somewhat blindly follow the majority choice. Such a specific expression of a "status-quo" bias typically should not, by its symmetric impact on all potential choices, however, affect incremental willingness-to-pay for a more sustainable variant. In fact, the "ceteris paribus" perspective may also have the opposite effect of inviting free-riding on the sustainability contributions of others.[71]

When willingness-to-pay is thus shaped by the expected behaviour of others and when this will likely change when an agreement is in place, counterfactual willingness-to-pay for the sustainable product may differ from that measured under the factual scenario. The prediction of how consumers will change their behaviour, which inter alia depends on the forecasted price, is certainly fraught with much uncertainty, as is the estimated relationship between individual willingness-to-pay and the behaviour of others. While this clearly imposes considerable challenges, eliciting such a dependency, e.g., in a conducted conjoint analysis, may come with little additional costs. The obtained range of (aggregate) willingness-to-pay may then be scrutinized.

III.2.4 Superimposing (Supposedly) "True" Preferences

Recall that I presently still consider an individualistic welfare analysis, so that consumer preferences are measured ceteris paribus. Therefore, a consumer's preferences refer only to her own choice but not to the choice of other consumers and the thereby possibly incurred externalities. When a consumer derives benefits primarily from the use value of a good, as in the razor example discussed above, we should typically believe that the consumer is the best arbiter of her own welfare. Still, as I already discussed, consumers may make errors for various reasons.

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[69] In Inderst et al. (2021c), we provide a short formalization. Inderst et al. (2021b) analyse competition and firm communication under such preferences.

[70] Such an approach was undertaken in the ACM's "Chicken-of-Tomorrow" conjoint analysis (ACM 2014 and Mulder and Zomer 2017). The ACM conducted a discrete choice experiment to measure consumers' willingness-to-pay for various sustainability attributes for chicken meat. The ACM included in the description of the different hypothetical choices whether an alternative was chosen either by a "large" or by a "small" number of consumers. In Inderst et al. (2021c), we confirm this analysis and, in addition, analyse the interaction effects between the various sustainability attributes and the perceived choices of other consumers.

[71] In fact, standard economic theory would predict such increasing free-riding in particular when one's own behaviour is far from pivotal for a particular outcome (cf. for an experimental confirmation Falk et al. 2020). This seems to be, however, less prevalent when the governing social norm is strong (e.g., in a related context Bartling and Fischbacher 2012).

In a hypothetical choice situation, care can be taken to reduce the potential for errors that may result, for instance, from lack of information, from mistakes in processing information or as they otherwise follow heuristics that are ill-suited for the given choice. This could even include rephrasing the choice problem. For instance, when one believes that consumers exhibit inconsistent time-preferences in their purchase behaviour, thereby foregoing longer-term costs savings from more energy-efficient appliances, in a hypothetical choice experiment they could be confronted with alternatives designed to overcome such a bias. For instance, they may be asked to compare not only a single purchase but longer-term purchasing plans.[72]

Now, one might still argue that this can fail to capture consumers' "true" preferences, e.g., as consumers may lack the cognitive capacity required to take into account the complex effects of their choice on others. A consumer may then fail to internalize such externalities even though in other contexts she shows a great deal of altruism, including for future generations. One may then be inclined to super-impose preferences that are different from preferences revealed through the consumer's choices or statements, regardless of the chosen framing or context. A justification for such a "laundering" of preferences may, however, be rather limited when considering sustainability preferences.[73]

To see this, I first take a different application where such "laundering" may be much more justifiable. Suppose that there was scientific consensus that consumption of a particular product increases the mortality risk for the user. Under an assessed agreement, firms would phase out this product and replace it with an only marginally more expensive but perfectly healthy alternative. Suppose next that sampled consumers still fail to acknowledge these benefits, even in a hypothetical choice situation where they are presented with the respective evidence, e.g., as they distrust this evidence. Suppose also that it is evident from their overall behaviour that they care considerably for their health. I constructed this example so that one would indeed be inclined to "launder" preferences and super-impose a different choice "in the self-interest of consumers". As I argue next, with respect to sustainability benefits, however, such an argument should typically be much less convincing.

Take thus again the example where the consumer supposedly fails to internalize externalities on others, e.g., as the consumption of a more sustainable product variant could lead to health benefits of others. If the consumer does not internalize this even when corresponding information is provided, however, there seems to be little ground for attributing this to, say, insufficient cognitive capacity rather than a lack of altruism in this particular context. Put differently, while also in this example there may be proven evidence that the non-sustainable variant has negative externalities on others, this does not resolve the question of how much the consumer wishes to care about others in this particular act of consumption. Second-guessing her "true" level of care

[72] I acknowledge that this again generates a gap between choices that would be observed in the market, where no such "purchasing plans" may be available, and the outcome from the described hypothetical choice experiment. I recall that the present objective is not, however, to obtain the best descriptive theory but rather to measure consumer welfare. To what extent such a measure should be based on choices obtained in a context that most closely resembles a market solution or instead in a modified context is a question that turns up repeatedly.

[73] I note explicitly that measuring the welfare implications (externalities) of the consumption of others represents a different issue, as the respective preferences can not be extracted from a consumer's own choice. See in detail Section III.3.2.

could often involve a large margin of error, next to infringing on consumer sovereignty. While I acknowledge that there may be cases where consumers fail to understand the full implications of their choices, the scope for extending sustainability benefits by "laundering preferences" or super-imposing "true" preferences should be rather limited. Note that this discussion and these reservations obviously do not apply when the respective preferences or benefits that are obtained from a reduction of externalities cannot be learnt and extracted from a consumer's own choice, such as when a change of consumption by others reduces negative health externalities (see Section III.3.2).). As I note repeatedly, such a distinction between recognizable benefits may also be obtained through the imposed standard of proof, which then draws such a line.

III.3 Collective Consumer Welfare Analysis

In what follows, I no longer presume that consumer preferences are elicited ceteris paribus. Instead, the focus lies on consumers' preferences over the concomitant decisions of other consumers in the same market. Consumers' welfare may depend on these decisions as their health is affected by externalities. But consumers may also care about the decisions of others without being directly affected, e.g., as they care about the welfare of animals slaughtered for both their own meat consumption as well as that of other consumers. An individual consumer's welfare may thus be (much) higher precisely when all or a majority of other consumers change their consumption following an agreement. Incremental consumer welfare is in this case measured across different scenarios. Such a procedure is reminiscent of that typically applied under cost-benefit analysis, notably for the provision of a public good.

As I discuss in what follows, such a comparison with a cost-benefit analysis highlights the key limitations and caveats when such a collective consumer welfare analysis is undertaken: The overall context of a competition analysis is different, e.g., as it typically precludes redistributive measures, which may instead accompany or be even inherent in the provision of a public good. Also, as the preceding example of animal welfare suggests, competition analysis may be ill-equipped to delineate the preferences regarding the consumption of others that are still deemed permissible without excessively infringing on consumer sovereignty in the market.

I organize this section as follows. In Section III.3.1 I generally introduce and illustrate such a collective consumer welfare analysis. There, I also point to important caveats and limitations. In Section III.3.2 I focus on environmental externalities and with this on specific tools for their measurement.

III.3.1 Eliciting Preferences for Collective Choices

III.3.1.1 Illustration

To make the discussion more transparent, I first restrict myself to the case of the direct elicitation of consumer preferences. [74] I subsequently discuss cases where such an elicitation of preferences over other consumers' choices may not be possible or where other approaches are more reliable or more cost efficient, notably with respect to environmental externalities.

[74] *This discussion relies much on Inderst and Thomas (2021c).*

Recall that the presented tools for the elicitation of consumer preferences, e.g., through choice modelling, apply irrespective of how the different alternatives or scenarios that consumers shall assess are phrased or framed. Again, I take up the fuel example. To simplify the discussion, I suppose that there presently exists only the less sustainable fuel that an agreement would replace with a new fuel, which is more sustainable because harmful emissions are reduced. In a contingent valuation analysis, albeit now with a focus on such collective choices, consumers could now be asked about the maximum price that they would pay for the sustainable fuel in a scenario where all other consumers also make this choice, and also about their preferences when neither they nor other consumers choose the sustainable variant. Likewise, in a choice experiment, a consumer would express her preferences between two scenarios that differ both in the consumer's own consumption as well as that of other consumers.

Hence, the ceteris paribus assumption is now clearly no longer satisfied. The considered choice situation is obviously different from that where a consumer is asked to choose between different fuel variants, keeping the behaviour of other consumers fixed. If the consumer did not care about the externalities of her own consumption on others, sustainability benefits would now exist only because the consumer's preferences for the choices of others and the thereby generated or avoided externalities on herself. The extracted willingness-to-pay could then clearly be much different from that under an individualistic consumer welfare analysis. Equally, it would be different from the willingness-to-pay realized in the market in case consumers had access to both fuel types. The collective nature of the constructed choice scenario leads to an internalization of externalities, albeit each consumer now assesses the externalities that she experiences rather than only the externalities that she generates for others.[75]

As just described, irrespective of the nature of (broad) sustainability benefits, consumer preferences over the choices of others could be elicited with the described methods. Comparing different scenarios, an aggregation of such preferences would then allow to calculate (incremental) consumer welfare, including such preferences. Prima facie such an analysis should thus fall under the notion of a consumer welfare analysis. In what follows, however, I express several reservations. As will become obvious, these reservations are motivated in particular by a possible consideration of non-environmental sustainability benefits, where, in my view, notably the ringfencing of legitimate preferences over the choices of others represents a question that is largely outside the remit of competition law and its enforcement.

[75] There exists some analogy to a distinction proposed by Robert Sudgen in the context of cost-benefit analysis. He distinguishes between a (likely more prevalent) "citizen frame" and a "consumer frame". He operationalizes these frames with the following two questions (Sudgen 2005, Section 4). For the consumer frame: "Given this hypothetical choice problem, to be faced by you as an individual, how would you respond". And for the citizen frame: "Given this hypothetical problem of collective choice, to be faced by you and your fellow-citizens together, how would you (in the singular) propose that the collectivity responds". Sudgen's focus is, however, different and lies on the various problems associated with hypothetical choices, including those related to potential (behavioural) biases, as also discussed previously. He proposes to use the "consumer frame" even for cost-benefit analysis in the public sector.

III.3.1.2 Caveats

III.3.1.2.1 The Nature of Considered Externalities and Consumer Sovereignty in Markets

As presently discussed, both the individualistic and the collective consumer welfare analyses rely on the elicitation of preferences and their subsequent aggregation. Still, in my view there exist important differences, which I discuss in this and the following sections.

As repeatedly discussed, sustainability agreements may involve the introduction or promotion of more sustainable variants combined with a possible commitment to phase out a less sustainable variant, such as in the fuel example. In this case, consumers may be deprived of a choice alternative that they previously preferred and that they may still prefer even when a new, more sustainable alternative was offered. Below I discuss the distributional implications of this, which may be much more pronounced in a collective consumer welfare analysis. Presently, I focus on how this restriction in choice impacts consumer sovereignty in the market.

In the market, a consumer will find her preferred product as long as she and other likeminded consumers express a sufficiently high willingness-to-pay. When the discussed assessment is now analysed under a collective consumer welfare analysis, other consumers' preferences over her own choice may instead determine whether she still has access to her preferred alternatives. I acknowledge that the underlying reason for this is otherwise non-internalized externalities so that the agreement may be intended to correct for a market failure. But such a supposed lack of internalization by assumption takes place within the legal boundaries. By undertaking a collective consumer welfare analysis and clearing an agreement on this basis, consumers may be deprived of their preferred choices based on the "vote" of other consumers, which, however, took place outside of the political process. As I repeatedly acknowledge, these reservations should not presume that the status quo, e.g., in terms of environmental laws, always fully reflects such societal preferences. They should also not presume that a change of such laws or stepping up regulation are always, in some sense, superior to dealing with such issues, notably on a case-by-case basis, within competition law. Still, my arguments suggest that basing a decision on such a collective consumer welfare analysis should require a careful deliberation of the extent to which the respective preferences should be considered.

I acknowledge that some consumers may loose out under a broad range of agreements that have a positive net balance, even without a consideration of externalities. Likewise such positively assessed agreements can reduce choice. This is, for instance, typically the case with standardization agreements. However, in these cases only preferences with respect to consumers' own choices are aggregated, but not preferences over the choice of other consumers. I also acknowledge that without an agreement a consumer does not have the choice to reduce externalities that she suffers from the consumption of others. Hence, one may also regard the factual situation as one where consumers have less choice. The latter situation is however the outcome of the societal process leading to the prevailing norm. That said, notably with a focus on environmental externalities I discuss further below whether and when an agreement to go beyond existing standards and norms may be considered as filling a gap in the expression of societal preferences.

I now briefly return to the discussion of alternative, non-consequentialist welfare criteria in Section II.3.1.2, where I briefly introduced the concept of opportunities, which in the present context may be operationalized by consumer sovereignty. If one places a value on this, an additional implication of the preceding discussion is that one should exert greater care when one wishes to reduce individual sovereignty and choice based on elicited preferences regarding the choices of other consumers. This immediately leads to the question of which preferences that restrict the choices of others are deemed legitimate in the first place.

III.3.1.2.2 Ringfencing Legitimate Preferences over the Choices of Others

As I already discussed, a consumer may have strong preferences for animal welfare, which naturally should not be restricted to those slaughtered for her own consumption. Through the discussed method of eliciting preferences, she could now express such preferences also with respect to the consumption of others. When assessing an agreement based on an aggregation of such preferences, a given consumer's preferences may then restrict the freedom of choice for others and it may impose considerable costs on them.

This clearly raises the question when such expression of preferences over the choices of others is deemed legitimate in competition analysis. Should this be restricted to externalities that have physical (health) implications on others? Or should a group of consumers be given the right to "vote" on issues, such as animal welfare or fair trade, not only with their willingness-to-pay regarding their own consumption but also with their expressed preferences over the consumption of others?

This discussion highlights a tension between the maximization of consumer welfare, including preferences over the choice of other consumers, and individual rights and the freedom to choose. Such tension is at the heart of many societal decisions.[76] Through the political process, in particular, citizens express their preferences for collective choices that constrain individual liberties or that impose certain costs (e.g., in the form of taxes) on individual choices while still other choices are subsidized. In the present context, products offered in the factual scenario (i.e., without an agreement) by assumption adhere to existing legal norms, such as those applying to animal welfare. When an agreement that restricts choices is cleared based on the expression of preferences over the choices of others, such a "vote" necessarily takes place outside of the political process, as already noted. Prima facie it may thus risk not conforming to the balance that society has already struck between welfarism and individual liberties.

III.3.1.2.3 Distributional Implications

When a fraction of consumers express strong preferences over the choices of other consumers and when willingness-to-pay over the considered scenarios is aggregated without any weighting, these consumers may tilt the balance: an agreement may then be deemed to be in consumers' interest even when prices are higher. The resulting distributional implications can be very pronounced, as I discuss next. In particular,

[76] *In social choice theory, the tension between welfarism and individual rights goes under the name of Sen's paradox (Sen 1970). Various proposals restrict preferences to those that are "tolerant" or not "meddlesome" (e.g., Blau 1975, Craven 1982).*

they should typically be larger than when the assessment proceeds based on an individualistic consumer welfare analysis.

To see this, I start with such an individualistic consumer welfare analysis. There, a consumer weighs her own costs from paying a higher price with the benefits obtained from her own choice. Clearly, when price discrimination is not feasible or likely, all affected consumers pay the same incremental price per consumed unit, so that some may gain given their high perceived benefits and others may end up worse off. Still, the respective difference between individual benefits and costs is limited by the scale and scope of a consumer's own consumption. This is different in a collective consumer welfare analysis.

Comparing only the scenarios where all consumers purchase the more or less sustainable variant, a consumer with low demand will put little weight on a higher price while the externalities from the more sustainable consumption of other consumers are still as relevant as those expressed by a consumer with high demand. When the agreement is cleared, the former consumer will then end up bearing only a very limited fraction of the overall costs.[77] In addition, differences in preferences over the consumption of others are scaled up by the sheer number of such other consumers and their choices. This adds to the heterogeneity of preferences and thereby to the possible scale of distributional implications.[78]

Competition enforcement typically does not dispose over instruments to iron out potentially large distributional implications. This is clearly different in circumstances where a cost-benefit analysis concerns the provision of a public good or the realization of another policy goal. There, transfers or other compensatory mechanisms are typically possible.

For competition analysis the potentially large distributional implications (where potentially few consumers with high demand burden much of the costs while the majority of benefits accrues to other consumers) should limit the scope of such collective consumer welfare analysis. I acknowledge again that these distributional implications are the outcome of the internalization of otherwise non-priced externalities. In the fuel example, by purchasing the non-sustainable variant in the factual scenario without the agreement, consumers with high demand have potentially large externalities on others. The agreement could thus be seen as correcting for such a market failure, so that the discussed distributional implications are simply part of such a correction. When making such an argument, it must again be kept in mind, however, that the non-sustainable variant still satisfies all legal requirements. When existing norms and standards are viewed as an expression of societal preferences, they should also reflect society's trade-off taking into account precisely the distributional implications of, in my example, higher fuel prices. I have, however, already acknowledged the limitations also of this view, e.g., in light of imperfections of the political process or as a necessarily coarse regulatory framework could even envisage that companies take certain autonomous decisions.

[77] This ties into the question of defining the set of potential consumers, which turns out to be much more decisive in a collective consumer welfare analysis (see also below).

[78] I presume here that subjects do not strategically distort their stated preferences or choices so as to thereby affect the outcome.

III.3.1.3 Definition of Potential Consumers

For the presently considered consumer welfare analysis, the definition of the relevant market primarily serves the purpose of identifying the group of potential consumers.[79] When one conducts an assessment of an agreement through an individualistic consumer welfare analysis, the erroneous exclusion of certain potential buyers may bias results if they have an over-proportionally low or high incremental willingness-to-pay for the considered sustainable product. When the group of potential buyers is made too large, however, this should not affect results for the following reason: Such an assessment needs to compare different (factual and counterfactual) scenarios and is thus concerned with differences in realized consumer welfare. If the considered sample of potential consumers erroneously contains individuals who are not potential buyers, their elicited willingness-to-pay would fall below the factual and counterfactual price. Hence, the consumer surplus that they realize in this market would thus be zero in both scenarios: They would ultimately not show up in the aggregated consumer welfare calculation.

This is not the case under a collective consumer welfare analysis, notably when the respective scenarios are phrased as collective choice options. Thereby, a subject states (implicitly) how much she values the outcome where, for instance, all consumers purchase the more sustainable variant. While she may have a high willingness-to-pay for other consumers' purchases of a more sustainable variant, her willingness-to-pay for the particular product may be insufficient. Enlarging "the market" by such an inclusion of affected citizens could tilt the overall assessment; however, these citizens are not (potential) buyers in the market.

My present restriction to a consumer welfare standard is guided by my corresponding interpretation of the "fair share" provision. Antitrust law and its enforcement are typically not concerned with the problem of non-internalized externalities and thereby with consumer preferences over the choices of other consumers. With such a restriction, it is indeed sufficient to look at potential buyers to assess market performance. When externalities come into the perspective, however, considering only consumer welfare may seem restrictive. Trying to overcome such a perceived restriction by artificially enlarging the market, i.e., the set of consumers, seems however ill-conceived. When a consumer standard is preserved, one should instead base the definition of the relevant market on consumers' (ceteris paribus) individualistic willingness-to-pay, even when consumer welfare was subsequently calculated based on a collective consumer welfare analysis. If one intends to instead increase the scope of considered externalities, one should instead make this transparent by changing the applied standard, if this is legally feasible and if it is deemed preferable in the first place (cf. Section VI).

[79] *For other aspects of the overall assessment of a horizontal agreement, however, the definition of the relevant market should follow a more standard procedure, as this determines the competitive constraints on the concerned firms.*

III.3.2 Additional Measurement Tools for Environmental Sustainability Benefits

III.3.2.1 Motivation

In this section, I exclusively deal with environmental sustainability. So far I have focused on measuring preferences for products in the concerned market, through both directly and indirectly eliciting the respective willingness-to-pay. The focus lies now on the measurement of externalities.

Suppose an agreement restricts the use of particular extensive farming methods and that this preserves a specific natural habitat that is both home to endangered species and generates benefits for recreational purposes or as it contributes to air quality. If preserved, the natural habitat would thus generate both use value and non-use value. Measuring the benefits derived from its use for recreation, one could still apply the techniques introduced previously, albeit the assessed products or services would no longer be those traded in the relevant market. These methods should, however, be less applicable to the benefits in my example that derive from cleaner air. As I discuss, so-called surrogate markets may allow for extracting preferences from other observed choices, such as expenditures that are made to avoid bad air quality. Other methods rely on external measurements of, say, the impact of bad air quality on the quality of life, e.g., as expressed in health data. In what follows, I confine myself to only a brief discussion.[80]

When I discuss a specific measurement of such externalities, I typically do not repeat the restriction to the welfare of consumers, i.e., potential buyers in the relevant market. When the concerned externalities are diffuse and when the number of consumers is relatively small compared to that of all affected citizens, such a restriction obviously fails to take into account most of these externalities. Also, to the extent that some of the subsequently discussed methods rely on already existing measurements that relate to the population at large, the applicability of these measurements needs to be confirmed when the group of consumers is not representative of the population. An adjustment of existing measurements to consumers may be particularly feasible when these are derived on a per-head basis. Often, however, as I discuss below, such measurements focus on total economic value, which has no immediate relationship with consumer welfare.

III.3.2.2 Tools

III.3.2.2.1 Using Revealed Preferences for the Attribute of Interest

When the externality affects the benefits derived from another good or service, the effect on consumer welfare may be obtained by using the already discussed methods, i.e., by either eliciting willingness-to-pay either directly or indirectly through real or hypothetical choices. When consumers have little experience with the assessment of such benefits, e.g., as the respective goods (such as clear air) are not directly traded, there exist alternative methods that still rely on revealed preferences. In what follows, I provide a selective discussion of such methods to demonstrate their scope. Such methods have been developed, notably in the field of environmental cost-benefit analysis.

[80] *Much of this is taken from Inderst et al. (2021a), which draws on a vast literature of cost-benefit analysis in environmental economics.*

For instance, recreational benefits from areas that would be preserved by an agreement can be measured by so-called travel cost methods. The implicit valuation for the respective area is thereby derived from the various costs, including time, that people incur to travel to these areas. Data is typically obtained from a survey.

Hedonic pricing methods look at prices and consumers' choices in markets that are related to the (non-traded) good that is presently of interest, such as air quality. The key assumption is thereby that the value of goods traded in such surrogate markets depends also on the good of interest. For instance, the value of houses should depend on many different attributes, such as size, but potentially also on local air quality. Setting up a so-called hedonic price function for housing, one can derive a relationship with air quality. If this relationship is causal, the respective coefficient provides information on willingness-to-pay for, in this case, air quality. Given the focus on consumer welfare, it still needs to be checked whether such a measurement is applicable to the specific group of concerned consumers.

Another source of information relates to observed averting or defensive expenditures. For instance, a measure for the benefits from what is now a reduction in noise rather than air pollution may be derived from the costs that people incur for double-glazing in areas with heavy traffic. When it is not possible for people to insulate themselves against the respective externalities, they may have to incur expenditures on medical services and products, meaning that these costs of illness provide another indication for the benefits derived from a reduction of such externalities.

III.3.2.2.2 Dose-Response Methods

More generally, estimations of the relationship between the exposure to a certain, in our case, externality and notably health implications are referred to as dose-response methods. These may measure even a direct economic impact, as deteriorations in health may affect individual capacity to work. Externalities, such as noxious particulate matters, may also impact mortality risk, as expressed in a shorted value of statistical life. Implications for health or increased morbidity need to be monetized. In the environmental economics literature and beyond, various estimates of such monetized values exist and they are used in cost-benefit analyses for public policy. While they abstract from the specific circumstances of a particular group of consumers in the present context, such existing values have the advantage of relying on objective measures.

More generally, for the measurement of the impact of environmental externalities, there may often be scope to rely on existing estimates. Before I discuss the sources and use of such estimates, I note that in the present context, the focus is on consumer welfare. This is an important difference to more standard cost-benefit analyses. There, environmental costs and benefits are typically assessed under a framework of total economic value. This includes not only the direct (e.g., health) impact on all citizens, but also the impact on the value of resources, e.g., when externalities lead to a depreciation of the value of land. A restriction to consumer welfare instead requires a much more limited and focussed analysis.

III.3.2.2.3 Transferring Estimates from Existing Studies

As I already noted, using existing estimates as sources can increase the reliability and objectivity of a measurement of environmental externalities, to the extent that these

are sufficiently applicable to the respective context. Moreover, such an approach can make the whole analysis more efficient, reducing the potentially considerable costs of undertaking a dedicated study. In what follows, so as to illustrate the scope of such an approach, I selectively discuss several ways how to harness existing estimates.

In a cost-benefit analysis, the method of benefit transfer refers generally to the practice of transferring existing estimates to a new study. Often, this simply applies to the transfer of estimates from one (study) site to another (policy) site, possibly with some adjustments. For instance, applied to individual benefits, when willingness-to-pay for an avoided externality was extracted in one study, the potentially different socioeconomic characteristics of a now analysed group of consumers may need to be accounted for. This may relate, for instance, to differences in income to the extent that this makes individuals more sensitive to prices. Such dependencies can also be potentially obtained from extant meta-studies, which more generally relate benefit measures to quantifiable characteristics of many studies.

In some instances, one can also rely on existing integrative studies and databases. On a national and international base, such sources tabulate, for instance, the willingness-to-pay for detailed pollution abatements, derived by various or one of the methods discussed previously.[81]

III.4 Required Standard of Proof

III.4.1 General Remarks on the Need for Quantification

I have provided both a more conceptual discussion of potential sustainability benefits as well as an overview of some measurement tools. While I have brought in non-utilitarian welfare considerations, such as those pertaining to individual liberty and notably consumer sovereignty, as a potential constraint for a too broad consideration of notably externalities, the focus was on a monetized metric of consumer welfare throughout. This allows for making costs and benefits commensurable by a single metric.[82]

As already noted, such a quantification exercise is not necessary when an agreement stays within one of the safe havens as defined by the guidelines. Amongst other conditions, this is only possible if the combined market share of the participating firms is sufficiently small. In all other cases, one might presume that in order to be exempted, costs and benefits of an agreement need to be calculated so as to arrive at its net impact. At various points, the guidelines suggest that such calculations are indeed necessary: *"In cases where the likely effect of the agreement is to increase prices for consumers within the relevant market, it must be carefully assessed whether the claimed efficiencies create real value for consumers in that market so as to compensation for the adverse effects of the restriction of competition"* (Guidelines para 55). However, on other occasions, the guidelines seem to suggest that even in case of a likely price increase, such a full quantification of the balancing effects may

[81] *Inderst et al. (2021a, p.40 ff.) discuss in detail the example of the Netherland's CE Delft Handbook of environmental prices, as well as other sources.*

[82] *Likewise, in a multi-goals approach environmental sustainability constraints may impose restrictions on the maximization of consumer welfare. As discussed above, in this report I do not discuss such an approach. Absent explicit legal requirements, prima facie it seems unclear which constraints should be imposed.*

not be required. This is exemplified for the case of an agreement that reduces the time to bring new products to the market (Guidelines para. 89).

When a full quantification is supposedly not required, it still seems necessary to at least rely on broad estimates. Otherwise, there could not be a presumption that the benefits, e.g., from a faster introduction of new products, outweigh a price increase. For instance, it would be unreasonable to presume that, as a principle, product innovation trumps higher prices. Even a reduced assessment should thus be well-founded and well-documented. In particular, when an appreciable price increase or a loss of choice is to be expected, the argument for why benefits would considerably outweigh such a loss of consumer welfare should be sound. If benefits are so large, it should be possible to provide at least a lower bound that would thus exceed an upper bound estimate for the respective consumer loss. A balancing, even one based on rough estimates, together with possible bounds not only reduces the risk of erring but it makes the whole assessment transparent and open to scrutiny. A purely qualitative approach instead may also generate scope for yielding to pressure to either accept or reject a particular agreement. While the general importance of avoiding externalities that negatively affect health is broadly accepted in the case of ecological sustainability, for instance, the specific relevance of this argument can be disputed only when it is sufficiently quantified in a specific case. That said, I acknowledge, however, that in the light of all available evidence, the required standard of proof for particular benefits and with it the required quantification may differ on a case-by-case basis.

III.4.2 Revisiting the Standard of Proof in Case of Sustainability Benefits

III.4.2.1 Individualistic Consumer Welfare Analysis

Again I split the discussion into two parts. I focus on willingness-to-pay under an individualistic consumer welfare analysis in the first part and I turn to the collective analysis and thereby notably to externalities in the second part.

Recall that (incremental) willingness-to-pay for more sustainable products derives primarily from non-use value, e.g., the value a consumer places on sustaining biodiversity also for future generations or on securing a fair wage for farmers in the product's country of origin. I already noted that different from utility obtained by a direct physical sensation, the elicitation of such willingness-to-pay is particularly sensitive to various outside determinants. On the one hand, this generates noise and thus a greater potential for errors as well as potential systematic biases (cf. the discussion of the warm glow). On the other hand, context specificity generates scope for a broader measurement of preferences, which allows to determine, for instance, how access to information, time for reflection, or a change in the expected behaviour of other consumers affects willingness-to-pay.

Taken together, this implies that any such measurement must be conducted transparently and with care and that it must be put under particular scrutiny. Reporting statistical information on the measurement's precision and robustness are equally important as is an intuitive assessment of the reasonableness of the obtained values, as I have already discussed.

III.4.2.2 Collective Consumer Welfare Analysis and the Evaluation of Externalities

Recall that I have split my discussion of such a collective consumer welfare analysis into two parts. In the first part, I discussed generally the integration of consumers' preferences over the choice of other consumers. This could include, for instance, the benefits derived from a consumer when other consumers are also constrained to purchasing meat from animals raised under a higher animal welfare standard than what is legally required. In the second part, I confined myself to environmental sustainability and discussed additional instruments for the measurement of such externalities, e.g., via the impact on health or morbidity.

I have expressed several conceptual reservations regarding the integration of preferences over the consumption of other consumers, in particular outside the area of environmental sustainability. These reservations concern the difficulty in delineating those preferences regarding the consumption of others that are deemed permissible for such an analysis or the potential for particularly large distributional implications. I noted that the heterogeneity in individual preferences, e.g., for animal welfare or fair trade, could be considerable when scaled up in such a collective analysis, which now also applies to the potential margins of errors. Standards of measurement should thus be particularly high and results should be particularly scrutinized when individual preferences are elicited for such a collective welfare analysis.

I finally turn to the measurement of environmental externalities, for which I have discussed various possibilities. I note again that in comparison to a more standard cost-benefit analysis that may assess total economic value, the focus on a consumer welfare standard should typically heavily restrict the size of considered externalities. This should also apply for the quantification of emissions and their impact on, for instance, health. Such emissions, notably at the site, may be either too local for consumers to be affected or they may be too diffuse as in the case of CO2. Still, one may envisage cases where various circumstances conspire so that a sizable impact on consumers can be established in the aggregate, e.g., when a large fraction of the population constitute consumers and when the impact of emissions is neither too local nor too global.[83] The installation and use of home furnaces and some of their emissions may provide an example. In such cases, adding-up the measured impact of a range of more or less noxious emissions may prima facie swamp the loss of welfare associated with a price increase, in particular when emissions from a one-time consumption have persistent effects over a long time. In this case, there may be calls for a lowering of the applied standard, potentially even doing without a measurement.

There are however various reasons for why even in such cases a transparent record of the size of the various benefits should be provided. For one, this makes it necessary to lay open the sources of the respective estimates, given that various sources may differ by a large order of magnitude (cf. below the discussion of the social cost of CO2). Moreover, it becomes thereby transparent which sustainability benefit, e.g., which reduced emission, is deemed particularly relevant. For instance, it seems insufficient to defend an agreement to phase out a particular product variant based on a claim of (too) high electricity consumption without either further specifying why such benefits

[83] *This may also require sufficient market coverage of the agreement, also as, otherwise, outsiders to an agreement could free-ride and the intended effects would not materialize (or to a much lesser extent).*

would escape consumers or why and to what extent such a saving reduces externalities on consumers.

III.5 Intertemporal Aggregation

Considering different cohorts of consumers separately may be necessary for different reasons. Preferences may change over time or current consumption may have persistent effects on future consumers, e.g., as noxious emissions and their effects may persist or as the production and consumption of (only) non-sustainable variants even deprives future consumers of choices. Also, costs may fall more than proportionally on the present cohort of consumers. In this section, I discuss such an intertemporal aggregation.

Before moving on, one limitation should be specifically taken into account. Take for instance the case of an agreement that enhances animal welfare. Suppose that an assessment of current consumers' preferences would reveal an insufficient willingness-to-pay in the aggregate, given the predicted price increase associated with the agreement. Firms may, however, point to a steep rise in consumers' attention to animal welfare and may claim that the outcome of the assessment would be reversed when taking into account (changed) preferences of future consumers. In this case, however, the welfare maximizing solution could be to postpone the agreement, provided that it will be necessary at all in the future. In other cases, instead, without the claimed benefits of an agreement, future cohorts of consumers may even be deprived of such a choice. Outside of environmental sustainability, however, this seems less likely to be the case. In sum, what is thus required in this case is some form of persistence or even irreversibility that is associated with current production and consumption decisions (and their consequences).

III.5.1 Welfare of Future Cohorts of Consumers

In Section III.5.1.1, I first discuss environmental externalities. Current production and consumption of a less sustainable product may generate emissions that have an effect not only on, for instance, the health of the current population but also on that of future citizens, given that the respective hazardous substances may persist. Section III.5.1.2 considers willingness-to-pay of future cohorts of consumers. When also integrating the welfare of such future consumers, their preferences must be estimated. Depending on the considered time horizon and the observed dynamics of society's appreciation of particular sustainability benefits, a forecast may be necessary.

III.5.1.1 Externalities on Future Cohorts of Consumers

Current consumption can also have externalities on future cohorts of consumers, such as on their health when noxious emissions are persistent or as it deprives future consumers of choices.

Their incorporation should, however, consider the following caveats. Current consumers should internalize such externalities if they are themselves affected in the future. To be specific, suppose hypothetically that for the relevant time horizon we could safely restrict consideration to the current cohort of consumers, though they may purchase repeatedly over time. At each occasion, a consumer would (unless its

effect is too diffuse), however, consider the impact of her emission on her own future self. Moreover, altruism, amongst other motivations, may induce a consumer to even internalize such externalities on other future consumers. Measuring the benefits derived from reduced emissions separately and adding them to those elicited from consumers may then lead to a double-counting of the welfare effects on future cohorts. [84]

The consideration of externalities on future consumers, if this proves relevant, makes the analysis even more sensitive to the definition of the potential group of buyers as a widening of this group now applies to any year that is considered in addition. Defining the group of relevant buyers may, however, prove particularly difficult if this involves such a forecast.

III.5.1.2 Prospective Willingness-to-Pay and the Forecasting of Preferences

When integrating the preferences of future cohorts of consumers, obviously their willingness-to-pay cannot be extracted from market observations or from hypothetical choices. These preferences thus need to be forecasted. In principle, this applies as well to consumers who are potential buyers now, but who may also make purchases in the future. While preferences may often be reasonably stable over a short or intermediate time horizon, this may not be the case when the appreciation of the considered sustainability attribute undergoes particularly large changes in society. Individual consumers may also adjust their preferences when there is a change in public attention and societal norms. I now briefly discuss possible instruments for forecasting preferences of a future cohort of consumers. I note, however, that such an exercise is not standard and should typically involve considerable margins of error.

As I discussed in Section III.1.1, other socio-demographic variables can also be elicited when extracting willingness-to-pay for the existing cohort of consumers. In the ensuing statistical analysis, these can then be related to willingness-to-pay. If such a relationship is found and can be assumed to be causal, forecasts about changes in these variables can be utilized to forecast changes in willingness-to-pay between cohorts of consumers.[85] Another possibility is to utilize changes in the context that is provided to subjects when eliciting preferences. Such changes in the context, e.g., regarding available information or greater awareness, may be informed by forecasts about such societal changes.

III.5.2 Discounting

As I noted above, future cohorts of consumers need to be explicitly considered when costs and benefits are not equally distributed over time, which may be due to changing preferences or as current production or consumption has externalities. In all such cases, the relevant time frame needs to be determined, though notably with a higher discount rate (see below), the exact cut-off matters less as more distant cohorts receive only a relatively small weight. The considered time horizon may depend on the imposed standard of proof, i.e., the required precision for such

[84] *Of course, this issue also arises in a purely contemporaneous exercise when a given consumer's willingness-to-pay also internalizes the impact of her emissions on others. Again, taking into account such emissions separately would then lead to some degree of double-counting.*

[85] *This and other possible approaches are discussed in Inderst and Thomas (2021b).*

estimates. In this section, I focus on the weighting of the welfare of different cohorts of consumers.

III.5.2.1 Weighing Individual Gains and Losses over Time vs. Weighing over Different Cohorts of Consumers

With respect to weighting over time, the guidelines contain the following provision (Guidelines para 88): "*In order to allow for an appropriate comparison of a present loss to consumers with a future gain to consumers, the value of future gains must be discounted. The discount rate applied must reflect the rate of inflation, if any, and lost interest as an indication of the lower value of future gains*". It is my understanding that this relates to a given cohort of consumers or likewise to an individual consumer. Indeed, when costs and benefits are not distributed equally over time, these must be also aggregated at the level of an individual consumer. Then, such discounting is necessary as, viewed from the present perspective, gains and losses that lie further in the future are of diminished importance.

That people typically exhibit such a discounting of future "payoffs" is an established fact in economics. A broad literature in empirical and experimental economics has tried to establish individuals' actual discount rates, which were found to be generally large but also highly heterogeneous across individuals as well as across the analysed context.[86] The guidelines seem to apply an economic concept of lost time value, e.g., supposing that if a consumer had received the monetized benefits already now, she would have saved the respective interest on a loan that she had to raise instead. I also acknowledge that there are legal provisions for the applicable interest rate in the case of suffered damages.[87]

In what follows, I focus instead on the aggregation of costs and benefits over a potentially different cohort of consumers over time. This raises different issues, such as that of intergenerational equity. Here, the underlying economic question that determines the discount rate is no longer that of how an individual can substitute over time, but how this applies to society as a whole. In other words, it is the so-called social discount rate that is now of interest, to which I turn next.

III.5.2.2 The Social Discount Rate

To repeat, when benefits and costs are not equally distributed across time and thereby also across a different cohort of consumers, the time dimension needs to be incorporated. The prevalent way to do so is to express these in terms of their present value, thereby again obtaining a single metric. The standard process for assigning different weights to different points of time is that of discounting. A higher discount rate, say 7 % instead of 5 %, puts less weight on the future. When the discount rate is higher, the corresponding discount factor is lower.

I now discuss the use of the so-called social discount rate.[88] In the most basic formulation, it has two components. The first component is the utility discount rate,

[86] *See Matousek (2021) for a meta study of the experimental evidence.*

[87] *These typically do not explicitly take into account the inflation rate. Neither does the mentioned (financial) economics approach. To recapitulate the latter: The time gap is "bridged" by supposing that the respective party instead takes out a loan or repays a loan earlier (and saves on the respective interest). Again, no separate consideration of the inflation rate is thereby needed.*

[88] *The topic of discounting is widely explored in the literature of cost benefit analysis (cf. for an authoritative discussion Arrow et al. 2014). A very short, technical introduction is given in Inderst et al. (2021a).*

which more narrowly captures impatience over time. The second component builds on a representative utility (function), which typically exhibits a decreasing return to the used metric of societal consumption (diminishing marginal utility). When societal consumption is supposed to grow over time, given the exhibited decreasing return in the underlying utility (function), this leads to more discounting of future consumption. When future consumers are thus thought to enjoy generally higher consumption (higher welfare), less weight is placed on their consumption. The effect of such additional discounting due to a growth-in-consumption factor is diminished, however, when such growth is fraught with uncertainty ("social discount rate under risk").[89]

Over the last decades, the concept of a declining discount rate has gained increasing acceptance. With this, the so-called "tyranny of discounting", by which welfare realized further in the future becomes virtually irrelevant for current decision making, is mitigated. Such a declining discount rate can be motivated, for instance, by uncertainty over future discount rates, limited asset substitutability, or a principle of intergenerational equity.[90]

Despite conceptual progress, there is still much dispute about the applicable social discount rate.[91] When consumer surplus is distributed relatively equally over time or when for other reasons the time horizon is kept short, differences in the discount rate will not have a large impact. Such a large impact instead arises when the considered time horizon is long and when current consumption has a persistent and sizable effect on future consumers' surplus, e.g., as it deprives them of a choice option. As noted above, in such cases, the respective measurement of consumer welfare may be fraught with particularly high uncertainty. If this raises the required standard of proof, the time horizon for considered consumer welfare may again be shortened.

[89] In a cost benefit analysis for public projects, project specific risk or uncertainty factors are also included. According to standard capital market theory, only so-called systematic risk matters (i.e., risk that cannot be diversified away). I do not discuss this separately in the present context.

[90] See Atkinson and Mourato (2015, chapter 8).

[91] For instance, the report by Stern (2007) applies a discount rate of 1.4%, while in its critique Nordhaus (2007) opts for a rate of 4.3%.

IV Indispensability of an Agreement

IV.1 Background on the Existing Framework

I recall from the Introduction that, to the extent that an agreement restricts competition, all elements of the agreement must be necessary for realizing the objective and the claimed benefits according to the provisions of Article 101(3) TFEU. This thus relates both to the agreement itself as well as to all the restrictions that follow from it.

As already noted in the Introduction, the current legal framework, however, provides provisions for an exemption from the general prohibition of horizontal agreements that may restrict competition. For the purpose of this report, it is not necessary to provide an account of all aspects of such exemptions. Provided that respective market share thresholds are also met, the guidelines also provide so-called safe harbours for certain agreements and practices.

As an illustration, I briefly consider standardization agreements. Here, the guidelines highlight the potential positive effects on, for instance, quality and safety. Standard-setting agreements may escape prohibition if, inter alia, the following conditions are satisfied: "*Participation in standard-setting is unrestricted [...], the procedure for adopting the standard in question is transparent, standardisation agreements [...] contain no obligation to comply with the standard and provide access to the standard on fair, reasonable and non-discriminatory terms*" (Guidelines, para 280). When such agreements become binding and obligatory, however, they are typically not considered as covered by Article 101(3) TFEU.[92]

Still, overall there are clearly many occasions of sustainability agreements that should not raise concerns as they do not appreciably restrict competition.[93] In what follows, I instead restrict considerations to agreements that raise competition concerns so that a potential trade-off exists and sustainability benefits have to be taken into account in order to clear the agreement.

While I acknowledge that various scholars point to Commission decisions and statements that suggest that sustainability concerns have already been explicitly taken into account, it seems fair to say that this is not common practice. In fact, the Commission's approach up to now seems to still conform with the overall picture that emerged from an OECD roundtable on horizontal environmental agreements in 2010.

[92] *Interestingly, the preceding 2001 Horizontal Guidelines had special provisions for environmental agreements, which are close in spirit to the current provisions for standardization agreements. Precisely, the Commission's 2001 Horizontal Guidelines (in para. 179) defined environmental agreements as "agreements by which parties undertake to achieve pollution abatement, as defined in environmental law, or other environmental objectives ... in particular those set out in Article 174 of the Treaty" [now Article 1919] and held that such an agreement was unlikely to restrict competition if it "does not place any precise individual obligation upon the parties" (para 185).*

[93] *While I acknowledge the different legal setting, with a particular focus on sustainability agreements, the list of such "innocuous" agreements in the ACM's guidelines may also be informative ACM (2021, para 23-27). Here, the ACM lists agreements that incentivize undertakings to make a positive contribution to sustainability without being binding, codes of conduct promoting sustainable practice, agreements to promote sustainable products and to stop production of less sustainable variants (provided they do not appreciably affect product diversity and price), joint initiatives that are necessary for sustainable product innovation and agreements that commit members as well as their suppliers and distributors to respect national and international standards.*

There, the executive summary states that competition authorities do not treat sustainability agreements differently unless they have an explicit public interest mandate and test. Specifically (OECD 2010, p. 11): "*When examining an agreement among competitors that pursues environmental policy goals, most competition authorities will apply the generally applicable analytical framework and consider only whether the agreement produces direct economic benefits typically cognisable under their competition laws; they will not consider non-economic benefits related solely to environmental policies in their evaluation*".

In this report, as I noted in the Introduction, I largely restrict consideration to sustainability benefits that are reflected in consumer welfare. In the following section, I first draw on the preceding analysis to basically recapitulate how sustainability benefits can be taken into account under a consumer welfare approach. This does not yet answer the question of indispensability, to which I turn subsequently.

IV.2 Recapitulating (Potentially Extended) Sustainability Benefits

It seems expedient to first recapitulate, based on the preceding analysis, how sustainability benefits can be taken into account under a consumer welfare standard. Following the approach taken so far, I apply the distinction between an individualistic and a collective consumer welfare analysis.

The starting point for capturing and measuring sustainability benefits are consumers' expressed preferences, i.e., the willingness-to-pay for sustainability attributes in their consumption choice. This is, prima facie, not different from the measurement of benefits derived from other product attributes, notably those relating to quality. As sustainability benefits are typically non-use values, e.g., motivated by altruism or ethical principles, this generates, however, well-known problems in their measurement (e.g., through stated preferences in a contingent valuation analysis or through a choice experiment in a conjoint analysis). But it also generates additional scope as expressed preferences should be more sensitive to contextual factors, such as information, awareness or the expectation about the behaviour of other consumers.

Certain characteristics of choices relating to sustainability, such as complexity or the long time horizon associated with the manifestation of the impact of consumption choices, may induce errors or even systematic biases. This suggests applying a potentially different concept and measurement of consumers' supposedly "true" environmental preferences and benefits. I took a somewhat different perspective, as I noted how these potential errors and biases may be mitigated in hypothetical choice situations.

I further discussed sustainability benefits associated with preferences over the choices of other consumers. I expressed reservations against considering such preferences outside environmental sustainability (i.e., environmental externalities). Again, consumers' welfare from the absence or reduction of such externalities may be directly elicited from their statement or expressed preferences over different scenarios. As these externalities are associated with the choices of other consumers rather than with a consumer's own choice, however, I discussed alternative methods for the measurement of the respective sustainability benefits. While these methods borrow from standard cost-benefit analysis in environmental and resource economics, it must

be taken into account that, in the present context, benefits are restricted to those enjoyed by consumers in the relevant market.

IV.3 Starting Point: Competitive Forces in the Sustainability Space

I focus now first on sustainability benefits that are appreciable to consumers as they are associated with their own choice (rather than with reduced externalities of the choice of other consumers). As I already noted, such sustainability benefits should be prima facie regarded similarly to benefits derived from perceived superior quality, though I have already acknowledged several special characteristics of benefits derived from non-use value.

Over the last two decades, a substantial empirical literature in management science and economics has emerged that demonstrates how firms compete in such a "value space". In an environment where consumers show an increasing appreciation of value-oriented dimension of products and of the overall corporate image, firms that differentiate themselves in this respect can monetize a comparative advantage.[94] Such a monetization hinges of course on whether the respective attributes are sufficiently perceived and appreciated by consumers. But this is also a prerequisite for consumers deriving welfare from the consumption of such products in the first place.[95]

Sustainability attributes, just as any other perceived quality attribute, can thus allow firms to obtain a competitive advantage. Gaining customers and market share based on such an advantage is in turn facilitated in a more competitive environment. Indeed, various empirical studies have shown that measures of CSR are positively linked to the degree of prevailing competition.[96] If one considers sustainability only in terms of such vertical differentiation, one thus indeed needs to be sceptical about claims that sustainability is promoted by an agreement rather than by competition. This can be different, however, when more sustainable products require substantial shared investments and when such investments lead to spillovers. This is already recognized not only in the guidelines, as noted above, but also in a substantial body of literature, notably on research joint ventures. It is widely recognized that such agreements can increase efficiency but also that they can reduce competition with prima facie an ambiguous net effect.[97]

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[94] *Both conceptually and empirically, this is often framed more widely in terms of the whole CSR-spectrum. See Bansal and Roth (2000) and Porter and Kramer (2006) for early points of reference in the management literature and more recently, Iannuzzi (2017).*

[95] *The management literature has identified various facilitators for consumers to develop such willingness-to-pay, e.g., a certain degree of awareness or an association also with a use-value such as health (e.g., Servaes and Tamayo 2013, Delmas and Colgan 2018; cf. also the early literature survey by Kitzmueller and Shimshack 2012). Knowledge of this literature as well as the respective practical cases may provide additional background for critically assessing claims whether, for instance, agreements are necessary to ensure the respective appreciation of sustainability attributes.*

[96] *E.g., Delmas and Montes-Sancho (2010), Du et al. (2011), Fernández-Kranz and Santaló (2010), Flammer (2015), Simon and Prince (2016), Ding et al. (2020). Based on a theoretical analysis, where sustainability attributes are captured through vertical differentiation, Schinkel and Spiegel (2017) and Schinkel and Treuren (2021) argue that firms have stronger incentives to promote sustainability under competition than under coordination. In the analysis of Dewatripoint and Tirole (2020), competitive pressure has what they call "no ethical impact" when prices are set in the market.*

[97] *A large literature, both theoretically and empirically, has developed starting from d'Aspremont and Jacquemin (1988), Suzumura (1992) and Kamien et al. (1992). Whether the net benefits are positive or negative in the presence of shared investment costs and spillovers depends, for instance, on the extent to which cooperation also reduces competition in other dimensions.*

The upshot of the preceding discussion is the following. When sustainability benefits can be seen largely in terms of vertical differentiation, which notably abstracts from externalities, prima facie competition rather than coordination between firms should be beneficial unless such coordination leads to specific benefits, e.g., due to the sharing of investment in innovation or the required infrastructure and spillover effects. This is true for any exemptable agreement and it is thus clearly not restricted to sustainability benefits. With this background, I turn to the question of whether beyond this there is specific scope for indispensability of an agreement in case of sustainability this.

IV.4 Additional Scope for Indispensability in Case of Sustainability Agreements

The subsequent discussion builds on the preceding discussion of different sustainability benefits. Based on this, I isolate and critically discuss three potential reasons for why there may be additional reasons or specific scope for indispensability of an agreement in case of sustainability benefits. The first such rationale builds on the aforementioned notion of spillover (or network) effects. The second rationale builds on consumers' supposed failure to sufficiently appreciate sustainability benefits. The third rationale focuses on externalities.

IV.4.1 Additional Scope for Network Effects under Sustainability Agreements

As I noted above, the guidelines already appreciate the potential benefits of an agreement under spillover (or network) effects and shared investment in R&D and infrastructure. Here, an agreement can overcome coordination failure or ensure that investment costs can be distributed over a sufficiently large number of consumers who, for instance, subsequently use the newly generated infrastructure or technology. Another example that is also treated in the guidelines is that of the development of a joint standard. This also applies to the introduction and dissemination of joint labels, which can be of particular relevance for consumers' appreciation of sustainability benefits. In fact, as discussed in Section II.3.2, the non-use value and complexity associated with sustainability benefits should render such standardization and dissemination of credible information particularly important.

I also discussed that the appreciation of sustainability benefits should depend on social norms, which in turn may be influenced by the observed or expected behaviour of others (Section III.2.3). This may give rise to a particular form of network or spillover effect. Then, a firm introducing more sustainable products may not benefit from a first-mover advantage but it may be at a disadvantage due to consumers' limited appreciation of the respective benefits. Second-moving firms may instead benefit from consumers' higher appreciation based on the discussed change in norms or, more simply, from increased dissemination of information, for instance.[98] As I discussed above, hypothetical choice experiments may provide an indication regarding the

[98] *In fact, that reasons other than a change in norms lead to such network effects, e.g., information dissemination or the build-up of a complementary infrastructure, has been recognized also in the environmental economics literature (e.g., Sartzetakis and Tsigaris 2005).*

strength of such an effect, while it remains to be determined case-by-case whether the respective agreement is in fact indispensable or not.[99]

IV.4.2 Consumers' Failure to Appreciate Sustainability Benefits

I first note that in the case of the discussed network or spillover effects, the lower willingness-to-pay of consumers when the market share of sustainable products is still low does not imply a failure of consumers' appreciation. It is simply a reflection of present circumstances, including the prevailing norm. Still, consumers' failure to appreciate benefits may be due to a lack of information or misinformation. These could impede, for instance, the unilateral introduction of more sustainable products. As already discussed, provided that it could be shown why firms' individual actions to inform consumers fail, an agreement may correct for such failure.

I now recall the discussion in Section II.4 about consumers' potential biases when making choices. There, I referred to various examples from the experimental and behavioural economics literature. I also noted that, according to this literature, some characteristics of choices relating to sustainability benefits may be particularly conducive to such biases. When consumers supposedly fail to "sufficiently" appreciate sustainability, market forces should prima facie not lead to the efficient outcome. Under such circumstances, consumer welfare may be higher, for instance, when firms agree to introduce a more sustainable product and to phase out a less sustainable variant even though consumers (or a sufficient number of them) exhibit higher revealed preferences for the former. Here, the agreement would thus realize higher consumer welfare only when super-imposing "true" preferences. Taking up a possible example from above, consumers may supposedly fail to appreciate the long-term cost savings from an electrical appliance, instead focusing too much on the lower immediate purchasing cost of a less expensive variant, which, however, is less sustainable as it consumes more energy.

I have already outlined the challenges of such an approach, without however negating its possible relevance in particular circumstances. In particular, I have noted that rather than hypothesizing about such a bias that a consumer supposedly has against her own best interest, such preferences should be elicited directly from the consumer, e.g., through respectively modified hypothetical questions or in a different context that may, for instance, provide additional information.[100] This may allow for determining whether, for instance, at the point-of-sale consumers indeed yield to a bias as their choice differs when providing more information or time to reflect. If such an analysis indeed reveals a higher willingness-to-pay, I have already discussed reasons for using this in a consumer welfare analysis as well as some caveats. The

[99] *Inderst et al. (2021b) analyse the conditions for when, under such a network effect, coordination between firms fosters or forestalls the introduction of more sustainable products.*

[100] *In behavioural economics, there is a long tradition of distinguishing between biases that are either solved in the market or that the market may even exacerbate (or exploit); e.g., Barr et al. (2009) and Bar-Gill (2011), who speak of "behavioural fallabilities" in the latter case. In these cases, typically the consumer directly suffers damages by purchasing the wrong product, e.g., by overpaying, which is typically also measurable. Clearly, this is different when one supposes that the consumer fails to internalize externalities on others that she would supposedly have preferred to consider.*

gap between such willingness-to-pay and the current market outcome may then provide a starting point for an analysis of the indispensability of an agreement.[101]

IV.4.3 Externalities (under a Collective Consumer Welfare Analysis)

I recall that due to various reservations, I have restricted the further discussion of the collective consumer welfare analysis to the consideration of environmental externalities. I also recall that under a consumer welfare standard only those externalities are considered that are exerted on a consumer in the relevant market by consumption and production of the considered products.

To the extent that a consumer does not herself internalize such externalities on others, they do not enter into her willingness-to-pay. Consequently, such externalities cannot be reflected in (individualistic) choices in the marketplace. This is indeed also the key difference between the individualistic and the collective consumer welfare analysis. By the very nature of such externalities, if they are not sufficiently internalized, market forces should then fail to lead to the efficient outcome. Remaining with the preceding example, an agreement that phases out a product that generates a particularly high level of harmful emissions may then enhance consumer welfare and it may be considered indispensable as this outcome would not be realized under competition. If preferences over the choices of others were generally taken into account in a (collective) consumer welfare analysis, in principle this would apply equally to, for instance, the discussed cases of fair trade or animal welfare. Also in these cases, the market outcome does not reflect such preferences over the choices of others. As I already argued, it does not seem sufficient to argue only that the market fails to take into account such externalities (in a wider sense). Instead, it seems necessary to argue at least as well why the outcome under the agreement should more closely represent societal preferences, such as regarding the trade-off between individual liberties and aggregate welfare or likewise regarding aggregate welfare and its distribution. Also with this in mind, I have already expressed serious reservations regarding the consideration of preferences over the choices of others outside environmental sustainability. Taking a purely welfarist approach would risk ignoring the aforementioned societal trade-offs, as reflected in existing norms and standards.

That said, I acknowledge the various arguments that have been put forward for why such norms and standards do not fully exhaust societal preferences, in particular with regards to environmental sustainability. As already discussed, obstacles in the political process or information deficits among voters and policymakers could at least delay an adjustment of standards and norms. In certain circumstances, one may then imagine that firms put forward agreements that fill such gaps.[102]

[101] *Firms may have an incentive for such an agreement as such lower-cost products may have a particularly low margin.*

[102] *Firms may have such incentives for various reasons (albeit, in other cases, they may also have incentives to delay more restrictive standards and norms, such as by lobbying or outright collusion). For instance, the agreement may prove less costly than subsequent regulation that is enforced under increased awareness of the underlying problem. Also, firms may cater to preferences of better informed owners and investors. And regulation may also foresee the autonomous role of firms to fill certain gaps.*

V Transcending the Consumer Welfare Standard to Include Out-of-Market Benefits

V.1 Preliminary Remarks

I have so far restricted consideration to so-called "in-the-market benefits", applying a consumer welfare standard in the relevant market. Externalities of production and consumption could thereby only be considered to the extent that a particular consumer wishes to do so or, under a collective consumer welfare analysis, if a consumer in the market was affected. I imposed such a restriction based on my understanding of current practice. Even if there was disagreement in this respect, the preceding analysis should still be of interest as it documents the potential within such a standard. And I also acknowledge that the standard is explicitly different in other jurisdictions.[103]

There is a broad and intense debate about what should be the objective of, and the standard applied by, competition law. Even absent a change in law that would explicitly widen the mandate of a competition authority accordingly, various rationales have been proposed for why sustainability should receive more consideration. For instance, this may substitute for more costly (for society) environmental regulation. Or despite societal preferences for such wider consideration, there may be political failure to formulate and enact the respective norms, so that the enforcement of competition law may step in to fill this gap. I acknowledge these and various other arguments, also against such an enlargement of objectives, but I do not contribute to this discussion. Still, in what follows, I briefly discuss how out-of-market benefits could be incorporated as well as additional caveats.

V.2 Incorporation of Out-of-Market Benefits

V.2.1 Broadening the Welfare Standard

An immediate way to include out-of-market benefits is to extend the welfare analysis beyond consumers. Obviously, this applies only to the discussed collective welfare analysis as citizens who are not potential buyers do not derive benefits from the respective choice.

I now recall my focus of the collective welfare analysis on environmental sustainability. This restriction seems even more warranted when extending the welfare standard beyond consumers. For instance, non-consumers of meat may have rather strong preferences over whether and how much meat other consumers purchase, but competition law and its enforcement is surely not the right place for a balancing of such diverse interests. Now with a focus on environmental sustainability, I can directly refer to the discussion in Section III.3.2. In fact, I already noted there that the

[103] *A widely cited example is that of Australia: "When considering whether there is a public benefit from proposed conduct, the ACCC considers whether benefits are of value to the community generally and, if so, how much weight society attaches to those benefits. Of particular relevance will be the number and identity of the likely beneficiaries" (ACCC 2019); or: "For example, if the proposed conduct was likely to increase pollution or reduce public health and safety, the ACCC would take this into account in balancing the public benefits and detriments". See also the Introduction for a discussion of different approaches of European national competition agencies.*

respective measurement instruments are in fact typically applied to society as a whole rather than a subgroup of consumers. In this sense, an extension of the welfare standard to capture benefits of environmental sustainability does not lead to additional measurement problems. I discuss more conceptual reservations below.

V.2.2 Integrating (Well-Defined) Policy Objectives Regarding (Environmental) Sustainability

In the technical report Inderst et al. (2021b), we also discuss the possibility to integrate into a welfare analysis, and thus into a single metric, the achievement of certain, well-defined policy objectives. Here, I do not want to express a view on what such policy objectives could or should be. Instead, I only shortly repeat how such an integration may proceed.

One possibility could be to achieve such an integration within the framework of a cost-effectiveness analysis. Generally, such an instrument compares different projects or policies to then select the one that attains a given target most efficiently, i.e., it generates minimum cost or achieves the maximum in terms of the stated objective for a given cost level. Such an instrument is thus particularly suitable when there is a fixed target, as I presently assume. More specifically, in this case one would consider a proposed agreement as one such project, whose realization would thus contribute to the achievement of the respective policy objective, such as an emission target. With the realization of the agreement, other projects may no longer be necessary. In such a case, it may thus be possible to calculate the (marginal) abatement costs that the agreement may thereby save and, under certain conditions, take those into account in a welfare analysis alongside consumer welfare. Such a monetization would thus still allow obtaining a unified metric for the balancing of costs and benefits.

V.2.3 Specific Limitations and Caveats

V.2.3.1 Practical Reservations

I acknowledge that the measurement of environmental externalities on consumers, as discussed in Section III.3.2, requires expertise that should typically not lie within the core competences of competition agencies. As one extends the standard to all citizens, environmental externalities should more often become substantial. In fact, given that now the number of affected people may far exceed that of consumers, the balancing of costs and benefits may hinge crucially on the size of the measured externalities. When these are thus measured with a large margin of error, the risk of type-II errors (of not prohibiting an anticompetitive agreement) may notably increase. Exerting the necessary expertise to limit such errors is thus of considerable importance.

Such expertise may be particularly required when the experts' estimates differ widely. Such differences are, however, to be expected given already widely diverging measurements of certain environmental prices in the literature. A case in place is that of CO2, which may become relevant in particular when, as discussed above, explicit policy targets are incorporated in an assessment. Values for the so-called social cost of carbon reported in the literature differ by a huge margin. Such costs are typically derived from integrated assessment models and crucially depend on the chosen parameters, which also reflect underlying objectives. And these environmental prices

typically far exceed, for instance, average prices of CO2 under the EU Emissions Trading System.[104] A competition agency would have to take a stance on this.

V.2.3.2 Distributional Implications

Within a consumer welfare standard, I have already expressed some reservations about the consideration of (environmental) externalities notably when this may have considerable distributional implications. For instance, potential buyers with very low demand would contribute very little in terms of paid higher prices, while they would benefit equally from reduced externalities. Under a broader standard, one would now consider the preferences and welfare of citizens who do not even intend to purchase the respective products and pay a higher price.

As I noted above, competition authorities typically do not have the means to address such a potentially very uneven distribution of costs and benefits. However, I acknowledge that in this report I have not taken into account a possible enlargement of such instruments. For instance, at least in principle it may be envisaged that groups of consumers that have a high marginal utility of income and are thus particularly affected by a price increase may need to be compensated through adequate remedies (to the extent that, for instance, regional price differentiation does not contradict other legal requirements in the single European market).

[104] The EU Emissions Trading System is based on the cap-and-trade principle. It applies to heavy energy-intensive installations, such as power plants or industrial plants, and airlines operating between two countries. On a discussion of estimates for the social cost of carbon, see Inderst et al. (2021a).

VI Concluding Remarks

I do not repeat the organization of this report or my main conclusions. I refer to the summary and the introductory remarks for this. As I have noted there, this report largely takes as given that an assessment of an agreement proceeds under a consumer welfare standard. The main focus of this report is thus to discuss how sustainability benefits can be incorporated under such a standard. I explore the scope for this, but also express reservations at various points.

The object of this report is, however, not a discussion of whether a broader welfare criterion or a separate consideration of sustainability is either possible or preferable. This should not imply that economics and economists should not take part in such a debate. In contrast, in my view they are particularly qualified to contribute to this debate for a number of reasons. In particular, any approach that is advocated for must ultimately be put into practice, for which a measurement and balancing of costs and benefits is essential. Economists are unlikely to ignore such considerations, at least when they have practical experience. Economists also have a long tradition of asking the question of how a given objective can be achieved most efficiently, including through careful regulatory and institutional design.[105] Finally, both formal analysis and empirical work may help with scrutinizing different arguments. I thus abuse my concluding remarks as a call for economists to participate in this important debate.

[105] *In light of the many possible references, I choose to showcase my own work. In Hofmann et al. (2017), we carry out a theoretical analysis of when a Pigouvian tax on externalities should be accompanied with subsidized financing of abatement activities, for which various countries indeed have specialized entities. I have yet not seen such a formalized theoretical foundation for the involvement of competition law and its enforcement (instead of relying alone on a Pigouvian tax on emissions).*

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