

The Role of Competition and Consumer Protection Laws and Policies in Supporting Environmental Sustainability in Singapore

ABSTRACT

Competition and consumer protection laws should strike a balance between inter-firm agreements/collaboration promoting sustainability, and maintaining healthy competition. The exigency for firms to align with national sustainability goals poses a dilemma: can competition be sacrificed for future welfare?

This paper focuses on business agreements forwarding sustainability goals instead of agreements that stifle sustainability, enabling us to evaluate if the Competition and Consumer Protection Commission of Singapore's (CCCS) current framework adequately assesses "out-of-market" efficiencies and costs of anti-competitiveness.

While green innovation and competition are essential to increasing sustainability, "out-of-market" efficiencies are difficult to *quantify* and *qualify* as they are (1) non-pecuniary, (2) long-run benefits, and (3) indirectly related to the market. Additionally, anti-competitiveness in the Green Economy arises primarily through novel agreements instead of traditional mergers. Moreover, the accompanying problem of Greenwashing demands a novel solution: its high prevalence undermines the current CCCS model reliant on consumer proactivity.

In lieu of these difficulties, we propose a framework that aligns with CCCS' undergirding principles and aims to (1) qualify "out-of-market" efficiencies as *demand-side efficiencies* and *dynamic efficiencies*, (2) quantify aforementioned efficiencies through various valuation methodologies, (3) utilise quantitative indicators to analyse the

costs of anti-competitive agreements, and (4) offer detailed specifications for the objective justification of sustainability claims.

Singapore's national drive towards sustainability has deep implications for economic sectors like the Green Finance industry. While the Green Economy is on the rise, this paper's recommendations seek to empower CCCS in the effective facilitation of healthy competition and achievement of sustainability. Instead of attempting to reform CCCS' underlying principles, this paper demonstrates that its existing principles can be applied in unique ways to address market failures and "out-of-market" efficiencies prevalent in the Green Economy.

(281 words)

1. INTRODUCTION

While competition and consumer protection law (CCPL) is essential to maintaining healthy competition, it potentially undermines sustainability innovations. The Competition and Consumer Protection Commission Singapore's (CCCS) total welfare approach seeks to balance economic efficiencies achieved and reduced competition levels. Yet, "out-of-market" efficiencies arising from sustainability benefits are often excluded from the assessment.

The climate emergency underscores the exigency of sustainability innovations and energy efficiency, necessitating the adaptation of CCPL to drive sustainable developments. We first examine CCCS' underlying principles, specifically its aptness for sustainable goods. We then explore the qualification of environmental benefits as "net economic efficiencies" under CCCS' principles, providing a sustainability-specific framework to quantify costs of anti-competitive behaviour and economic benefits of sustainability innovations. Subsequently, we consider greenwashing, suggesting methods to protect consumers.

2.0 ANTI-COMPETITIVE AGREEMENTS AND ABUSE OF DOMINANCE

CCCS' legislation addresses mergers and collusion between market players, leading to inefficient markets and stifling competition. However, reduced competitiveness arises through agreements and standards on energy-efficient products, increasing prices. For instance, European manufacturers of domestic appliances set agreements to sell washing machines meeting certain energy-efficient standards. This reduces consumer variety, restricting choice to costlier models (OECD, 2021).

Anti-competitive behaviour may provide the environment for abuses of dominant position. The State of California and four car manufacturers intended to increase fuel efficiency through horizontal agreements (ibid.). This excludes firms unable to comply (Ebeling, 2009), limiting the range of cars that could be driven and creating exclusionary effects analogous to a single firm abusing its dominance.

2.1 CCCS CURRENT FRAMEWORK

CCCS' cost-benefit analysis conceptualises economic gains as total welfare: beyond consumer welfare, producer welfare factors into the calculus. This principle is at heart a balancing act. For instance, CCCS allows anti-competitive agreements that provide “net economic benefits” (NEB). A loss in consumer welfare (increased prices) is permissible, if total benefits produced significantly outweigh this. Balance is similarly observed in CCCS' merger guidelines, which grant exemptions for “net economic efficiencies”.

2.2 SUSTAINABILITY BENEFITS

CCCS defines “economic benefits” as quantifiable gains (Chen, 2020). In assessing efficiency claims under the NEB exclusion, CCCS currently mandates that claimed benefits offset or mitigate competition concerns specific to the industry. Benefits only qualify if they occur within (a) the relevant or closely-related market (excluding generalised, cross-market efficiency gains), and (b) a reasonable timeframe.

For instance, collaborating airlines often submit that agreements will “strengthen Singapore as an aviation hub” (CCCS, 2018). In assessment, CCCS considers only quantifiable benefits direct to the agreement, such as increases in flights or passenger numbers; general benefits to Singapore’s status are not considered additional efficiencies.

However, sustainability benefits exhibit generalisable, third-party spillover effects borne by neither producer nor consumer. Such “out-of-market” efficiencies accrue in the long term, with little immediate direct benefit to both market and society. Therefore, sustainability gains are unaccounted for under CCCS’ current scope of “net economic benefits”.

2.3 ENVIRONMENTAL BENEFITS AS “ECONOMIC EFFICIENCIES”

Given similarities in sustainability benefits from agreements and mergers, we draw upon CCCS’ framework of “net economic efficiencies” (for mergers), to consider “net economic benefits” from sustainability agreements as (1) Dynamic efficiencies; (2) Demand-side efficiencies.

Dynamic efficiency refers to innovations by merged firms or firms in agreements, relative to the pre-agreement situation (CCCS, 2016). This is particularly relevant to markets for sustainability goods, which tend to have many agreements for R&D collaboration (Dall-Orsoletta, 2022). Consequently, these non-price improvements increase product quality (sustainability) in the market.

Sustainability agreements also boost **demand-side efficiencies**, increasing attractiveness of products to consumers. Demand for sustainable products has grown,

with 81% of consumers avowing such preferences (Simpkins, 2021). Thus, moving towards energy efficiency and sustainability increases satisfaction gained from consuming an additional unit of goods. Sellers' increasing sustainability commitments would heighten demand for their products, consequently raising producer surplus. Hence, environmental benefits are not restricted to the long-term; they directly contribute to consumer and producer surplus.

2.4 QUANTIFYING ECONOMIC BENEFITS

We propose employing market-based, cost-based, and non-market-based valuation methodologies to quantify environmental benefits as demand-side and dynamic efficiencies.

CCCS' prioritisation of **demand-side efficiencies** and product "attractiveness" as proxies for consumer welfare cohere with Samuelson's revealed preference theory, viewing consumer behaviour as approximations of utility derived from environmental goods. The hedonic pricing model (HPM) concretises CCCS' quantification of **demand efficiencies** via multi-factor regression analysis of environmental goods (Williams, 1995).

Market prices of products are a function of various characteristics consumers consider. Hence, once all alternative characteristics are excluded, price variances are likely a result of environmental characteristics. The regression coefficient of various environmental indicators (energy-efficiency ratings, air quality indicators etc.) approximates their value. Applying their respective regression coefficients precisely values sustainable goods. For instance, energy-efficient refrigerators can be valued based on regressing indicators like NEA's tick rating system.

This quantifies environmental benefits as “attractive” product features, constituting demand-side efficiencies. This ensures sustainability benefits arising from agreements are localised within specific markets and directly linked to immediate increases in total welfare.

Given potential limitations in quantifying non-price improvements in **products for dynamic efficiencies**, non-market-based approaches, specifically the Dose-Response method, circumvent such difficulties regarding energy efficiency and sustainability.

Quah & Tay (2003) formulated changes in risk of health impact (*i*) given pollutant (*j*) in Singapore as: $dH_{ij} = a_i * dA_j * POP_i * MortalityRate$, where a_{ij} = Dose-Response function coefficient (DRFC) for *i* given *j*, dA_j = change in ambient concentration of *j*, POP_i = population at risk of *i*. Due to variations in DRFC across medical research, CCCS can apply a range of coefficients - low, median, high. Then, multiply aggregate mortality changes (dH_{ij}) by value of statistical life (VSL). In Singapore, contingent valuation methods place VSL around \$850,000-\$2.05 million (ibid).

Applying these formulas to emission **reductions** from energy-efficient innovations arising from mergers/agreements clearly quantifies environmental benefits as **dynamic efficiencies**. These are, like demand-side efficiencies, market-specific. This overcomes internal difficulties by increasing certainty of the benefits arising from innovations.

Moreover, the net present value (NPV) of future cost savings for energy-efficient goods can be calculated from its energy consumption reductions, energy price projections, financial and social discount rates (Williams, 1995). While these are neither demand-side/dynamic efficiencies, aforementioned savings directly increase both short-term and long-term **consumer welfare**.

2.5 COSTS OF ANTI-COMPETITIVENESS

Within markets with sustainable goods, agreements are likely the predominant form of collaboration between businesses in Singapore.

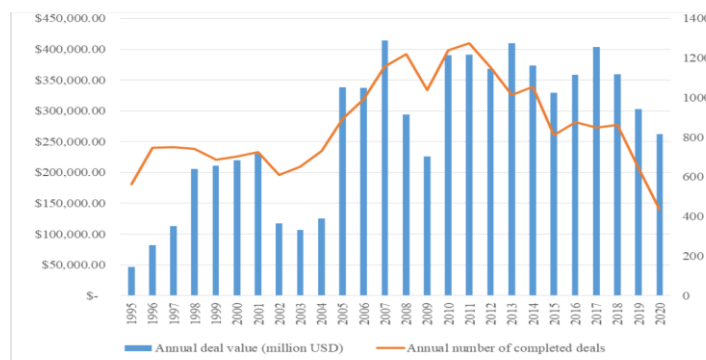


Fig 1. M&A Deal Volumes and Values (Andriuškevičius, Štreimikienė 2021)

Fig 1. illustrates the falling volume of M&A deals in the energy sector, suggesting that anti-competitive behaviour would involve agreements and standards set between firms, rather than mergers.

Currently, CCCS focuses on 4 types of anti-competitive agreement: price-fixing, market-sharing, bid-rigging, production control. However, such agreements are unlikely regarding sustainability efforts. Agreements such as technical standardisation (importers implementing energy-efficiency thresholds for products) and research & development (R&D) collaborations are more likely given Singapore's import-driven consumption and emphasis on sustainability innovation by Small-Medium-Enterprises (Singapore Green Plan, 2022).

Given the nature of these agreements, CCCS' criteria to approximate their costs on competitiveness are: (a) combined market share below 25%, (b) whether standards

imposed are fair, (c) the availability of alternatives in the market (i.e. market concentration).

For agreements to achieve substantial sustainability gains, the combined market share of firms partaking in agreements will likely exceed 25%. Rose's "Comedy of the Commons" (1986) exemplifies this, demonstrating that "increasing returns to scale" are reaped as more firms participate in agreements. Therefore, criteria (b) and (c) are more apt for sustainability agreements than criterion (a).

Hence, we outline methods of applying criteria (b) and (c) to objectively assess costs of anti-competitive agreements.

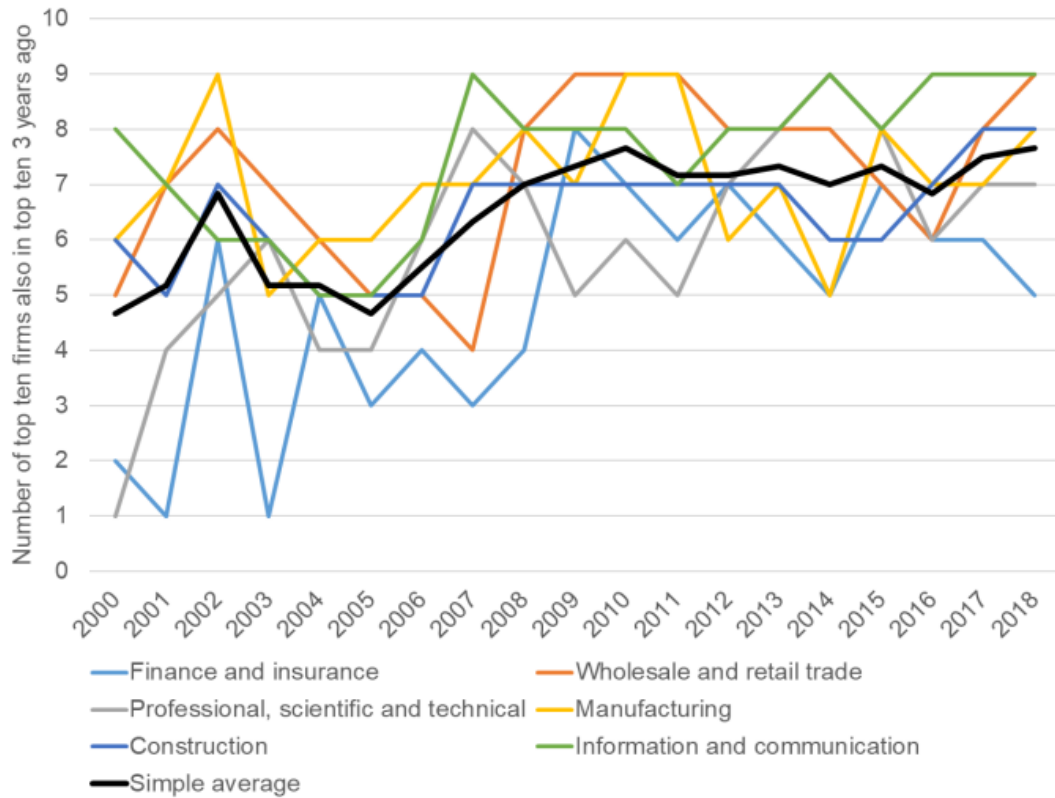
2.6 QUANTIFYING ECONOMIC COSTS

We propose 3 types of market indicators - leading, coincident, and lagging. This plurality concretises the evaluation of aforementioned criteria (b) and (c).

Leading indicators include R&D-expenditure-to-sales and advertisement-to-sales ratios which approximate the strength of barriers to entry (BTEs): higher ratios indicate higher BTEs. This facilitates objective applications of criterion (b), quantitatively determining if imposed sustainability standards lead to excessively high BTEs.

Meanwhile, coincident indicators like the Panzar-Rosse model (H-statistic) capture transmissions of input prices to revenue via summing revenue elasticities with respect to input prices, implicitly measuring competition levels (OECD, 2021). H-statistic values are ≤ 0 , between 0 and 1, and 1 for highly concentrated, moderately concentrated and perfectly competitive markets respectively. This concretises applications of criterion (c), enabling CCCS to pinpoint critical markets lacking viable alternatives.

Rank persistency in higher revenue sectors



Dynamic structural indicators like rank stability were employed by the UK Competition Authority to monitor domestic competition levels and availability of alternatives (ibid). For instance, the “information and communication” industry (green) exhibits greater rank stability than the “finance and insurance” industry (blue). Utilising criterion (c), agreements in the former industry are likely costlier than those in the latter.

Lastly, lagging indicators quantify the “appreciable adverse effect on competition” of agreements formed (CCCS 2021). Lerner’s index, $(Price - Marginal Costs) / Price$, examines the extent of mark-ups. Marginal costs are approximated by De Loecker and Warzynski’s (2012) approach, calculating ratios of firms’ output elasticity with respect to

input quantity (derived from firms' estimated Cobb-Douglas production functions) and input costs (% of revenue).

This accounts specifically for sustainability agreements, which inevitably raise prices given increased costs. Therefore, analysing mark-ups enables objective assessments of the validity of higher prices arising from standards. Agreements leading to excessive mark-ups can be identified: higher ratios indicate unnecessary mark-ups and consumer welfare losses, quantifying costs of anti-competitiveness.

3.0 ASYMMETRIC INFORMATION

Protection from misleading claims made by producers is critical to consumer welfare in markets tending towards sustainability, where companies “greenwash” their products through false or unverifiable claims. For example, Quorn foods used unverifiable claims about reduced carbon footprints to mislead consumers (Southey, 2020). In fact, 98% of green-labelled products are greenwashed (packagingdigest.com, 2014).

Akerlof's (1970) “Market for Lemons” demonstrates how overstating a product's benefits leads to consumers discounting willingness to pay, resulting in missing markets. As consumers grow weary of greenwashing, neither producer or consumer surplus would be generated due to missing markets. Due to potential losses in total welfare, CCCS should aim to protect consumers from “greenwashing”.

3.1 CCCS' CONSUMER PROTECTION AND FAIR TRADING AGREEMENT (CPFTA)

CCCS's CPFTA outlines 2 ways whereby asymmetric information reduces consumer welfare: misrepresenting a good's “standard, quality...method of manufacture”;

and misrepresenting an “advantage” of the good (CCCS, 2003). The CCCS framework “empowers” consumers; the onus is on consumers to complain to relevant authorities. However, the CPFTA places an over-emphasis on Price Transparency, neglecting the extent of non-price greenwashing.

Regarding price transparency, CCCS outlines obligations for suppliers, specifying that for price benefits and discounts, the time period applicability must be clearly expressed (CCCS 2020). In contrast, the Second Schedule of the CPFTA (ibid.) lacks specific guidelines for substantiating sustainability claims. The CCCS can only file injunctions regarding misleading claims based on a case-by-case complaint to STB or CASE (CCCS 2022), relying on consumers to report non-price unfair trade practices.

With respect to sustainability, consumer proactivity may be diminished given the extreme prevalence of greenwashing (98% of products) (Cleanlink, n.d.), rendering differentiation difficult. Distinctively, price-based unfair practices tangibly impact consumers. For instance, drip pricing incurs unexpected costs, making it easy for consumers to identify such unfair practices.

In contrast, misleading representations of energy efficiencies go unnoticed by consumers. The CCCS’ framework of proactivity must be complemented by an outline of actions for producers, increasing the ability of consumers to identify unfair non-price trade practices.

3.2 SIGNALLING MECHANISMS

To protect consumers from greenwashing, we propose adopting common data assessment methods for firms to substantiate sustainability claims, rendering data

complete (covering relevant environmental factors like emissions, electricity etc.) and consistent (standardising tools used to substantiate sustainability claims).

The European Commission (Directorate-General for Environment, 2021) employed these methods to objectively assess products' life-cycle environmental benefits, guarding against misrepresentations. This provides unified analytical tools to assess environmental benefits and verify data quality.

CCCS can also partner Enterprise Singapore's Sustainability Programme, integrating aforementioned analytical tools into their "Sustainability Standards Adoption", providing transparent information on firms' sustainability capabilities. This extends CCCS' collaborations with other agencies (CCCS, 2005) beyond minimising "regulatory burdens" to constructing specific standards to substantiate sustainability claims.

By providing transparent, objective, and accessible data, consumers are protected against misleading information, safeguarding consumer welfare. This also enables firms to clearly signal their products' sustainability advantages, preserving total welfare.

4.0 CASE STUDY OF CONSEIL EUROPÉEN DE LA CONSTRUCTION D'APPAREILS DOMESTIQUES (CECED)

To illustrate our proposed cost-benefit framework and examine whether businesses can collaborate yet compete fairly, we analyse CECED's agreement on importing/producing washing machines above energy-efficiency rating D. While firms in the agreement had a market share of 90%, the European Commission permitted this agreement based on (1) efficiencies for consumers and society (2) collective sustainability benefits, which outweighed potential harms (OECD, 2021).

While (1) is accounted for under CCCS' current framework, (2) would likely be discounted as generalisable and indirect benefits, without specific timeframes. Under our framework, these sustainability benefits constitute direct, market-specific **demand-side efficiencies** (quantified via HPM) as environmentally conscious consumers gain welfare purchasing energy-efficient washing machines. Such benefits also constitute **dynamic efficiencies** (quantified via non-market-based valuations) as standards encourage firms to enhance lower-end washing machines to become compliant.

To assess "potential harms", our framework concretises objective applications of CCCS' criteria for anti-competitiveness. Leading indicators would likely show that BTEs imposed are low, since the agreement mandated an accessible energy-efficiency threshold (rating D). However, coincident indicators likely show a moderately competitive market (Mordor Intelligence, n.d.). The agreement also violates CCCS' criterion on market share (<25%) due to the high combined market share of participants (90%).

Yet, this successfully achieves a balance between collaboration and competition. Accessible standards allow alternatives to emerge, while high combined market shares indicate most producers operate under similar standards. This implies that exclusion of producers is unlikely, facilitating collaboration through the established agreement while competing with improved products. Moreover, lagging indicators screen for direct abuses of dominance like unfairly high mark-ups, evaluating the validity of higher prices post-agreement to ensure balance and adequate competition.

While this case study primarily links to the Singapore Green Plan's (2022) goal of "sustainable town and districts", it also extends to other goals, like collaborative R&D.

This demonstrates how our framework applies to future agreements, especially standards arising from government-stipulated energy-efficiency ratings prevalent in Singapore.

5.0 CONCLUSION

With the emergence of green and renewable energy industries, CCCS should facilitate collaborations which achieve sustainability gains. In line with the Singapore Green Plan, CCPL must be open in considering the sustainability benefits of business collaboration.

However, maintaining healthy competition and protecting consumers should take priority over sustainability gains. This is not merely based on total welfare. Reduced competition and “greenwashing” would disincentivise firms from innovating and setting energy-efficient standards in the long run, hurting Singapore’s drive toward sustainability.

Hence, CCPL must outline objective metrics for evaluating environmental benefits and anti-competitiveness’ costs, guiding the economy towards the simultaneous attainment of consumer, producer and environmental welfare. CCCS’ legislation should hence aim to bridge the idealism of sustainability and the practicality of competition.

(2465 words)

BIBLIOGRAPHY

- 66% of consumers willing to pay more for sustainable goods, Nielsen Report reveals.* Ashton Manufacturing. (n.d.). Retrieved May 25, 2022, from <https://ashtonmanufacturing.com.au/66-of-consumers-willing-to-pay-more-for-sustainable-goods-nielsen-report-reveals/>
- Akerlof, G. A. (1970). The Market for “Lemons”: Quality Uncertainty and the Market Mechanism. *The Quarterly Journal of Economics*, 84(3), 488–500. <https://doi.org/10.2307/1879431>
- Andriuškevičius, K., & Štreimikienė, D. (2021). Developments and trends of mergers and acquisitions in the Energy Industry. *Energies*, 14(8), 2158. <https://doi.org/10.3390/en14082158>
- Business collaboration guidance note.* Competition and Consumer Commission of Singapore. (2022, April 4). Retrieved May 25, 2022, from <https://www.cccs.gov.sg/legislation/competition-act/business-collaboration-guidance-note>
- CCCS Guidance Note for Airline Alliance Agreements.* Competition and Consumer Commission Singapore. (2018, September 5). Retrieved May 24, 2022, from <https://www.cccs.gov.sg/-/media/custom/ccs/files/legislation/ccs-guidelines/revised-guidelines-jan-2022/2-cccs-guidelines-on-the-section-34-prohibition.pdf?la=en&hash=048FAACD722012D1310229F289808DEF4795D12B>
- Chen, E., Clements, S., & Shiau, D. (2020, September 15). *The great convergence between sustainability and competition law: Recent developments.* Allen & Gledhill. Retrieved May 25, 2022, from <https://www.allenandgledhill.com/sg/publication/articles/16777/the-great-convergence-between-sustainability-and-competition-law-recent-developments>
- Commitments & Injunctions.* Competition and Consumer Commission of Singapore. (2022, May 24). Retrieved May 25, 2022, from <https://www.cccs.gov.sg/cases-and-commitments/commitments-injunctions>
- Competition Commission Publishes Six Revised Guidelines. (2005, November 23). *Competition and Consumer Commission of Singapore.* Retrieved from <https://www.cccs.gov.sg/media-and-consultation/newsroom/media-releases/competition-commission-publishes-six-revised-guidelines>.
- Consumer Protection (Fair Trading) Act 2003 (2021 Rev Ed).
- Dall-Orsoletta, A., Romero, F., & Ferreira, P. (2022). Open and collaborative innovation for the Energy Transition: An Exploratory study. *Technology in Society*, 69, 101955. <https://doi.org/10.1016/j.techsoc.2022.101955>

Directorate-General for Environment. (2021, December 16). Recommendation on the use of Environmental Footprint methods. European Commission. Retrieved May 2, 2022, from https://ec.europa.eu/environment/publications/recommendation-use-environmental-footprint-methods_en

Ebeling, J., & Yasué, M. (2009). The effectiveness of market-based conservation in the tropics: Forest certification in Ecuador and Bolivia. *Journal of Environmental Management*, 90(2), 1145–1153. <https://doi.org/10.1016/j.jenvman.2008.05.003>

Europe Home Appliances Market: 2022 - 27: Industry share, size, growth - mordor intelligence. Europe Home Appliances Market | 2022 - 27 | Industry Share, Size, Growth - Mordor Intelligence. (n.d.). Retrieved May 27, 2022, from <https://www.mordorintelligence.com/industry-reports/europe-home-appliances-market-industry>

Enterprise development grant - market access: Standards adoption: Enterprise Singapore. Enterprise Development Grant - Market Access | Standards Adoption | Enterprise Singapore. (n.d.). Retrieved May 27, 2022, from <https://www.enterprisesg.gov.sg/financial-assistance/grants/for-local-companies/enterprise-development-grant/market-access/standards-adoption>

Greenwashing affects 98-percent of products, says TerraChoice. packagingdigest.com. (2014, January 30). Retrieved May 25, 2022, from <https://www.packagingdigest.com/smart-packaging/greenwashing-affects-98-percent-products-says-terrachoice>

Guidelines on Section 34 Prohibition. Competition and Consumer Commission of Singapore. (2016). Retrieved May 2, 2022, from <https://www.cccs.gov.sg/-/media/custom/ccs/files/legislation/legislation-at-a-glance/cccs-guidelines/cccs-guidelines-on-the-section-34-prohibitions-2016.pdf?la=en&hash=E990CDA262BCD1BBBD0C9F0E4129BC9B11F8022>

Guidelines on price transparency. Competition and Consumer Commission of Singapore. (2020, November 1). Retrieved May 25, 2022, from <https://www.cccs.gov.sg/legislation/consumer-protection-fair-trading-act/price-transparency-guidelines>

Government of Singapore. *Singapore Green Plan 2030*. (2022, 8 May). Retrieved May 27, 2022, from <https://www.greenplan.gov.sg/>

OECD (2021). *Methodologies to measure market competition*. OECD Competition Committee Issues Paper. Retrieved 20 May 2022, from <https://oe.cd/mmmc>

OECD Secretariat. (2021, November 19). *Environmental considerations in competition enforcement*. Retrieved May 25, 2022, from <https://www.oecd.org/daf/competition/environmental-considerations-in-competition-enforcement.htm>

- Quah, E., & Tan, T. S. (2019, October 18). *Valuing the environment*. ADBI Working Paper 1012. Asian Development Bank. Retrieved May 25, 2022, from <https://www.adb.org/publications/valuing-environment>
- Rose, C. (1986). *The Comedy of the Commons: Custom, commerce, and inherently public property*. *The University of Chicago Law Review*, 53(3), 711. <https://doi.org/10.2307/1599583>
- Simpkins, K. (2021, December 21). *Climate change news coverage reached all-time high, language to describe it shifting*. Phys.org. Retrieved May 25, 2022, from <https://phys.org/news/2021-12-climate-news-coverage-all-time-high.html>
- Southey, F. (2020, September 30). *Quorn advert banned over carbon footprint claim: 'it was never our intention to mislead consumers'*. foodnavigator.com. Retrieved May 25, 2022, from <https://www.foodnavigator.com/Article/2020/09/30/Quorn-advert-banned-over-carbon-footprint-claim-It-was-never-our-intention-to-mislead-consumers>
- Study: Greenwashing affects 98% of cleaning products*. CleanLink. (n.d.). Retrieved May 25, 2022, from <https://www.cleanlink.com/news/article/Study-Greenwashing-Affects-98-of-Cleaning-Products--10955>
- Tick rating*. National Environment Agency. (n.d.). Retrieved May 27, 2022, from <https://www.nea.gov.sg/our-services/climate-change-energy-efficiency/energy-efficiency/household-sector/tick-rating>