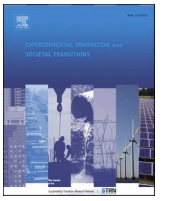
Environmental Innovation and Societal Transitions 56 (2025) 101000

Contents lists available at ScienceDirect

Environmental Innovation and Societal Transitions

journal homepage: www.elsevier.com/locate/eist



Advertising restrictions and sustainability transitions: does banning advertising of harmful products induce innovation in benign alternatives?

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ARTICLE INFO

Keywords:
advertising
sustainability transitions
regulation
innovation

ABSTRACT

Environmental activists increasingly seek to ban advertising of polluting products. Advertising bans (of tobacco and alcohol for example) have been widely used in support of public health objectives, but such bans have received little attention from environmental policy or sustainability transition scholars.

Sustainability transition studies have noted that advertising contributes to the durability of socio-technical regimes, which suggests advert bans can be seen as attempts at regime destabilisation. In this paper, we focus attention on the potential for advertising bans to influence product innovation incentives, and thus establish niches for sustainable innovations. We use a case study of the Norwegian beer market, using low/zero-alcohol beer as an analogy for sustainable innovation. We show that restricting advertising of a harmful product can stimulate innovation in a benign alternative. We conclude that carefully designed advertising bans could be a useful part of the policy toolbox for stimulating sustainable innovation.

1. Introduction

As the urgency of the climate change and biodiversity crises become more apparent, policy commentators are increasingly identifying new regulatory and policy ideas for influencing or accelerating sustainability transitions. One such idea is to restrict advertising of polluting goods and services.

Recent years have seen a proliferation of activist campaigns that seek to restrict advertising of goods and services associated with carbon emissions. Notable examples include banfossilfuelads.org, worldwithoutfossilads.org, and badverts.org. Some activists have focused on high carbon goods and services (such as Sports Utility Vehicles [SUVs] and flights) while others have argued that fossil fuel extraction companies should be unable to advertise. In response, governments have started to introduce restrictions, including a ban on adverts for some fossil fuels in France (Stewart, 2022), a proposed ban in Ireland (Oireachtas, 2024) and similar bans in a number of cities, including proposed or implemented bans in Sydney, Stockholm, Sheffield and Amsterdam (Sabin, 2022)). Beyond fossil fuels, Haarlem in the Netherlands banned advertising of meat (because of the high carbon footprint), while the French Assemblée Nationale recently debated bills banning advertising of fast fashion on environmental grounds (Assemblée Nationale, 2024), and banning advertising of energy-inefficient household products and other polluting goods (Assemblée Nationale, 2020).

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https://doi.org/10.1016/j.eist.2025.101000
Received 2 April 2024; Received in revised form 21 February 2025; Accepted 15 April 2025
Available online 25 April 2025
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Despite growing interest in restricting adverts for polluting companies and goods, there is a substantial research gap on the role of advert regulation as an environmental policy tool. Within research on socio-technical transitions towards more sustainable systems, advertising has largely been addressed either as a tool for government (i.e. information campaigns to consumers; (Bennett et al., 2016)), or it has been considered as part of the institutional 'regime' – i.e. part of the discursive context that helps to reinforce norms around particular consumption practices (Elzen et al., 2004). The potential for restrictions on advertising to play a significant role as a policy instrument aimed at inducing innovation and thus stimulating or accelerating sustainability transitions has been overlooked.

Outside of the environmental policy domain, it is common for policymakers to restrict advertising of goods deemed to be harmful, on the basis that such bans will reduce consumption. Advertising bans have been implemented in sectors where policymakers are concerned about the social or health impacts of consumption. The most prominent are tobacco and alcohol, but more recently there have been advertising bans for sugary drinks (Taillie et al., 2020), foods high in sugar, salt and fat (Dubois et al., 2018), and high sugar foods and drinks marketed at children (Potvin et al., 2012). Most of these have focused on banning advertising of specific products, while in some areas (particularly tobacco, and also alcohol in some countries) there are also bans on brand-level advertising (i.e. adverts promoting the brand without reference to the product are not allowed).

The experiences from advertising bans motivated by public health concerns can provide lessons for advertising restrictions in support of environmental policy goals. Most of the literature from these other policy domains has explored whether banning advertising has a direct consumption effect. Disentangling the causal effects of advert bans on consumption has proved challenging, not least because advert bans are often introduced as part of a wider policy package of measures used to discourage consumption (Petticrew et al., 2017). But while the evidence is contested the literature does provide cautious support for the idea that banning or restricting advertising can lead to reduced consumption of goods judged to be harmful (Petticrew et al., 2017; Quentin et al., 2007; Rossow, 2021).

In this paper, we focus on a previously overlooked issue: the potential for advertising bans to foster "niches" for the development of alternative products that are less harmful than those targeted by the advert ban. Innovation in environmentally-sustainable consumer products plays an important role in sustainability transition processes, and this paper explores whether and how advertising bans can induce such innovation. We address the following research questions:

1. Can banning adverts of harmful products induce innovation in alternative benign products (i.e. those that have lower environmental footprint or that are less harmful to health)?
2. Can banning adverts of harmful products lead to higher rates of advertising of alternative benign products?

We argue that the experiences of banning adverts for products such as alcohol and tobacco are relevant for understanding the potential impacts of product advert bans motivated by environmental concerns. We explore these research questions in the context of a case study on alcoholic drinks, and discuss what lessons can be drawn for sustainability transitions policy.

2. Theory and background: advertising bans and socio-technical transitions

2.1. Advert bans as regime destabilisation

Sustainability transitions scholars have not previously written about advert bans, and indeed have not written extensively about advertising. Private sector spending on advertising is broadly similar in magnitude to private spending on R&D (advertising spending is around 1% of global GDP (WARC Media, 2023), compared to around 2.5% of GDP for R&D (World Bank, 2025)). While R&D is more directly associated with the innovation processes that play such a prominent role in transitions, advertising plays an important role in the way that businesses seek to shape consumer perceptions and habits. Seen in this light, the relative neglect of advertising in transitions literature is perhaps surprising.

Where transitions scholars have touched on advertising in their work, they have largely focused on the role of advertising in reproducing existing socio-technical regimes (Elzen et al., 2004). Smink et al. (2015) describe how incumbents use advertising to shape the institutional environment, reinforcing norms and framing incumbent products to foster legitimacy. Car adverts, for example, reinforce a frame in which car-based mobility relates to 'freedom' and 'independence' (Sovacool, 2017); while advertising was used to frame coal fires as 'cosy' when coal as a domestic fuel was threatened by gas central heating (Turnheim & Geels, 2013)). Advertising reinforces the cognitive and normative rules that shape the behaviour of actors.

Activists, though not using the language of socio-technical regimes, have also been concerned about the potential for advertising to reinforce cultural narratives that support established socio-technical arrangements. A particular area of concern for activists has focused on 'greenwashing', i.e. attempts by companies to convince consumers that their products have a better environmental performance than they do in reality (Delmas & Burbano, 2011). Greenwashing is a strategy deployed by incumbent regime actors in order to reduce consumer or policy pressure for improved environmental performance. Governments have responded to greenwashing concerns by tightening rules on environmental claims in advertising (e.g. (ASA, 2023)), while activists have argued that an appropriate response to pervasive greenwashing is complete bans on advertising for companies and products that are environmentally harmful, such as fossil fuels (e.g. badverts.org; banfossilfuelads.org).

Advertising bans can thus be seen as examples of policies aimed at "destabilising the regime" (Turnheim & Geels, 2013) – by undermining the capacity of businesses either to directly influence consumer behaviour and thus re-produce consumption patterns (Boons et al., 2021), or to shape the discursive environment and bolster the social meaning of their brands and products.

2.2. The potential role of advertising bans in transitions: from destabilising the regime to nurturing niches

While acknowledging the potential of advert bans to destabilise incumbent socio-technical regimes, in this paper we focus on a different possibility that has not been previously discussed in the literature. We explore the possibility that advertising bans can contribute to the establishment of niches that foster innovation in benign alternatives to traditional products. By "benign alternatives", we refer to equivalent products that have a lower environmental footprint, or that are healthier.

In competitive markets, companies see advertising as a key strategic activity for maintaining their brand identity and driving sales. Companies that have had their freedom to advertise limited by regulation can be expected to seek ways to circumvent those regulations, including through innovation.

We hypothesise that, where a benign alternative to a harmful product is possible, banning advertising of the harmful product will create an incentive for product innovation in the benign alternative. The proposed causal mechanism is intuitive: firms advertise in order to maintain their brand prominence and to drive sales of core products. If they are prevented by an advert ban from using their existing (harmful) product portfolio to do so, they will innovate to create similar but benign products that enable them to continue to advertise, and thus maintain brand prominence and influence sales of both the benign alternative and the original harmful product. In short, we expect that when advertising of specific products is banned, this can create incentives that shape a socio-technical niche in which alternative, less harmful products can compete.

We also expect differences in innovation incentives created by different types of advert bans. While some activists have focused on banning advertising of polluting products (which we call a 'product advert ban'), others have demanded that companies associated with such products (such as fossil fuel extraction companies) are prevented from advertising anything (a 'brand advert ban').

Unlike product advert bans, brand advert bans appear unlikely to influence product innovation choices by incumbents. If it is no longer possible to use benign alternatives to advertise the incumbent's brand, the advert ban creates no clear incentive for incumbents to develop benign alternatives.

3. Method: a case study on the Norwegian market for low-alcohol beer

3.1. Empirical setting: bans on alcohol advertising

There are, so far, rather few examples of product advert bans that have been motived by environmental concerns. To understand whether such bans can have effects on product innovation, we examine evidence from a different context: bans on alcohol advertising. In both environmentally-motivated advert bans and alcohol advert bans, the policy is motivated by the goal of shifting consumer behaviour away from the consumption of goods with socially undesirable consequences, whether because of public health effects or environmental harm.

We argue that our hypothesised causal mechanisms are likely to be 'portable' from the context of alcohol advertising to other consumer goods, under certain conditions (consumer products for which advertising is widespread, and where it is both economically and technically possible for companies to develop benign alternatives). Our argument is that the marketing and innovation responses of breweries to bans on alcoholic drink adverts can provide us with insight into causal mechanisms that may be expected to operate when adverts for polluting goods are restricted. The idea that causal mechanisms studied in one context can be generalised others is well established (Falleti & Lynch, 2009; Yin, 2017). As Bengtsson and Hertting argue "identifying a certain mechanism in one context generates reasonable expectations of finding a similar mechanism in other similar settings" ((Bengtsson & Hertting, 2014) p. 718). We return to the limits of this argument in the discussion.

3.2. Case study approach

We adopt a case study approach to test explore our hypotheses that advert bans on mainstream harmful products can influence product innovation decisions for niche benign alternatives. Several countries have introduced bans on alcohol advertising. Examples of relatively strict and long-standing alcohol advertising bans include those of Norway, Sweden and France (Österberg & Karlsson, 2002). In principle, such bans could be used as the basis for quantitative analysis of the causal effect of advert bans on the subsequent levels of innovation in low or non-alcoholic beer. However, such an approach is impractical because of weak data on product launches of low- and non-alcoholic beers in these countries, and the limited availability of data on advertising.

Instead, we adopt a case study, exploring whether advertising restrictions do indeed influence product innovation choices by gathering data directly from actors involved in making those choices. The findings from a single case study are not generalisable in a statistical sense. Instead, we use a process tracing approach to identify whether a potentially generalisable causal mechanism is present in the case (Beach & Pedersen, 2019). The hypothesised causal mechanism—the incentives created by advertising restrictions—is an analytically generalisable mechanism (Flyvbjerg, 2006; Yin, 2017)) that could be investigated in other cases.

3.3. Case selection

We reviewed advertising ban policies to identify a suitable case study. We focused on beer, because this is a product that has both been widely subjected to advertising product bans, and because it is possible to produce a 'benign' alternative product (low/no alcohol beer) that lacks the harmful attributes of the mainstream product. We examined countries that have alcohol advertising restrictions, and identified Norway as the most promising case.

Several features make the Norwegian beer market a good case study for the effects of product advert bans on innovation. Norway is an 'extreme' case (the advertising restrictions are uniquely stringent), and extreme cases are particularly valuable in case study research (Flyvbjerg, 2006). The comprehensive nature of advert restrictions in Norway makes it easier to identify how those restrictions have influenced corporate strategies. We examined possible alternative countries, such as France and Sweden, and found that these cases have advertising restrictions with weaker coverage (Österberg & Karlsson, 2002; Purves et al., 2022). For example, in many countries advertising bans are restricted only to certain forms of media (e.g. no television advertising), which means that companies can respond by advertising in different venues, undermining the expected innovation incentives associated with banning adverts.

Norway's ban on advertising alcoholic beverages came into force in 1975. More recent changes to the scope of the ban between 1997 and 2004 (Government of Norway, 2004) enable us to observe how a change in advert ban design influenced product innovation choices both before and after the change. There is an important limitation of this case choice. As will become clear, the case does not provide clear insight into the impacts of the initial *introduction* of a product advert ban, because of the circumstances of Norway's beer market when the first advert ban was introduced.

In our case study, we ask the following questions:

1) How has Norway's advert ban influenced product innovation decisions among Norwegian brewers?
2) How has Norway's ban on advertising alcoholic drinks influenced incentives for advertising low- or zero-alcohol drinks?

3.4. Data collection and analysis

The case study was developed using semi-structured interviews (n = 8) with people that had direct experience of brewery decision-making around innovation and marketing. Two interviews were conducted via extended email exchanges rather than orally, with participants responding to emailed questions, and then providing clarification to follow up questions from the authors. Interviews took place between 2020 and 2023, with some delays associated with the covid pandemic. We identified participants by using LinkedIn to identify people that worked in marketing or innovation roles in breweries, and using snowball sampling to identify people that had worked at the marketing or innovation departments of key breweries during the past 20 years. We also contacted smaller breweries and the industry association directly. All the interviewees from breweries had been directly involved in making strategic decisions related to marketing and/or product innovation.

The beer market in Norway is dominated by Ringnes (which is owned by the Carlsberg Group) and as a result Ringnes plays a prominent role in the case. We also spoke to three other breweries that produce both alcoholic and non-alcoholic beers, including: Hansa Borg (owned by Royal Unibrew), Norway's second largest brewer and distributor of one of Norway's leading alcohol-free beers (Clausthaler); a mid-size brewery; and a micro-brewery.

Interviewees were asked how advertising bans had affected their product innovation choices, and their related advertising and marketing strategies. Following the interviews we followed up with participants to confirm key points and check our interpretation. We thus collected stated reasons for choices made in innovation and marketing, as well as examples of actions taken (in terms of both product development and marketing). We also asked what else had shaped innovation choices, and we recorded potential rival explanations for observed marketing and innovation outcomes (following good practice guidance for case studies, e.g. in (Bennett & Checkel, 2015; Yin, 2017)).

We compared potential explanations of observed innovation and marketing choices against published material (to triangulate and test the evidence from interviews). We reviewed relevant government policy documents and parliamentary debates, and news media coverage related to the advertising ban and brewery product innovation choices. These documentary sources help to verify key points made by interviewees, and those used are cited in the case description below. Documents were identified using targeted searches of parliamentary proceedings and government publications, and general web searches.

Data was analysed using three approaches, following strategies suggested by Yin (2017): i) developing a chronology of the brewing industry, highlighting key policy changes and innovation and marketing events that were mentioned by interviewees; ii) assessing the evidence for our hypothesised causal mechanisms in shaping reported and observed innovation and marketing choices, using the process tracing tests suggested by Mahoney (2012); iii) assessing the possible rival explanations for reported/observed innovation and marketing choices.

4. Regulation of advertising and product innovation: a case history of Norwegian alcohol-free beer

4.1. A brief history of the Norwegian brewing industry

Alcohol has been tightly controlled in Norway for more than a century (Horverak, 2012). Alcoholic drinks have been taxed according to alcohol content for many decades, with higher-alcohol beverages incurring a higher tax rate (Österberg & Karlsson, 2002). There are also restrictions on where beer can be purchased. Alcoholic drinks stronger than 4.7% ABV (Alcohol By Volume) have long been available for retail sale only through the state alcohol monopoly Vinmonopolet. Grocery stores must be licensed to sell beer between 2.7% ABV and 4.7% ABV, but there are no such restrictions on low-alcohol beer (<2.7% ABV) (Government of Norway, 2023).

From 1935-1987, the brewing industry was operated as a cartel administered by the brewers' association, with regional monopolies providing an agreed set of beer varieties. The rationale was to present a united front against the temperance movement, and to forestall nationalisation (Midling & Bazilchuk, 2018). The industry was, during this period, effectively prevented from experimenting with new

varieties by the cartel agreement. The cartel collapsed in 1987, enabling a new era of innovation in Norway's brewing industry.

4.2. The era of lettøl advertising: 1975-2000

The major brewers in Norway have produced low-alcohol beers (<2.7% ABV) or "lettøl" for many decades. Lettøl advertising was allowed under the laws that were in operation from 1975-1997. The breweries—particularly big players like Ringnes—heavily advertised their low-alcohol beers as a way of maintaining their brand image (confirmed by interviews; see also (Government of Norway, 2004). This advertising was, in the words of interviewees, *"all about driving sales of normal beer"*, since "*no-one made any money on the [low alcohol] products*". The brewers' ability to use lettøl advertising to drive sales of mainstream beer was described by one interviewee as a 'loophole' in the advertising restriction laws. Our participants universally confirmed that the ban on advertising mainstream (>2.7% ABV) beer resulted in higher advertising of low-alcohol beer than would have occurred in the absence of the ban.

In addition to the original lettøl recipe from the late 1940s, breweries also experimented with zero alcohol or low alcohol beers (Tidsskriftet Rusfri, 1992). In 1972, the first non-alcoholic beer (called "Zero") was launched by the cartel as a response to heavy lobbying from the temperance movement (Tidsskriftet Rusfri, 1992). After the cartel collapsed, Ringnes launched another alcohol-free beer, known as "Ringnes Alf". Neither the cartel standard "Zero" nor Ringnes' own "Alf" were considered successful. The first successful alcohol-free (<0.5% ABV) beer in Norway was in fact an import: the German "Clausthaler", imported by Hansa Borg brewery and launched in Norway in 1989.

In response to the launch of Clausthaler, Ringnes launched a new zero alcohol brand, Munkholm, in 1991. With the launch of Munkholm, Ringnes aimed to avoid contaminating the new beer by association with its previous alcohol-free failures (Ringnes Alf). The marketing campaign that accompanied the launch of Munkholm—and which is still widely remembered in Norway—emphasised the 'Norwegian-ness' of the brand, in contrast to the imported Clausthaler.

4.3. The impact of a shift to a brand advert ban: 2000-2008

In 1997, the Alcohol Act was amended to strengthen the alcohol restrictions in two ways (Österberg and Karlsson 2002). First, brewers could no longer advertise any alcoholic drinks (the limit is now 0.7% alcohol, which meets the minimum 'alcohol free' definition). Second, the changes aimed to close the 'loophole' – to stop the implicit advertising of alcoholic drinks through adverts for near-identical non-alcoholic drinks (Government of Norway, 2004). For example, Ringnes could no longer advertise a Ringnes beer, even if it was zero alcohol. As the government puts it: "*This is designed to cover advertising for non-alcoholic and low-alcohol products, which in reality also serves as advertising for alcoholic beverages*" (Helsedirektoratet, 2016). However, it was still possible for Ringnes to advertise Munkholm, and for Hansa to advertise Clausthaler, since these alcohol-free beers had a different brand identity from their parent brewers. This was a shift from a 'product advert ban' to a 'brand advert ban'.

By the time the rules changed, lettøl consumption was already in decline, at the expense of alcohol-free beer (Figure 1). This was likely driven in part by increasingly stringent drink-driving laws, as well as the emergence of Clausthaler and Munkholm as palatable alternatives to lettøl. The shift in advertising laws resulted in the elimination of advertising for lettøl, and the accelerated decline in lettøl consumption from the late 1990s is also consistent with the hypothesis that advertising does have a causal influence on consumption (though by itself it is not strong evidence of this causal effect).

The trend observed in Figure 1 may also reflect one of the responses of breweries, which was to drastically reduce the production of

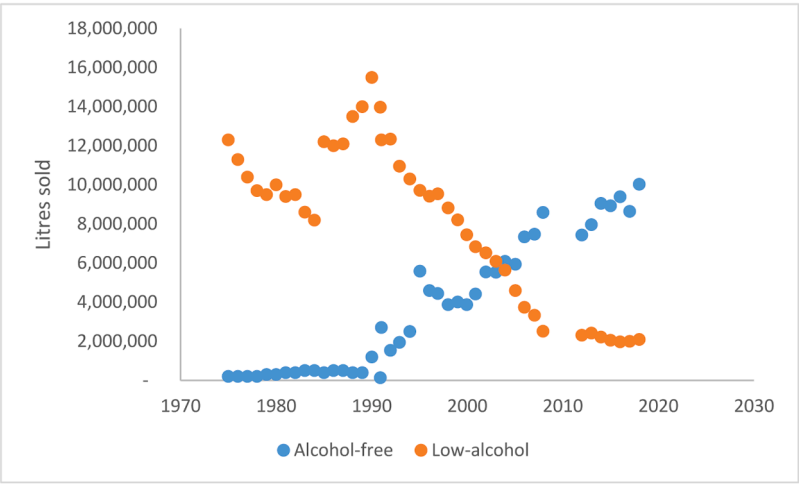

Figure 1. Sales of alcohol free (<0.7%) and low alcohol (0.7-2.7%) beer in Norway. Source: Data from 2012 onwards was taken from (Bryggeri og Drikkevareforeningen, no date); Data from 1990-2008 from (Government of Norway, 2010); Data from 1975-1990 are from (Tidsskriftet RUSFRI, 1992).

lettøl (low-alcohol), because "*[when] we were no longer allowed to promote products branded with the same logo as we have on products above 2.5 % abv… the incentive to sell 2.5 abv beer fell apart*". Lettøl was not very profitable and had been maintained by many breweries as a means of advertising to drive sales of mainstream beer. We spoke with one brewery that had previously had a lettøl and no longer offered one – though they said that they would consider re-introducing a lettøl if the rules returned to the pre-1997 system in which lettøl advertising could be used to drive sales of mainstream beer.

Our expectation was that the shift from a *product advert ban* to a *brand advert ban* would reduce the incentives for product innovation in the benign product category. Once the breweries are no longer able to use a low or zero alcohol product as a means of advertising their brand, they no longer had a clear incentive to use alcohol-free product launches and associated advertising as a way to promote the wider brand and drive sales of 'normal' beer. As will become clear however, the unexpected response to the brand advert ban of one major brewery—Ringnes—highlights clearly the link between advertising restrictions and product innovation incentives.

The rule change shook up advertising practice – it was no longer possible for large breweries like Ringnes to advertise their range of beers by advertising the lettøl versions. The picture prior to the brand advert ban was one in which breweries felt able to maintain brand presence through advertising of their lettøl. With the loss of that opportunity, there was much discussion in the marketing departments of leading brewers as to how to promote their products within the tight confines of the new advertising laws.

Ringnes responded with a new approach to advertising new product launches. In 2006, Ringnes conducted a simultaneous launch of four new Munkholm alcohol-free beers and four very similar new Ringnes beers (Dagligvarehandelen, 2006). Each Munkholm beer had a Ringnes alcoholic equivalent, with a very similar packaging design (see Figure 2 for an example). There were four in the series: an Asian-style dry beer, a "Cuban-style" beer with added mint and lime, a German wheat beer, and an amber ale styled as 'arctic'. The beers were promoted as reflecting beer styles from around the world, and the series was called "around the world" for the Ringnes beers and "Horizon" for those branded as Munkholm.

There was little doubt to observers that, despite the different brand names, these beers were intended to be alcoholic and non-alcoholic versions of the same beer. Newspapers reported the launch in exactly those terms: "*Ringnes has come up with a new series of beers from around the world. And you get the beers both with and without alcohol*" (Bruland, 2006).

This was a clear case in which the advert ban drove product innovation choices within the Munkholm brand. Interviewees with direct involvement in this episode confirmed that at least part of the rationale for creating the Munkholm products was to use Munkholm advertising to drive sales of the Ringnes alcoholic equivalents. While some interviewees also told us that this was not the *only* reason for developing and advertising the Munkholm beers, all interviewees agreed that the opportunity to advertise the Munkholm beers played a central role in this joint product development strategy.

The move was controversial within the sector – one person described it to us as a "dirty trick" that sought to side-step the new advertising restrictions. Some felt that the move damaged the credibility of the sector as being socially responsible and feared it could elicit a further tightening of the rules. Nevertheless, the strategy continued with two further co-ordinated launches later for Christmas 2006 and in early 2007 ((Aperitif, 2008); see Figure 3).

A similar strategy was not possible for Hansa, the brewery that produced and sold Clausthaler, the other major alcohol-free brand in

Figure 2. Munkholm's alcohol-free dry Asian beer (left) and Ringnes' alcoholic dry Asian beer (right, released simultaneously in 2006. Pictures reproduced with permission from Ratebeer.com.

Norway. Hansa produced Clausthaler under licence from the brand owner (the Radberger group), which prevented Hansa from product innovation within the brand.

Applying process-tracing logic (Mahoney, 2012), the case allows us to clearly identify the causal mechanism at work: banning advertising of the mainstream 'harmful' product influences the incentives of producers to innovate new versions of the niche 'benign' product, to enable advertising that can drive sales of the 'harmful' product. The case thus supports both of our hypotheses: i.e. advertising bans can influence product innovation decisions, and they can also result in higher levels of advertising for the 'benign' product than would otherwise have occurred.

4.4. Beer advertising and product innovation since 2008

Later, the joint product launches–particularly the Horizon/Round-the-World series—were judged to have been a failure. Neither the alcohol-free versions, nor their alcoholic cousins, were a commercial success. One interviewee with close knowledge of the case felt that the market "*wasn't ready*" for the kind of style diversity that the campaign relied on, since this was some years before the craft beer revolution. As a result of the poor commercial response, and the concern that joint product launches risked incurring further regulatory response, Ringnes moved away from this approach.

However, even under such a tightly restricted advertising environment, there is some evidence that advertising of no-alcohol beer continues to be higher than it would be in the absence of a ban. Those close to the marketing activities of major breweries told us that there is still a feeling that there is some 'spillover' from advertising alcohol-free beer into beer more generally as a category. As the market leader, it thus makes sense for Ringnes to market Munkholm more heavily than it might do in the absence of ban, in order to boost to sales of beer overall. This logic partly justifies advertising spending within the Munkholm brand.

We also found evidence that product innovation incentives in low/no-alcohol beer continue to be influenced by regulations restricting mainstream beer advertising among brewers that lack a no-alcohol brand. Norway's rules on where and when alcoholic drinks can be sold mean that lettøl and alcohol-free beer provide breweries with greater brand exposure than mainstream beer. Supermarkets sell alcohol in a designated zone of the store, which operates under more restricted opening hours than the rest of the store (e.g. it remains closed on Sundays and must close at 8pm on weekdays and 6pm on Saturdays, even if the supermarket remains open). Low/no alcohol products are located outside this zone and so remain visible to consumers for longer hours, and remain visible to consumers that only occasionally enter the alcohol zone. This means that being represented on the low/no alcohol shelves of supermarkets is one way for mainstream beer brands to maintain brand prominence and familiarity. One brewery told us that greater

Figure 3. Ringnes and Munkholm 'Bavarian style' beers launched simultaneously in February 2007. Pictures reproduced with permission from Ratebeer.com.

exposure to consumers provided by the no/low alcohol shelves "*creates an incentive for us to have a wide diversity of products in the non-alcoholic shelf. And tactically [we] also have corresponding [flavours] in the alcohol shelves.*"

Recent years have seen considerable product innovation in the low- and zero-alcohol markets, with breweries introducing 'radler'-style beers (with lemon or other fruit flavours), and a wider range of 'craft' low- and zero-alcohol beers. For all but microbreweries, which have a limited product range, the range of alcohol-free beer styles tends to mirror the range of mainstream beer.

4.5. Key insights from the case study

The ban on alcohol advertising in Norway has been through two distinct stages in the last few decades. Until the law shifted to a brand advert ban, it was possible for breweries to advertise low-alcohol beers using the same brand identity as their main products. This generated high levels of spending on lettøl advertising, which was widely seen as a way around the rules: Norwegian breweries advertised their low-alcohol products at least in part to drive sales of higher-alcohol equivalents. The pre-1997 product advert ban helped to create a niche for lettøl, and when advertising of lettøl was banned, this niche collapsed: without the advertising opportunities it created, lettøl was a less attractive produce for breweries, and over the years many stopped producing it.

Following the change, product innovation choices in the Munkholm range were clearly influenced—at least for some years—by the desire to use Munkholm adverts to drive sales of Ringnes beer. Even under a very tight brand advertising ban, which policymakers had designed to avoid any link between alcohol-free and alcoholic beer, product innovation in Munkholm beers was, at least for a period, strongly influenced by the advertising ban.

The results thus provide good evidence that advertising restrictions had a causal influence on product innovation choices, in effect creating a niche within which zero alcohol beer was promoted. The story is messier than our hypotheses had predicted: to our surprise, the evidence that advert bans influence product innovation is weaker for the period of the 'product advert ban' than the 'brand advert ban'. However, this is in part because there was limited product differentiation during the earlier period.

Participants were clear that the advertising ban influenced product innovation choices, with the shift from a product advert ban to a brand advert ban directly leading to the joint product development strategy employed by Ringnes during 2006-2008. However, the fact that Ringnes later abandoned this strategy is consistent with our hypothesis that brand advert bans generally create weaker incentives for product innovation than bans on adverts for harmful products.

Evidence for a continued link between advertising and innovation choices comes from other brewers that lack an alcohol-free brand. They exploit the exposure on supermarket shelves as way to increase brand recognition (i.e. as a form of advertising), and ensure that similarities in their mainstream and low/no alcohol product portfolios exploit that exposure to help drive sales of their mainstream beer.

The case also shows that the product advert ban increased incentives to advertise the benign version of the product (i.e. low/no alcohol beers), resulting in a higher level of advertising on the benign version that would otherwise have been the case.

The findings thus provide some confirmation for our hypotheses. Advert bans of a 'harmful' version of a product can stimulate innovation in 'benign' versions of the same product, particularly where firms produce both benign and harmful products under the same brand. While a single case does not provide a statistically generalisable finding, the causal mechanism identified appears likely to operate in other cases: the incentive to advertise can drive benign product innovation when harmful product advertising is banned.

4.6. Alternative explanations

Consistent with good case study practice, we have sought to identify alternative possible explanations for our findings. In particular, we have identified other influences on the development of low- and zero-alcohol beer during this period.

We identified several plausible alternative explanations for the observed increases in investment in advertising of low- and zero-alcohol beer during the period, and increases in product innovation in these categories. Interviewees highlighted other policy changes (notably tightening of drink-driving laws) which enhanced demand for zero-alcohol beer during the period. Moreover, developments in brewing process technology outside Norway meant that zero-alcohol beer tastes better now than it did in the 1990s. These changes have created conditions that facilitated the wider Norwegian adoption of zero alcohol beer, leading to a market that became increasingly interesting to brewers in its own right.

Clearly advertising restrictions were not the only factors driving brewers' choices to advertise and innovate in low- and zero-alcohol beer. Nevertheless, we identified no other explanations that could account for the 'joint product launch' strategy of Ringnes; and our respondents from several breweries made clear that advertising restrictions on mainstream beer had driven much higher spending on lettøl than would have otherwise occurred, and that they had influenced product innovation choices. We are therefore confident in the internal validity of our findings.

5. Discussion

5.1. Interpreting the Norwegian beer case in the context of environmental sustainability

Our results strengthen confidence in our hypotheses, suggesting that banning advertising of harmful products can incentivise product innovation in benign alternative products, and can lead to higher levels of advertising of the benign alternatives. To what extent might these hypotheses hold in other contexts? In other words, is it valid to generalise the observed causal mechanisms from this case to a broader set of contexts, and conclude that advert bans motivated by environmental concerns could stimulate 'green'

innovation?

In general, we see no reason why the core causal mechanisms would not be applicable to advertising bans motivated by environmental objectives. However, there may be conditions in which the observed causal mechanisms are too weak to have a significant influence. In particular, where the costs of product innovation are high, the incentives created by the opportunity to advertise may be insufficient to incentivise costly innovation activities. Similarly, if advertising restrictions are weak or partial – relating only to certain advertising channels such as TV broadcasts or print media – the incentive to innovate may be correspondingly weak. More generally, such policies are most relevant where direct-to-consumer advertising is an important part of firm strategy.

While we see advertising bans as potentially playing a role in stimulating innovation in socially or environmentally benign products, it is also clear that such policies are limited in their power. They are best seen as a complement to other policy approaches – part of a wider policy mix.

5.2. *Potential countervailing effects of advert bans: do they unintentionally mandate "greenwashing"?*

One result of a product advert ban is that incumbent firms that dominate the supply of harmful goods will present to society a brand and public image that is shaped by adverts for their 'benign' offerings. In the context of environmental aspects of products, this is precisely the behaviour that is often castigated as 'greenwashing' (de Freitas Netto et al., 2020; Delmas & Burbano, 2011). It is for this reason that many environmental activists argue for brand advert bans as well as product advert bans (see, e.g. https://www.worldwithoutfossilads.org/).

Policymakers considering banning adverts for harmful products thus face a dilemma. While introducing such bans can help to accelerate the emergence of benign alternatives, there may be countervailing effects: bans of product adverts will 'clean up' the brand image of firms supplying benign alternatives, and may serve implicitly as continued advertising for the harmful goods. This was the fear of the Norwegian authorities when they removed the possibility of any advertising for brands associated with alcohol. It is plausible that bans on advertising of harmful products could reduce social pressure on those brands to transition to more socially responsible alternatives.

Two considerations may help inform policymakers of the most appropriate strategy. First, there is a spectrum from advertising that is largely about driving product sales to advertising that is largely 'institutional': i.e. focused on enhancing the public image of the company (Berkowitz et al., 1992; Reich & Soule, 2016). For example, Exxon for many years focused adverts on their algal biofuels development programme, despite the fact that this programme represented a tiny fraction of corporate activity (Plec & Pettenger, 2012; Si et al., 2023). Where advertising is largely focused on maintaining a positive image for the company, rather than the product, banning advertising of the product would be unlikely to influence the product innovation or advertising strategy of the firms.

Second, the appropriateness of product advert bans and brand advert bans may depend on the phase of the transition, and the maturity of benign alternatives. Product advert bans likely make most sense relatively early in a transition, when the costs (political or economic) associated with restricting sales of the harmful product are high, and when stimulating the development and legitimation of alternatives is a key policy goal. However, alternatives must either be relatively easy to create, or at a level of maturity that means the incentive to advertise drives real investments in product development. Later in the transition, once alternatives have become well established, the countervailing effects associated with greenwashing may become more important than the stimulating effects on benign product innovation, and a switch to a brand advert ban may become more appropriate. As firms' product portfolios change towards being dominated by the benign alternative, a brand advert ban may create incentives for earlier exit from the harmful product market than would otherwise have been the case.

A further option is a partial brand advert ban, in which advertising of the brand is only allowed where some minimum share of sales arise from the benign alternative. This would limit the risk that tokenistic activity in the benign product market could be used to maintain brand prominence and advertising in support of the harmful product. This would avoid the situation reported to have occurred under Sweden's beer advertising ban, in which alcohol free drinks that did not exist were advertised in order to drive sales of mainstream beer (Kauppila et al., 2019).

6. Conclusion

Bans on advertising have become an increasingly prominent feature in discussions of environmental policy. In this paper, we have explored a hitherto neglected dimension of such bans – their role in fostering niches for sustainable innovation. Our findings from the Norwegian beer brewing industry show that banning advertising of harmful products can stimulate innovation in benign alternatives, and that such bans can also lead to higher levels of advertising of the benign alternative than would have occurred in the absence of a ban. While advert bans are typically seen as a form of 'regime destabilisation', our study shows that advert bans can also foster niches for innovation in cleaner or healthier alternative products.

Our case study thus suggests that advertising bans could contribute to or accelerate sustainability transitions, by stimulating product innovation of benign alternatives, and promoting increased advertising of those alternatives. In concluding, we argue that advertising bans may be a useful component of a policy mix to drive transitions to greener products and socio-technical systems. We note, however, that the effects of such policies may depend on the maturity of alternatives, and that policymakers should be aware of the potential for product advert bans to facilitate greenwashing.

Finally, we also highlight that there is a much wider need for further research into the potential role of policies relating to advertising in sustainability transitions. We highlight four key areas for future research: i) the role played by advertising—and advert bans—in shaping the barriers to entry faced by new entrants into markets in which a harmful good competes with a benign alternative;

ii) the role played by advertising in shaping social norms around benign and harmful products, and thus influencing the socio-technical regime; iii) the extent to which advertising plays an important role in legitimizing emerging new technologies; and iv) the relative political acceptability of advertising bans (for example, advert bans impose lower costs on business than outright product bans, and may thus be more politically acceptable, yet they may also be seen as paternalistic and in breach of free speech laws and norms). In short, there is a rich research agenda for sustainability transition scholars related to the role of advertising, and the potential for advertising restrictions to influence and shape transitions.

CRediT authorship contribution statement

Will McDowall: Writing – review & editing, Writing – original draft, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. **Anders Underthun:** Writing – review & editing, Investigation.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data availability

The data that has been used is confidential.

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