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PROMOTING ENVIRONMENTAL PROTECTION THROUGH MORE INFORMATION ON CAR LABEL: DIRECTIVE 1999/94/EC

Research article

Abstract

In this article the author highlights that due attention has to be paid to environmental problems. First and foremost, among the most convincing causes, one should be stressed, that is automotive industry. After stating some ways to reduce carbon dioxide emission, the author analyzed the advantages and disadvantages of Directive 1999/94/EC, which is effective in promoting consumers' awareness of fuel economy and CO₂ emissions of passenger cars. Based on the role of car label, the author gave some suggestions to update the Directive.

Keywords: car label, environmental protection, air pollution, automotive industry, Directive 1999/94/EC.

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СОДЕЙСТВИЕ ОХРАНЕ ОКРУЖАЮЩЕЙ СРЕДЫ С ПОМОЩЬЮ ДОПОЛНИТЕЛЬНОЙ ИНФОРМАЦИИ О МАРКИРОВКЕ АВТОМОБИЛЕЙ: ДИРЕКТИВА 1999/94/ЕС

Научная статья

Аннотация

В этой статье автор подчеркивает, что необходимое внимание должно быть уделено экологическим проблемам. Прежде всего, среди наиболее убедительных причин следует подчеркнуть, что это автомобильная промышленность. Изложив некоторые способы сокращения выбросов углекислого газа, автор проанализировала преимущества и недостатки Директивы 1999/94/ЕС, которая способствует повышению осведомленности потребителей об экономии топлива и выбросах CO₂ легковых автомобилей. Исходя из роли автомобильной маркировки, автор дала несколько предложений по обновлению директивы.

Ключевые слова: автомобильная маркировка, защита окружающей среды, загрязнение воздуха, автомобильная промышленность, Директива 1999/94/ЕС.

1. Introduction

A lot of scientific evidences show that climate change and iceberg melting is the consequences of greenhouse gas (GHG) emission. It adversely affects the ecological system, water resources, food safety, public health and makes environment susceptible, contributing to a looming future. Climate change no doubt has been the most controversial environmental issue in the past decades. Some human activities are to blame for the GHG emissions. Carbon dioxide (CO₂) is the major GHG produced by industrialized countries whereas vehicle emission contributes a proportion of 20% to total CO₂ emissions in European Union, USA and Japan [26]. Additional data indicates that CO₂ from this source accounts for about 17 % of total global CO₂ emission. Furthermore, vehicles are the main cause of air pollution in urban areas [19]. As Harrington and McConnel has pointed out, incomplete fuel combustion could directly release certain hazardous pollutants while some pollutants else formed during combustion. Some successive chemical reactions in the atmosphere may also form hazardous products [16]. Generally, in urban areas, vehicles emit a majority of carbon monoxide and up to 50% or more of nitrates and organics. Considering increasing number of vehicles, Cannon and Sperling expressed their growing concern that elevated carbon dioxide emissions from European transportation system will fail its 2020 emission goal, which is a 20% reduction in

greenhouse gas emissions by the emissions in 1990 [10]. Although automotive industry and its related industries have done great harm to the environment and even might have threatened the survival of human beings, they are still essential to both micro- and macroeconomy. Because of its strong linkage to society and highly integrated technology, automotive industry is regarded as a pillar industry by many countries. For these reasons, automotive industry is not only regarded as a sign of one country's manufacturing and innovating capability, but also an indicator of the country's overall global competence. One obvious benefit brought about by automotive industry is increased employment [15]. Annual global automobile production is 60 million and they consume 50 % petrol. The direct employees by the industry is 4 million, with a lot more indirectly [27]. The industry also contributes enormous wealth to the world. In average, annual turnover number of global automotive industry has exceeded 2.75 trillion euros which accounts for 3.65% of global GDP [3]. Furthermore, the world witnessed an 25% increase in total number of automobiles manufactured from 2007 to 2017 implying expanded market demand. Meanwhile, as one of the main exportation goods, global automobile exportation sums up to 698.2 billion dollars which had exceeded that created by fossil fuel exportation [31]. In this case, considering both its significance and environmental concern, people have been trying to make vehicles more environment friendly by legislation and technological innovation. This essay will focus on relevant regulatory issues of the automotive industry to show its strengths and weaknesses, as well as some prospective reformations.

In order to reduce carbon dioxide emission, many innovative technologies have been developed and applied. One of them is to increase the efficiency of fuel consumption by longer lifecycle. Three representative examples are biofuels, battery and hydrogen power, which can reduce overall CO₂ emissions effectively. In fact, some countries such as USA and Brazil have been using ethanol made from corn, sugar and sugar cane as fuel [20]. However, biodiesel and ethanol are expensive at this moment and their production has pushed up food prices. As Iguchi predicted that biofuels made from cellulosic materials would have much more lifecycle GHG benefits. Another method is to improve fuel consumption efficiency of vehicles by more advanced combustion technologies such as variable valve systems, gasoline direct injection, and cylinder deactivation [28]. Sperling also pointed out that electric-powered cars and hybrids enabled greater GHG reductions. The main problem with them is that they are always associated with higher development and commercialization costs. In fact, to enhance their competence, many leading automobile companies are actively exploring more effective and innovative technologies to reduce GHG emissions by automobiles.

Besides technological innovation, several new business modes have been developed in which car-sharing gains most popularity. It means renting a car on a sharing platform. This mode can increase the turnover of resources which could be beneficial to sustainable development. Jung and Koo concluded in their study that sharing of conventional automobile could not cause a considerable change to GHG emissions [21]. Only when the electric-powered vehicle infrastructure be established could a significant reduction in GHG emissions be made. Meanwhile, Nieuwenhuis and Wells expressed their concern on the characteristics of this mode: high investment and low revenue [23]. Nowadays, a number of people begin to seek for a more practical operational mode to sustain. In optimistical view, car-sharing has now been changing the way people travel and the market of many developing countries like China, slowing down the growth of car stock.

While some companies (e.g. Toyota) are developing new environment friendly technologies, business mode shift has also been actualized. However, it is frustrating to see few innovations on the supply side as well as few changes in consumer side which aims at GHG emissions reduction [30]. It is mainly an indicator that manufacturers have not base their products on low-emission technologies. Comparing with conventional vehicles which equipped with internal combustion engines with mechanical transmission and Budd-type pressed steel bodies, the number of environment-protection applications is yet negligible [23]. One important reason is that the market demand of mainstream cars prefers to power-intensive models (e.g. sports utility vehicles) which provide better performance, comfort and safety [2].

Similarly, although the public expressed their concern about environment-related issues and learned about the relationship between car usage and CO₂ emissions, little has changed in vehicles purchases. Furthermore, most people pay attention to environmental problems in relation to traffic but few of them constrained the usage of cars for short trips. Usually, in respond to the call for energy saving, when presented with a list of energy-saving actions, the public prefer to reduce household consumption than driving less. A similar study by Bibbings showed that most drivers clearly understand air pollution and its adverse effects on climate change [8] and another study by Barr also indicated that people who are aware of the environmental impacts by flight refuse to fly less [6]. Thus, the confliction between behaviour and awareness always exists [9]. Those who choose a low-carbon car concern more about money saving or healthcare benefits than environmental concern.

As Whitmarsh and Köhler have put forward, the main driving force for environment-related innovation was regulatory rather than a response to environment protection [30].

With long time development, regulation on automotive industry has evolved from air pollution to GHG emissions and now to a broader theme: sustainability [24]. The goals for this theme are not related to environmental improvement solely or mainly, but to a series of broader social and economic goals. Additionally, policies to support the development of biofuels technology are partially designed to meet the economic requirements of industry. Germany and the UK also offer subsidies for scrappers in order to stimulate demand. The automotive industry is proactive in this policy-making process; on contrary, final decisions are always based on compromise between regulatory authorities and industry [18]. Therefore, regulatory practices have greatly improved the environment-related performance of automobiles, resulting in many folds lower automobile emissions today than that in 1970s [24], necessitating regulatory practices. Considering the importance of automotive industry and people's demand for cars, regulatory activities should focus on guiding policies instead of simple driving restriction. More attention should be paid to market demand and consuming preferences for their great influence on purchase decision-making. Last but not least, reasonable regulations on power industry are called for to improve the competence of automobile companies applying environment-friendly technologies to mitigate environmental risk [20].

2. Methods

2.1. Merits and flaws of Directive 1999/94/EC

Directive 1999/94/EC was adopted by European Parliament on 13th December 1999 to ensure information about fuel economy and CO₂ emissions in respect of new cars sold or leased in EU is available to consumers. The ultimate goal of this Directive is encouraging people to purchase more environment-friendly cars. It can be classified as a command and control guideline for it sets up several standards or targets to exemplify required information and countries who disobey this Directive will be penalized. In this Directive, a sign on all new cars indicating its CO₂ emissions and fuel economy level is mandatory. True fuel consumption and CO₂ emissions data of new models on sale or lease are mandatory through advertisements. Free fuel economy and CO₂ emission guidelines for new cars should be available. All literature should indicate fuel consumption and CO₂ emissions. As mentioned above, Directive 1999/94, also named Car Labelling Directive as a part of broader policies (European Commission, 2011) was on effect with supply-side policies and demand-side instruments in order to stimulate environment-related innovation [13]. European Commission (2011) has come to the conclusion that Car Labelling Directive plays a positive role in reduction of GHG emissions and also contributes to less fuel consumption in the transportation sector.

One of the most powerful strengths is to promote public awareness of CO₂ emissions as well as fuel economy. According to report by European Commission (2011), in many countries, there have been more and more people (more than 75%) who become aware of fuel economy and CO₂ emissions since the implementation of this Directive. Another presentation by European Commission (2011) showed that more people had considered CO₂ emissions as an important factor in decision-making that the percentage from 33% in 2007 to 41% in 2008 (as 'very important'). To estimate the effectiveness of the Directive in Spain, a study by IDEA (2004) interviewed 304 users and 711 dealers and found that up to 57% interviewees agreed that the information provided about fuel consumption and GHG emissions is helpful. Moreover, 45% of the interviewees rank it highly-rated when deciding to purchase a new car. All these indicate increased awareness of fuel economy and CO₂ emissions brought about by Car Labelling Directive.

Another strength is to encourage purchase of more environment-friendly cars by offering referential information. Since cost is the key determinant in car purchase decision, some countries publicize information about running cost and taxes. Similarly, some Member States use indicators with different colors to differentiate vehicle tax, being more intuitive for information. Although there is no apparent relationship between CO₂ emissions and tax rate, this Directive offer a method to figure out tax rate by vehicle type. Many people may change their mind to purchase an environment- friendly car due to tax rate. Member States also take advantages of CO₂ emissions information to ensure that scrap plans are developed for high-carbon vehicles and that local authorities act for local incentives for low-emission vehicles. Thus, the Car Labelling Directive is invaluable to promote a series of global and local policies conducive to energy-saving vehicles. Furthermore, informative labels have been considered with consensus as the most successful way today. As European Commission predicted this Directive would help European Union to reduce GHG emissions by 40% of that in 1990 by 2030, by assisting consumers in informed choice-making.

However, there is evidence that consumers still do not pay much attention to fuel efficiency in buying new cars. Noblet's study suggested that energy signs were less effective in comparison among more energy-efficient models than in comparison among specific models when initial outlay is a decisive factor [25]. Meanwhile, there is a growing gap between the actual and testing cycle emissions, and the number of alternative fuel vehicles in the market is increasing which lead to concern about the relevance of the Directive to people. Shortly speaking, the information is somehow difficult to interpret by consumers. European Parliament and other authorities also pointed out that although information about fuel economy and CO₂ emissions is meaningful, it is still not enough to influence consumers' choice [4]. Additionally, according to European Parliament's review on relevant literature, the label on environment-related information is most effective when it combines with financial incentives. Thus, many Member States like the UK have developed regulations to provide additional tax information in order to enhance the function of labels. Another issue that limits Car Labelling Directive is that the scope of this Directive does not include second-hand cars whereas second-hand car market is bigger than new car market.

Furthermore, the needs of print-out guidelines are considered as a waste of resources by many countries and it may exert negative effect on public impression of printing media. In fact, according to European Commission, study from national ministry and a national consumer association showed that labelling is the most effective way to convey information. In this case, compared with electronic guidelines, paper-based guidelines are less environment-friendly in practice.

2.2. Reform and addition

Considering consumer behaviors and market situations as well as pleasant experience, several modifications can be made to Directive 1999/94/EC.

1. Improve label

As Waechter found, consumers prefer the colour of efficiency labels to data. On the other hand, consumers favour large vehicles with high absolute power consumption [29]. Taking this into consideration, the attention-worthy factor is that which of price, fuel consumption, size, safety, brand, comfort and power plays a dominant role in actual trade [1; 12]. According to Codagnone, actually less attention is paid to environmental impacts than other factors [11]. Moreover, Min found that energy cost information lowers the discount rate consumers apply when purchasing efficient, yet more expensive vehicle. This observation suggests that the provision of explicit information on annual fuel costs could enhance the effectiveness of car labelling [22].

Therefore, in order to trigger consumers' thinking, labels should: directly show CO₂ emissions of a car at specific running distance such as 10,000 kilometres; clearly assign the car into a category with colour indicator; be certified by authorities to be

acceptable to consumers. These improvements aim at raising consumers' awareness and broadening their knowledge about the environmental impacts of cars by providing intuitive information on cost. Additionally, these advices are consistent with EU's goal: smoothing knowledge gap between suppliers and consumers, and strengthen its effectiveness. Its main improvements are reflected on the more intuitive presentation which makes it easier for comparison of various parameters parallelly. Notably, ambiguous terms such as 'environment-friendly', 'green' or 'eco' without supportive data should not appear on labels.

Other suggestions from Haq and Weiss on label recognition are valuable [17]. Since the promotion of the newly designed car label in 2012, German car buyers' recognition of the car label increase from 29% to 34%. Meanwhile, a study on ten Member States showed that 45% had no idea about car label while 40% consider car label difficult to recognize [11]. In response to this finding, Haq and Weiss pointed out that a lack of graphic and coloured labels in certain countries may be a hindrance to promote people's awareness.

Hence, three means can help promote public recognition of label usage: (1) labels should be designed in similarity to application labels (e.g. colour, style). (2) car labels should be significant to read. (3) position for car labels should be specified.

2. Economic instrument

As mentioned before, financial incentives play a significant role in car purchasing which means extra taxes for extra CO₂ emissions. It may change people's behaviour. By imposing extra tax on certain car models with high carbon dioxide emissions, ordering of cars attractive to consumers but not environment-friendly can be lowered. Specifically, the extra tax shown on the car labels should be emphasized to deliver such a message: this model is not cost-effective. Thus, car-makers have to develop more environment-friendly models to compensate for the sales loss. Although this method would probably cause somewhat loss to producers, it can promote a more benign market environment as it will encourage environment-concerned innovation. Another method related to cost-effective measures is automobile subsidy such as lower price and tax incentives for cleaner and more fuel-efficient cars. This can also be reflected by price. For example, the government build some car parks which is exclusive to cars with low emissions. BEUC (2017) also recommend the use of public transportations. However, such policies should be carefully assessed in case of significant burden on public transportation [7]. Bamberg and Fujii similarly suggestions such as single-month bus pass, parking restrictions and shutdown of highways [5], [14]. In general, some countries have implemented these suggestions and some have not. If the same measures are implemented in the EU, execution and effectiveness would be improved.

3. Increase publicity

Advocacy for car labels and specific car models is increasing so that it not only influence car-owners but also their family members, which is meaningful to promote an environment-friendly society. Because of the superior efficiency of Online Economy, authorities could encourage car-makers to advertise for environment-friendly car models online. Meanwhile, authorities themselves should do a good job in promotion such as public service announcements, forum on environment-friendly vehicles and maintenance of websites. Only when the whole society becomes concerned about environment protection, will consumers think more about environment. Government should also correlate low-carbon to the quality of life and shape people's behaviour into lower-carbon.

4. Expand scope

Since many other topics are not discussed in this Directive, many people advocate to expand the scope of this Directive to include other types such as vans, heavy duty vehicles, used cars. Furthermore, used cars are in fact more polluting upon use, so expanding the scope can make people understand more about fuel economy and CO₂ emissions by these second-hand cars. This practice is supposed to encourage consumers to reduce purchase of less environment-friendly used cars. The rationale is similar for other models. Additionally, expanding the scope to include more media has become more and more important due to increasing importance of Internet to consumer decision-making. For example, vehicle-selling websites also need to provide information the Directive ordered at significant position. Websites offering vehicle evaluation should be instructed to give environment-related assessment and relevant information about promoting policy. Although the impact of this policy on consumers' decision-making is unknown, it enables more acceptable messages from consumers which promote further thinking about environment-friendly cars in future.

3. Results

This article focuses on environment protection in regard to passenger cars and Directive 1999/94/EC. It starts from the significance of automotive industry and its environmental impact. Then it moves to the efforts by car-makers and government to actualize sustainable technologies and some issues were addressed calling for legislation. After evaluation on both advantages and disadvantages of Directive 1999/94/EC on car labels, this essay shed some light to this Directive's weaknesses. Advices are provided on car label itself, cost-effective instrument, publicity and scope.

In conclusion, Directive 1999/94/EC is effective in promoting consumers' awareness of fuel economy and CO₂ emissions of passenger cars. Although its implementation brings about some problems, many Member States are actively updating it and some extra contents are added which enhance its implementation. Some suggestions in this essay are based on the updated directive.

However, it is not enough to consider just unilateral factors. Usually, directive enacts in the form of combined policy in which psychology or behaviour of consumers, social environment and fundamental infrastructure should be considered. Thus, the policy can effectively relieve the environmental stress and reduce GHG emissions. Furthermore, not only demand-side but also supply-side contributes to the final outcome. It may not be warranted that directives on environment will result in development of environment-friendly technologies since customer needs dominate. Only when economic incentives bring benefits to both sellers and buyers or market trends call for innovation could sustainability be maintained. An acceptable environmental directive should encourage producers to develop innovative technologies and in the mean time encourage consumers to make decisions rationally.

Conflict of Interest

None declared.

Конфликт интересов

Не указан.

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