Understanding Market potential for biodiesel in Spain: A Pilot study based on consumer preferences

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UNDERSTANDING MARKET POTENTIAL FOR BIODIESEL IN SPAIN: A PILOT STUDY BASED ON CONSUMER PREFERENCES

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ABSTRACT

The production and use of biodiesel is an important alternative in Europe to diminish the emission of gases in order to fulfill the Kyoto protocol goals. Supported by the Common Agricultural Policy (CAP), the production of biodiesel has increased in Europe but the consumption is only of considerable importance in some countries. In Spain, the consumption of biodiesel is still low compared to other EU countries. The aim of the paper is to analyze consumers' preferences for biodiesel in Spain. To do that a choice experimental approach has been used to assess consumers' valuation of different diesel options and calculate the willingness to pay for biodiesel. The data come from a recent survey conducted in Spain (Region of Aragón). Results indicate that diesel users would pay an extra price of 0.05 € to fill biodiesel up instead of fill conventional diesel, which is the highest premium consumers are willing to pay for any diesel attribute considered. The paper also explores factors affecting the premium consumers are willing to pay for this fuel.

Keywords: Biodiesel, consumer, preferences, Spain, choice experiments

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INTRODUCTION

Biofuels has been put forward as one of the strategies to allow reductions in greenhouse gases emissions. Many countries have set targets for overall transport related energy consumption to be supplied by biofuels and in the case of Spain most of the supply of biofuels is centered in biodiesel. As biodiesel will have to coexist with other fuel options in the market and its use is based on voluntary individual decisions, reaching the set targets will be directly related to how consumers will react to these new products available in the market.

Production and distribution costs of biofuels are currently higher than fossil ones and unless subsidized by public authorities they will have to be marketed at higher prices. This is the case in Spain where, even when subsidies are in place, biodiesel retail prices are higher than fossil equivalents. Understanding whether consumers will be willing to pay this higher prices and why, is a key issue that should be taken into account when designing policies to increase biodiesel use.

In this paper we attempt to answer both questions, whether there is a willingness to pay and the factors that explain its variability, by undertaking a demand analysis for diesel in a mid-sized Spanish town. The rest of the paper is structured as follows: the basic of the choice modeling approach used are presented in the next section. This is followed by a description of how the data has been obtained and its main characteristics. Results of both the consumer choice model, mean and individual specific willingness to pay for the different attributes are presented and discussed. The paper ends with some tentative conclusions that can be derived from our results with regards to optimal policy design for biodiesel introduction in Spain.

METHODOLOGY

Choice experiments (CE) have been selected to assess consumers' preferences for biodiesel for a number of reasons. CE is capable of valuing multiple attributes simultaneously, its framework is consistent with random utility theory, and the hypothetical choices presented are similar to real market decisions (Lusk *et al.*, 2003 and Adamowicz *et al.*,1998). Choice modeling is based on Lancastrian consumer theory of utility maximization (Lancaster, 1966)

and consumers' preferences over food attributes are modeled in a random utility framework (McFadden, 1974). In the choice modeling approach consumers choose between alternative products that contain a number of attributes with different levels. Individuals choose the alternative that provides the greatest utility and the probability of selecting an alternative increases as the utility associated with it increases. The utility function is known by the individual but some of its components are unobserved by the researcher. Thus, utility is taken as a random variable where utility from the nth individual facing a choice among *j* alternatives within choice set *J* can be represented as,

$$U_{njt} = v_{njt} + \varepsilon_{njt} \qquad [1]$$

Where n is the number of respondents; j the number of alternatives within choice set *J,* t the number of choice occasions, v_{njt} utility determined by the attributes and their values for alternative j in t choice occasions and ε_{njt} an extreme value error term $(0, \sigma^2)$, i.i.d. over alternatives and independent of v_{njt}

Different choice models can be derived contingent on the specification of the density of unobserved factors $f(\varepsilon_{njt})$. The selection of this function will depend on the assumptions underling the consumer's preferences. If preference heterogeneity across consumers is expected, a general specification such as the Randon Parameters (RPL) or mixed logit model can be used. Assuming that v_{njt} is linear in parameters ($v_{njt} = \beta_n' x_{njt}$), each consumer has his own vector of parameters β_n [1] which deviates from the population mean β by the deviation parameters η_n. The β_n is random across individuals with a density function f(β). In the RPL model, the conditional probability that individual n chooses alternative j in a particular choice occasion t, is represented as:

$$L_{njt}(\beta_n) = \frac{\exp(\beta'_n x_{njt})}{\sum_i \exp(\beta'_n x_{nit})} \qquad [2]$$

[1] β_n does not carry the subscript t as taste is assumed to vary over respondents but not over choices.

For the maximum likelihood estimation, the conditional probability of the sequence of choices made by each respondent is obtained according to the following expression:

$$S_n(\beta_n) = \prod_t L_{nj(n,t)t}(\beta_n) \qquad [3]$$

where *nj(n,t)* represents the alternative chosen by person *n* in choice occasion *t*. The unconditional probability for this sequence is given by:

$$P_n(\theta) = \int S_n(\beta_n) f(\beta_n \mid \theta) d\beta_n. \qquad [4]$$

Since the integral in [4] does not have a close form, the probabilities have to be simulated by summing over *R* random draws of β, which are taken from the probability density function $f(\beta_n \mid \theta)$ (Train,1998, 1999 and 2003). For the estimation of the RPL, Halton draws rather than random draws are used since they provide a more efficient simulation for the RPL.

Mean random parameters are derived as the average of the parameters over the *R* replications. The derived standard deviation which represents the amount of spread or dispersion around the sample population is calculated over each of the *R* draws. In addition to these estimated parameters, the RPL model provides also estimates parameters for each individual in the sample, reflecting that consumers present heterogeneous preferences. Then, to analyze the reasons behind consumers' heterogeneity in preferences the conditional parameters estimates for each individual will be calculated to obtain individual-specific WTP. These conditional parameters are the common-choice-specific parameter estimates which are conditioned on the choices observed to have been made (Hensher *et al.,* 2005). These individual-specific WTP will be regressed in order to identify the factors determining consumers WTP for biodiesel.

In deriving WTP estimates based on random parameters, all the information in the distribution or just the mean or standard deviation estimates can be used. In our study, both WTP have been calculated by taking the ratio of the parameter estimated for the analyzed attributes to the price parameter multiplied by minus one. Mean WTPs are calculated using the mean estimates parameters and WTPs for each individual in the sample are calculated using the individual-choice-specific estimates parameters (Campbell, 2007). The reported choice

model has been estimated using NLOGIT 3.0 (Greene, 2002) while regressions fitted to explain WTP heterogeneity have been estimated using STATA 10.0.

DATA

Data were collected from a survey conducted in Zaragoza, a medium-sized town located in northwest Spain, during April 2008[2]. This town was selected to be representative of the country as it has similar socio-demographics as those of the overall Spanish Census of Population (see Table A.1. in Appendix). This questionnaire had as main objective the identification of diesel consumer attitudes, knowledge and preferences for different aspects of biodiesel market development. Consumers were asked questions related to biodiesel fill up habits (where and why), knowledge about biodiesel, attitudes towards biodiesel, biodiesel consumption (actual use of biodiesel, intention to purchase, place of purchase, etc.), attitudes towards biodiesel purchase, as well as subjective norms and, perceive behavioral control (Ajzen, 1991). The questionnaire also contained questions on socio-demographic characteristics (i.e. sex, family size and composition, age, education level, income).Last, the questionnaire also included questions to implement the choice experiment.

Before the final questionnaire was administrated, a pilot survey was undertaken to identify consumer believes and knowledge with regards to biodiesel as well as their willingness to pay for this fuel. This pilot, conducted to a small sample of respondents (N=20), allowed us to select the diesel characteristics more important to buyers and have an initial idea of the interval in which willingness to pay for biodiesel was located. With this information the most relevant attributes to be included in the choice experiment design were selected. The most relevant aspects for consumers when deciding which diesel to fill up were the proximity of the petrol station to buyers' every day route and whether the petrol station is associated to a nation-wide oil company (REPSOL, BP, etc.) against being independent. Results from the contingent valuation open-ended questions indicate that the maximum premium buyers were willing to pay to fill biodiesel up instead of conventional one was 10%.

From these results the choice set design constructed considered four distinctive diesel characteristics (price, type of diesel, petrol station location and petrol station association), each of them taking two or more different levels. Table 1 shows the attributes and the levels

[2] The data set used in the analysis was gathered by students from the IAMZ-CIHEAM in the Postgraduate Specialization Course on Agro-food Marketing 2007-2008.

used. The selection of price vector was done as follows. A baseline price scenario was selected corresponding with the mean price of a liter of diesel in different petrol stations at the time of the survey (1.1 €/liter). Based on the results of the CV pre-test a 10% premium was included to reflect the highest extra price shoppers were willing to pay to buy biodiesel instead of conventional one and also a 10% discount was included to detect whether consumers not willing to purchase biodiesel would do it at a discount.. The other attributes entered the choice set with two levels.

Table 1. Attributes and levels used in the experimental design.

Attribute	Levels
Price	0.99 € per liter 1.10 € per liter 1.21 € per liter
Type of diesel	Biodiesel Conventional diesel
Petrol station in the proximity of the consumer's every day route	Yes No
Petrol station associated to a nation-wide oil company	Yes No

Information regarding the meaning of the price, type of diesel and petrol station characteristics (proximity and nation_wide) was presented to participants right before the choice experiment question. The choice set design was created employing an unlabeled octagonal design created with SPSS© 14.0, which resulted in a total of 12 choice sets. In order to avoid an order effect in the responses, the order of the choice sets was randomized. The 12 selected choice sets were blocked into three blocks, with each respondent randomly allocated to one block of four choice sets. Thus, each respondent had to choice four times between three diesel options: two options which described the hypothetical diesel and a third option offering consumers the possibility of "not buying" (see on example of choice set in Appendix I).

Sample size included 121 diesel users. Considering this sample is extracted from an infinite population and assuming a confidence level of 95.5% (k=2) and p=0.5 the error level associated to the reported estimates is ±9%. A stratified random sampling procedure was used based on age. Target respondents were owners of diesel engine vehicles and the questionnaire was delivered face to face at selected petrol stations located throughout the town and its

suburbs. Interviewers approached randomly selected individuals asking them one screening question: whether they have a diesel motor vehicle. In the case of a negative response, the interviewer selected randomly another customer belonging to a given age group, until finding a participant matching the requirement. Sample summary statistics are presented in table 2. The majority of respondents were male (69.5%). The respondent's average age was about 39, living in a household with three members. Approximately 60% of respondents state that they have an income between 1,500 and 3,500 € and more than half of the sample has complete university studies. Finally, the percentage of households with kids less than six years old is 20%, and with people more than 65 years old, 11%.

Table 2. Sample characteristics (%, unless stated) and exogenous variables definition.

Variable definition	*Name (type)*	*Value*
Individual characteristics		
Gender		
Male	FEMALE (dummy: 1=female)	69.5
Female		30.5
Age (Average from total sample)	AGE (continuous)	39.22
Education of respondent		
Elementary School	UNIVERSITY (dummy: 1=university)	9.3
High School		34.7
University		55.9
Average Household Income[a]		
Less than 1,500 €		14.0
Between 1,501 and 2,500 €	HIGH_INCOME (dummy: 1=higher than 3,500 €)	28.0
Between 2,501 and 3,500 €		33.3
Between 3,501 and 4,500 €		14.9
More than 4,500 €		9.7
Household Size (Average from total sample)	HSIZE (continuous)	3.3
Household with kids less than 6 years old (1=Yes)	KIDS6 (dummy:1=yes)	20.3
Household with adults more than 65 years old (1=Yes)	ELDERLY (dummy: 1=yes)	11.0
Consumers' knowledge on biodiesel		
Consumer self-assessed knowledge of biodiesel	KNOW (dummy: 1=yes)	86.4
Consumers' diesel fill up habits		
Individual usually fills diesel up in petrol stations in the proximity of the every day route	FILL_DAILYROUTE (dummy: 1=yes)	76.3
Individual usually fills diesel up in petrol stations associated to a nation-wide oil company	FILL_NATIONWIDE (dummy: 1=yes)	21.2
Consumers attitudes towards biodiesel		
I Lack of information on the effect of biodiesel use on engines	LACK_INFO (5-point increasing scale)	3.72
Biodiesel use contributes to overexploitation of natural resources	OVER_EXPLOTATION(5-point increasing scale)	3.12
Consumers' behaviour model		
Attitudes towards biodiesel purchase	ATT_PURCH (5-point increasing scale)	3.92
Subjective norm	SUB_NORM (5-point increasing scale)	2.97
Perceived behavioral control	PERC_CONTROL (5-point increasing scale)	3.85
Perceived difficulty to purchase	PERC_DIFF (5-point increasing scale)	2.48

[a] 3% of respondents do not provide information on the income level

MODEL SPECIFICATION AND ESTIMATION RESULTS

In the final specification of the utility function, an alternative-specific constant representing the A and B choice option was introduced (ASC). It is expected that this constant would be positive and significant, indicating that consumers will get higher utility from alternative A and B than from the no-buy option C. The type of diesel (BIODIESEL), the proximity of the petrol station to the buyers' every day route (PROXIMITY) and whether the petrol station is associated to nation-wide oil company (NATION_WIDE) variables are effect coded and the price (PRICE) represents the price levels given to consumers for each hypothetic product.

Price is expected to have a negative impact on utility while, the effects of the other variables are the posed questions in the paper.

In the RPL, the researcher has to specify the distribution for the random coefficients that satisfied his expectations about consumer behavior (Train, 2003). Since consumers may either like or dislike the diesel attributes considered in the experimental design, a normal distribution is used. The estimation of the RPL was conducted using NLOGIT 3.0 treating price as a fixed coefficient and letting the coefficients of the other three attributes random.

The results of the RPL estimate are presented in Table 3[3]. The final specification of the utility function relies on statistical tests that support the significance of the included coefficients. With respect to the overall fit, the model is statistically significant with a chi-square statistics of 379,8 which is higher that the critical value, suggesting that the considered diesel characteristics are jointly significant, affecting consumers' utility. As expected, the alternative specific constant is positive and statistically significant; indicating that consumer utility for purchase alternatives is higher than the non-purchase option.

Table 3. Mixed Logit Model results for diesel choice.

Variable	Coefficient	Stand. Error	t-statistic
Mean Values			
β_0	14.6031	1.9480	7.491
Price	-11.8731	1.7548	-6.766
BIODIESEL	0.6486	0.1427	4.546
PROXIMITY	0.6135	0.1365	4.495
NATION_WIDE	0.3199	0.1252	2.555
Standard deviations			
BIODIESEL	0.8440	0.1956	4.313
PROXIMITY	0.8378	0.1756	4.769
NATION_WIDE	0.7686	0.2015	3.814
Number of observations			1416
Chi-square			379.79
Log likelihood			-328.64
Pseudo R^2			0.360

The non-random parameter (PRICE) is negative and the Wald test indicates that it is statistically significantly different from zero at the 5% of significance level. Therefore, price increments decrease the associated utility level provided by the choice of each diesel products. The mean of the three random parameters (BIODIESEL, PROXIMITY and

[3] Three individuals did not answer to all choice questions and have been subsequently dropped from the analysis presented.

NATION_WIDE) are statistically significant explaining consumers' utility. The positive value of the mean parameter estimates indicates that utility associated to biodiesel, proximity and nation-wide associated petrol station is higher than for their alternatives (conventional diesel, petrol station not close to usual route and independent petrol station). Looking to heterogeneity in preference, the Wald statistics for the derived standard deviation parameters indicates that the dispersion around the mean estimate is statistically different from zero for the three analyzed characteristics of diesel. In other words, the effect of these attributes on the utility function differs across diesel buyers.

However, the interpretation of direct estimate parameters is not enough to fully understand consumers' valuation. Therefore, we calculate the marginal values or willingness to pay for the effects of the attributes (BIODIESEL, PROXIMITY and NATION-WIDE) shown in table 4. Mean WTP values are calculated by taking the ratio of the mean parameter estimated for the diesel attributes to the mean price parameter multiplied by minus one.

Table 4. WTP estimates for individual attributes considered (€ per liter).

Attribute	Mean	Standard deviation
BIODIESEL	0.054	0.04438
PROXIMITY	0.051	0.04296
NATION_WIDE	0.027	0.03812

Results indicate that all the considered attributes carry a positive premium, with the highest WTP associated with the biodiesel type (0.054 € per liter of biodiesel). This implies that, on average, 0.054 € per liter is the premium that makes diesel buyers indifferent between the two levels of utility, associated with conventional diesel and biodiesel. Slightly behind, the WTP for the proximity of the petrol stations to buyers' every day route is 0.051 €. Finally, consumers are willing to pay about half, 0.027 € extra, for a liter of diesel fill up in a petrol station associated to a nation-wide oil company.

Results presented indicate that consumer valuation for the different options to fill up diesel is heterogeneous. However, the model results do not allow explaining this heterogeneity. To do so, the determinants of individual WTP estimates have to be identified. This can be achieved by focusing on individual-specific WTP from the Random Parameter model instead of on mean WTP. Using individual-specific WTP as a dependant variable and through the

specification and estimation of value functions for each diesel characteristic statistically significant factors explaining WTP variation can be identified. For the objectives of this paper we would be interested in knowing only those factors explaining WTP for biodiesel. However, we also present the results identifying the factors determining NATION_WIDE to see whether these are common to both attributes and thus, promotion of biodiesel could be made following the same basics of marketing for well-known brands.

We assume that determinants of WTP heterogeneity are not only buyers' socio-demographic characteristics but also buyers' knowledge on biodiesel, buyers' fill up habits and the factors of Ajzen's behavioral model (Azjen, 1991). These include attitudes towards the product, the attitude that the person holds toward engaging in the behavior (purchase attitude), the degree of social pressure felt by the person with regard to the behavior (subjective norm) and the degree of control that the person feels he/she has on performing the behavior (perceived behavioral control). Following Sparks *et al.,* 1997, the perceived behavioral control may be composed of two separate constructs, perceived difficulty and perceived control. Perceived difficulty means the skills and abilities that consumers own and are believed by them to influence the degree of personal control over the behavior. The definitions of the exogenous variables that explain WTP variability can be found in table 2.

As far as product knowledge is concerned, diesel buyers were asked whether they knew what biodiesel was, those answering yes are considered to have a subjective knowledge of the product (KNOW) although the quality of this knowledge has not been measured. To measure diesel buyers fill up habits, respondents were asked to indicate whether they usually fill diesel up in petrol stations in the proximity of their every day route (FILL_DAILYROUTE) and/or whether they usually fill diesel up in petrol stations associated to a nation-wide oil company (FILL_NATIONWIDE). Over 75% of respondents stated that they usually fill diesel up in petrol stations in the proximity of their every day route and 21% that they usually fill diesel up in petrol stations associated to a nation-wide oil company.

Consumers were asked to rate, using a 5-point increasing scale, different statements related to agreement with biodiesel impacts (both positive and negative) and importance given to biodiesel characteristics when deciding to consume it or not[4]. Only two of the aspects have

[4] As far as impacts are concerned eight statements were asked for such as "biodiesel is less pollutant than conventional diesel"; "biodiesel can be produced using local raw materials" or "biodiesel use helps fighting

been finally included: importance given to "*lack of information on the effect of biodiesel use on engines*" when deciding not to buy biodiesel (LACK_INFO) and agreement with the statement "*biodiesel use contributes to the overexploitation of natural resources*" (OVER_EXPLOITATION). Finally, the three factors from Ajzen's behavioral model have been measured. Attitudes to biodiesel purchase were measured asking diesel buyers their degree of agreement in a 5-point increasing scale to the sentence "*I believe that buying biodiesel is good*" (ATT_PURC). Subjective norm was measured asking diesel buyers their degree of agreement in a 5-point increasing scale to the sentence "*Most people who are important to me think that I should buy biodiesel*" (SUB_NORM). The perceived behavioral control was measured asking diesel buyers their degree of agreement in a 5-point increasing scale to the sentence *"If biodiesel were available in petrol stations, nothing would prevent me from buying it"* (PERC_CONTROL) and the perceived difficulty to the sentence "*even if I should want to buy biodiesel, I do not think I would ever be able to do so*" (PERC_DIFF).

Table 5 presents the value function estimates for the two attributes considered. Each equation has been estimated by Ordinary Least Square (OLS), as the two endogenous variables are continuous. As far as the interpretation of the results, first it should be pointed out that both models are overall statistically significant (F values reject the null hypothesis that all estimated parameters are equal to zero at the 5% significance level) and they explain a reasonable part of the WTP heterogeneity (adjusted R^2 values are higher than 20%). Robust t-ratios are reported for individual parameter significance to correct by heteroscedasticity (Greene, 2008).

against climate change". As far as consumption is concerned statements were related to reasons for not buying biodiesel and included statement such as "Its not available on my normal petrol station"; "there is no sufficient information on biodiesel available" or "it can increase the maintenance costs of my vehicle".

Table 5. Factors affecting individual willingness to pay for different diesel options.

	BIODIESEL		NATIONWIDE	
Variables	***Estimates***	***t-ratios***	***Estimates***	***t-ratios***
Constant	0.0989	3.57	0.0444	3.57
Socio-demographics				
AGE			- 0.0006	- 2.11
UNIVERSITY	0.0243	3.18	0.0108	1.67
HIGH_INCOME			0.0139	1.68
KIDS6			- 0.0143	- 1.69
ELDERLY			- 0.0284	- 2.75
Consumers' knowledge on biodiesel				
KNOW	- 0.0254	- 1.87		
Consumers' diesel fill up habits				
DAILY_ROUTE	- 0.0142	- 1.82		
KNOWN_BRAND			0.0164	2.31
Consumers attitudes towards biodiesel				
LACK_INFO	- 0.0058	- 1.85		
OVER_EXPLOTATION	- 0.0059	- 2.28		
Consumers' behavior model				
ATT_PURCH	0.0092	2.08		
DIFF_PURCH	- 0.0087	- 2.85		
F VALUE	5.59		4.27	
Adjusted R^2	0.25		0.20	

Number of observations=118 / Robust White (1980) t-ratios are reported

First, it must be highlighted that factors explaining the value attached to both, biodiesel and whether the petrol station is associated to a nation-wide oil company are very different. While the latter depends mainly on buyers' socio-demographic characteristics, the former is better explained by buyers' biodiesel knowledge, buyers' fill up place, attitudes towards biodiesel and the Azjen's factors. Only one buyer' socio-demographic characteristics affects WTP for biodiesel, with higher WTP being associated with individuals which have university degrees (UNIVER). On the other hand, and as far as knowledge and habits are concerned, buyers who have heard about biodiesel and those who state that they usually fill diesel up in petrol station in the proximity of their every day route are less willing to pay for biodiesel.

The role of attitudes and components of Azjen's behavioral model are the most significant determinants of biodiesel WTP. Buyers who highly believe that there is a lack of information on the effect of biodiesel on engines are less willing to pay for biodiesel. In the same way, buyers who highly believe that biodiesel might contribute to overexploitation of natural resources are less willing to pay for biodiesel. This seems to show a clear reluctance to pay for biodiesel associated with lack of product credibility and/or reliability as well as its

potentially negative side-effects. This is further reinforced by the fact that no buyers' attitudes towards positive biodiesel aspects have been statistically significant determining WTP. Last, two other constructs significantly explain biodiesel WTP; subjective norms and the perceived difficulty to purchase. Then, consumers with positive subjective norms will be more likely to pay an extra price for biodiesel while consumers who perceives more difficulty in purchasing biodiesel will be less likely.

As mentioned, value function for biodiesel differs from that of the more common attribute of brand. For this concept, socio-demographics are nearly the only variables statistically significant explaining WTP (AGE, UNIVERSITY, HIGH_INCOME, KIDS6 and ELDERLY). Household income (INCOME) and having attained a university degree (UNIVERSITY) increase values attached to the petrol station be associated to a nation-wide oil company. However, older people measured by the age of respondent and the presence of people with more than 65 years in the household, negative influence this WTP. Those household with kids less than 6 years old are less willing to pay for diesel in petrol stations associated to a nation-wide oil company. Finally, those buyers who state that they usually fill diesel up in petrol station associated to nation-wide oil companies are more willing to pay for diesel in those petrol stations, reflecting the good predictive capacity of our model.

CONCLUSIONS

In this paper the potential market for biodiesel has been explored using a choice experiment approach. Preliminary findings show that consumers are willing to pay a premium for biodiesel and that this product can have market success even in the absence of public support policies. However, this must be confirmed with a supply side analysis of the extra-cost biodiesel must face when entering the market. Biodiesel valuation does not seem to resemble that of a common product attribute such as brand and is limited by the fact that overall opinion about is not positive, both from a technical and environmental perspective. However, these results might be affected by the fact that fieldwork was undertaken precisely during the period in which higher food prices were a main media topic and biofuels were being blamed for those higher prices. Moreover, our data set is quite limited both in size and scope and further research is needed to confirm whether these exploratory findings can be extrapolated to society as a whole.

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