


## Sustainable consumption of services: willingness-to-pay for sustainable alpine skiing experience

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### ABSTRACT

In this study, we examine sustainable consumption from a ski area perspective by using the exploratory sequential mixed-method approach. We apply a cross-national approach to investigate how customers' preferences for sustainable service alternatives translate into willingness-to-pay, comparing results from Norway and Switzerland. The results show that alpine skiers in general report being willing to pay more for a day pass if the ski area is either environmentally-certified, carbon-neutral, or uses only natural snow. The positive effects are reported even stronger among environmentally-friendly skiers and skiers from Switzerland. We discuss the implications our results have for ski area managers wanting to incorporate sustainability in the overall pricing strategy.

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## Introduction

Tourism is a complex phenomenon that often depends on the natural environment while at the same time often having negative consequences on the environment. In the relationship between tourism and the environment, companies can play a significant role by altering their attitude towards sustainability issues to respond to the growing interest in “green” initiatives and the dynamics of the competitive landscape (Confente & Scarpi, 2021; Fraj et al., 2015; Loorbach & Wijsman, 2013; Martínez-Martínez et al., 2019).

In order to increase the degree of sustainability, companies must not only design their operational processes to meet the sustainability goals, but also educate and/or stimulate their customers and encourage sustainable consumption (Davis et al., 2018; Hosta & Zabkar, 2021; White et al., 2019). Sustainability value can provide consumers a sense of the product or service being special, resulting in emotional benefits and foster trust, as a very important shared value (Font et al., 2021). Customers' decision to consume sustainably or unsustainably can be affected by their mindset, as well as by social norms and

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beliefs about what is socially appropriate and approved in a given situation (Peattie, 2010; Sheth et al., 2011). With more focus on sustainability in the society in general, it follows then that many companies could benefit from including sustainability in their business model. Incorporating such a sustainability value in the business model could benefit multiple stakeholders simultaneously (Baldassarre et al., 2017; Bocken et al., 2014; Grinstein & Riefler, 2015).

### *Alpine skiing industry*

The current study is set in the context of the alpine skiing industry. The alpine skiing industry is all about the experience—serving the skier's needs and creating a customer experience that creates loyalty to the ski area. To ensure desirable skiing experience, the ski areas typically produce artificial snow and use the snow groomers to prepare the downhill slopes already before season-opening as well as during the whole winter season. Ski areas of all sizes are facing issues related to environmental sustainability and are increasingly forced to adopt tools created to implement the concept of sustainability in their business activities, such as management systems standards and ecolabels (Duglio & Beltramo, 2016; Polderman et al., 2020; Żemła, 2021).

Demonstrating environmental considerations and promoting conservation can help a ski area gain a competitive advantage (Kotler, 2011; Seetaram et al., 2018). Yet, providing sustainable value requires a deep understanding of what sustainability means to various actors as well as how the whole supply chain could collaborate in the value co-creating process as switching to more environmentally-friendly and sustainable strategies imposes significant additional costs on the ski area (Font et al., 2021; Kim et al., 2017). This raises an important question: can sustainability and ski area's profitability co-exist?

Some previous research has found that voluntary environmental initiatives such as the use of renewable energy, recycling, and easy access by public transport have a positive impact on ski areas' economic performance, although it could take at least two years before environmental intentions result in improved financial performance (Goncalves et al., 2016; Hart & Ahuja, 1996). The Global Sustainability Study 2021 survey reveals that more than a one third of global consumers is reporting being willing to pay more for sustainable products or services, and companies should, therefore, prepare for sustainability to become the expectation and not the exception in the future (Simon-Kucher & Partners, 2021). Yet to our knowledge there is only one existing study by Haugom et al. (2021) that has addressed the possibilities to combine pricing schemes with environmental consideration to make alpine skiing more sustainable. Therefore, the purpose of this study is to fill this knowledge gap by using sustainable consumption theory to investigate how consumer's preferences for sustainable service provider alternatives translates into willingness-to-pay (WTP).

The main contribution of this paper is twofold. Firstly, we answer to recent calls in literature (Field et al., 2021; Lim, 2017) to examine how the private sector can be encouraged to invest in building sustainable service systems to assist communities in becoming more resilient and sustainable. Secondly, using data from Norway and Switzerland, we contribute to the literature on sustainable service consumption by examining whether WTP for sustainable services differs in countries within relatively close

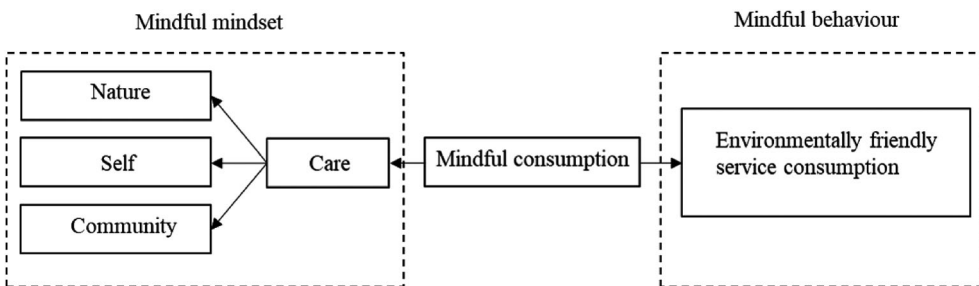
geographical proximity and bound by a common history, laws, and free labour and capital movement (Ganglmair-Wooliscroft & Wooliscroft, 2022; Gregory-Smith et al., 2017). The findings provide insights on how the ski area can incorporate environmental properties into the pricing strategy and justify incremental changes to pricing. We discuss these implications towards the end of the article.

## Theoretical background and hypotheses

### *Sustainable service consumption*

Although the field of sustainable consumption behaviour has become a fundamental concept for practitioners as well as for academics, there is no single definition of the word phrase among academic researchers (Lim, 2017). In general, sustainable consumption can be described as the decision-making process that considers the consumer's social responsibility in addition to individual needs and desires (Vermeir & Verbeke, 2006). In general, sustainable consumption embodies the dilemma of giving up personal benefits in favour of a more abstract, perhaps some intangible benefit to someone or something else (Hardisty & Weber, 2009).

One of the theoretical perspectives to understand sustainable consumption is mindful consumption. An engagement in mindful consumption emphasizes conscious choices in accordance with the consumer's values and preferences. To that extent, the consumer's mindset guides and shapes the behaviour in mindful consumption. Yet, the previous studies offering the understanding and conceptualization of mindful consumption, are mostly limited only to the consumption of goods (Lim, 2017). This is partly because the service sector has typically been perceived as less damaging to the environment than the manufacturing sector (Rosenblum et al., 2000; Sheth et al., 2011). Therefore, we set our analysis in the context of alpine skiing that responds to earlier calls in literature (Field et al., 2021; Lim, 2017) to place a greater focus on the mindful consumption of services. To this end, based on the model of mindful consumption offered by Lim (2017), we propose a conceptual model for mindful service consumption where we define a mindful behaviour as a choice of an environmentally-friendly service consumption (see Figure 1). A mindful mindset reflects a conscious sense of caring for self, community, and nature and is translated into the intent to consume in a way that improves one's well-being, and is in accordance with one's values (Sheth et al., 2011). Caring for self is not about being selfish or self-centred, but is about paying attention to one's well-being that includes both



**Figure 1.** A model for mindful service consumption. Adapted from Lim (2017).

eudemonic aspects such as happiness and economic aspects such as monetary sacrifices. Caring for community is essential both for collective well-being as well as individual well-being as most people find happiness in a social context (Dennis et al., 2016). Caring for nature is based on intrinsic, instrumental, and aesthetic values (Killbourne, 2006). While typical consumer decision making focuses on maximizing immediate utility for the self, mindful consumption choices involve longer-term benefits to other people and environment (White et al., 2019). Accordingly, we assume that a mindful mindset has the potential to lead to support of the service provider's initiatives to improve its environmental performance by choosing to consume environmentally-friendly service alternatives (see Figure 1).

### ***Sustainable consumption and WTP***

In the service sector, the lack of a clear definition of a production unit makes the assessment of environmental performance rather difficult. Yet, the service providers can improve their environmental performance by choosing, for instance, more environmentally-friendly product suppliers, reducing resource inputs in their operations, or educating their consumers about the relative merits of different services or company's engagement in other voluntary environmental initiatives. Ottman et al. (2006, p. 24) emphasize that

although no consumer product has a zero impact on the environment, in business, the terms 'green products' or 'environmental products' are used commonly to describe those that strive to protect or enhance the natural environment by conserving energy and/or resources and reducing or eliminating use of toxic agents, pollution, and waste.

Today's consumers claim to prefer companies that care about environment concerns. In fact, more than three-quarters of world's citizens claim to be willing to pay more for environmentally-friendly products. However, there remains a challenge in translating this willingness into actual purchases (Hughner et al., 2007; Kotler, 2011; Simon-Kucher & Partners, 2021; Young et al., 2010). A stated WTP is typically used as a valuation approach to assess a consumer's assigned value to a product or service, in our case WTP for environmentally-friendly skiing compared to conventional alternatives. Some previous studies have suggested that skiers are ready to pay more to visit ski areas attempting to reduce their environmental impact (Hudson & Ritchie, 2001; Needham & Little, 2013; Weiss et al., 1998). Moreover, skiers claim to visit a ski area that is environmentally-friendly more often in the future if the ski area more visibly promotes its initiatives to their visitors (Needham & Little, 2013). One way of providing information about service providers environmental initiatives and increase a positive effect on consumer's WTP is eco-labelling (Duglio & Beltramo, 2016; Eustice et al., 2019; Vecchio, 2013). Another way is to inform consumers about service provider's participation in carbon offsetting projects. The voluntary carbon credit market can be seen as an important component in the global effort to mitigate climate change. Examples of carbon offsetting project types include forestry, methane destruction, industrial gases, renewable energy, energy efficiency, and other (Broderick, 2008; CORE, 2020). There are several studies that have addressed WTP for non-compulsory carbon offset programmes (Brouwer et al., 2008; Casado-Díaz et al., 2020; Choi & Ritchie, 2014; Kostakis &

Sardianou, 2012; Seetaram et al., 2018). However, only very limited efforts have been made to investigate WTP for such programmes within the alpine skiing industry. Recently Haugom et al. (2021) have found that there is a substantial interest among alpine skiers to pay additional cost to compensate for the CO<sub>2</sub> emissions associated with the skiing activity. Based on the discussions above, we propose the following hypotheses:

*H1: Skiers would be willing to pay more for a one-day ski lift ticket in the ski area that is environmentally-certified.*

*H2: Skiers would be willing to pay more for a one-day ski lift ticket in the ski area that participates in carbon offsetting projects to balance out ski area's climate impact.*

Some consumers are more environmentally-friendly than others (Han, 2021). An environmentally-friendly consumer can be defined as an individual who is aware of global environmental problems and who chooses to make conscious buying decisions, by purchasing local, ethical and environmentally-friendly products and services. In general, environmental awareness positively affects demand and WTP for environmentally-friendly products and services (Casado-Díaz et al., 2020; Kostakis & Sardianou, 2012; Reynisdottir et al., 2008). Accordingly, we propose the following hypothesis:

*H3: The skiers that make up the environmental friendly segment would be willing to pay more for environmentally-friendly alpine skiing than the environmental unfriendly segment.*

Although skiers claim to choose an environmentally-responsible ski area over a ski area that is not involved in the voluntary environmental programmes, they tend to prioritize a high-quality skiing experience (i.e. quality of snow, number of ski slopes), often over environmental concerns (Damm et al., 2014; Kirk, 1995; Needham & Little, 2013; Weiss et al., 1998). Snow reliability is one of the main factors when choosing an alpine skiing destination (see e.g. Damm et al., 2014; Falk, 2013; Falk & Hagsten, 2016; Pütz et al., 2011; Unbehaun et al., 2008) and insufficient snow depth on ski slopes can result in a lower quality (e.g. undesirable snow conditions) as well as quantity and diversity of the alpine skiing product (e.g. partly closed ski areas, crowdedness on slopes) (Steiger et al., 2019). Due to investments in snow-making facilities, ski lift operators have become less sensitive to variations in natural snow depth (Falk & Lin, 2018). Previous research has pointed out that one of the main obstacles against sustainable consumption is the perceived trade-off between sustainability and functional product quality. Furthermore, even environmentally-friendly consumers tend to choose less sustainable products to ensure the superior functional performance of the chosen product or services as well as personal comfort level (Casado-Díaz et al., 2020; Haugom et al., 2021; Luchs & Kumar, 2017). Based on these considerations, we expect that:

*H4: Skiers would be willing to pay more for a one-day ski lift ticket in the ski area that ensures reliable snow cover by artificial snow production.*

## Methodology

### Data collection

The exploratory sequential mixed-method approach was used in this study. First, we conducted 40 semi-structured online interviews with skiers both in Switzerland and Norway

to understand skiers' general attitudes towards environmental issues related to alpine ski areas as well as skier's suggestions on how ski areas may improve their environmental performance (see Appendix 1 for interview guide). Once collected, the data from the interviews were summarized and presented in an online workshop to ski area representatives from Switzerland and Norway by the research team to identify the key environmental attributes associated with alpine skiing. After the workshop, we ended up with three environmental attributes each with two levels (environmental certification, carbon-neutral skiing, and usage of artificial snow) and the price attribute with four levels to be included in choice-based conjoint (CBC) questionnaire (see Table 1). A CBC questionnaire allows to determine attribute importance because of its ability to simulate a realistic decision-making situation (Rao, 2014).

The price levels were defined based on the average one-day ski pass prices in ski areas in Switzerland and Norway for the winter season 2019/2020 to prevent extreme response behaviour among respondents (Gensler et al., 2012). Extreme response behaviour tends to occur when the price is too high or too low. If the price is too high, the respondent will choose the option not to visit a ski area. While alternatives at too low prices will motivate the respondent to choose these alternatives over the no-purchase option. In order to ensure statistical efficiency, two criteria were taken into account when generating the hypothetical ski area alternatives: level balance and orthogonality (Rao, 2014). We used orthogonal main effect plan to ensure that each level of one attribute occurred with each level of another attribute with proportional frequencies. An orthogonal array ended in eight hypothetical ski area profiles. Eight choice sets were designed using the shifting method (Rao, 2014, p. 140). The initial orthogonal design for choice sets does, however, not achieve utility balance, and some of the alternatives in the choice sets did not make sense. In order to achieve more equal alternatives within each choice set, the swapping procedure was applied (Rao, 2014, p. 145). To keep the CBC model simple, respondents

**Table 1.** Attributes and attribute levels.

Attribute	Description	Levels
Environmental certification	Indicates whether the ski area is approved as environmentally-friendly with environmental certification (specific requirements related to energy conservation, waste management, charging stations for electric cars are fulfilled).	Yes
Carbon-neutral skiing	Indicates whether the ski area participates in carbon offsetting projects to balance out ski resort's climate impact (i.e. purchasing climate quotas corresponding to the average CO <sub>2</sub> footprint from skiing throughout an entire season).	No
		Yes
Natural snow	Indicates whether the ski area is dependent only on natural snow cover to prepare ski slopes.	No
		Yes
Price	Price for one-day ski pass.	No (it also produces artificial snow to ensure the necessary amount of snow on the ski slopes)
		EUR 30
		EUR 40
		EUR 50
		EUR 60

If you were considering visiting a ski area and these two were the only alternatives, which of the ski area would you choose to visit?

*Please assume that these two ski areas are different only in these features and you have decided to buy a one-day ski pass.*

Ski area 1	Ski area 2	No-purchase option
Environmental certification	<b>NO</b> environmental certification	I would not visit any of these two ski areas
Carbon-neutral	<b>NOT</b> carbon-neutral	
<b>Only natural</b> snow	Artificial snow	
EUR 60 (one-day ski pass)	EUR 30 (one-day ski pass)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Figure 2.** An example of CBC choice set.

were told to imagine they were choosing among alternatives of two hypothetical ski areas that are different only in terms of their environmental responsibility. The no-visit option was included to make experimental setting more realistic (Parker & Schrift, 2011) and to estimate the purchase threshold (Gensler et al., 2012). See Figure 2 for an example of CBC choice set.

Previous research have emphasized that respondents may tend to respond in a socially desirable manner (Fisher, 1993) when they are asked about their WTP more for environmentally-friendly products. But this willingness does not necessarily correspond to their actual behaviour (see e.g. Gerpott & Mahmudova, 2010; Perrini et al., 2010). To control for socially desirable answers, we included a short form (12 items) of the original 20-item Impression Management subscale of the original Balanced Inventory of Desirable Responding (BIDR) measurement (Asgeirsdottir et al., 2016; Paulhus, 1991) in the questionnaire. Additionally we included a control question capturing the respondents' self-identity as "green" consumer, as it may influence their preferences for sustainable products and services (Olson, 2013). We asked respondents to evaluate their level of agreement with the following statement: "It is important to me that the products I purchase are environmentally-friendly".

The questionnaire is attached in Appendix 2. Data quality from the questionnaire may suffer also from respondents who respond "randomly" without considering the content of the item. However, such careless respondents could be detected by screener questions (Berinsky et al., 2014; Meade & Craig, 2012). Accordingly, we have included two screener questions in our questionnaire. As the first screener, we used an instructed response item where we gave a respondent instruction on how to answer a question: "Please mark *Somewhat agree now*" and as the second screener we used two identical CBC choice sets.

The CBC questionnaire was conducted in Norway (in Norwegian) and Switzerland (in German) in the period between 29 September and 12 October 2020. Five-hundred

Norwegian residents and 500 Swiss residents were recruited from a large online panel to participate in an online questionnaire. When recruiting participants, we used a screening question to ensure that respondents are familiar with alpine skiing (“Have you ever tried alpine skiing or snowboarding before?”). Those answering no to this question did not participate in the survey.

### Model specification

We use the CBC method to examine skiers’ preferences and to estimate their WTP for a more sustainable skiing experience. The CBC approach is like an experiment where, for a series of various product or service choice sets, an individual is asked to choose one alternative from the choice set. The choice theory assumes that an individual acts rationally so that the utility of the alternative chosen exceeds the utility of all other alternatives (e.g. different ski areas) under consideration (Rao, 2014, p. 129). Accordingly, the utility function of a chosen product alternative  $i$  can be defined as follows:

$$U_i = V(\beta, X_i) + \varepsilon_i \quad (1)$$

where  $V$  is a function of the attribute levels of the alternative  $i$ ,  $\varepsilon_i$  is a random error term,  $X_i$  is a vector of attribute levels of the alternative  $i$ , and  $\beta$  is a vector of estimated coefficients that are weights associated with each attribute level. In a real-life situation, skiers have the opportunity to refrain from visiting a ski area at all; therefore, a *none* option should be included in the choice sets. Accordingly, assuming that  $\varepsilon_i$  follows an extreme-value distribution (McFadden, 1973), the choice probability (including a none alternative) obtained by an alternative  $i$  among a set of  $j$  alternatives can be defined by the following logit model:

$$\Pr(\text{choice} = i) = \begin{cases} \frac{e^{V(\beta, X_i)}}{1 + \sum_{j=1}^n e^{V(\beta, X_j)}} & i \neq \text{None} \\ \frac{1}{1 + \sum_{j=1}^n e^{V(\beta, X_j)}} & i = \text{None} \end{cases} \quad (2)$$

In other words, the probability of choosing alternative  $i$  is a function of both the attribute levels of alternative  $i$  and the attribute levels of all other alternatives under consideration. The none option does not have a systematic utility, since it has no attributes and the systematic utility component is zero ( $e^0 = 1$ ) (Paczkowski, 2018).

### Results and discussion

Filtering out careless respondents who failed screener questions, we ended up with a sample of 801 respondents, of which 392 were Norwegian residents and 409 Swiss residents. The average age in the Norwegian sample is 43 and 47 years in the Swiss sample. While more than 60% of the Norwegian respondents have an average net income of EUR 60,000 or more, only approximately 48% of the Swiss respondents fell into these high-income groups. The average score on impression management items were approximately 3 for Norwegian respondents and 4 for respondents in Switzerland. The total scores on impression management items can range from 0 to 12. Accordingly, our results indicate that respondents in the current study do not tend to systematically



overreport their performance of desirable behaviour. However, the responses to the environmental friendliness statement showed a non-uniform distribution of the various alternatives. Specifically, the respondents in our sample have mostly chosen the response “Neither agree nor disagree” and “Somewhat agree”. For this reason, and to better contrast between environmentally-friendly and unfriendly skiers, we chose to use a dummy specification of the variable measuring environmental-friendliness. We have defined those who have answered “Agree” or “Strongly agree” to the statement “It is important to me that the products I purchase are environmentally-friendly” as environmentally-friendly skiers.<sup>1</sup> The complete descriptive statistics are given in Table 2.

Each respondent was asked eight choice experiment questions similar to that presented in Figure 2. Accordingly, the number of events was calculated by multiplying the number of respondents by the choice sets per respondent. The total number of events in this study is 6408<sup>2</sup> which fulfils the minimum requirements of the CBC analyses (see e.g. Orme, 2010). We analysed the respondents’ choice data using a conditional logit model, which is based on the random utility theory (McFadden, 1973). The respondent’s utility is divided into a representative component and a random component. The representative component of utility for the no-purchase option is normalized to 0. In the present study, we use four separate model specifications.

By examining the effect of the respondent’s valuation of the attributes *Environmental certification*, *Carbon neutral*, and *Natural snow*, the systematic component of the utility of

**Table 2.** Sample characteristics.

Variable	Norway	Switzerland
<b>N</b>	392	409
Gender (%)	<b>100.00</b>	<b>100.00</b>
Male	47.70	50.61
Female	52.30	49.39
Average age (years)	<b>42.81</b>	<b>46.93</b>
	Median = 41.50	Median = 48.00
	SD = 15.82	SD = 17.06
Education level (%)	<b>100.00</b>	<b>100.00</b>
Higher education	66.59	40.58
High school Diploma or equivalent	30.36	48.67
Other	3.05	10.75
Net income (%)	<b>100.00</b>	<b>100.00</b>
Below EUR 10 000	1.79	10.51
EUR 10 000–30 000	3.06	6.11
EUR 30 001–60 000	16.58	17.36
EUR 60 001–90 000	21.68	24.45
EUR 90 001–120 000	16.07	13.94
More than EUR 120 000	22.45	10.03
Prefer not to answer	18.37	17.60
Average number of skiing days in a typical season	<b>4.00</b>	<b>5.26</b>
	Median = 2.00,	Median = 4.00
	SD = 5.40	SD = 5.52
Environmental consciousness (%)	<b>100.00</b>	<b>100.00</b>
Environmentally-conscious	24.23	54.53
Environmentally-unconscious	75.77	45.47
BIDR-6, 12 Impression management items scale	<b>3.43</b>	<b>4.25</b>
	Median = 3.00	Median = 4.00
	SD = 2.26	SD = 2.95

Note: All monetary values are converted from Norwegian kroner and Swiss francs to euro.

respondent  $n$  for choosing the skiing day alternative  $i$  is as follows (Model 1):

$$V_{in} = ASC_i + \beta_1 EC_{in} + \beta_2 CN_{in} + \beta_3 NS_{in} + \beta_4 Price_{in} \quad (3)$$

where  $ASC$  is the alternative-specific constant;  $EC$  represents a dummy variable taking a value of 1 if a ski area is approved with environmental certification, and 0 otherwise;  $CN$  is a dummy variable taking a value of 1 if a ski area participates in carbon offsetting projects, and 0 otherwise;  $NS$  is a dummy variable taking value of 1 if a ski area is dependent only on natural snow, and 0 otherwise, and the  $Price$  it the price variable. Additionally, we examine the effect of the respondent's country of residence and environmental friendliness on their valuation of attributes *Environmental certification*, *Carbon neutral*, and *Natural snow* in the Models 2, 3, and 4, where *Switzerland* is a dummy variable taking a value of 1 if respondent  $n$  is Swiss resident, 0 if Norwegian; *Env friendly* is a dummy variable taking a value of 1 if respondent  $n$  is an environmentally-friendly, 0 otherwise.

The estimation results are presented in Table 3 and indicate that all environmental attributes have positive and statistically significant coefficients, indicating that skiers evaluate environmental initiatives positively (Model 1). Among the three attributes the strongest effects are found for *environmental certification* and *only natural snow* and the weakest effect *carbon neutral ski area* when considering the whole sample. Model 2

**Table 3.** Estimation results using conditional logit models.

Attribute	Model 1	Model 2	Model 3	Model 4
ASC	2.187*** (0.097)	2.202*** (0.097)	2.196*** (0.098)	2.201*** (0.098)
Environmental certification	0.884*** (0.047)	0.781*** (0.052)	0.872*** (0.054)	0.852*** (0.050)
Carbon-neutral ski area	0.389*** (0.035)	0.330*** (0.042)	0.046*** (0.046)	0.382*** (0.040)
Only natural snow	0.843*** (0.042)	0.712*** (0.047)	0.477*** (0.051)	0.665*** (0.045)
Price	-0.050*** (0.003)	-0.050*** (0.003)	-0.050*** (0.003)	-0.050*** (0.003)
<i>Interaction effects</i>				
Environmental certification × Environmentally-friendly		0.274*** (0.056)		
Carbon-neutral ski area × Environmentally-friendly		0.161*** (0.060)		
Only natural snow × Environmentally-friendly		0.342*** (0.056)		
Environmental certification × Switzerland			0.037 (0.055)	
Carbon-neutral ski area × Switzerland			-0.065 (0.059)	
Only natural snow × Switzerland			0.721*** (0.055)	
Environmental certification × Environmentally-friendly × Switzerland				0.148*** (0.062)
Carbon-neutral ski area × Environmentally-friendly × Switzerland				0.048 (0.066)
Only natural snow × Environmentally-friendly × Switzerland				0.658*** (0.062)

Notes: level. ASC – alternative-specific constant for each alternative relative to the “none of these” option (the observed component of utility for the option is normalized to 0). Number of events = 6,408. Model estimation was performed using the Support. CEs package in R statistical software.

\*\*\* Significant at the 1% level. \*\* Significant at the 5% level. \* Significant at the 10%

examines the differences in the effects from the various attributes for environmentally-friendly skiers compared to those who are not. The results show that skiers that fall into the environmentally-friendly group value a ski area's environmental initiatives significantly more positively than those in the "environmentally-unfriendly" group. This study uses data from Norway and Switzerland which makes it possible to examine potential differences in the effects between skiers in Norway and Switzerland (Model 3). The coefficients of the interaction terms in this model indicate whether skiers in Switzerland value the various attributes different than their peers in Norway. The results show that the attributes *Environmental certification* and *Carbon-neutral ski area* are not valued significantly different by skiers in Switzerland (coefficient not significantly different from zero). However, the interaction term between the attribute *only natural snow* and *Switzerland* is positive and statistically significant. This is further supported in Model 4 where we have interacted the environmental attributes with both the *environmental friendliness* and country of residence (*Switzerland*). The results for the three-way interactions show that one or more of the three possible two-way interactions differ across a third level. As the two-way interactions showed a positive and significant effect for the Switzerland interactions, the results could indicate that environmentally-friendly Swiss respondents value both environmental certification and natural snow higher than Norwegians. The effect of the *price* variable is, as expected and in line with general economic theory, negative and statistically significant. The price variable is used to estimate marginal WTP for the various attributes which we discuss next.

### Marginal WTP

Each of the product alternatives was presented together with a price which allows us to estimate the WTP each potential skier has for each product alternative level. Varying WTP represents the various monetary values that skiers give to the attribute levels associated with each product alternative—a more desirable alternative level will have a higher associated WTP (Phillips, 2005). We used estimated coefficients from the conditional logit model ( $V_{in} = ASC_i + \beta_1 EC_{in} + \beta_2 CN_{in} + \beta_3 NS_{in} + \beta_4 Price_{in}$ ) to calculate how much an average visitor would be willing to pay for the selected level of an attribute that reflects ski area's environmental responsibility. The marginal willingness-to-pay (MWTP) for each non-monetary variable can be estimated by the function:

$$MWTP = -\beta_{nm}/\beta_m \quad (4)$$

where  $\beta_{nm}$  is the estimated coefficient of the non-monetary variable and  $\beta_m$  is the estimated coefficient of a price variable.

In Table 4, we see that an average skier is in general report being willing to pay more for one-day ski pass when visiting a ski area that is environmentally-certified or participates in voluntary carbon offsetting projects, supporting *H1* and *H2*. An average skier report being indifferent between skiing at the environmentally-certified ski area and paying approximately EUR 18 more for one-day ski pass and skiing at a ski area that does not have environmental certification. When it comes to the ski area's participation in carbon offsetting projects, an average skier report being willing to pay, on average EUR 8 extra for a day-pass to support ski area's engagement in such projects.

**Table 4.** Marginal WTP for various attributes in case of one-day ski pass.

Attribute	Model 1	Model 2	Model 3	Model 4
Environmental certification	EUR 17.73 [16.47, 19.08]	EUR 15.57 [14.09, 17.13]	EUR 17.36 [15.70, 19.12]	EUR 16.95 [15.55, 18.43]
Carbon- neutral ski area	EUR 7.80 [6.55, 9.11]	EUR 6.58 [5.04, 8.19]	EUR 8.51 [6.80, 10.29]	EUR 7.60 [6.15, 9.13]
Only natural snow	EUR 16.91 [15.66, 18.32]	EUR 14.19 [12.73, 15.72]	EUR 9.49 [7.86, 11.12]	EUR 13.23 [11.88, 14.64]
<i>Interaction effects</i>				
Environmental certification × Environmentally-friendly		EUR 5.46 [3.25, 7.78]		
Carbon-neutral ski area × Environmentally-friendly		EUR 3.21 [0.87, 5.61]		
Only natural snow × Environmentally-friendly		EUR 6.82 [4.57, 9.22]		
Environmental certification × Switzerland			EUR 0.75 [−1.44, 2.92]	
Carbon-neutral ski area × Switzerland			EUR −1.29 [−3.60, 0.98]	
Only natural snow × Switzerland			EUR 14.35 [11.92, 17.19]	
Environmental certification × Switzerland × Environmentally-friendly				EUR 2.94 [0.51, 5.47]
Carbon- neutral ski area × Switzerland × Environmentally-friendly				EUR 0.95 [−1.67, 3.54]
Only natural snow × Switzerland × Environmentally-friendly				EUR 13.09 [10.46, 15.93]

Note: We assume that ski areas are different only in these three attributes. 95% CI in square bracket.

While some previous research has pointed out that even the most environmentally-friendly consumers do not always act in environmentally-friendly ways when they are on leisure trips (see e.g. Barr & Prillwitz, 2012; Juvan & Dolnicar, 2014; McDonald et al., 2012; Passafaro et al., 2015), the results of our study show that environmentally-friendly skiers report being willing to pay more for more environmentally-friendly alpine skiing than environmentally-unfriendly skiers and therefore support our hypothesis *H3*.

Our results do not support *H4* as skiers have higher reported marginal WTP for skiing at a ski area that operates only with natural snow than a ski area that produces artificial snow. The results are in line with Unbehaun et al. (2008) who find that the majority of skiers are willing to choose more expensive, but natural snow secure skiing destinations and accept artificial snow as a necessity that ensures sufficient snow conditions for the skiing activity itself (Unbehaun et al., 2008). Accordingly, the artificial snow production is not perceived as a positive attribute of a ski area to pay an additional cost for. In addition, in terms of WTP an average skier in Switzerland value ski area's possibility to operate only with natural snow cover higher than an average skier in Norway. Such findings could be attributed to the fact that ski areas in Switzerland are typically situated at higher altitudes compared to those in Norway. While Norwegian ski areas are naturally located at higher latitudes than Swiss resorts, the combined effects of climate and altitude in Norway may necessitate a greater reliance on artificial snow production to ensure adequate snow conditions (Landsforening, 2020; Scott et al., 2020; Statista, 2018).

To further examine whether the environmental attributes were valued differently in Switzerland and Norway, we also interacted the attributes with the environmental friendly

segment and country. This way we can document differences in the reported WTP among the skiers who claim being environmental-friendly in the two countries. The results of the models when including these variable specifications suggest that environmentally-friendly skiers in Switzerland have a significantly higher reported marginal WTP for both *environmental certification* and *natural snow* when compared to environmentally-friendly skiers in Norway.

## Conclusions and managerial implications

Voluntary environmental initiatives may have a positive impact on a company's economic performance and may ensure higher profits in the long run if the company is not only able to operate more sustainable but also promote sustainable consumption (Goncalves et al., 2016; Hart & Ahuja, 1996). In this article, we have examined how customers' preferences for sustainable service alternatives translates into WTP for an opportunity to ski at an environmentally-friendly ski area. The results of this study both negate and support some of the hypotheses. Alpine skiers, especially environmentally-friendly skiers, report being willing to pay more for a day pass if the ski area is either (1) environmentally-certified, (2) carbon-neutral, or (3) uses only natural snow.

While skiers, in general, report being willing to pay more for a one-day skiing experience at an environmentally-friendly ski area their valuation of environmentally-certificated or carbon-neutral ski area is not statistically different between Switzerland and Norway.

WTP for various environmental initiatives at a ski area is affected by how environmentally-friendly the skiers are. Considering that the sense of belonging to a so-called environmentally-friendly group (i.e. mindful mindset) could lead consumers to make pro-environmental choices (i.e. mindful behaviour) also at higher prices, service providers can offer the opportunity to buy a more expensive but environmentally-friendly service alternative. In the case of alpine ski area, it could be a "green" ski pass. Often environmentally-friendly consumers have a desire to make a positive impression on others in public contexts (Green & Peloza, 2014; Van der Werff et al., 2013). As compensation for the pro-environmental purchase, some additional and visible benefits could be included in such a "green" ski pass. Additionally, skiers' WTP are dependent on their knowledge about environmental initiative a ski area are practicing (see e.g. Needham & Little, 2013). A ski area should therefore have a strategy to highlight its voluntary environmental initiatives, either on a website or by environmental-labelling. Many official environmental certifications are not affordable or achievable by most ski areas. However, according to our interviews with ski area managers, skiers positively evaluate the ski areas' environmental self-certification verifying and proclaiming its pro-environmental initiatives at a fixed point in time. This study highlights that a ski area that is able to operate without artificial snow production has a substantial competitive advantage compared with those not able to do so. In general, our findings could possibly support decision-makers to take the initial step toward a more sustainable operation supported by innovative pricing approaches. In other words, rather than increasing the ski area's pro-environmental activities and merely targeting the environmentally-friendly skier segment, the ski area can expand its market for the long-term mutual benefits of the ski area and the planet by the implementation of regular and "green" ski tickets. Consequently, as the ski area operates in a more sustainable manner, variable pricing might stimulate skiers to be active participants in

sustainable value creation and simultaneously helping the ski area to maximize its sustainability and strategic business benefits. Such variable pricing is based on the principle of consumer self-segmentation and can therefore be considered a fair practice, especially if communicated through collective efficacy of engaging in pro-environmental actions (White et al., 2019).

We expected that skiers would be willing to pay more for a one-day ski lift ticket in a ski area that used artificial snow production, but this, however, turned out not to be the case. This is rather surprising, because, due to climate change, many ski areas may suffer from insufficient snow amount to ensure good quality of the ski slopes and previous research by Luchs and Kumar (2017) has emphasized that consumers tend to choose less sustainable products to ensure superior quality of chosen product alternative. Future studies on the current topic are therefore required in order to elucidate perceived values of sustainable service consumption and monetary and quality sacrifices by the consumer.

Our research has some limitations that should be acknowledged. This study examines only two levels of snow-related variables and the inclusion of several levels of this attribute (e.g. ski area that operates only with artificial snow<sup>3</sup>) in future studies could improve the understanding of skiers' evaluation of the artificial snow production and WTP for sufficient snow cover on ski slopes.

Although we estimated marginal WTP for sustainable alpine skiing in a setting close to real purchase decisions, a limitation of our research is that hypothetical WTP methods such as CBC approach tend to overestimate real WTP (Schmidt & Bijmolt, 2019). Therefore, we suggest that future research should validate our research results using experimental designs, measuring actual purchase decisions.

Another potential limitation is the use of a single-item variable to measure environmental friendliness. A multi-item measure in combination with factor analysis or the use of hybrid choice models could improve the analysis and enhance our insights further.<sup>4</sup>

Peng and Lin (2009) have stressed out that education can act as mediation linking cultural values and environmental performance. In this study, we do not examine what effect the skiers' education level has on evaluation of environmental attributes, because our sample was somehow overrepresented by respondents with high school education (49%) in Switzerland, while in Norway 67% had a higher education. Therefore, future studies are needed to deepen scholars' and practitioners' understanding on how education level affects evaluation of the ski area's initiatives to operate in more environmentally-friendly way.

In this study, we do not find a statistically significant difference between skiers in Switzerland and Norway when it comes to their evaluation of environmentally-certificated or carbon-neutral ski area. However, previous research has documented that consumers' cultural characteristics can influence attitudes toward the environment and intention to behave environmentally (Auger et al., 2010; Dangelico et al., 2020; Ganglmair-Wooliscroft & Wooliscroft, 2022; Morren & Grinstein, 2016; Thøgersen, 2010). It would therefore be interesting to examine, how skiers' cultural background affects their WTP for environmentally-friendly alpine skiing in future studies.

The current study is an exploratory endeavour, based on environmental initiatives of a single service industry. This limitation affects the generalizability of the findings, as some context-specific factors might have steered our study in a certain direction. Yet, we do

believe that the framework we present can be adopted by practitioners and scholars from the service industry more generally.

## Notes

1. Testing various specifications of this variable revealed that a dummy specification best revealed the contrast between the environmentally-friendly and unfriendly skiers.
2. The number of events in Norway – 3,136 = 392 × 8 and in Switzerland – 3,272 = 409 × 8.
3. We thank an anonymous referee for suggesting these attribute levels for future research.
4. We thank an anonymous referee for suggesting these directions for future research.

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## Appendix 1

### INTERVIEW GUIDE (skiers)

This interview is a part of a research project in the alpine skiing industry. The main purpose of this interview is to understand environmental issues related to ski resorts.

1. How often, in a typical season, do you go skiing?
2. What kind of ski pass do you typically purchase?
3. How environmentally-friendly is alpine skiing today? Can you explain your answer?
4. What is your attitude towards the environment?
5. What is it that ski resorts could do in order to become more environmentally-friendly?
6. Which specific actions (e.g. carbon offsets) should ski resorts implement in order to set them positively apart in terms of environmental impact/sustainability?

### BACKGROUND QUESTIONS:

1. Gender?
2. Age?
3. Place of residence?

## Appendix 2

### CUSTOMER SURVEY ABOUT SKIERS' WILLINGNESS-TO-PAY FOR MORE SUSTAINABLE SKIING EXPERIENCE

The main purpose of the questionnaire:

This questionnaire is a part of a research project in the alpine skiing industry. The main purpose of this interview is to understand environmental issues related to ski resorts and estimate the skiers' willingness-to-pay to visit a ski area attempting to reduce its environmental impacts.

The interview will take approximately 7 min. We highly appreciate your response.

Q1. Have you ever tried alpine skiing or snowboarding before?

- Yes
- No —> **END QUESTIONNAIRE**

Q2. In a typical season, how many days do you ski at a ski resort?

\_\_\_\_\_ days

Q3. What level of skiing/snowboarding are you at?

- A beginner
- At intermediate level
- Advanced
- An expert
- Other (please specify)

Q4. What kind of ski pass do you typically purchase?

- One-day ski pass
- Multi-day ski pass
- Season pass
- Single run
- Other (please specify)\_\_\_\_\_

Q5. Do you usually rent skiing/snowboarding equipment at the ski resort?

- Yes, I rent it at the resort
- No, I bring my own
- Other (please specify)

Q6. What mode(s) of transportation do you usually use to get to the ski resort? (you may choose more than one answer)?

- Car
- Electric car
- Train
- Airplane
- Bus
- Ferry
- Other(please specify)

Q7. What is your total budget for one skiing day **per person** (including ski rental, ski pass, transportation, restaurant etc.)?

\_\_\_\_\_ EUR

Q8. Please evaluate your level of agreement with the following statement.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
It is important to me that the products I purchase are environmentally-friendly.							

Q9. Please mark "Somewhat agree" now:

	Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
Mark as indicated	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

In the following questions, we ask you to evaluate **nine pairs** of ski resorts that differ in terms of their environmental responsibility and choose which you would like to visit.

Before doing so, it is important that you read the information listed below carefully!

ENVIRONMENTAL CERTIFICATION – this statement indicates that ski resort operation is approved as environmentally-friendly with environmental certification (requirements related to energy conservation, waste management, charging station for electric cars are fulfilled)

**NO ENVIRONMENTAL CERTIFICATION** - this statement indicates that ski resort operation is **NOT** approved as environmentally-friendly (requirements related to energy conservation, waste management, charging station for electric cars are **NOT** fulfilled)

**CARBON – NEUTRAL** – this statement indicates that ski resort participates in carbon offsetting projects to balance out ski resort’s climate impact (i.e. purchasing climate quotas corresponding to the average CO2 footprint from skiing throughout an entire season)

**NOT CARBON – NEUTRAL** - this statement indicates that ski resort **DOES NOT** participate in carbon offsetting projects to balance out ski resort’s climate impact.

**ONLY NATURAL SNOW** – ski resort is dependent only on natural snow cover to prepare ski slopes

**ARTIFICIAL SNOW** – Ski resort produces artificial snow to ensure the necessary amount of snow on the ski slopes

Q10. If you were considering visiting a ski resort and these two were the only alternatives, which of the ski resort would you choose to visit?

*Please assume that these two ski resorts are different only in these features and you have decided to buy a one-day ski pass.*

Ski resort 1	Ski resort 2	No-purchase option
Environmental certification	<b>NO</b> environmental certification	I would not visit any of these two ski resorts
Carbon-neutral	<b>NOT</b> carbon-neutral	
<b>Only natural</b> snow	Artificial snow	
EUR 60 (one-day ski pass)	EUR 30 (one-day ski pass)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q11. If you were considering visiting a ski resort and these two were the only alternatives, which of the ski resort would you choose to visit?

*Please assume that these two ski resorts are different only in these features and you have decided to buy a one-day ski pass.*

Ski resort 1	Ski resort 2	No-purchase option
<b>NO</b> environmental certification	Environmental certification	I would not visit any of these two ski resorts
<b>NOT</b> carbon-neutral	<b>NOT</b> carbon-neutral	
Artificial snow	<b>Only natural</b> snow	
EUR 50 (one-day ski pass)	EUR 60 (one-day ski pass)	
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q12. If you were considering visiting a ski resort and these two were the only alternatives, which of the ski resort would you choose to visit?

*Please assume that these two ski resorts are different only in these features and you have decided to buy a one-day ski pass.*

Ski resort 1	Ski resort 2	No-purchase option
Environmental certification <b>NOT</b> carbon-neutral Artificial snow EUR 40 (one-day ski pass) <input type="checkbox"/>	<b>NO</b> environmental certification Carbon-neutral <b>Only natural</b> snow EUR 50 (one-day ski pass) <input type="checkbox"/>	I would not visit any of these two ski resorts    <input type="checkbox"/>

Q13. If you were considering visiting a ski resort and these two were the only alternatives, which of the ski resort would you choose to visit?

*Please assume that these two ski resorts are different only in these features and you have decided to buy a one-day ski pass.*

Ski resort 1	Ski resort 2	No-purchase option
Environmental certification Carbon-neutral Artificial snow EUR 40 (one-day ski pass) <input type="checkbox"/>	<b>NO</b> environmental certification <b>NOT</b> carbon-neutral <b>Only natural</b> snow EUR 30 (one-day ski pass) <input type="checkbox"/>	I would not visit any of these two ski resorts    <input type="checkbox"/>

Q14. If you were considering visiting a ski resort and these two were the only alternatives, which of the ski resort would you choose to visit?

*Please assume that these two ski resorts are different only in these features and you have decided to buy a one-day ski pass.*

Ski resort 1	Ski resort 2	No-purchase option
Environmental certification <b>NOT</b> carbon-neutral <b>Only natural</b> snow EUR 60 (one-day ski pass) <input type="checkbox"/>	<b>NO</b> environmental certification Carbon-neutral Artificial snow EUR 30 (one-day ski pass) <input type="checkbox"/>	I would not visit any of these two ski resorts    <input type="checkbox"/>

Q15. If you were considering visiting a ski resort and these two were the only alternatives, which of the ski resort would you choose to visit?

*Please assume that these two ski resorts are different only in these features and you have decided to buy a one-day ski pass.*

Ski resort 1	Ski resort 2	No-purchase option
<b>NO</b> environmental certification Carbon-neutral Artificial snow EUR 60 (one-day ski pass) <input type="checkbox"/>	Environmental certification <b>NOT</b> carbon-neutral Artificial snow EUR 50 (one-day ski pass) <input type="checkbox"/>	I would not visit any of these two ski resorts    <input type="checkbox"/>

Q16. If you were considering visiting a ski resort and these two were the only alternatives, which of the ski resort would you choose to visit?

*Please assume that these two ski resorts are different only in these features and you have decided to buy a one-day ski pass.*

Ski resort 1	Ski resort 2	No-purchase option
<b>NO</b> environmental certification <b>NOT</b> carbon-neutral <b>Only natural</b> snow EUR 40 (one-day ski pass) <input type="checkbox"/>	<b>NO</b> environmental certification Carbon-neutral Artificial snow EUR 30 (one-day ski pass) <input type="checkbox"/>	I would not visit any of these two ski resorts    <input type="checkbox"/>

Q17. If you were considering visiting a ski resort and these two were the only alternatives, which of the ski resort would you choose to visit?

*Please assume that these two ski resorts are different only in these features and you have decided to buy a one-day ski pass.*

Ski resort 1	Ski resort 2	No-purchase option
<b>NO</b> environmental certification Carbon-neutral <b>Only natural</b> snow EUR 40 (one-day ski pass) <input type="checkbox"/>	Environmental certification Carbon-neutral Artificial snow EUR 50 (one-day ski pass) <input type="checkbox"/>	I would not visit any of these two ski resorts    <input type="checkbox"/>

Q18. If you were considering visiting a ski resort and these two were the only alternatives, which of the ski resort would you choose to visit?

*Please assume that these two ski resorts are different only in these features and you have decided to buy a one-day ski pass.*

Ski resort 1	Ski resort 2	No-purchase option
Environmental certification Carbon-neutral <b>Only natural</b> snow EUR 60 (one-day ski pass) <input type="checkbox"/>	<b>NO</b> environmental certification <b>NOT</b> carbon-neutral Artificial snow EUR 30 (one-day ski pass) <input type="checkbox"/>	I would not visit any of these two ski resorts    <input type="checkbox"/>

Q19. How much do you agree with the following statements about yourself?

	Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
I sometimes tell lies if I have to.							
I never cover up my mistakes.							
There have been occasions when I have taken advantage of someone.							
I never swear.							
I sometimes I try to get even rather than forgive and forget.							
I have said something bad about a friend behind his/her back.							

(Continued)



Continued.

	Strongly disagree	Disagree	Somewhat disagree	Neither agree or disagree	Somewhat agree	Agree	Strongly agree
When I hear people talking privately, I avoid listening.							
I always declare everything at customs.							
I sometimes drive faster than the speed limit.							
I have taken sick leave from work or school even though I was not sick.							
I have some pretty awful habits.							
I do not gossip about other people's business.							

Q20. Gender

- Male
- Female

Q21. Age?

\_\_\_\_\_ years old

Q22. What is your place of residence?

Country\_\_\_\_\_

Q23. What is the highest level of education you have attained?

- Doctoral level degree
- Master's degree
- Bachelor's degree
- High school Diploma or equivalent
- Less than high school completion
- Other (please specify)

Q24. What is your household's approximate total NET income?

- Below EUR 10 000
- EUR 10 000 – EUR 30 000
- EUR 30 001 – EUR 60 000
- EUR 60 001 – EUR 90 000
- EUR 90 001 – EUR 120 000
- More than EUR 120 000
- Prefer not to answer

THANK YOU!