



Original research article

# Public responses to an environmental transport policy in Sweden: Differentiating between acceptance and support for conventional and alternative fuel vehicles

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## ABSTRACT

Understanding public responses to environmental policies can help in achieving a move towards more renewable energy. Focusing on two types of public responses to a policy, namely public acceptance and public support, this study utilizes a survey of car owners (N = 1422) to explore public responses to an environmental transport policy in Sweden. The results demonstrate higher levels of public acceptance than support for the policy and that adopters of Alternative Fuel Vehicles (AFVs) are more prone to accept and support the policy by expressing higher intentions for continuous AFV adoption. Results of regression analyses show that policy acceptance can be explained by environmental beliefs and previous experience with AFVs. In addition, public support is also explained by public acceptance, even when controlling for other factors, which lends support to the deduction that policy acceptance can be theorized as antecedent to policy support. This study emphasizes the importance of understanding different types of public responses to an energy policy in order to recognize drivers for, and barriers against, successfully implementing a policy and communicating it with the public.

## 1. Introduction

One of the most pressing sustainability issues currently is the level and increase of transport worldwide. Transportation results in many environmental problems of which the most serious ones are carbon dioxide (CO<sub>2</sub>) emissions, giving rise to climate change, and fossil oil depletion. Evidence also points at, compared to other sectors, the contribution of the transport sector to environmental degradation has become worse over the years [1]. In addition, it has been argued that transport is one of the most important sectors for achieving sustainable development overall [2], and that transportation has been unsuccessfully addressed in policy-making so far [1,3]. To meet these sustainability and policy challenges, the European Union (EU) has established several goals to reduce carbon emissions and increase the share of renewable fuels in transportation systems [4]. Similarly, single member states, such as Sweden, have decided on goals and environmental policies for increasing the share of renewable fuels and promoting socio-technical transitions to a less environmentally harmful transportation system [5]. One example is the Swedish environmental transport policy “Fossil fuel independent car fleet by 2030” which is the focal research

interest in this paper. This policy targets the replacement of fossil fuel based cars with Alternative Fuel Vehicles (AFVs, i.e., car that can run on other fuels than fossil based gasoline and diesel primarily, such as different types of electric vehicles, EVs) by the year 2030. Announced in 2009, this policy has ever since been discussed and, in some instances, criticized for being poorly communicated and overly ambitious considering the lack of actual measures so far taken to reach it [6]. As such the policy has been debated ever since its announcement, yet, little is known about the public responses to this specific energy policy and individuals’ willingness to support the policy by taking actions. This is a problem since previous research shows that above and beyond politicians’ consistency and commitment to a policy, understanding public responses to a policy is important for increasing its chances for successful fulfilment [3,7–10]. Moreover, users, in this case car owners, contribute to the formation of public opinion, which is often formative for activities at the political level [11,12]. In this light, understanding the public responses to the “Fossil fuel independent car fleet by 2030” policy may uncover drivers for and barriers against successfully communicating and implementing renewable and sustainable energy policies in general.

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Also from a theoretical perspective, understanding more about public responses is important. In the literature where public responses to environmental policies is investigated, several studies use the term ‘public acceptance’, which in some studies is discussed synonymously with the term ‘public support’ [13], and in some studies not [14,15]. This conceptual ambiguity creates both empirical and theoretical problems. Theoretically, by not making a clear distinction between the two terms, there is a risk that acceptance is taken to mean support and vice versa. This is not only confusing, but also hinders theoretical development and the possibility to relate to other psychological responses such as agreement, opposition and resistance [14]. Empirically, by not distinguishing the terms, it becomes impossible to know for example how many people in a community accept a new policy and how many actually are willing to engage themselves in supporting it [16,17]. Recently this conceptual ambiguity has been recognized and thus acceptance has been conceptualized as a reaction to an external phenomenon in a passive and non-decision form, whereas support is a more action-oriented response [14,15]. Accordingly, people can tolerate and accept a policy with passive yet positive responses and attitudes towards the policy, but not actually be in support of it and be willing to take actions necessary for the realization of the policy. In one study it was found that there were higher acceptance levels than support levels in the two samples, pointing to the differences in the two terms [14]. This led the authors to call for more research where this distinction between acceptance and support is made in order to further establish the acceptance and support concepts. This call has been echoed by other researchers as well [15,18]. Taking this into consideration here and recognizing this conceptual difference between public acceptance and public support, this study contributes by exploring public responses to an environmental transport policy. In order to further understand how acceptance and support are related to each other and to other factors that have been found influential in previous literature (e.g., [13,19,20]) we also investigate the influence of sociodemographic factors, environmental beliefs, and previous experience with environmental technology (here AFVs), on acceptance and support. Identifying the factors that influence public acceptance and support for environmental policy and the relations among these factors, can lay a foundation for improving policy planning, implementation and communication, and thus a better transition towards a more sustainable society.

The aim of this study is thus to investigate the public responses to an environmental transport policy with the two constructs of public acceptance and public support, in the context of an energy policy in Sweden; the so called “Fossil fuel independent car fleet by 2030”. We examine the level of acceptance and support for the policy among Swedish car owners, together with the way and extent in which acceptance and support are related to each other and to other important attitudinal factors, including environmental beliefs, experience with AFVs and socio-demographics. Finally, the differences between AFV-adopters and non-adopters in terms of environmental beliefs, policy acceptance, and support are analyzed.

In this paper we first discuss the background and other studies concerning policy acceptance and support in order to clarify the concepts. Thereafter we discuss the influence of environmental attitudes and beliefs on policy acceptance and also research results pertaining to AFV adoption and socio-demographics. Subsequently the results of the study are presented following on the description of the methodology of the online survey. Finally we discuss the results in relation to previous conceptualizations of public policy acceptance and support, develop policy recommendations and put forth some limitations of our approach and finish by pointing to some future research areas.

## 2. Background

### 2.1. Public acceptance and support for policies

Public responses to policies and technologies are important areas of

study in order to understand how environmental policies can be successfully planned, implemented and communicated. A growing body of research has been developed on the issue of public acceptance, assessing and confirming that acceptance of a certain policy varies among different groups of the public [10,21,22]. For example it has been found that higher levels of environmental beliefs correlate with higher levels of environmental policy acceptance in areas such as transport [3,23,24], wind power [13], and carbon capture and storage [25]. These studies are important in the way that they establish general relationships among environmental beliefs and policy acceptance. However, conceptualization and operationalization of the policy acceptance construct varies in different studies and contexts which gives rise to some confusion as to what is actually being measured and thus discussed. For example [23], measure acceptability of two transport policies in Sweden with attitudes towards the policy, asking about the extent to which people are in favor or against the implementation of the policy. Adopting a different perspective on acceptance, a body of research has however conceptualized public acceptance as a mix of public attitudes and willingness or intentions to act for supporting the policy. For instance [26], study biofuel acceptance among Greeks and assess both attitudes and willingness to pay for biofuel as acceptance [13]. study acceptance of wind power in the US by measuring public attitudes and feelings towards wind power and also whether citizens would encourage wind power development in their area or not [25]. advance the definition of acceptance as “an individual’s positive attitude towards an issue at a determined point of time which is expressed in a certain opinion or in a certain behavior such as endorsement, approval, approbation”. We however argue, in line with [14,15,18], that attitudinal and behavioral measures need to be studied separately as, theoretically and conceptually, they are two different constructs. Thus [14] suggest conceptualizing public acceptance as attitudes towards the policy and defining public support as behavioral intentions and willingness to take actions to support the policy to grasp a more action-oriented response to a policy. The importance of such differentiation has been emphasized in their empirical study showing that public acceptance and support of new high voltage power lines were different in their sample of UK and Norwegian respondents. Their study showed that people may tolerate and accept a policy with passive yet positive responses and attitudes but not actually be in support of it and be willing to take actions necessary for the realization of the policy [14]. In line with this we argue that relying on a conceptually confused measure to gauge public responses to environmental policies might make policy planning, implementation and communication less effective and thus both the policy process and, ultimately, the environment stands to lose. Moreover, such aggregation of public attitudes and intentions may, to some extent, limit the implications for policymakers in the sense that it doesn’t clarify whether the public is merely evaluating the policy positively/negatively or if they are willing to actually engage in the behaviors that can result in the realization of the policy goal as well.

Against this background, in this study we focus on two public responses to environmental policy: acceptance and support. We define public acceptance as attitudes (positive/negative) towards the “Fossil fuel independent car fleet by 2030”. Regarding public support, which involves action-orientation, we define it here as intention to adopt AFVs. We do this for two reasons: First, intentions imply a probability of future actions [27,28] and thus include the action-oriented part. Second, as discussed above, the policy in this study implies the replacement of fossil fuel based cars with AFVs. An active support of this policy could be argued to result in such replacement which requires drivers to replace their fossil fuel based cars with AFVs. Moreover, based on the results of [14] we propose that public acceptance of a policy is an antecedent to public support for a policy. Having positive attitudes towards the policy can be one of the factors that have positive impact on the support for this policy and intentions to adopt an AFV in the future. Thus we explore the relationship between public acceptance and support and we further investigate these two public responses to

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