Energy Policy 94 (2016) 387–395

Contents lists available at ScienceDirect

Energy Policy

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

How much carbon offsetting and where? Implications of efficiency, effectiveness, and ethicality considerations for public opinion formation ☆

Brilé Anderson, Thomas Bernauer *

ETH Zurich, Center for Comparative and International Studies (CIS) and, Institute of Science, Technology and Policy (ISTP), Haldeneggsteig 4, 8092 Zürich, Switzerland

HIGHLIGHTS

- We use a framing survey experiment to study public opinion on carbon offsetting.
- Efficiency gains increase public support for international carbon offsetting.
- Concerns about effectiveness/additionality and ethicality reduce support.
- More information on efficiency gains and strengthening additionality could help increase support.

ARTICLE INFO

Article history:
Received 6 August 2015
Received in revised form
6 April 2016
Accepted 10 April 2016

Keywords:
Climate change mitigation
Carbon offsetting
Public opinion
Online framing experiment

ABSTRACT

A fundamental policy design choice in government-led climate change mitigation is: what role should flexibility mechanisms like carbon offsetting play in reducing greenhouse gas (GHG) emissions. Since public opinion affects the policy choices of government, we investigate how arguments regarding carbon offsetting's economic efficiency, effectiveness, and ethicality, which have been key points in the public debate, impact the public's preferences. We fielded an online framing experiment in the United States (N=995) to empirically identify how arguments for and against carbon offsetting influence public preferences for the inclusion of offsetting in national GHG mitigation policy. We find that the public's support for international offsetting increases and support for reductions at their source (i.e. within firms' own operations) diminishes when considerations of economic efficiency gains are at the forefront. Support for offsetting declines when individuals are confronted with arguments concerning its effectiveness and ethicality, which suggests that future policies will require clear standards of additionality in order to address these concerns. Moreover, we find that how carbon offsetting is framed matters even amongst climate skeptics and support could potentially be enhanced via improved communication on efficiency gains.

1. Introduction

In December 2015, the member states of the UN Framework Convention on Climate Change adopted the Paris agreement, which commits 195 countries to reduce greenhouse gas (GHG) emissions in order to avoid major climatic changes. These reductions will have economic implications for countries. For example, while it is difficult to estimate costs exactly, the U.S.'s intended commitment under the Paris Agreement could decrease GDP by an average of 0.7 percent by 2030[1] (World Resources Institute, 2015). However, it is also likely that the U.S. will experience positive economic impacts from improved public health and environmental quality, which might outweigh these costs. Nonetheless, governments are exploring various policy instruments to ease any potential costs of GHG reduction to make these policies more acceptable to the public and firms.

One such policy is an emissions trading system (ETS), also known as cap-and-trade, which is a market-based mechanism to reduce emissions. In an ETS, the government sets a limit on emissions. Regulated sectors' allotted GHG emissions, referred to as allowances, can be distributed to firms within the sector either directly, by auction, or via transactions on secondary markets. In an ETS, a firm's allowances must equal their emissions by the end of a designated period, which can be achieved by reducing their emissions (i.e. reductions at their source) or acquiring more

☆ http://www.ib.ethz.ch

* Corresponding author.
E-mail address: thbe0520@ethz.ch (T. Bernauer).

[1] The authors calculate their own reference case scenario using U.S. government projections of business-as-usual scenario by U.S. Energy Information Agency and U.S. Environmental Protection Agency.

http://dx.doi.org/10.1016/j.enpol.2016.04.016
0301-4215/

allowances. It can be difficult for firms to balance their emissions and allowances; therefore, ETS frequently permit carbon offsetting as an alternative means for firms to compensate their emissions. Offsetting credits investments in projects that abate GHG emissions elsewhere. The emissions reduced via the project are quantified in credits, which can account for an investing firm's emissions or sold to other firms to account for theirs. Accredited emissions reductions are the difference between business-as-usual emissions (i.e. GHG emissions had the project *never* been implemented) and the emissions after the project. Policies are usually designed to have a one-to-one ratio of one ton of carbon dioxide or equivalent GHG reduced to one credit.

1.1. Existing offset policies and their differences

As of early 2016, a diverse set of governments including British Columbia, California, the European Union, China (i.e. cities of Beijing, Chongqing, Shanghai, Shenzhen, and Tianjin, with two provincial systems in Guangdong and Hubei), Kazakhstan, New Zealand, Ontario, Québec, the Regional Greenhouse Gas Initiative[2] (RGGI), South Korea, and Tokyo accept offset credits in their ETS (International Climate Action Partnership, 2016). However, existing policies differ drastically on the amount of offset credits firms may use to compensate for their emissions and where projects can occur. For example, in the RGGI, firms may account for up to 3.3 percent of their emissions with offset credits as long as projects occur within the nine states comprising the RGGI, while the rest of their emissions must equal their allowances. On the other hand, in New Zealand, firms may compensate all of their emissions (i.e. 100 percent) with offset credits earned from projects anywhere in the world (see Supplementary Information (SI) A for a detailed comparison of policies).

Major differences between policy choices can be partially explained by controversies over the efficiency, effectiveness, and ethicality of offsetting (see Hyams and Fawcett (2013), Page (2013), The Globe and Mail (2007, 2009) and The New York Times (2008a, 2008b, 2009a) for an overview of the debate). Proponents of carbon offsetting point to large economic efficiency gains (UNFCCC, 2012), which in turn would allow for more GHG reductions at a lower cost. Opponents voice concerns over its effectiveness and question whether projects actually reduce GHG emissions. Moreover, the ethicality of offsetting is contested since it can be seen as obfuscating sources' responsibility for their emissions (Dechezleprêtre et al., 2008, Haya, 2009; Lloyd and Subbarao, 2009; Newell et al., 2009; Olsen and Fenhann, 2008).

1.2. Public preferences on offsetting

The growing importance of carbon offsetting notwithstanding, we know relatively little about individuals' preferences on offsetting in national mitigation policy, and how controversies over carbon offsetting's efficiency, effectiveness, and ethicality, which dominate the academic literature and policy discourse (see Hyams and Fawcett (2013) and The New York Times (2008b, 2009a, 2009b)), affect their preferences. Prevailing public sentiment sets important constraints in the political space within which policies can be developed and implemented in democratic political systems (Holcombe, 2006). This is particularly true for matters that are potentially costly to individual citizens such as the mitigation of GHG (see Fell et al. (2015)). To our knowledge, no prior study has experimentally investigated public preferences with respect to carbon offsetting in national mitigation policy.

Empirically, we focus on the U.S. since it is the largest GHG emitter in terms of historically accumulated emissions (Baumert et al., 2004) and to date has been unable to implement a federal GHG reduction policy by means of an ETS with offsetting. Multiple bills[3] in Congress proposed a GHG ETS with offsetting yet none have translated into a legislative reality. The Waxman-Markey Bill came closest to fruition. The Waxman-Markey Bill passed the House of Representatives in June 2009, but the Senate never voted on it or its own version of a climate bill despite Democratic control (Energy and Environment Publishing, 2009). Yavich (2010) and The New York Times (2010) attribute the stalling of Waxman-Markey in the Senate to a lack of public support. “It seems that no amount of effort would have been enough to overcome the lack of popular and industry support for a measure that pitted the U.S. economy against the global environment”, (Yavich, 2010 p.10). At the time, estimates of the bill's expense to the average household ranged from 80 to 111 USD annually to 1600 to 3400 USD annually (Centre for Climate and Energy Solutions, 2009). In addition, the inclusion of offsetting, a measure intended to decrease firms' costs, and thereby lessen the costs passed on to consumers,[4] stirred controversy over the bill's effectiveness. For example, Phil Radford, the former Executive Director of Greenpeace, stated, “[T]he bill would not force polluters to cut their own pollution until more than a decade from now. Instead, they could buy ‘offsets’ …” and Brent Blackwelder, former President of Friends of the Earth, claimed, “It [Waxman-Markey Bill] contaminates carbon markets with ‘offsets’ that will delay U.S. pollution reductions and are unlikely to result in intended reductions overseas,” (Yale Environment 360, 2009). Therefore, the governmental provision of offsetting, which was intended to appease public distress over the costs of mitigation, stirred controversy in itself. Yet, it is still unclear after this public debate; what role, if any, the public believes offsetting should play in national mitigation.

We use an issue framing experiment to investigate whether and how prominent arguments in the carbon offsetting debate, namely arguments concerning efficiency, effectiveness, and ethicality, affect public preferences for its use in GHG mitigation. In the next section, we outline these arguments and their potential impact on public opinion. These arguments are presented in stylized form and used as frames (i.e. treatment conditions) in the framing experiment. This allows us to identify the causal effects of specific arguments on public preferences. We then describe the research design, present the results, and end with a discussion of policy implications and options for further research. We find that efficiency considerations increase support for international offsetting and decrease support for reductions at the source, while concerns over their effectiveness and ethicality reduce support for international and domestic offsetting.

2. Efficiency, effectiveness, and ethicality considerations: expected implications for policy preferences

Why are some GHG mitigation policies very permissive of

[2] The RGGI is a cooperative effort between Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island and Vermont to reduce GHG emissions from the power sector.

[3] For example, the Clean Air Planning Act (2003), Climate Stewardship and Innovation Act (2005), Climate Stewardship and Innovation Act (2007), Low Carbon Economy Act (2007), the Climate Security Act also referred to as Lieberman-Warner Act (2008), American Clean Air and Security Act commonly referred to as Waxman-Markey Act (2009), and Clean Energy Jobs and American Power Act (2009) also known as Kerry-Boxer Bill.

[4] OECD (2009) found firms with reduction obligations tend to pass on the added costs to consumers. In addition, energy companies passed on additional costs to consumers (Fell et al., 2015; Fezzi and Bunn, 2009; Kara et al., 2008; Mokinski and Wölfing, 2014; Sijm et al., 2008; Smale et al., 2006).