Energy Policy 98 (2016) 254–265

Contents lists available at ScienceDirect

Energy Policy

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

Chinese companies' awareness and perceptions of the Emissions Trading Scheme (ETS): Evidence from a national survey in China

Lin Yang [a], Fengyu Li [b,c], Xian Zhang [d,*]

[a] School of Management and Economics, Beijing Institute of Technology, 100081 Beijing, China
[b] School of Finance, Central University of Finance and Economics, 102206 Beijing, China
[c] TIAS School for Business and Society, Tilburg University, 5000 LE Tilburg, Netherlands
[d] The Administrative Center for China's Agenda 21, Ministry of Science and Technology, 100038 Beijing, China

HIGHLIGHTS

- This paper provides a timely study of companies' awareness of ETS in China.
- ETS is not approved by companies as a cost-effective mitigation tool.
- External pressure is the most important indicator.
- Carbon price fails to promote companies to upgrade mitigation technologies.

ARTICLE INFO

Article history:
Received 9 January 2016
Received in revised form
22 July 2016
Accepted 31 August 2016

Keywords:
ETS
Awareness
Perception
Carbon trading

ABSTRACT

China announced the launch of a national Emissions Trading Scheme (ETS) in 2017; however, companies appear show little enthusiasm for participation in the ETS in China. This paper identifies the factors affecting companies' awareness and perceptions of ETS by conducting a national survey based on an online questionnaire from May to November 2015 in seven carbon trading pilots. The results indicate that companies' attitudes towards the ETS are positively influenced by government regulations and policy, public relations management and estimated economic benefit. Of these, public relations management is the decisive factor and estimated economic benefit is confirmed to be a relatively weak predictor. A company's environmental and energy strategy exerts insignificant effects on its preference for the ETS, although the sampled companies are very willing to save energy and reduce emissions. There exists an inverted U-shape relationship between a company's level of mitigation technologies and its attitudes towards the ETS. The carbon price fails to stimulate companies to upgrade mitigation technologies. The majority of companies treat participation in the ETS only as a means of improving ties with governments, as well as of earning a good social reputation, rather than as a cost-effective mechanism to mitigate greenhouse gas emissions.

1. Introduction

1.1. Background of ETS in China

As global warming and climate change issues are becoming increasingly serious, the Emissions Trading Scheme (ETS) is considered to be one of the most important means of environmental management and has been confirmed as a good choice for China to realize its mitigation target (Wang et al., 2013, 2015; Cui et al., 2014). As an emerging market-based mitigation instrument, the ETS is thought to be able to internalize environmental costs and helps to realize more efficient allocation of resources. In this system, participants with high abatement costs buy emission allowances to emit more, while participants with low abatement costs are being rewarded for their additional emission mitigation (Braun, 2009; Jaehn and Letmathe, 2009). China has pledged to bring its CO_2 emissions to a peak around 2030 and reduce its CO_2 emission intensity per unit GDP (gross domestic production) by 40–45% in 2020 and by 60–65% in 2030 compared to the 2005 level. Indeed, innovatory exploration has been carried out in order to achieve the emission reduction goals, and the ETS has been deemed to be a cost-effective approach (Cui et al., 2014; Tang et al., 2015; Yang et al., 2016). In March 2011, the establishment of a carbon emission trading market was referred to in the Twelfth

* Corresponding author.
E-mail address: zhangxian_ama@163.com (X. Zhang).

http://dx.doi.org/10.1016/j.enpol.2016.08.039
0301-4215/

Five-Year plan (State Council, 2011a, 2011b). The National Development and Reform Commission (NDRC), China's top economic planning agency, appointed seven pilot sites across the country. After two years of preparation, China's seven carbon trading pilots were officially launched in 2013 and 2014. In 2017, the Chinese President, Xi Jinping announced the creation of the world's largest national carbon market, larger than the EU's 10-year-old emissions trading scheme.

In order to develop a robust and effective ETS at national level in China, it is critical for the country to thoroughly assess the problems that have been discovered in the seven carbon trading pilots and carefully identify ways to address these issues. The ETS is ultimately aimed at driving companies to upgrade mitigation technologies through setting a price on greenhouse pollution, so that they are able to decrease abatement costs (Liu et al., 2016). Thus, mature participants and a favorable operation mechanism are prerequisites for the maintenance of the long-term healthy development of the ETS.

1.2. Research questions and objectives

In practice, companies' approval of market-based environmental policies is one of the most important prerequisites for their actual progress and success (Chen and Zhang, 2005; Liu et al., 2013a, 2013b; Zhang et al., 2014a; Liu et al., 2016). Therefore, policy analysis at company level is meaningful and necessary (Dieperink et al., 2004). Companies' in China appear to show little enthusiasm for participation in the ETS at present, and this lack of enthusiasm has been identified as the most significant barrier for the implementation of the ETS (Sun et al., 2015; Wei, 2015; Feng et al., 2015; Li et al., 2016; Liu et al., 2016). The Chinese government and experts expect companies to be able to participate actively in ETS, promote technological upgrades and ultimately enhance their competitiveness (Peng et al., 2014; Yang et al., 2016). However, the ETS does not appear to have been viewed as a priority by Chinese companies. The disparity between strong incentive policies and unsatisfactory participation indicates that the ETS as a mitigation instrument is encountering skepticism from companies. Apart from the imperfect regulations and incomplete trade system (Kemfert et al., 2006), a company's awareness and perceptions towards the ETS play a key role (Cornwell et al., 1997). In line with the government's efforts, policy makers need to understand how companies respond to the ETS. Such an understanding would provide useful feedback for governmental initiatives, provide an opportunity to evaluate and reformulate existing initiatives, and possibly influence the design of the mechanism to invigorate the market.

To date, the research on China's ETS has been concentrated mainly in the areas of theoretical analysis (Chang and Wang, 2010; Duan et al., 2014; Zhang et al., 2014a; Qi et al., 2014; Jotzo and Löschel, 2014; Liu et al., 2015; Zhao et al., 2016; Zhang, 2016), carbon allowance allocation (Zhang et al., 2014b, 2015; Xiong et al., 2015, 2016; Zhang and Hao, 2015), carbon price volatility (Li and Lu, 2015), and mitigation potential and cost-effectiveness (Zhou et al., 2013; Cui et al., 2014; Hübler et al., 2014; Wang et al., 2015, 2016; Li and Jia, 2016). However, scant empirical research clarifying how companies perceive the ETS has been carried out. Therefore, in order to bridge the divergence between the Chinese government and companies for the invigoration of the carbon market, this research measures companies' awareness and perceptions of the ETS. Some previous studies have analyzed the effectiveness of market-based instruments in affecting the company's efforts in energy saving (Blok, 1993; De Groot et al., 2001; Klok et al., 2006; Liu et al., 2014), and three topics will be further discussed in this paper based on the previous research:

a) Companies' recognition level of the ETS;
b) The relationships between a company's awareness and the identified determinants, as well as company characteristics;
c) Companies' behavioral responses in terms of energy-related technological upgrades to the introduction of ETS.

The paper is structured as follows: firstly, we will give a brief introduction to the ETS in China; secondly, we will explain the analytical framework of this study and identify the determinants of a company's awareness and perceptions of ETS; thirdly, we will analyze the empirical results to answer the questions presented above; finally, a conclusion and some policy implications will be given.

2. Analytical framework of this study

Companies' awareness and perceptions as regards the implementation of a certain environmental policy are multi-dimensional constructs, including attitudes, willingness to act, technological upgrading and so on (Maloney and Ward, 1973; Hammerl, 1994; Zsoka, 2008). External pressures and internal considerations have been used extensively in previous studies on companies' awareness and behaviors in response to environmental management policy (Yang and Zhou, 2005; Delmas and Toffel, 2008; Liu et al., 2013a, 2013b; Ye et al., 2013; Zhu et al., 2013). We also analyze factors influencing companies' awareness and perceptions of the ETS in terms of these two aspects.

External pressures from society are often considered as significant motivations for companies to adopt environmental management practices, such as complying with regulatory requirements (Jones, 2010) and meeting public demands (Gualandris and Kalchschmidt, 2014). These external motivations push companies to implement certain practices in order to obtain institutional value in the market and the social community (Meyer and Rowan, 1977; Sumiani et al., 2007). We selected the government regulation and policy, as well as the public relation management as external factors influencing a company's perception of participating in the ETS. It has been verified that coercive external pressure is related to the compulsory pressure exerted by powerful agencies such as the government (Reijnders, 2003; Henriques and Sadorsky, 1996; Rivera, 2004; Liu, 2014). Companies generally have to make changes in response to energy and environmental policies and involuntarily strengthen their environmental concerns (De Groot et al., 2001). The ETS in China is characterized by the distinctive political-economic context (Han et al., 2012; Yu and Elsworth, 2012), and thus the governmental policy and regulations of this system have significant effects on the operational environment and management decisions of companies. This is consistent with the institutional theory that governmental intervention is an essential external pressure on a company to enhance its environmental awareness and behaviors (Stavins, 1998; Bansal and Roth, 2000; Liu et al., 2010, 2014). In addition, a pro-environmental social climate can motivate a corporate responsibility to protect the environment and conserve energy. Many companies engaging in voluntary environment-related activities aim to satisfy social expectations (Duarte, 2010). Companies are inclined to exhibit pro-environment preferences when they live in a social community that cares about environmental issues (Yin and Ma, 2009; Zhu and Geng, 2013). With increasing concern for environmental protection, the ETS has been increasingly widely regarded as the new approach for encouraging companies to save energy and reduce emissions. Furthermore, China has signaled a strong intention to set up a national ETS and position itself on the international stage of carbon trading. Therefore, establishing and developing good relations with the local government, institutions and the