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Overcoming collective action barriers to energy sustainability: A longitudinal study of climate protection accord adoption by local governments

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ABSTRACT

High levels of observed city involvement in energy and climate initiatives indicate that free-riding has been much less of a barrier to local climate protection efforts than suggested by theories of collective action. This study investigates why local governments have adopted various energy and climate change policy instruments despite the non-excludability of climate benefits. This paper advances theories of institutional collective action (ICA) and policy diffusion by testing ICA based hypotheses that local officials are able to overcome collective action problems to the extent that the costs of these initiatives are minimized through policy network interactions, the extent to which climate action produces localized benefits or compliments local environmental, development or growth management efforts, and the extent to which energy and climate protection efforts generate selective benefits to elected and appointed local government officials who advance their career interests depending on the existing configurations of political system institutions. Analysis of adoptions of the Climate Protection Agreements by Florida Cities indicates larger cities are more likely to adopt climate agreement, while district elections decrease the likelihood of climate policy adoption. Moreover, economic development rather than growth management or environmental problem situation is linked to climate initiatives.

1. Introduction

Climate change and energy sustainability have emerged on the world stage in the past decade in a highly visible fashion since the Kyoto Protocol was signed in 2005, building on decades of international work on climate change reduction efforts. Even cities have taken a position on this hot topic as more than 400 US cities had signed the U.S. Conference of Mayors Climate Protection Agreement (CPA) by 2007. Yet this action raises a paradox in public policy research as climate protection policies address a classic common pool resource area in which individual cities would seem to have an incentive not to adopt any stringent policies. As is so well detailed in Garrett Hardin's *The Tragedy of the Commons* [1], from an economic perspective, cities might be expected to free ride on the actions of other governments that undertake the costs and efforts necessary to reduce carbon emissions and will not voluntarily sign up, especially since a city's individual contribution to solving the global crisis is miniscule. Reductions of emissions solely within the jurisdiction of a city only alter climate change risks for that jurisdiction if they reduce the earth's total concentration of greenhouse gases by a meaningful amount. Nonetheless, cities do voluntarily adopt climate protection commitments. Therefore, we ask whether political, institutional or socio-economic factors contribute the most to explaining policy adoptions in this new policy area.

A series of studies have been conducted to explain the motivations for local adoption of climate policies and actions, however, there are three types of limitations of the extant literature that this paper intends to make progress on. First, there is not sufficient attention to the institutional collective action nature of the problem. The collective action problems were mentioned in many studies, but the theorization of the analytical framework was not explicitly based on the collective action problems among local governments. This paper integrates the hypotheses into the Institutional Collective Action (ICA) framework, which could provide a coherent theoretical explanation for the local climate actions. Second, there is not sufficient attention to the influence of local policy diffusion on local governments' adoption of climate actions. This paper further develops the policy diffusion framework at the local level by testing how the climate actions of neighbors influence cities' climate actions with a longitudinal data set.

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We use the theoretical frameworks of institutional collective action (ICA) and policy diffusion to develop hypotheses related to why cities voluntarily adopt climate change policies. This work is the initial product of a larger project to extend theories of ICA and policy diffusion to investigate a wide array of local government level energy and sustainability policies [2]. ICA provides a framework to integrate factors that contribute to voluntary cooperative actions on such policies [3,4]. Few studies examine policy innovation related to common pool resource policies. Furthermore, the literature on policy innovation in cities is relatively small, and the climate protection agreement is a case of a rapidly diffusing policy, a type of policy innovation, which has not yet been studied extensively. Thus in this work, featuring an important policy area related to globalization – climate change policy, we extend the policy innovation and diffusion framework [5] to a new policy type, and bring in the powerful ICA theoretical framework to generate factors related to policy innovation to be tested in our multivariate model. We estimate the timing of local adoption of climate protection agreement in Florida cities using a panel logit with Generalized Estimating Equations (GEE) estimation. The results indicate larger cities and adoption by neighbors increase the likelihood of Energy/Climate Protection (E/CP) policy adoption, while district elections decrease the likelihood of E/CP policy adoption.

2. Energy and climate protection initiatives by U.S. cities

Cities are estimated to produce more than a third of all greenhouse gas emissions [6], and many cities experience great vulnerability to climate risks [7], yet their role in climate protection policies until very recently has been negligible. Most of the climate change policies have been adopted at the national level. One could argue that, cities are well equipped with the tools for policy leadership on climate change given their traditional authority over transportation, recycling, parks, and their broad powers to regulate land use within their boundaries [8].

Over 900 cities have signed the U.S. Conference of Mayors Climate Protection Agreement, in which they commit to meet Kyoto Protocol goals for greenhouse gas (GHG) emission reductions [9] and over 500 cities have become members to the International Council for Local Environmental Initiatives (ICLEI) and agree to inventory and reduce GHG emissions. Interest in a broad range of environmental and energy sustainability policies has grown in the past ten years. Many communities have also adopted new policies and processes such as the use of renewable energy sources (wind, solar, biofuels), incorporated energy efficiency principals into land use plans, adopted green building standards, introduced rebates and incentives for purchase of energy efficient devices, and introduced alternative fuel and hybrid vehicles into municipal fleets [2,10]. As of June 25, 2007, 55 FL mayors had pledged to support the CPA [11].

The few newspaper accounts of the CPA in Florida have generally been positive about the CPA. But what does CPA actually require of cities? Miami Mayor Manny Diaz's office released a press release on June 25, 2007 that described the major elements of the CPA based on the Kyoto Agreement of 2005. First, the city will work to meet or surpass the Kyoto Protocol targets for carbon reduction in the community by promoting urban forests, by adopting anti-sprawl policies to reduce traffic, and by promoting clean energy through public information campaigns. Second, the city will work with other levels of government as well as additional cities to meet or exceed the GHG reduction targets that the Kyoto Protocol laid out as a target for the United States – a 7% reduction by 2012 from the 1990 levels of carbon emissions. And third, support legislation by the US to establish a greenhouse gas reduction law that would establish a national emission trading system.

The rapid adoption and diffusion of city level energy and climate protection policies defy the accepted logic of collective action [12], which predicts that local governments will not voluntarily invest in climate protection efforts and will free ride on the efforts of others, because their contribution to the collective good is infinitesimally small and the benefits generated are non-excludable. Greenhouse gases are global pollutants, so city residents will share any environmental benefit with every living being on the planet. The actual geographic location of local emissions is unimportant because fluctuations in local emissions contribute to or subtract from the global concentration but otherwise have no local effects. We examine the seemingly irrational motivations for local governments' climate protection actions from the theoretical perspectives of ICA and policy diffusion.

3. A review of local climate policy adoption

Numerous studies have investigated the reasons underlying national commitment to climate actions [13–15]. Even though national governments' involvement in international climate policies have different dynamics compared to state and local governments' climate actions, these studies still pointed out that domestic air pollutions and organized interest groups are important determinants for national commitment to climate actions. Studies on the state level climate action research are also abundant, including the adoption of Renewable Portfolio Standards [16–18], net metering [19], and state climate action plans [20]. In general, these studies identified relevant factors affecting state climate policy adoption, including the influence of neighboring states, air pollutions, environmental ideologies, climate risks and the adoption of other policy instruments etc. In addition, drivers for state climate actions like economic benefits, environmental benefits and political benefits are also examined [21,22].

Another more relevant stream of literature to local climate actions is the literature on local adoption of sustainability policies and initiatives. Spurred by the work of Kent Portney's *Taking Sustainable Cities Seriously* [23], numerous studies were conducted to examine what factors contribute to the adoption and implementation of sustainability policies [2,24–29]. Several important findings of these studies are theoretically stimulating for our current research. First, different from classic stereotypical argument that there is a trade-off between sustainability and economic development, many studies found that sustainability and economic development are synergistic [23,29]. Second, the role of local political institutions is further examined in these studies. It is theoretically well developed and empirically robust that the influence of organized interests on the adoption of sustainability policies is mediated by local form of government or legislative election rules [2,27,28]. The relevance of this literature is that as a type of sustainability policy, the adoption of local climate policies could also be influenced by local political institutions.

The works that directly address local climate protection actions are also developing very fast. Betsill first studied the adoption of CCP (Cities for Climate Protection) programs in the local government in the US [30]. She emphasized that local government's decision to adopt local climate policies is driven by localized policy benefits such as air pollution reduction and economic benefits. The factors that are identified to influence local climate policy adoptions include reduced cost [31–33], community wealth [34–38], economic development opportunities [32,39–41], co-benefits [31–33], policy entrepreneurs [31,41], political will [30,42], state mandates [43], climate risks [7,44,45], neighbor influences [46], municipal-owned utilities [46], fiscal stress [47] and local political institutions [46,47]. Some recent studies have examined the termination of climate protection initiatives at the local level [48,49], although the ending of symbolic climate program does not necessarily mean the abandonment of the substantive climate commitment [49]. Studies have also been conducted to examine climate protection plans in some subnational context [50].

4. Theoretical framework

The problem description and theoretical framework presented here integrate several theoretical and methodological approaches developed in previous work on transaction cost barriers to environmental