Contrasting Capacities From City to International Levels of Government in Addressing Climate and Energy Issues

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Abstract

How does extent of involvement at various levels (from city to international) relate to individual and organizational capacities and to the use of collaborative and analytical techniques of policy analysis? This article pursues this question through an analysis of data from a questionnaire administered in 2011 to actors involved in climate and energy issues in Colorado. The results indicate that involvement in city-level climate and energy activities includes a combination of local government officials and actors from a range of nongovernment and state and federal government organizations. Whereas individual capacity is unrelated to involvement, organizational capacity is associated with involvement at the national and international levels. In addition, involvement at the city, state, and international levels is associated with the use of collaborative techniques (such as facilitation). By contrast, involvement at the national and international levels is associated with the use of analytical techniques (such as modeling and economic analysis). The article complements the existing literature on climate and energy issues by highlighting how the use of different tools and techniques of policy analysis depends on the extent of involvement by different levels of government.

Introduction

Addressing climate change at the city level is often viewed as a significant opportunity to mitigate the effects of climate change. The reason is simple: one-half of the planet's population lives in urban areas with far-reaching carbon footprints, and higher levels of government have shown more inaction than action (Hillman and Ramaswami, 2010; OECD, 1995). Thus, scholars and practitioners have voiced a need for city-level action on climate issues. Ramaswami et al. (2008), for example, described how climate-change policies at the city level can engage vast segments of the planet's population and mitigate effects in large spatial areas. Betsill (2001) argued that policies at the city level are crucial for countries to meet their commitments within national and international climate agreements. Dietz, Ostrom, and Stern (2003) reported on the importance of locally designed institutions (that is, rules) for adaption to and mitigation of climate change. Lutsey and Sperling (2008) detailed several advantages to decentralized action on climate change, including better opportunities for policy experimentation, an ability to tailor policies to fit the preferences of constituents, an ability to test the political responses to innovative policies, and local expertise and experience in implementing and administering programs.

Many of the existing empirical studies of local action on climate change focused on the activities of city leaders (Rutland and Ayett, 2008). Recent research efforts, for example, have involved survey data from hundreds of city managers and mayors. These large-sample surveys provided a broad representation of local governments and helped to explain patterns of sustainability activities from recycling programs and bike paths to green-collar workforce training and renewable energy incentives (Daley, Sharp, and Bae, 2012; Hawkins and Wang, 2012; Svara, Watt, and Jang, 2012). They also advanced understanding of why a local government would engage in sustainability efforts when the benefits are distant and uncertain and the costs are immediate and localized. One of the limitations, however, of such large-sample survey designs is the lack of description and explanation within any particular city or state. One of the contributions of this article is to complement existing large-sample survey studies with an in depth analysis within one state, focusing on the capacities of and the tools and techniques used by actors in dealing with climate and energy issues.

Addressing climate change at the city level often confronts several barriers and challenges (for example, Rutland and Ayett, 2008). One barrier is the difficulty of reconciling the interests of various local stakeholders with those of businesses, which often oppose environmental programs and policies. The development of local environmental actions also faces challenges from the limited resources of local governments, limited or insufficient jurisdictions to address issues, and conflicts with other, higher priority programs and policies at the local level. Betsill (2001) identified three barriers that can prevent policy action at the city level: (1) uncertainty related to the institutional home for climate policymaking; (2) lack of capacity to develop climate policies and programs and to oversee, monitor, and analyze carbon emissions; and (3) deficient commitment to investing financial resources to address climate change.

Overcoming these barriers and challenges requires not only the right institutional arrangements to foster trust and cooperation but also policy action across all levels of government, backed by a policy analytical capacity (PAC) to inform such actions. *PAC* relates to information acquisition and use in the policy process (Howlett, 2009). To study PAC at any level of government is to assume that, even with cooperation and trust among actors facing an ongoing societal dilemma, learning and sustainable decisionmaking will falter unless individuals and organizations are able to acquire and use relevant policy analysis tools and techniques to make the best decisions in responding to uncertain situations. This article explores how the extent of involvement at various levels (from city to international) relates to individual and organizational capacities and to the use of collaborative and analytical techniques of policy analysis.

The context for this study is climate and energy issues in Colorado, which possesses a balance of traditional energy resources and has experienced a recent rise in renewable energy. The threats to the state from climate change include shorter and warmer winters, a thinner snowpack, earlier melting of the snowpack with increased spring runoff, increased periods of drought, more wildfires, and substantial losses of alpine forests to pine beetle infestations. Like many areas of the world and the United States, Colorado launched an initiative to address climate change, which resulted in the creation of the Colorado Climate Action Plan, in November 2007, which called for a 20-percent reduction of state greenhouse gas (GHG) emissions by 2020 (Ritter, 2007). Although the specifics of Colorado are different from those of other states, the forecast adverse effects of climate change and tepid response make Colorado typical among states.

This article proceeds with a description of the policy analysis and PAC literatures. It then describes the context of climate and energy policies in Colorado and the methods of data collection and measurement. The results indicate that involvement in city-level climate and energy activities encompasses local government officials and actors from a range of organizational affiliations. Although individual capacity is unrelated to the extent of involvement at each level, involvement at the national and international levels is associated with great organizational capacity. Finally, actors involved at the city, state, and international levels are more likely to use collaborative techniques, whereas actors involved at the international and national levels are more likely to use analytical techniques.

Description of Policy Analysis and Policy Analytical Capacity

Local action on climate change often develops through activism and leadership at the city level, from small- and medium-sized towns to New York City (Hawkins, 2011; Rutland and Ayett, 2008). Actors involved in local climate-change policy operate within networks to distribute information, gain support, generate policy ideas, and advocate for action (or stasis) on climate change to authorities (Ingold, 2011; Selin and VanDeveer, 2007). Although the literature on climate activities often deals with the factors associated with the adoption of sustainability efforts and of climate policies and politics (Daley, Sharp, and Bae, 2012; Hawkins and Wang, 2012; Svara, Watt, and Jang, 2012), an examination of the capacities of and techniques used by policy actors to analyze and evaluate climate and energy policy alternatives is mostly absent.

The lack of capacity and techniques for learning and adaptive decisionmaking can be problematic for developing, adopting, and implementing effective policies. Partially in response to the policy successes of operations research during World War II and to the policy failures of the Great Society programs in the 1960s, a voluminous literature has focused on improving the art and craft of providing policy advice and on the development of various technical approaches for generating and using information for better policy processes (Weimer and Vining, 2010). In describing such approaches, for example, Lindblom (1959) compared the *root method*, whereby individuals start the process of analyzing policies from the ground up, with the *branch method*, whereby individuals continually build on current situations in a step-by-step, incremental process. Lindblom argued that although the root method is ideal in an abstract sense, individuals more often pragmatically use the branch method, resulting in a more incremental and less systematic and methodical form of decisionmaking. Nonetheless, Lindblom's root method is typical of the rational decisionmaking and technocratic or analytical approaches to policy analysis that dominated discussions about the appropriate tools and techniques for providing policy advice for much of the 1960s and 1970s (for example, Dror, 1967; Stokey and Zeckhauser, 1978).

Dissatisfaction with rational, analytical approaches became a salient topic among researchers from the late 1970s onward (Lindblom and Cohen, 1979; Weiss, 1977). Brewer and deLeon (1984), for example, described how the effectiveness of policy analysis tools is constrained by the skill, experience, and judgments of the individuals, the time and resources available, and the characteristics of the problem. Jenkins-Smith (1990) furthered the argument by explaining how the use of policy analysis is contingent on the political landscape. Other public policy scholars underscored the threats to democracy from technocracy through the removal of the average citizen from the policymaking process (Bobrow and Dryzek, 1987; deLeon, 1997).

In response, Hass (2004) described new approaches to policy analysis that are transparent, inclusive, and substantively rich (see also NRC, 1996, and Radin, 2000). Hass's arguments paralleled the recently increasing use of collaborative governance strategies, which strive toward inclusive stakeholder processes for overcoming collective action problems (Ansel and Gash, 2008; Innes and Booher, 2010; Leach and Pelkey, 2001) and for incorporating scientific and technical information with local knowledge in decisionmaking (Ascher, 2007; Montpetit, 2011; Weible, 2008). One result is a policy analysis literature that has developed and diversified its tools and techniques over time (Roe, 1994; Weimer and Vining, 2010). Contributing to this policy analysis research tradition, Howlett (2009) offered PAC, which refers to the ability of individuals and organizations to acquire and use knowledge in the policy process.

At the individual level, PAC comprises several dimensions, including education level, years of experience, and various skills for employing analytical tools and techniques (Wellstead, Stedman, and Lindquist, 2009). Skills can involve different areas of formal training, including the ability to conduct applied research, statistical methods, policy analysis, policy evaluation, trends analysis and forecasting, political feasibility analysis, and modeling of various scenarios. Less analytically focused skills that place greater emphasis on engaging stakeholders in collaboration can include facilitation and consensus building.

PAC also operates at the organizational level. Most individuals do not possess the personal resources to participate in policy issues over prolonged periods. Many policy actors represent government agencies, businesses, nonprofit organizations, or academic and research organizations with extensive resources. Policy actors, thus, attempt to leverage these organizational resources in pursuit of policy objectives.[1] The extent of PAC the organization possesses is determined by whether it has adequate knowledge, skills, and people to respond to a policy issue (Craft and Howlett, 2012; Howlett and Oliphant, 2010) and by the priority the organization assigns to addressing a particular policy issue.

One value in analyzing PAC is to better understand the capacity among policy actors in their use of a variety of tools and techniques of policy analysis. The approach is neither technocratic nor

[1] We define *policy actors* as those individuals seeking to influence government policies in a given topical area.

post-empirical policy analysis. It does not seek to offer advice to clients but rather to develop a better understanding of a particular issue in the management of uncertainty. The PAC approach also works from an assumption that addressing complex problems requires the combination of multiple tools and techniques that range from the technocratic and analytical to the collaborative. Whereas issues from technocracy to uncertainty are certainly important, this article seeks to assess the extent of and differentiate the relative distribution of PAC among actors involved in climate-change and energy issues.

PAC is best viewed as either a concept defined by the generation and use of information in the policy process or as a framework for providing guidance for understanding the generation and use of information in a particular policy subsystem. In positing relationships from a theoretical perspective, PAC is mostly underdeveloped. One of the major theoretical arguments that PAC supports is the existence of positive relationships between policy actors with great PAC and a high probability of shaping policy agendas, affecting the design and content of policies, developing a better understanding of the context in which policies will be implemented, and determining the evaluation of policy outputs and outcomes across levels of government (Howlett, 2009). This article, however, seeks a different focus by exploring the relationships some other concepts identified within PAC have with the extent of involvement in various levels of a government system. Specifically, this article provides a theoretical investigation into whether capacity varies, first by extent of involvement in climate and energy issues at levels from city to international, and second by individual and organizational PAC.

Case Context: Climate and Energy Policies in Colorado

Since the beginning of the industrial age, the burning of fossil fuels has released substantial amounts of GHG into the atmosphere (IPCC, 2007). The accumulation of these gases has resulted in a trapping of heat within the Earth's atmosphere and a gradual warming of the planet. According to the Intergovernmental Panel on Climate Change, the leading international scientific institution on climate-change research, "warming of the climate system is unequivocal …" and "many natural systems are being affected by regional climate changes, particularly temperature increases" (IPCC, 2007: 30–31). Despite these findings and the basic processes that cause climate change being scientifically well established (Mastrandrea and Schneider, 2010), the need for public policies to address climate change remains a contentious issue (Layzer, 2006; Oreskes and Conway, 2010). Advocates and opponents of climate-change policy disagree about the degree to which human actions cause climate change and the need for government intervention through climate and energy policies.

These debates can be found through all levels of government, from the international to the local level. Beginning in the early 1990s, the international community of governments began to consider policy options for addressing climate change. In 1997, the international community adopted the Kyoto Protocol, an international agreement to address climate change. In February of 2005, the Protocol took effect for the 141 countries that had ratified it. Although the United States was originally a signatory, the U.S. Senate did not ratify the treaty and, subsequently, the United States does not participate in the Kyoto Protocol (Layzer, 2006). Whereas the United States showed initial leadership in addressing climate change at the international level, the country has become increasingly hesitant to mitigate its GHG emissions through actions including regulatory or fiscal policies (McKinstry, 2003).

Whereas the federal level is stagnating on climate-change issues, the state and city levels are increasingly active on climate change (Rutland and Ayett, 2008). More than 30 states have created a climate action plan (EPA, 2011). Climate action plans typically outline climate policy goals and identify a set of recommendations that a state can employ to address climate change. Climate policies at the city level often develop independently from state-level actions (Rutland and Ayett, 2008). Hundreds of U.S. cities are members of ICLEI—Local Governments for Sustainability, an international association of local governments that have made a commitment to sustainability. To address climate change, ICLEI formed the Cities for Climate Protection program to assist cities in addressing climate change (Rutland and Ayett, 2008). Similarly, more than 1,000 mayors have signed on to the United States Conference of Mayors' Climate Protection Agreement to advance the goals of the Kyoto Protocol through local government leadership and action (Maggioni, Nelson, and Mazmanian, 2012; USCM, 2009).

To better understand efforts to mitigate and adapt to climate change, this study examines local efforts in Colorado. The state provides an effective case study to examine climate and energy policies because of its vast traditional energy resources, the rise of its renewable energy sector, and its vulnerability to climate change. Colorado has long been a major producer of traditional energy, with several major fossil fuel-rich basins, major production of coalbed methane, and vast reserves and major production of natural gas (U.S. EIA, 2009). In recent years, Colorado's renewable energy sector has grown partially in response to the state's renewable energy portfolio standard, enacted via ballot initiative in 2004 and subsequently strengthened by the legislature in 2010 (DSIRE, 2010). The Colorado case is also informative because of the state's vulnerability to both current and predicted effects of climate change, including shorter and warmer winters and increased periods of drought (Ritter, 2007). Scientists project that, in the ensuing decades, climate change in Colorado will produce temperature increases of 3 to 4 degrees Fahrenheit, longer and more intense wildfires during the summer seasons, and an increase in water shortages.

Former Colorado Governor Bill Ritter launched an initiative to address climate change statewide, which resulted in the creation of the Colorado Climate Action Plan in November 2007. This plan called for a 20-percent reduction of the state emission of GHG 2020. This plan for the state was created in a collaborative manner by a diverse set of stakeholders, including "business and community leaders, conservationists, scientists and concerned citizens" (Ritter, 2007).

Methods

A web questionnaire was administered in the spring of 2011 to policy actors in Colorado actively involved in climate and energy issues at the international, national, state, and local government levels. The sample was collected through a modified snowball sample technique, targeting those individuals involved in Colorado climate and energy issues by first searching the Internet and newspapers for government and nongovernment organizations and the people therein. The online search was complemented by preliminary interviews of five people involved with Denver and

Colorado climate and energy issues. The total sample was 793 individuals, of whom 272 returned fully completed surveys, for a response rate of 34 percent. Another 87 individuals returned partially completed surveys, the inclusion of which equals 359 respondents and a 45-percent response rate. This analysis uses only the completed surveys.

Operational Measures

To examine capacity on climate and energy issues at the city level, this article uses five groups of independent variables: extent of involvement, formal training, advanced degree, organizational capacity and priority of climate and energy issues, and proclimate-change beliefs. The primary dependent variables are the frequency in the use of tools and techniques of policy analysis.

Tools and Techniques Used

To measure the tools and techniques that policy actors use, respondents were asked the following question: “How often have you used the following tools and techniques as part of your work in the past year?” The tools listed included political feasibility analysis, risk analysis, modeling, collaborating with those with whom you agree, collaborating with those with whom you disagree, environmental impact analysis, facilitation and consensus building, economic analysis, and informal tools and techniques. Respondents were asked to respond using a scale consisting of “never,” “yearly,” “monthly,” “weekly,” and “daily.”[2]

Extent of Involvement

To measure extent of involvement, respondents were asked this question: “At what level (international, national, state, or city) do you currently focus your efforts regarding climate-related issues and/or energy policy?” For each level—international, national, state, and city—respondents could choose “not involved at all,” “somewhat involved,” or “primary involvement.” We coded the responses 0, 1, or 2, respectively.

Individual Capacity: Formal Training

To measure the formal training of policy actors, respondents were asked the following question: “In which of the following areas have you received formal training?” The areas listed were statistics, policy analysis, policy evaluation, trends analysis and forecasting, and modeling. We used a dichotomous code to code whether individuals had received formal training in each of the five areas.

Individual Capacity: Advanced Degree

Respondents were asked, “What is the highest level of formal education you have attained?” Potential responses ranged from “not a high school graduate,” “high school graduate,” “some college,” “bachelor’s degree,” “master’s or professional degree,” or “Ph.D., M.D., or J.D.” The “master’s or

[2] Respondents were also asked about community impact analysis, but so few responded affirmatively that we removed this variable.

professional degree" and "Ph.D., M.D., or J.D." responses were combined into an advanced degree dichotomous variable, with 1 equaling a positive response to one of the two categories and 0 equaling a bachelor degree or less.

Organizational Capacity and Priority of Climate and Energy Issues

To measure organizational capacity, we asked respondents two questions pertaining to organizational resources and priorities. For the question on organizational resources, we asked respondents, "Compared to similar organizations, does your organization have adequate knowledge, skills, and people to respond to climate-related issues and energy policies?" The sample was asked to respond using a 5-point Likert scale consisting of "very low capacity," "low capacity," "medium capacity," "high capacity," and "very high capacity." We coded the responses 1 through 5, respectively. To measure climate and energy issues as an organizational priority, we asked respondents, "Compared with other issues that your organization responds to, how much of a priority are climate-related issues and energy policies?" The sample was asked to respond using a 5-point scale consisting of "much lower," "lower," "about the same," "higher," and "much higher." We coded the responses 1 through 5, respectively. We then created an organizational capacity scale by taking the mean of the two variables (factor loading = 0.88; Cronbach's alpha = 0.70).

Proclimate Change-Beliefs Scale

This study controls for individual beliefs regarding climate issues, although this scale is not a component of individual PAC. The survey asked respondents to report their beliefs on the severity of climate change; its causes; and possible policy approaches for mitigating carbon emissions, including energy and carbon taxes, cap-and-trade systems, and policies promoting renewable energy generation. Respondents answered using a 5-point scale, ranging from "strongly agree" (5) to "strongly disagree" (1). These individual questions were then aggregated by their means into a single-scaled item, called proclimate-change beliefs.[3]

Results

We present the results in two parts. The first part (exhibits 1 through 3) presents the descriptive results for the extent of involvement, formal training, organizational capacity, and proclimate-change beliefs. In addition, exhibit 3 outlines the creation of a scale for collaborative tools and techniques and another scale for analytical tools and techniques. The second part (exhibit 4) presents the explanatory results from the ordered logit models and the ordinary least squares (OLS) regression models to explain the variation in the frequency in the use of tools and techniques.

[3] Respondents were asked to express their extent of agreement and disagreement with the following questions: (1) "The severity of predicted impacts on society from climate change are vastly overstated" (reversed, factor loading = 0.880); (2) "Human behavior is the principal cause of climate change" (factor loading = 0.820); (3) "Decisions about energy and its effect on climate are best left to the economic market, and not to government" (reversed, factor loading = 0.687); (4) "An energy and/or carbon tax is required to combat climate change" (factor loading = 0.800); (5) "A cap and trade system of permits for the emission of greenhouse gas is required to combat climate change" (factor loading = 0.698); and (6) "Government policies to promote renewable energy generation are required to combat climate change" (factor loading = 0.795). We calculated the mean of the five items to create the proclimate change-belief scale (Cronbach's alpha = 0.870).

Descriptive Analysis

Exhibit 1 lists the means for extent of involvement at the city, state, national, and international levels by six organizational affiliations: (1) local government (city or county), (2) nonprofit organization, (3) academic or consultant, (4) business, (5) federal government official, and (6) state government official. The results show that involvement in city-level activities is not restricted to local government officials. The mean values across all organizational affiliation categories indicate many actors are "somewhat involved" in climate or energy issues at the city level, with a statistically significant difference across organizational affiliations for involvement at all levels ($p < 0.01$, based on an independent sample, Kruskal-Wallis Test).

Local government officials indicate they are primarily involved in city-level activities (mean = 1.8). State and federal government officials report the least involvement in city-level activities (means < 1). The policy actors from the remaining organizational affiliations report that they are, on average, "somewhat involved" in city-level activities. Exhibit 1 also shows that actors are most consistently involved in state-level activities (means ranging from 1.2 to 1.7) and least consistently involved in international activities (means ranging from 0.1 to 0.9).

Exhibit 1

Extent of Involvement at Each Level, by Actor Category

Level	Organizational Affiliation (mean)						Total
	Local Government	Nonprofit Organization	Academic or Consultant	Business	Federal Government Official	State Government Official	
City	1.8	1.3	1.1	1.0	0.9	0.8	1.2
State	1.2	1.6	1.2	1.4	1.3	1.7	1.4
National	0.5	1.1	1.1	1.2	1.4	0.7	1.1
International	0.1	0.5	0.9	0.4	0.5	0.2	0.4

Notes: Affiliations are ordered from left to right by the extent of involvement at the city level. Responses were coded as follows: 0 = "not involved at all," 1 = "somewhat involved," and 2 = "primary involvement." A Kruskal-Wallis test indicates $p < 0.01$ for involvement at all levels, indicating a significant difference across affiliations.

Exhibit 2 lists the correlation coefficients between extent of involvement at each level and individual PAC, organizational PAC, and proclimate-change beliefs, and it also lists the total means for the variables.[4] The top part of exhibit 2 presents the data for individual PAC, which is measured by formal training and education level. Overall, the results show no association with involvement at any level. Total means range from 46 percent of respondents reporting formal training in statistics to 24 percent reporting formal training in modeling. In addition, about three-fourths of respondents have an advanced degree.

The middle part of exhibit 2 presents two organizational capacity questions by primary extent of involvement. The total means indicate that, on average, respondents report that their organization

[4] We calculated point-biserial correlation coefficients for the association between extent of involvement at each level and individual PAC, Kendall tau b coefficients for the association between extent of involvement at each level and organizational capacity, and Spearman rank-order correlation coefficients for extent of involvement at each level and proclimate-change beliefs. Results from exhibit 2 are robust across different measures of correlations.

Exhibit 2

Associations Between Extent of Involvement at Each Level and Individual and Organizational PAC and Proclimate-Change Beliefs

	Extent of Involvement (correlation coefficients)				Total Means
	City	State	National	International	
Individual PAC					
Area of formal training					
Statistics	0.05	– 0.01	– 0.09	– 0.12	46%
Policy analysis	0.06	0.03	0.08	0.03	45%
Policy evaluation	0.02	0.08	0.03	0.02	42%
Applied research	– 0.05	– 0.03	0.04	– 0.12	34%
Trends analysis and forecasting	0.01	– 0.05	0.07	– 0.00	25%
Modeling	– 0.07	– 0.04	0.03	– 0.00	24%
Education					
Advanced degree	– 0.03	0.05	0.12	0.01	73%
Organizational PAC					
Organizational priority on climate-related issues and energy policies[a]	– 0.00	0.14*	0.18**	0.18**	3.7
Organizational capacity on climate-related issues and energy policies[b]	– 0.05	0.02	0.22**	0.17**	3.7
Proclimate change-belief scale[c]	0.12	– 0.17*	– 0.07	0.03	3.9

PAC = policy analytical capacity.

**p < 0.05. **p < 0.01.*

[a] Exact wording: "Compared with other issues that your organization responds to, how much of a priority are climate-related issues and energy policies?" (1 = "much lower," 2 = "lower," 3 = "about the same," 4 = "higher," and 5 = "much higher").

[b] Exact wording: "Compared to similar organizations, does your organization have adequate knowledge, skills, and people to respond to climate-related issues and energy policies?" (1 = "very low capacity," 2 = low capacity," 3 = "medium capacity," 4 = "high capacity," and 5 = "very high capacity").

[c] Responses were coded as follows: 1 = "strongly disagree," 2 = "somewhat disagree," 3 = "I neither agree nor disagree," 4 = "somewhat agree," and 5 = "strongly agree."

places a "higher" priority on and has "high capacity" regarding climate and energy issues. Both organizational capacity questions correlate with a great extent of involvement at the national and international levels. A great extent of city-level involvement is not statistically significant in association with either organizational capacity question. Involvement at the state level, however, is associated with respondents reporting a high organizational priority for addressing climate and energy policies. The bottom part of exhibit 2 shows the proclimate-change beliefs by primary level of involvement. Most actors report that they "somewhat agree" (mean of about 4) with the items in the proclimate change-belief scale. No significant association exists between proclimate-change beliefs and involvement at the city, national, or international levels. A negative association, however, emerges between proclimate-change beliefs and involvement at the state level.

To help describe the tools and techniques that actors use, exhibit 3 outlines two scales via factor analysis from nine question items with factor loadings. The first scale encompasses collaborative tools and techniques, including collaborating with those with whom you agree, collaborating with those with whom you disagree, facilitation and consensus building (for example, focus groups and roundtables), and informal tools and techniques (for example, brainstorming and problem mapping). The second scale encompasses analytical tools and techniques, including modeling (for

Exhibit 3

Collaboration and Analytical Scales for Tools and Techniques

Question Items and Scales	Factor Loadings	
	Collaborative	Analytical
Collaborative tools and techniques scale (Cronbach's alpha = 0.75)		
Collaborate with those with whom you agree	**0.78**	0.20
Collaborate with those with whom you disagree	**0.72**	0.06
Facilitation and consensus building (for example, focus groups and roundtables)	**0.71**	0.19
Informal tools and techniques (for example, brainstorming and problem mapping)	**0.72**	0.27
Analytical tools and techniques scale (Cronbach's alpha = 0.70)		
Modeling (for example, climate-change scenarios and energy futures analyses)	0.07	**0.74**
Environmental impact analysis	0.10	**0.55**
Economic analysis (cost-benefit and economic impact analyses)	0.37	**0.63**
Risk analysis and assessment	0.15	**0.78**
Political feasibility analysis (for example, SWOT analysis and polling data)	0.35	**0.55**

SWOT = Strengths, Weaknesses, Opportunities, and Threats.

example, climate-change scenarios and energy futures analyses), environmental impact analysis, economic analysis (cost-benefit and economic impact analyses), risk analysis and assessment, and political feasibility analysis (for example, Strengths, Weaknesses, Opportunities, and Threats [SWOT] analysis and polling data). Cronbach's alpha for both scales is greater than 0.70.

Explanatory Analysis

Exhibit 4 presents the multivariate analysis explaining the variation in the frequency of use of various tools and techniques in climate and energy issues. Ordinal logit modeling was conducted for each tool and technique variable, with the explanatory variables organized by primary level of involvement, an organizational capacity scale, proclimate change-belief scale, the sum of an individual's formal training, and advanced degree. The models show moderate fit, with chi square probability less than 0.000 and pseudo R-square scores ranging from 0.05 to 0.15. The exception is the economic analysis variable, for which the ordered logit model inadequately fits the data. The results of an OLS regression analyses for the collaborative and analytical tools and techniques scales show a good fit, with adjusted R-square values equaling 0.26 and 0.21, respectively. All coefficients in exhibit 4 are unstandardized.

Overall, and with few exceptions, the results indicate that actors with significant city- and state-level involvement are more likely to engage in collaborative techniques than actors with little involvement. By contrast, actors involved in national and international levels are more likely to engage in analytical techniques. The exception is the result for actors operating at the international level, which is significant for collaborating with those with whom they agree and disagree and for the collaborative techniques scale. On further exploration into the data, we find that those involved at the international level frequently report a great extent of involvement at the city and state levels, as well.

For the other variables in exhibit 4, organizational capacity has significant, positive coefficients for six of the nine tools and techniques. Hence, those respondents reporting great organizational

Exhibit 4

Explaining Variation in Frequency of Use of Various Tools and Techniques in Climate and Energy Issues

	Collaborative Tools and Techniques					
	Facilitation and Consensus Building	Informal Tools and Techniques	Collaborate With Those With Whom You Disagree	Collaborate With Those With Whom You Agree		Collaborative Tools and Techniques Scale
Primary level of involvement						
City	0.52**	0.50**	0.40**	0.42**		0.25***
State	0.39	0.40	0.58**	0.49**		0.23**
National	0.02	0.18	0.34	0.43		0.15
International	0.28	0.26	0.61**	0.82**		0.23**
Capacity						
Organizational capacity	0.37**	0.51***	0.20	0.91***		0.25***
Proclimate-change beliefs	0.42**	0.09	– 0.32**	0.27*		0.05
Formal training	– 0.06	– 0.05	– 0.01	– 0.04		0.02
Advanced degree	0.66**	0.35	– 0.20	0.03		0.14
Psuedo R^2	0.06	0.06	0.06	0.15	Adjusted R^2	0.26
Prob > Chi^2	0.00	0.00	0.00	0.00	F-statistic	0.00

	Analytical Tools and Techniques						
	Political Feasibility Analysis	Risk Analysis and Assessment	Modeling	Environ-mental Impact Analysis	Economic Analysis		Analytical Tools and Techniques Scale
Primary level of involvement							
City	0.21	0.07	0.08	0.06	0.30		0.08
State	0.62**	0.19	– 0.04	0.08	0.04		0.09
National	0.02	0.63**	0.92***	0.70**	0.23		0.28***
International	0.38	0.22	0.35	0.46*	0.48*		0.21**
Capacity							
Organizational capacity	0.60***	0.48**	0.54**	– 0.00	0.14		0.14**
Proclimate-change beliefs	0.47**	0.14	0.06	0.11	0.04		0.05
Formal training	0.06	0.03	0.08*	– 0.09	– 0.03		– 0.01
Advanced degree	0.39*	0.45	0.65*	0.77**	0.27		0.26**
Psuedo R^2	0.08	0.06	0.10	0.05	0.02	Adjusted R^2	0.21
Prob > Chi^2	0.00	0.00	0.00	0.00	0.33	F-statistic	0.00

**p < 0.10. **p < 0.05. ***p < 0.001.*

Note: Models are ordered logit analysis with robust standard errors except for the two scale-dependent variables, for which ordinary least squares regression was used (coefficients are omitted from exhibit; for the collaborative technique scale the constant = 0.50, and for the analytical techniques scale the constant = 0.17).

capacity are also reporting great frequency in using facilitation and consensus building, informal tools and techniques, collaboration with those with whom they agree, political feasibility analysis, risk analysis and assessment, modeling, and the overall collaborative and analytical scales.

Finally, the proclimate change-belief scale is significant in five out of nine categories. Those who agreed strongly with the proclimate change-belief scale are more likely to engage in facilitation and consensus building, collaborate with those with whom they agree, and engage in political feasibility analysis. They are less likely to collaborate with those with whom they disagree. Of the two remaining individual-level variables, formal training provided little explanatory power in the models and advanced degree was positively associated with four out of the nine tools and techniques, plus the analytical scale.

Discussion and Conclusion

Issues involving technocracy and collaboration plague the use and development of policy-related information. These findings show that the organizational capacity and the tools and techniques of policy analysis used in one salient public policy issue—climate and energy issues—is partially conditioned by the extent of involvement with each level of the governing system. We expand on these results via the following three points.

First, *local capacity to respond to climate and energy issues should not be restricted to local government officials*. To understand city-level involvement in climate and energy issues requires a broader perspective that considers the system of actors engaged at the city level rather than a perspective focusing solely on those actors employed by local government agencies. Actors involved at the city level can be found in other sectors, including nonprofit organizations, academics and consultants, and the business community, and in organizations at higher levels of government, including state and federal agencies.

Second, *the organizational PAC is greater for organizations involved in climate and energy issues at the national and international levels, whereas individual PAC is associated weakly, if at all, with level of involvement.* A high degree of organizational capacity and priority for climate and energy issues is consistently and positively associated with involvement at the national and international levels. This finding supports existing arguments about the barriers of local-level activities to address climate-change issues (for example, Betsill, 2001). Based on this sample of policy actors, however, individual PAC does not vary by the extent of involvement in any level of government.

Third, *collaborative techniques are more likely used at the city, state, and international levels, and analytical techniques are more likely used at national and international levels.* Perhaps through the combination of devolution and political stagnation at the federal level, effort on climate and energy issues has shifted toward city-level activities. The close proximity to citizens and the need for local engagement perhaps motivates these actors to apply tools and techniques of policy analysis that are less technocratic and more engaging, such as facilitation, informal tools (brainstorming), and collaborating with those with whom you agree and disagree. More technocratic tools and techniques (for example, risk analysis, modeling, environmental impact analysis, economic analysis, and political feasibility analysis) are more likely associated with those actors engaged at higher levels of government, especially the national and international levels. One exception involves actors involved at the international level, who are also reporting frequent use of collaborative techniques. The results support the integration of diverse techniques within the toolbox of policy analysts and provide a nuanced understanding that the tools and techniques applied might vary by the contextual situation, as measured here by the extent of involvement at each level.

This article contributes to our understanding of policy actors and processes by exploring the policy capacity of the individuals and organizations involved in the policy process and the tools and techniques they use. Any interpretation of these results clearly should recognize the absence of any criteria of influence or successful decisionmaking in relation to any extent of PAC. Longitudinal and cross-sectional analyses are needed to assess whether PAC actually leads to greater influence or better decisionmaking. Finally, although advancing the literature in innovative measures of PAC, this study is hampered by measures that could still be more detailed and exhaustive, for example, by specifying the quality of the training and education or by capturing network structures.

Despite these caveats, this article provides theoretical insight into our understanding of local-level climate and energy policy and the individuals and organizations involved. By contrast to the debate about whether advanced education and training or more participatory forms of policy analysis and policymaking are needed, this article suggests that addressing complex local policy problems, such as climate change, involves a combination of analytical and collaborative tools and techniques. Given that most actors are involved, to various extents, at the local level, the interpretation should not be one of a strict dichotomy of roles, but rather as reflecting a tendency to use certain tools and techniques to fit particular problems and needs at any particular level of government. Hence, PAC is partially a function of the extent of involvement in government. Among the next steps is to develop rigor in theory and recognition in practice about the roles and relations among actors from different levels of government in public policy issues.

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