

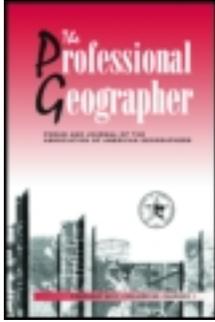
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### Hot Air: University Climate Action Plans and Disarticulated Federalism

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# Hot Air: University Climate Action Plans and Disarticulated Federalism

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Individual states and academic institutions have taken leadership on climate change policy in the United States. Without unified national policy, a patchwork of state policies fosters geographic variation among climate action plans (CAPs) for American College and Universities Presidents' Climate Commitment signatories. Correlation among indexes rating state climate policy and signatory CAPs and spatial analysis indicate that states with aggressive climate policy foster aggressive policy within their academies. Reflection on the national scale suggests that although state policies help combat climate change, they could be more significant if articulated within a more comprehensive national policy. **Key Words:** American College and University Presidents' Climate Commitment, climate action plan, climate change policy, multiscalar dynamic federalism, state-level regulation.

在美国，个别的州和学术机构已经在气候变化政策上取得了领导地位。在没有统一的国家政策的条件下，错落有致的州政策造成了美国的学院和大学校长气候承诺所签署的气候行动计划（CAPs）中的地理差异。评价国家气候变化政策和签署 CAPs 和空间分析之间的相关性表明，具有激进气候政策的州促进了他们州内院校的激进政策。全国规模的研究表明，虽然州政策帮助应对气候变化，如果在一个更全面的国家政策内来阐明，它们的影响可以更为显著。关键词：美国的学院和大学校长气候承诺，气候行动计划，气候变化政策，多标动态联邦制，州级监管。

A título individual, los estados e instituciones académicas de los Estados Unidos están asumiendo liderazgo sobre políticas de cambio climático. Ante la ausencia de una política nacional unificada, un mosaico de políticas estatales estimula la variación geográfica en los planes de acción climática (CAP) de los firmantes del Compromiso Climático de los Rectores de Institutos de Educación Superior y Universidades Americanas. La correlación entre los índices de evaluación de la política climática y firmantes de los CAP y el análisis espacial indican que los estados con una política climática agresiva alientan políticas igualmente agresivas en su entorno académico. La reflexión a escala nacional sugiere que aunque las políticas estatales ayudan a combatir el cambio climático, podrían ser mucho más significativas si estuviesen articuladas dentro de una política nacional de mayor comprensión. **Palabras clave:** Compromiso Climático de los Rectores de Institutos de Educación Superior y Universidades Americanas, plan de acción climática, política de cambio climático, federalismo dinámico multiescalar, regulaciones a nivel de estado.

Climate change has become one of the most pressing world issues, starting new movements in science, politics, and economics (Abler 2003; Hunt, Leaf, and Verolme 2003; Schreurs 2008). Many developed countries have taken leadership for years, but the United States has no overarching national policy regarding greenhouse gas emissions (Peterson

and Rose 2006). The federal policy vacuum has engendered concern and disappointment about U.S. leadership, but the lack of national leadership has not prevented action; rather, it has prompted local climate change policy within both public and private institutions, including states and institutions of higher education (Knuth et al. 2007; Wheeler 2008).

Among these policy instruments is the American College and University Presidents' Climate Commitment (ACUPCC), which encourages American institutions of higher education to become zero-net emitters of greenhouse gases (ACUPCC 2007).

The debate surrounding the content of the ACUPCC signatories' climate action plans (CAPs) mirrors the debate about the pros and cons of state leadership. Both question whether it is financially, technically, or politically feasible to reduce greenhouse gas emissions in a meaningful way without substantial leadership at a higher level of government. Therefore, this study focuses on how state-level policies affect the policies of their respective institutions of higher education. Some states and schools have adopted progressive policies, whereas others have opted to do nothing. Through a case study of signatories to the ACUPCC and their correlation with states' climate policies we reflect on how disarticulation among state and federal policy in the United States has failed to produce coherent greenhouse gas mitigation policy.

The presence of state-level policies might provide infrastructure fostering progressive greenhouse gas mitigation strategies in the colleges and universities of that state. This posits that states with aggressive greenhouse gas mitigation policies will have colleges and universities with similarly aggressive policies due to a higher level of support and guidance by the state. The lack of a comprehensive national policy and the fragmented nature of state policies will cause colleges and universities to have similarly fragmented CAPs on the national scale. Through geographical analysis of subnational climate change policy interactions, we can comment on the effects of the federal policy vacuum. The results have implications for the ACUPCC, its signatories, state-level governments, and the national government.

### **Federalism and the Role of State-Level Policies**

Federalism allows the multiple layers of government in the United States to stay united for their "common purposes" while maintaining partial sovereignty to "preserve their respective identities," resulting in a system that combines "self-rule and shared rule" (Elazar 1987, 33, 84; Dikshit 1971). Although states have power

to regulate when the national government does not reserve the right, Article VI of the Tenth Amendment establishes the supremacy of the Constitution and national laws. Using this power of preemption, Congress has recently taken a more active role in legislating areas traditionally regulated by the states, which has expanded the role of the national government in many policy areas and resulted in the expectation that Congress will legislate with at least minimum standards and rules (Zimmerman 1992). This trend, however, has not held with climate change regulation. Instead, states and subnational actors have used the federal structure of the United States to take leadership in the conversation about climate change regulation, whereas the national government has remained less engaged and taken little action on the issue (Environmental Law Institute 2007).

Many scholars highlight that states have historically been the first to take action on environmental issues that have only later been nationally regulated (Rabe 2002; Adler 2005; Litz 2008). This model reflects the current situation of state governments leading climate change policy without comprehensive national legislation (Rabe 2002; Adler 2005; Litz 2008). Buzbee (2006) described these circumstances as federal regulatory "underkill," creating opportunities for states to fill political opportunity gaps. Recognizing potential long-term economic benefits, many states have prepared for a transition to a low greenhouse gas-emissions society by encouraging or mandating energy efficiency, renewable energy, and green jobs (Byrne et al. 2007; Keeler 2007; Schreurs 2008).

Current state-level leadership, the "bottom-up" movement, toward national regulation on climate change has advantages over early federal action. There is an important "learning function" inherent in new policies; states can employ innovative and even risky ideas to test their effectiveness and feasibility (Buzbee 2006; Peterson and Rose 2006; Keeler 2007; Litz 2008). There are also structural and enforcement benefits when the scale of implementation is smaller and tailored to the unique aspects of the state, which traditionally has jurisdiction over energy development (Adler 1998). Further, Byrne et al. (2007) hypothesized that the passage of climate change policies has been easier at the state level due to the diminished influence of energy sector lobbyists. In fact,

state policies have become so progressive and widespread that some question whether action at the national level is necessary, arguing that a decentralized approach encourages economic efficiency and local democracy on this international issue (Adler 1998; Teske 2004; Lutsey and Sperling 2008; Gustavsson 2009).

Others maintain the necessity of a comprehensive national policy to mitigate greenhouse gas emissions (Etsy 1996; Litz 2008; Schreurs 2008). Although the federal structure of the United States allows for policy overlaps to prevent underkill, too much overlap or “excessive, scattered, or duplicative enforcement” leads to jurisdictional confusion with higher implementation and enforcement costs (Buzbee 2006, 20). Keeler (2007) described how delaying the creation of national policy increases instances of legislative mismatch among state policies and federal policy when new, superior laws come into effect.

Historically, federal legislation is more likely to place regulatory burdens on polluters because states tend to be more growth oriented and reluctant to impede their economies with inhibiting rules (Buzbee 2006; Keeler 2007). Although state and municipal climate change plans establish goals and recommendations, they vary widely and do not address critical issues or set up institutional frameworks, indicating limited usefulness without national regulation (Wheeler 2008). Climate change policy on the national and international scales addresses the regulatory tragedy of the commons problem, wherein “no single actor [such as a state] has clear responsibility for an environmental ill or can take credit for regulatory action” (Buzbee 2006, 19).

Adler (2005) discussed how economies of scale can help determine which level should reserve the power to legislate, most notably when it involves interstate commerce. For example, different product standards to reduce greenhouse gas emissions have proliferated in various states, such as for renewable energy credits (RECs); commerce could be interrupted as costs rise and suitable products are not delivered due to interstate inconsistencies. Such variation among state regulations on product manufacturing and standards illustrates “interstate spillover” and might warrant federal regulation (Adler 2005). “Global climate change policy is a prime example of increasing state ac-

tivity where federal action would provide for a greater jurisdictional match” (Adler 2005, 17).

Although debates abound about the primacy of national or state-level regulation writ large, a more realistic characterization is a multiscale dynamic federalism that establishes a regulatory conversation between different levels of government and results in legislation from both levels. The congressional and judicial ability to preempt state powers can seemingly create a dichotomy between state and national regulation, but many scholars have noted that these power relations are not “zero-sum” (Gormley 1987; Zimmerman 2005; Engel 2006; Osofsky 2010). Most preemption of power occurs when rules and regulations are established for the states to carry out in their own manner, because excessive command and control to establish uniform state actions has historically been ineffective. This dynamic federalism creates overlapping structures and regulations that may seem inefficient but actually ensure that there are no policy gaps, among other benefits (Buzbee 2006; Engel 2006). Osofsky (forthcoming) posited that, although a formal version of this fully integrated federalism might be difficult to achieve, several avenues for “partial diagonal regulation” (20) allow for full manifestation of these benefits. Through this unique manner, multiscale federalism develops a conversation over time among different levels of government, as Osofsky exemplified using the evolution of the Clean Air Act and the *Massachusetts v. EPA* case.

Engel (2006) described how federalism creates dynamic conversations among levels of government, spurring situations where “policy may start at one level of government before shifting to the level that may be considered optimal” (166). Furthermore, maintaining this conversation and overlapping regulation after reaching the optimal level is important for regulatory progression and innovation, as a sort of checks-and-balances system. Dynamic federalism creates a beneficial safety net for social problems (e.g., uneven potential for climate mitigation technology) and protects against excessive interest group influence at one level or another. Engel highlighted how this dynamic model preserves the complementary benefits of state and federal policy. States remain the laboratories of policy and capitalize on national research dollars, whereas the federal government spreads innovation among

the states through policies that establish floors rather than ceilings.

Although there are clear advantages and disadvantages to state- or national-level policies on greenhouse gas emissions, in the current political climate of gridlock in Congress and ever-increasing action at the state level, it is worthwhile to examine whether state-level and university climate policies reflect multiscale benefits. This study provides a picture of current state-level policies and how they correlate with climate policy enacted by institutions of higher education. Results permit us to reflect on the desirability of national leadership to more efficiently guide state-level policy for greenhouse gas mitigation.

### **Climate Change Policies in Higher Education**

Higher education has traditionally played a role in social movements, and its leadership in climate change policy is illustrative (Canan and Schienke 2006). Stephens et al. (2008) provided a historical framework for the unique role of higher education institutions as actors of social change, focusing on the recent trends in sustainability. Some debate how government policies and structures have factored into these movements. Calder and Clugston (2002) argued that U.S. institutions of higher education have been making progress on sustainability and climate change issues with little help from government or private foundations. Instead, innovation has primarily been from within their institutional structure with support from nongovernmental organizations (NGOs) and businesses. Knuth et al. (2007), in their study of the University of Pennsylvania, focused on the strength of local initiatives in place of national policy and the expanded benefits of interaction between the university and subnational government.

Nevertheless, there is consensus that higher education faces challenges in making policy changes, especially without national policy guidelines (Calder and Clugston 2002; Knuth et al. 2007; Stephens et al. 2008). These include “regional-specific dominant sustainability challenges, financing structure and independence, institutional organization, the extent of democratic processes, and

communication and interaction with society” (Stephens et al. 2008, 317). These challenges are often based on external structural factors that determine whether higher education has incentives to pursue sustainability, but an expanded role of government interaction in these areas can help ameliorate them (Calder and Clugston 2002; Knuth et al. 2007).

Some institutions of higher education fall within the range of state policies and initiatives to mitigate emissions, but others have no state framework (Calder and Clugston 2002; Willson and Brown 2008). Using the case study of California State Polytechnic University–Pomona, Willson and Brown (2008) examined the cost-effectiveness of greenhouse gas emissions–reducing strategies in accordance with Clean Air–Cool Planet (CA–CP) models on campus. They noted the merit of local planning and initiatives but concluded that the most favored mitigation strategies are the least cost-effective and generally a fantasy without supportive policies at the state or national levels. Essentially, colleges and universities without a guiding state-level policy are more likely to have less progressive greenhouse gas emissions–mitigation goals and strategies, whereas well-articulated state policies provide models and guidelines on which to base university CAPs.

Within the ACUPCC there are almost 700 North American institutions of higher education pledging to mitigate their greenhouse gas emissions. Their mission is to “to accelerate progress towards climate neutrality and sustainability by empowering the higher education sector to educate students, create solutions, and provide leadership-by-example for the rest of society” (ACUPCC 2007). Each college or university will take on the responsibility of reducing climate change by eliminating its greenhouse gas emissions, even without policy mandates or support.

The ACUPCC outlines steps for achieving these goals. Each college or university, after assessing its greenhouse gas emissions, must then formulate a CAP, setting targets to mitigate emissions and incorporate sustainable practices. These plans include a timeline toward eventually becoming climate neutral, or having no net greenhouse gas emissions, and the strategies and methods for reducing emissions and achieving sustainability (Carlson

2009a; ACUPCC 2007). These plans are based on each institution's preferences but are also influenced greatly by the state in which the institution resides due to climate change and energy efficiency regulations. For example, some states provide infrastructure and incentives for renewable energy development and purchasing, whereas these technologies might be much more expensive and difficult to implement in states with no climate change policy.

For many colleges and universities, these CAPs were due in September 2009, and the process of formulating realistic strategies and goals on time and within tight budgets was difficult (Carlson 2009a). Carlson (2009a, 2009b) examined this process and found that, for many schools, financial and institutional boundaries have affected their original plans for the commitment. Coping mechanisms included strategies such as postponing progress on reporting and greenhouse gas mitigation strategies, watering down the CAPs with the intention of revising them later, and even considering dropping out. Nevertheless, about a third of the signatory institutions completed their CAPs and are committed to their sustainability goals (ACUPCC 2010). Many of these colleges and universities plan to reach climate neutrality within the next forty years, but some only have concrete targets for the next few years and plan to use offsets or RECs in the future (Carlson 2009b). These vague goals possibly reflect the uncertainty of public policy, legislation, technology, and resources over the next forty or fifty years. Some critics wonder whether the ultimate goal of climate neutrality is realistic or beneficial at such a small scale (Carlson 2009b). Many schools have steered away from these options, choosing on-campus or local strategies that are guaranteed to mitigate greenhouse gas emissions (Carlson 2008, 2009b). Despite the debates and the obstacles ACUPCC signatories face in this step of their commitment, most agree that even if climate neutrality is not feasible, the changes they are planning for their campuses will transform the "culture around energy consumption" and have unforeseen financial and societal benefits in the future (Carlson 2009b).

## Methods

State policies do not map onto institutional strategies at the substate level perfectly,

making direct comparison of state climate change initiatives to university and college initiatives difficult. To assess how well state policy correlates with university and college policy requires consideration of many factors, including power generation and procurement, building efficiency initiatives, transportation, and transfer of pollution credits. These are regulated (or not) in different ways at each policy level. We design two indexes to compare the quality of state initiatives to university and college initiatives.

### *State Climate Policy Score*

Data came primarily from the Pew Center on Global Climate Change (PCGCC 2010) and the Database for State Initiatives on Renewables and Efficiency (2010) to compile a state-by-state climate policy score. Seventeen separate policies that aim to reduce greenhouse gas emissions can be grouped into the categories of climate change policies, energy sector, transportation, and building sector (Table 1). Some of these policies were specifically enacted in response to climate change, such as the Renewable Portfolio Standards and RECs, whereas others have been expanded due to their impact on greenhouse gas emissions, like appliance efficiency standards.

For each state, these policies were ranked from zero to two. A score of zero means that no policy is present; one signifies a weak, old, or vague policy; and a score of two indicates strong policies that effect significant emissions reductions. In five areas—climate change advisory groups, electricity emissions caps, REC tracking systems, state governments buying green power, and appliance efficiency standards—it was only feasible to determine a presence or absence of the policy, resulting in a score of either zero or one. The emissions reduction targets vary significantly among states; using House Resolution 2454, known as the American Clean Energy and Security Act or the Waxman–Markey Bill, we differentiate these states. This bill was passed in the House of Representatives and reflects what federal regulation might look like in the future. Its target is to reduce national greenhouse gas emissions 3 percent below 2005 levels in 2012, 17 percent below 2005 levels in 2020, 42 percent below 2005 levels in 2030, and 83 percent below 2005 levels in 2050 (PCGCC 2010). All state

**Table 1** State climate policy index scoring, which permits us to rank states based on the sophistication of their policies for greenhouse gas reduction

Policy area	Score		
	0	1	2
<b>Climate change policies</b>			
Climate action plans	No policy present or noncompliant with national policies	In progress	Completed
Regional initiative member		Observer	Member
Climate change commissions and advisory groups		Commission or advisory group	—
Emissions reduction target		Below IPCC recommendations	At or above IPCC recommendations
Emissions reporting/registry		Registry member or voluntary reporting	Registry member and mandatory reporting
<b>Energy sector</b>			
Electricity emissions caps		Emissions caps	—
Renewable or alternative energy portfolio standards		Renewable or alternative energy goal	Renewable or alternative standards
Renewable energy credit tracking system		Member of tracking system	—
Energy efficiency resource standards		Pending energy efficiency resource standards	Completed electricity and/or gas standards
State governments buying green power		Green power purchasing policy	—
<b>Transportation</b>			
Energy efficiency resource standards		Poised to adopt standards	Adopted standards
Vehicle miles traveled (VMT) policies		Smart growth policies	VMT and smart growth policies
Renewable fuel standards (RFS)/biofuel incentives		Tax exemptions, credits, or grants	Incentives and RFS with biofuel mandates
<b>Building</b>			
Green standards for state buildings		LEED recommended or other energy use/goal	LEED or equivalent standard required
Appliance efficiency standards		Appliance efficiency standards	—
Residential building energy codes		1998–2003 IECC or equivalent standard	2006–2009 IECC or equivalent standard
Commercial building energy codes		Pre 1998–2003 IECC/Pre 1999–2001 ASHRAE standards	2006–2009 IECC/2004–2007 ASHRAE or equivalent standards

Note: IPCC = Intergovernmental Panel on Climate Change; LEED = Leadership in Energy and Environmental Design; IECC = International Energy Conservation Code; ASHRAE = American Society of Heating, Refrigerating and Air-Conditioning Engineers.

emissions reduction targets are stated in the same way, which allowed objective comparison of the reduction percentages, baseline years, and target years. Point summations for state climate policy ranged from one point (Mississippi) to twenty-seven points (California). These totals were divided by the total possible points, twenty-nine, to get a state climate policy score expressed as a percentage, so that Mississippi

has a score of 3 percent and California of 93 percent (Table 2).

#### *CAP Strength Index*

For each state, we consider the CAP for two institutions of higher education with preference given to state flagship universities and large, public state schools. In states where CAPs

**Table 2** The fifty states ranked by state climate policy scores, in order from the least to the most progressive

State climate policy scores			
State	% Policies completed	State	% Policies completed
Mississippi	3.4	Utah	51.7
Alabama	6.9	Virginia	51.7
Nebraska	6.9	Michigan	55.2
North Dakota	10.3	Nevada	55.2
Tennessee	13.8	Arizona	58.6
Wyoming	13.8	Montana	58.6
West Virginia	17.2	Illinois	62.1
Alaska	20.7	Pennsylvania	62.1
Indiana	20.7	New Hampshire	65.5
Oklahoma	20.7	Wisconsin	65.5
South Dakota	20.7	Iowa	69.0
Arkansas	24.1	Minnesota	69.0
Georgia	24.1	Maine	72.4
Louisiana	24.1	New Mexico	72.4
Missouri	27.6	Connecticut	75.9
Texas	27.6	Florida	75.9
Kentucky	31.0	Vermont	75.9
Idaho	34.5	New Jersey	79.3
Kansas	34.5	Rhode Island	79.3
Ohio	34.5	Maryland	82.8
Hawaii	37.9	Oregon	82.8
South Carolina	37.9	New York	86.2
North Carolina	48.3	Massachusetts	89.7
Colorado	51.7	California	93.1
Delaware	51.7	Washington	93.1

for such institutions were not available, private institutions or special focus institutions were selected. In ten states (Arkansas, Arizona, Delaware, Hawaii, Idaho, Kansas, Oklahoma, Rhode Island, West Virginia, and Wyoming), only one institution of higher education was registered with the ACUPCC and had a CAP; therefore, these colleges and universities were analyzed regardless of type. Six states had no institution with a CAP due as of March 2010 (Alabama, Louisiana, Michigan, Missouri, Nebraska, and North Dakota). The remaining thirty-four states had at least two institutions with CAPs. Overall, the study includes mostly large, public master’s- and doctorate-awarding universities, with some small public schools, large and small private institutions, baccalaureate programs, and a few community colleges and special-interest programs.

The diversity of the colleges and institutions this study analyzes is reflected in their CAPs. We create a state CAP strength index to rank

the coherence of institutional greenhouse gas mitigation policies based on categories given in the CA-CP Calculator, the assessment instrument used by most ACUPCC signatories. It uses three broad scopes to differentiate between the sources of emissions on college campuses. The definitions according to the User’s Guide are as follows:

- Scope One—Direct emissions from sources that are owned and/or controlled by your institution.
- Scope Two—Indirect emissions from sources that are neither owned nor operated by your institution but whose products are directly linked to on-campus energy consumption.
- Scope Three—Other emissions attributed to your institution, deemed “optional” emissions by corporate inventories. (Andrews 2008, 8)

Within these three scopes, institutions could reduce emissions through twenty-eight discrete policies scored as in the state analysis using a point system from zero to two to establish an institution’s rank. Zero points were given when a clear policy was absent. One point represents vague strategies, plans for investigating the feasibility of a program, and tactics that partially addressed the entire source of emissions. Two points represent clearly articulated, often multidimensional plans, and large-scale mitigation programs.

Scope One emissions include stationary, mobile, or fugitive sources (Table 3). The presence of stationary power sources or livestock and agriculture programs varies greatly among schools, creating three possible point totals in Scope One (Table 4). For this study, stationary power and livestock and agriculture emissions were scored if the institution included them in the greenhouse gas audit required by the ACUPCC. Examples of strong policy in the stationary category are installing renewable energy, such as solar panels, wind turbines,

**Table 3** Scope One emissions strategies: The six subcategories included broadly capture how institutions can mitigate Scope One emissions

Scope One emissions mitigation	
Stationary	On-campus renewable energy On-campus stationary sources
Mobile	University fleet
Fugitive/process	Agriculture/livestock Refrigerants and chemicals Fertilizer application

**Table 4** Points possible for Scope One emissions strategies

Institution type based on Scope One emissions sources	Points Possible		
	Scope 1	Scope 2	Scope 3
Neither stationary nor agricultural sources	8		54
Either stationary or agricultural sources	10	12	56
Both stationary and agricultural sources	12		58

Note: Scope One emissions vary among institutions, usually due to their size and location, resulting in the three possible point totals.

geothermal plants, and cogeneration capacity. Mobile emissions can be reduced by reforming university fleet vehicles and landscape equipment, and ideal fugitive source policies include improving refrigeration appliances, reducing fertilizer application, or changing agricultural programs.

The remaining twenty-six categories in Scopes Two and Three are general to university operations and are assumed present with mitigation possibilities for this study, even when not mentioned in the institution's CAP. Scope Two emissions result from purchased electricity, chilled water, and steam from a third party. Most schools cannot stop purchasing electricity completely but could opt to buy green power from renewable energy sources or improve efficiency on campus. Colleges and universities were scored based on mitigation strategies in five broad areas including building retrofits, Leadership in Energy and Environmental Design construction mandates, incentives for changing energy-use behavior, and purchase of renewable energy (Table 5).

Scope Three is the most diverse source of emissions, originating from a variety of third-party producers, with commuting, air travel, and waste as significant aspects (Table 6). Policies for commuting generally involve incentive-based strategies to alter habitual use of personal vehicles to travel to and from campus. Scores for commuting strategies are based on the number, quality, and cohesiveness of the proposed programs. Schools generally buy offsets to mitigate institutional travel, but more progressive plans reduce miles traveled. Solid waste strategies emphasize reduction and

**Table 5** Scope Two emissions strategies

Scope Two emissions mitigation	
Purchased electricity use reduction onsite	LEED certification or equivalent Building use changes Energy efficiency improvements Energy conservation Behavior change incentives
Purchased electricity offsite	Renewable energy purchasing

Note: Scope Two mitigation broadly aims to reduce emissions via guaranteed use of renewable energy either off campus and improved efficiency on campus. LEED = Leadership in Energy and Environmental Design.

recycling across all sectors of campus. Because water consumption is new to emissions auditing software favored by most signatories, few institutions address the issue. For this study all water conservation measures—ranging from low-flow toilets to native plant landscapes—were grouped into one category.

Because of the varying number of subcategories within each scope, the point summation is skewed toward Scope Three policy interventions. To eliminate this bias we apply a weighting scheme based on the average emissions for all reporting institutions using data from the ACUPCC Reporting Institutions database (Table 7). To compute each signatory's CAP strength score, the subtotal points from Scopes One, Two, and Three are multiplied by their

**Table 6** Scope Three emissions strategies

Scope Three emissions mitigation	
Commuting	Bike/walking programs Mass transit programs Alternative car programs/incentives Carpooling program Parking changes/incentives Telecommunication On-campus living incentives
University travel	Air travel Other business/athletic travel
Solid waste	Reduce/reuse/recycle programs Electronic waste recycling Paper use reduction Dining changes Reuse waste oils Composting
Custom sources	Water use reduction

Note: Scope Three mitigation strategies relate to four general areas.

**Table 7** Emissions percentages by institution type and scope

Source	Special focus institutions		Tribal/associates institutions		Baccalaureate colleges		Masters colleges and universities		Doctorate granting universities		Total (%)
	% of Emissions	% of Institutions	% of Emissions	% of Institutions	% of Emissions	% of Institutions	% of Emissions	% of Institutions	% of Emissions	% of Institutions	
Scope One	34	1.3	13	5.3	32	18.4	25	22.4	3	52.6	29.7
Scope Two	44		35		46		43		47		45.4
Scope Three	22		52		22		32		21		24.9
Total	100		100		100		100		100		100.0

*Note:* Percentage of emissions are given by the American College and University Presidents' Climate Commitment. Percentage of institutions represents the proportion of a given institution type represented in this study through analysis of individual climate action plans (CAPs; e.g., 18.4 percent of the CAPs we studied were for baccalaureate colleges). For each institution type, the percentage of emissions for each scope is multiplied by the percentage of institutions. These values are then summed across institutional types for each scope to give the total percentages in the final column. We use the percentages in the final column to weight the influence of each scope for an institution's CAP strength index.

**Table 8** The fifty states ranked by climate action plan strength index, in order from the least to the most progressive

Climate action plan strength scores			
State	Score (%)	State	Score (%)
Alabama**	0.0	Indiana	33.5
Louisiana**	0.0	Ohio	34.1
Mississippi**	0.0	Pennsylvania	35.0
Missouri	0.0	New Mexico	35.8
Nebraska**	0.0	New Jersey	37.7
North Dakota**	0.0	Washington	39.3
Kansas*	11.7	Connecticut	41.0
Oklahoma	16.1	Utah	41.8
Hawaii*	17.0	Montana	42.2
Alaska*	20.7	New York	42.6
Kentucky	22.6	Florida	43.8
Delaware*	25.1	Colorado	43.9
West Virginia*	25.4	Vermont	45.7
Arkansas*	25.6	Illinois	46.5
Wyoming*	27.2	Georgia	47.8
Tennessee	27.4	Maine	47.9
South Dakota	27.8	New Hampshire	48.8
Rhode Island*	27.9	Wisconsin	49.8
Nevada*	29.0	Virginia	50.2
Idaho*	29.3	Michigan	51.2
North Carolina	29.4	California	51.8
Iowa	29.7	Arizona	52.9
Minnesota	30.9	Maryland	54.1
South Carolina	30.9	Massachusetts	57.5
Texas	32.4	Oregon	58.6

\*One University Climate Action Plan reported for state.

\*\*Zero University Climate Action Plans reported for state.

respective weighting index from Table 7. For example, the Scope Two subtotal for Arizona State University (ASU) is nine points out of a possible twelve. Multiplying this by the average percentage of emissions from Scope Two, or 45.4 percent, yields a weighted score of 4.07 out of a possible 5.43 points. Weighted scores are summed for all scopes and expressed as a percentage of total points possible, the institutional CAP strength score. These scores are averaged for each state to give the CAP strength index values found in Table 8.

## Data Analysis

Maps of state climate policy scores and CAP strength index indicate geographic coincidence of strong state-level climate change policy with

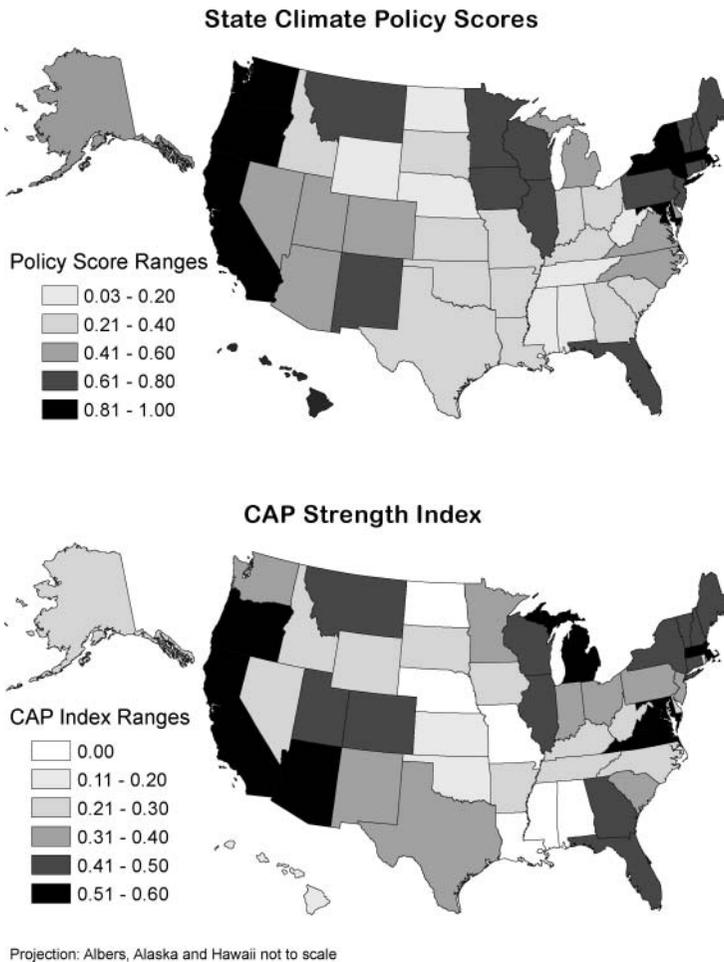
university CAPs (Figure 1). It is also evident that U.S. climate change policy at the state level is variable and fragmented. For example, Florida, New Mexico, and Montana stand out with progressive climate change policies among their generally low-scoring neighbors. There is some regionalization of state policies with scores clustering on the Pacific coast, among southwestern states, and in central states of the heartland; these are likely associated with regional climate change initiatives such as the Midwest Greenhouse Gas Reduction Accord and the Western Climate Initiative. The map of university CAPs indicates greater interstate variability.

In addition to geographical analysis we use the state climate policy score (Table 2) as the independent variable to determine correlation with the dependent variable, CAP strength index (Table 8), using linear regression. Figure 2 displays the positive and significant relationship between state climate policy scores and CAP strength index, labeled by state. The coefficient of determination indicates that state climate policy scores predict 54 percent of the variation in the CAP strength scores, a relatively strong and significant relationship. At the very least, the significant and positive relationship between state policy scores and CAP scores does not allow us to reject the association of state-level climate change policies with progressive CAPs from their respective colleges and universities based on a higher level of policy support and guidance.

## Discussion and Conclusions

Although state-level climate policy helps predict the sophistication of college and university CAPs, both reflect a general lack of cohesion nationally. Nevertheless, policies at the state level correlate with those at universities. Even among schools committed to mitigating gas emissions, there is a strong correlation of the strength of their commitment with their respective state policies. But are state policies enough to fill the national policy vacuum on climate change?

There is obvious potential for states to mitigate greenhouse gas emissions, but these actions are unlikely to lead to a coherent national strategy. Reluctant polluter states, such



**Figure 1** Maps of state climate policy scores and climate action plan (CAP) strength index. Climate change policies range from the lightest, least proactive to the darkest, most progressive. On the whole these maps indicate a patchwork of policies without much cohesion among the nation.

as Mississippi, Alabama, and Nebraska, would probably not adopt climate change policies on their own. Furthermore, differences among states create problems of interstate spillover, product standards and commerce, and the regulatory commons issue. Lacking a national policy, the United States would be unable to enter into international agreements. Our work supports Buzbee's (2006, 22) assertion that "Recent state activism does not and cannot . . . establish broad claims about state readiness to supplant federal environmental leadership." There is little incentive for states to take action

and risk conflict with the national government by implementing new pollution policies; consider the controversies over the *Massachusetts v. EPA* Supreme Court decision or California's vehicle emissions standards (Bergeson 2009; Westmoreland 2010). A federal climate change policy would alleviate state trepidation for internal policies.

Many scholars agree that a healthy mix of federal and state regulation on greenhouse gas emissions would foster innovation within climate change policy across the nation (Adler 2005; Keeler 2007). The guiding principle for



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