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Strategic Adaptive Governance and Climate Change: Policymaking during Extreme Political Upheaval

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Abstract: Adaptive governance seeks to address complicated and difficult policy problems. Due to the extreme political upheaval wrought by the Trump administration's dismantling of federal climate change programs, many state and local governments are considering new policy approaches. Yet by ignoring crucial aspects of politics and intergovernmental relations, the adaptive governance literature provides little guidance for such substantial issues. This paper introduces the concept of strategic adaptive governance, a framework for permitting policymakers to achieve the highest rate of compliance possible under existing conditions and constraints involving state and local policy, despite political upheaval. The strategic adaptive governance model embraces politics, accounts for the role of central authorities, and emphasizes the motivations, resources, and interdependencies of affected parties. We apply the model in an analysis of California's Global Warming Solutions Act of 2006 (AB 32), examining the extent to which it aligns with strategic adaptive governance, and evaluating the potential for the state to utilize the model. We find that AB 32 aligns moderately with strategic adaptive governance, and discuss how the model could help protect and enhance policy gains. More broadly, strategic adaptive governance provides a generic and universal framework for policymakers interested in tactical formulation of any regulatory policy.

Keywords: strategic adaptive governance; governance; adaptation; collaboration; resilience

1. Introduction

During the past two decades, a great deal has been written on adaptive governance, environmental policymaking, and sustainable development [1]. As Vella et al. (2016) [2] observe, adaptive governance was born out of the resilience literature in the ecological sciences. According to Scholz and Stiftel (2005) [3], adaptive governance involves the evolution and transition of new governance institutions capable of developing long-term policy solutions to very complex and difficult problems "through coordinated efforts involving previously independent systems of users, knowledge, authorities and organized interests" (p. 6). In their summary of the resilience literature, Vella et al. (2016) [2] find that normative guidelines for adaptive governance structures and functions call for "(1) devolved management rights/power to promote participation in decision making; (2) networks of collaboration to build social capital among actors at multiple levels of government and improve capacity for action; (3) flexible governance arrangements to allow actors to respond to surprises; and (4) learning through governance networks" (p. 364).

Cote and Nightingale (2012) [4] argue that resilience thinking has ignored important work by prominent social scientists, failed to deal with issues of power, and focused too much on governance structures and functions and too little on separate political, historical, and cultural policy contexts. The adaptive governance literature has placed too much emphasis on how government manages critical policy problems and too little on the politics of governing in and of itself. While adaptive

management can lead to broad support for certain policy decisions [5], such decisions are often too constrained by consensus-oriented limitations to be the most effective solutions for the most serious environmental problems we face, such as climate change, at the state and local level.

In sharp contrast to the Obama administration, the Trump administration has sought to dismantle nearly all efforts to reduce greenhouse gas (GHG) emissions at the federal level. Relaxing controls on mining and the use of coal is one major example. More generally, President Trump signed an Executive Order that directs the federal government to place jobs and the economy above efforts to control GHG emissions by curbing enforcement of all climate change regulations. In addition, the Trump administration has eliminated federal government websites containing scientific information supporting the increasing seriousness of climate change and recommendations on how to reduce GHG emissions. These actions have led many state and local government officials to contemplate new approaches to address climate change. The adaptive governance literature, which has ignored crucial aspects of politics and intergovernmental relations—as discussed below—provides little guidance in illuminating what those approaches might be, while the federal government quickly retreats on the climate change issue.

This paper contributes to the adaptive governance literature by introducing the concept of strategic adaptive governance with an analysis of the 2006 California Global Warming Solutions Act (AB 32), which created a broad, comprehensive, and economic-wide effort to reduce GHG emissions. The study introduces basic ideas and principles underlying strategic adaptive governance and examines whether and, if so, to what extent AB 32 and its implementation are in line with main strategic adaptive governance principles. We focus on AB 32 because it set forth California's overarching climate change governance approach, it stands out among policies addressing climate change, and it has been cited as having at least some traits consistent with adaptive governance [6]. In part, we consider the potential for California to implement a strategic adaptive governance approach to protect policy gains that already have been made and potentially enhance efforts to reduce GHG emissions. We conclude with a discussion about how other government entities could incorporate strategic adaptive governance in periods of extreme political upheaval.

2. Strategic Adaptive Governance

This study recognizes the needs and requirements of the political process and does not call for the elimination of politics in environmental policymaking and sustainable development. Instead, we recognize the continuing existence of politics in the adaptive governance process and the important role it plays in determining the nature of the process and whether leaders can be successful in accomplishing their goals. As noted, previous researchers have generally ignored the critical role politics plays in adaptive governance, a serious omission, especially during the current political upheaval at the federal level and considering how it is affecting climate change policy. The absence of significant discussion of politics in adaptive government research may in part be due to the focus of the existing literature. Most case studies and analytical papers about adaptive governance have concentrated on relatively small-scale issues that affect one ecosystem or sector of the economy. Common issues addressed include water management, forest management, and local climate change adaptation [7]. Although some studies have discussed the challenges of scale [1,7], politics has not been a focus. Rijke et al. (2012) [8] suggest that adaptive governance must find the proper fit between scale, the nature of the social and ecological system, and the problem. Olsson et al. (2007) [9] note the challenge of fitting scales and necessary moral, legal, and financial support for adaptive governance. This challenge is particularly difficult given the emphasis in the literature on prescribing bottom-up governance systems, which has generally been a tenet of adaptive governance.

Although the adaptive governance literature offers researchers critical insights into policymaking, important lessons can also be learned from other governance literatures. As an umbrella term, climate governance is an expansive category encompassing theories and research spanning global climate change policy efforts and international relations, national and subnational policy programs,

and the integration of state and non-state actors and networks [10–13]. Much of the literature has focused on the global nature of the problem, examining international regimes, negotiations, and networks [11,12]. Within this, climate politics has been a core focus, both from a global perspective and nation-states [11]. Scholars have examined a variety of political challenges, including collective action problems stemming from sovereign states with asymmetrical cost and the benefits of problem solving, economic costs and regulation, and weak enforcement mechanisms in the global climate change regime [14]. Much attention has been devoted to risk and uncertainty, government planning, the role of market forces and the interests of powerful actors (like the fossil fuel industry), and too-little public support for climate change mitigation [15]. Government entities, especially individual nations, struggle from discounting the costs of long-term climate change-related damages, political uncertainty about government support for mitigation incentives, and institutional arrangements that disincentivize long-term commitments that are accompanied by high short-term costs [14,15]. Climate change mitigation thus suffers from an "institutional inertia" problem whereby governments choose to delay, or not take action, rather than antagonizing influential groups that are benefiting from the status quo by making the substantial changes necessary [16]. At the United States federal level, in particular, the politics of climate change is encumbered by partisanship and political opportunism, the influence of well-funded interest groups, and issue framing that emphasizes scientific uncertainty [17,18].

Prominent in some climate governance literature and sharing some characteristics with adaptive governance, multilevel governance seeks to understand and facilitate policy coordination and the inclusion of networks of government and nongovernmental actors [19–21]. Increasingly, scholars have turned to multilevel governance in acknowledgement of the lack of, but need for, vertical integration on climate change policymaking [22,23]. The urban regime literature illustrates the political challenges of bringing together governments and jurisdictions [24]. Like adaptive governance, multilevel governance aims to allow for informal governance arrangements as opposed to only traditional top-down, command-and-control approaches [20,25,26]. Much of the multilevel governance builds on theories positing the benefits of policy decentralization and innovation [27,28]. Seemingly, because of the focus on smaller-scale issues and bottom-up arrangements, the adaptive governance literature has not integrated many of these political considerations.

The more decentralized and smaller the scale of the problem, the more plausible it is that a network of actors could address it through a bottom-up system given greater social capital and limited indirect implications. As the scale of a problem increases, the more likely it is that additional interests and values have relevance, the more indirect effects occur, and the more authority it takes to manage and govern the issue. Bottom-up governance entails consensus among those involved, which is harder to achieve with more parties involved. As farther-reaching issues are addressed, the challenge of scale increases, the role of politics becomes greater, and the potential for bottom-up governance decreases. Vella et al. (2016) [2] rightly raise this dilemma, discussing how voluntary and bottom-up governance structures struggle to have sufficient authority to enact change at a substantial level. Climate change mitigation is such an issue. One parallel is Layzer's (2008) [5] examination of ecosystem-based management systems, finding that initiatives built on stakeholder collaborative planning did not tend to produce positive results.

A bottom-up system of governance should not be essential to realize the benefits of other adaptive governance components. A hierarchical-based, top-down system should be able to embrace key characteristics of adaptive governance within traditional political systems, and embrace the fact that a universal consensus will not be reached about values, targets, priorities, goals, and means of achieving them. While adaptive governance traditionally emphasizes decentralized governance, the most important characteristics are system components that can directly shift and change in pursuit of a desired state or outcome. Drawing from key works in the literature [1,6,7,29], these characteristics include a reliance on knowledge and intensive inquiry that seizes on all sources of understanding, appraisal, learning-by-doing and making corrections, poly-centricity, transformability, room for innovation, and flexibility in institutions. Even when dealing with contentious political issues,

it is possible for legislatures and administrative agencies to develop strategic plans. The presence of such plans may influence the political dialogue, and may eventually become implemented when non-strategic efforts fail.

3. Policymaking during a Period of Political Upheaval

Public policies, including regulation, are typically incremental and partial rather than rational and comprehensive [30]. In an early work, Braybrooke and Lindblom (1970) [31] recognize that "the synoptic [rational] ideal is not adapted to man's limited problem solving capabilities" (p. 48). Rational policymaking is problematic because it does not account for the inadequacy of information, cost of information, difficulty of truly separating ends from means, and openness of the system of variables with which it contends. Policymakers using "cybernetic mechanisms," as Steinbrunner (1974) [32] refers to them, deal only with what they must, reacting only when the environment changes the variables the mechanism deems critical (as a thermostat would react to the cooling of a room by turning on the heat while ignoring all other stimuli). In this sense, incremental policymaking is simply the survival of those procedures and institutions best suited to handle complexity, and the rational ideal is never attained [30]. Normally, government applies standard operating procedures (roughly analogous to "cybernetic mechanisms") that deal with complexity by addressing only a few variables. This is particularly true during a serious political crisis.

The concept of overlap, or "where one policymaker leaves off, another will pick up," is central to cybernetic theory, and to the incremental model's response to the requirement for comprehensiveness suggested by rational theory. While incrementalism is an accurate description of traditional policymaking, it is less useful in explaining decision making during crisis, revolution, political upheaval, and what Braybrooke and Lindblom (1970) [31] term "grand opportunities." In such instances Dror's (1968) [33] "extra rational processes", Steinbrunner's (1974) [32] "cognitive based inference machines", and Jones's (1974) [34] non-incremental (and one might argue "cognitively based") "speculative augmentation" are core elements of the policymaking process. In these situations, conventional policymaking procedures cannot produce required outputs. Basing decisions on a few obvious information sources that can trigger appropriate cybernetic mechanisms does not permit the solution of the issue at hand. In periods of political upheaval, humans infer from available theory and data and make a decision. Essentially, decision makers estimate; they project in order to augment their normal ability to produce policies. In these circumstances, incrementalism cannot explain policy processes [30].

Strategic adaptive governance should reflect an effort by one or more government bodies to develop a comprehensive strategy or tactic for managing and controlling policy and behavior. Hoffer and Schendel (1978) [35] define strategy as the basic pattern of current and planned resource deployments and environmental interactions that indicate how an organization will achieve its objectives. In strategic adaptive governance, the stated policy goal (e.g., the reduction of GHG emissions and sustainable development) itself is only one component among several available to protect existing government efforts. Funding, technical assistance, collaboration, communication, and exhortation are examples of other techniques that can be used by government officials to preserve and even advance existing policy goals that are deemed desirable by a majority of experts and society.

During eras of extreme political upheaval at the federal level, there is often a desire by policymakers at other levels of government (including even global government) to band together and pursue a meaningful effort to at least preserve and possibly even further policy goals that are intended to protect the environment and advance sustainable development. In such cases, environmental policymakers at lower levels of government will try to accomplish this without raising the ire of new federal appointees fearing retribution. This will require them to navigate cleverly around possible new dictates and attempt to alter significantly present laws and legislation, or even block government efforts at other levels to improve environmental quality and enhance sustainable development efforts, such as reducing GHG emissions.

4. Obstacles to Pursuing Strategic Adaptive Governance

There are several potential obstacles to developing and implementing strategic adaptive governance approaches. Among other things, these obstacles include the difficulty of projecting behavior, estimating resources, setting priorities, explicit strategies, obtaining the resources and authority to develop policy, and implementing an effective policy. Such obstacles must be addressed by leaders if they wish to pursue strategic adaptive governance.

The critique of rational decision making levied by Braybrooke and Lindblom (1970) [31] also applies to efforts to adopt strategic adaptive governance approaches. It is likely to be difficult and costly to obtain all the information needed to project the impact of government action on regulated parties. Even cooperative firms may not be capable of projecting their own response to specific government actions, and non-cooperative firms may provide misleading information. Thus, the cost of making such projections can be quite high.

Still, it is critical for government to obtain an accurate picture of the regulated community's capacity for change and a comprehensive understanding of the effects of status-quo disruption. Rather than conducting major studies to project target population behavior, it may be far more fruitful to utilize Peters and Waterman's (1982) [36] strategy and conduct small-scale, short-turn-around pilot projects. For example, perhaps policymakers could allow different regions to experiment with a variety of regulatory approaches to see which approach provides the most desirable results. A version of such policy innovation is already taking place, to an extent, around climate change, given longstanding congressional gridlock and the lack of federal policies [37].

With a variety of governmental and even non-governmental organizations involved in the formulation and implementation of legislation and regulations, it may be difficult to estimate the full range of resources available. It also is difficult to project the level of state, local, and private resources that will be allocated in response to federal initiatives. Even currently-deployed resources are difficult to trace [30]. New legislative and regulatory tasks can sometimes be piggy-backed on existing functions. Established educational institutions and mechanisms, analytic laboratories, inspection facilities and personnel, reporting and control systems, and other resources may be accessed to meet legislative objectives in a cost-effective manner.

Identifying mechanisms for implementing state legislation and local policies may be difficult and costly, but setting strategic priorities can be even more problematic. In some cases, the statute being implemented may be so vague that it is difficult to justify priorities. In other cases, the statute is so specific that priority setting is often problematic if not impossible. Although it is easier to develop a policy strategy by articulating and prioritizing goals, agencies are frequently not eager to set such priorities. Programs often require explicit value trade-offs [30]. Legislative bodies, like the rest of the government, prefer to avoid such choices. Sometimes they avoid responsibility by utilizing vague standards and simply telling the implementing agency to "somehow solve the problem." At other times, legislative bodies can be overly specific in detailing the work it wants an agency to perform. Under this approach, trade-offs are avoided by telling the agency to promulgate rules immediately [30]. In the absence of substantial additions to the agency's resource base, such specificity is symbolic and often meaningless. Priorities must still be set. However, priority setting takes place in an atmosphere of extreme time and resource pressure rather than in a programmed planning exercise during a period of extreme political upheaval.

Trade-offs made in the "heat of the moment" may not be noticed and may be an easily ignored case of "non-decision making" [38]. Strategic choices committed to paper and analyzed can easily be used against a government agency. The danger of an explicit strategy is that the agency must specify what "it will not do in addition to what it will do." This is particularly problematic when legislation has "over-specified" a great number of activities that are not prioritized and are trivial. However, administrative necessity forces an agency to make choices, and explicit approaches can improve the quality of those choices. Unfortunately, a reasonable regulatory plan can also be a political liability. Yet, a caveat-laden strategy might succeed in obscuring hard choices, but it also might be an inadequate

guide to action. Perhaps the greatest difficulty in developing a strategic adaptive government approach is obtaining the "turf" and resources that are required. Program or line offices that control the turf may not control all the turf, and will almost never have the unencumbered resources needed to develop a thorough plan. Staff or policy offices may have the resources and expertise needed to develop a meaningful plan, but may not have the legitimacy or access to data needed to succeed. Clearly, a joint effort of some kind stands the greatest chance of success. Unfortunately, without firm and clear direction from a state or local legislative or executive body, it is difficult to see how such cooperation is in the immediate short-term interest of either the program or staff office. This could undermine efforts to pursue strategic adaptive governance.

This highlights the problem of grafting a rational planning process onto an incremental decision-making structure. Organizational units are divided and subdivided to narrow the scope of complexity that must be addressed by a given unit. This enables complex issues to be acted upon, but it does not ensure that the separate components of the issue are ever analyzed as a whole. In the typical regulatory process, feedback from the regulated community and the public is articulated by and through regional field offices, state and local governments, and interest groups [30]. The most unreasonable aspects of a regulatory policy are gradually adjusted to conform to the dictates of reality. In this sense, policymaking is actually an evolutionary process nearly always requiring modifications and mid-course corrections over time. Success is achieved when such adjustments lead to continued improvements of the given problem. The same, of course, can be said for strategic adaptive governance more generally.

Given these economic, political, and analytical biases, it is not surprising that there have been few meaningful attempts at strategic adaptive governance. In addition, it is difficult for such an activity to find a place in our political system. The most likely possibility would be in the policy offices of agency chief executives and/or their principal deputies. Agency policy and management shops, the other likely formulators of regulatory programs, have become something of an endangered species. While the 1960s and 1970s saw dramatic growth in these organizations, they suffered a sustained attack at the federal level during the Reagan administration [30]. They did not significantly grow in succeeding presidential administrations. No doubt, pursuing strategic adaptive governance is going to be more difficult during a period of extreme political upheaval, such as the present one, than in other periods marked by less partisanship and political and ideological discord.

5. A Model for Strategic Adaptive Governance

This section presents a framework for strategic adaptive governance, one that can be especially useful during a period of extreme political crisis. The framework incorporates elements of both incremental decision making (e.g., the need to take previous actions into account) and rational decision making (e.g, the need to carefully assess the benefits and costs of competing policy approaches). Many elements of the strategic adaptive governance model presented in this paper are drawn from the book *Strategic Planning in Environmental Regulation: A Policy Approach That Works* by Cohen et al. (2005) [30]. Their book introduces the concept of strategic regulatory planning and presents an overall approach for achieving compliance with, specifically, hazardous materials policy. Although this book narrowly focuses on the decision to include and later exclude methyl tertiary butyl ether (MTBE) in gasoline and the implementation of a critical provision of the Hazardous and Solid Waste Amendments of 1984, explicitly, the regulation of underground storage tanks, several important aspects of its theory of strategic policymaking are applicable to other environmental policy programs, including climate change policy (and probably to other policy areas, such as education, health care, and transportation). Their study provides a good basis on which to create a framework for strategic adaptive governance. The model outlined in Table 1 is divided into three phases of policy understanding, design, and implementation, and differs substantially from what has been analyzed in the previous literature on adaptive governance.

Table 1. Summary of the Strategic Adaptive Governance Model.

Phase I: Comprehensive Problem Understanding	Problem Recognition	Full understanding of the issue, its cause, its severity, the parties involved, and the development of a clear definition of the problem.
	Identification of Parties	Examination of all parties directly and indirectly involved or affected by the problem including legislative parties, regulatory parties, target groups, victim groups, and interested third parties.
	Historical Analysis	Policymakers gain an understanding of the history and seriousness of the problem, prior attempts to address it, and motivations and external causes of prior failed attempts at redress.
Phase II: Tactical Assessment and Policy Design	Situational Analysis	Identification (conceptually and operationally) of specific goals and desired outcomes, and assessment of strengths, weaknesses, resources, and motivations of involved parties.
	Party Analysis	Policymakers examine affected parties and weigh anticipated reactions to different regulatory approaches.
	Implementation Mechanism and Enforcement Determination	The policy planning and implementation processes that follows from analysis of the prior components to maximize the attainment of party goals and minimize outside interference. Determination of the desired degree of compliance, determination of the viability of self-regulation as a regulatory mechanism, and determination of the degree, type, and method of direct regulatory involvement.
Phase III: Flexible and Adaptive Implementation	Intensive Inquiry and Ongoing Evaluation	Research and cooperation among scientists, stakeholders, and enforcement entities about policy impacts, anticipated outcomes, and indirect effects.
	Learning and Innovation	Appraising the effectiveness of policies and processes, terminating failures, making adjustments, and mimicking and adopting innovative successes.
	Trans-Hierarchical Collaboration	Decentralized networks of interested parties can address issues collaboratively and provide ongoing advice including ideas, recommendations, and critiques about regulatory systems and new approaches.

5.1. Phase I: Comprehensive Problem Understanding

5.1.1. Problem Recognition

The first step in the development of strategic adaptive governance is problem recognition. Before taking any action, the following questions must be considered: What issue is being addressed? What is the source of the undesirable behavior? Why does this behavior persist? What parties are responsible for perpetuating the undesirable behavior? How serious is this problem? Presently? Potentially? How long has this problem persisted?

The problem recognition stage serves to focus efforts on a clearly definable problem or issue. Policymakers are encouraged to examine the issue in a dynamic rather than static process—the problem should be recognized as a logical result of dynamic forces. Admittedly, there is often a lack of information or some degree of uncertainty at the outset. The problem recognition stage serves to identify the issue and players, and to introduce the question at hand.

5.1.2. Identification of Parties

This step serves to identify all individuals and groups that are directly or indirectly involved in or affected by the problem. Most if not all these actors are frequently referred to as "stakeholders" in the public policy literature. Five primary categories of parties should be examined: legislative parties (e.g., Congress and state legislatures), regulatory parties (federal agencies, state agencies, and local officials), target groups, victim groups, and interested third parties.

The legislative parties usually serve as the impetus to pursuing adaptive governance. Moreover, they provide the legal authority for successful implementation and enforcement. The regulatory parties are usually considered the implementation and enforcement agents. In addition to serving this

role, regulatory parties are also knowledgeable about and interested in the issue being regulated [30]. They should be considered facilitators as well as enforcement agents.

Target groups are private or public groups or individuals whose behavior is considered counter to societal goals as determined by a legislative body. Target groups can vary by such characteristics as size, wealth, business, political, and economic self-interest, and geographic location. Members can either be organized into professional associations or they may exist independently of one another. In the public sector, agencies (e.g., the Tennessee Valley Authority) and individuals (e.g., county health officials) are potential target groups.

Victim groups are those who are adversely affected by the persistent behavior (past, present, or future) of the target population. Victims can be individuals or groups, or even society as a whole. In many cases, the outcry of these groups forces legislative bodies to enact effective public policy [30].

Finally, interested third parties are groups or individuals who have some direct or indirect stake in the issue, generally through the market system. Automobile insurance companies, for example, would constitute interested third parties in deliberations over proposed regulations concerning the installation of a new pollution control system in automobiles. Whether and, if so, to what degree they become involved in a controversy will often depend on their economic position in the controversy.

The identification of stakeholders is an essential step that must be taken in strategic adaptive governance. Often, traditional approaches focus only on regulatory parties and target groups. Failure to consider the role or position of other groups, such as interested third parties, can result in the development of misguided and unnecessarily expensive programs which can, in turn, lead to conflict. Without question, regulatory parties and target groups are the primary actors in environmental policymaking. However, it also is important to recognize and consider the roles of others that are affected by the issue.

5.1.3. Historical Analysis

This stage of the model requires state and local policymakers to gain an understanding of the history and seriousness of the problem, as well as the effectiveness of previous regulatory attempts at different levels of government. Questions that should be addressed include: How long has this suboptimal behavior persisted? What previous attempts have been made at prevention (e.g., regulatory and legislative attempts and market pressures)? How successful/unsuccessful were these attempts? Why? How have the regulated parties responded to these efforts? How have the other involved or affected parties responded? Why?

This step encourages policymakers to learn from the past. In the regulatory planning process, historical analysis is crucial. For various reasons, many prior regulatory efforts may have been unsuccessful at changing behavior, while other efforts may have changed the behavior in question but produced unwanted side-effects. The historical analysis stage not only ensures that prior mistakes are avoided but, more importantly, identifies the underlying party motivations and external causes that precipitated prior policy failure [30].

5.2. Phase II: Tactical Assessment and Policy Design

5.2.1. Situational Analysis

The situational analysis phase serves two purposes. First, it identifies, conceptually and operationally, the specific goals and desired outcomes. Second, it assesses the strengths, weaknesses, resources, and motivations of each party involved. From a tactical standpoint, policymakers attempt to predict the responses of each party to the regulatory stimulus and to explain the motivations or reasons for responding in such a manner. Public choice theory might be helpful in this regard [39]. Meetings, documents, and surveys can provide important data during this phase of the framework. A thorough situational analysis will help identify and eliminate unwise regulatory approaches at the outset, thereby increasing the potential for developing a successful plan.

The situational analysis is divided into two segments: mission objectives and party analysis. The mission/objective segment identifies the goals of the pertinent legislative and regulatory bodies. Why are they interested? What do they want to accomplish? How do they want to change behavior? How much change do they believe is needed or desired? The importance of this exercise is self-evident: A regulatory policy must follow from an attempt to achieve a set of clearly stated goals. Where the strategic approach to this step differs, however, is that the mission/objective must be addressed on two levels: policy and operational.

At the policy level, what does the legislative body or regulatory agency want to have happen and why? This question should be answered in broad, non-descriptive terms. The value of the policy mission/objective is to provide an overall direction to the policymaking process. The policy level also helps to identify legislative and regulatory priorities. Such questions as the urgency of the issue and the seriousness of the present/future problem should be addressed at this level. Climate change is a serious and urgent problem, and policymakers must consider this when they to pursue strategic adaptive governance in their efforts to stabilize or hopefully reduce GHG emissions.

In addition to the policy mission/objective, operational guidelines and goals also must be identified. Operational objectives should be concrete, quantifiable, attainable, and focus on measurable results. These objectives provide a basis for assessing the success or failure of strategic adaptive governance in modifying target group behavior on an ongoing basis.

5.2.2. Party Analysis

Policymakers at this level are required to examine each of the affected parties identified in phase one of the model, and ask a series of questions aimed at further anticipating party reactions to varying regulatory approaches. In general, the following question should be addressed: What are the motivations, goals, positions, and resources of the party to either comply with, ignore, or oppose the proposed behavioral changes? Broken down by specific party groups, additional questions and activities might prove insightful. Specifically, policymakers must become aware of the views and attitudes of legislative parties, regulatory parties, target groups, victim groups, and interested third parties [30].

5.2.3. Pursuing Strategic Adaptive Governance

This stage is what is most often considered the policy planning and implementation process. Here, specific regulatory devices are selected and the actual regulatory framework takes shape. We consider this step to be the most critical part of the strategic adaptive governance process.

The goal of strategic adaptive governance is to develop a clear plan that follows from and is consistent with the tactical analysis performed above and that can avoid or at least minimize outside interference, such as from the federal government. The general premise is that the more consistent the adaptive government approach is with the tactical analysis, the more successful (in terms of compliance and improved conditions) the approach is likely to be [30]. There are three main activities in the strategic adaptive governance stage: determination of desired degree of compliance, determination of the viability of self-regulation as a regulatory mechanism, and determination of degree, type, and method of direct regulatory involvement. The level of success in making accurate calculations along these lines will, in turn, determine the level of success in developing and adopting an effective strategic adaptive governance framework that will be able to navigate around extreme political upheaval.

5.3. Phase III: Flexible and Adaptive Implementation

5.3.1. Intensive Inquiry and Ongoing Evaluation

In this part of the model, now regarding the ongoing implementation of the policy and governance system, the regulating entity facilitates research and cooperation among partnering agencies or bodies, scientists, stakeholders, and other parties. Drawing from key tenets of adaptive management and

governance [6,29,40], research should focus on policy impacts, anticipated outcomes, and indirect effects. The involvement of diverse groups of people, communities, and stakeholders is paramount to ensuring that the broadest possible considerations are included. This research should embrace the concept of intensive inquiry [6], embracing human insights and choices, and being open to nuances and details that are significant to local areas but may not be prominent in standard analyses.

This research must be a living, evolving process that is part of ongoing evaluation of policies and governance systems, and should be undertaken as the regulating entity goes through the rulemaking process and afterward. Such a system is built on the recognition that complicated issues such as climate change, policies addressing them and the effect of those policies, and the potential best solutions are always in a state of flux [29]. What was most effective at one time may change due to new technologies, market forces, politics, social changes, and other variables. Indirect effects and anticipated outcomes may shift accordingly. Ongoing evaluation, built on comprehensive research and analysis, serves as stimuli for the flexibility and adaptability in the system.

5.3.2. Learning and Innovation

Addressing problems in an adaptive system entails experiential learning. Knowledge and learning between actors operating at different levels of governance, and within different arenas of policy and management, is critical [7,40]. The governance system must appraise the effectiveness of policies. Ineffectual measures should be terminated and analyzed to evaluate if those failures portend problems with other approaches, factoring in contextual differences. Adjustments should be made to policies where there is some indication that changes could increase effectiveness, or if changes could reduce indirect effects or be beneficial for stakeholders or communities without compromising the primary goals. Purposeful engagement in this process with scientists, stakeholders, and diverse communities is important to identify opportunities and impacts [1]. The governance system should study other efforts for innovative policies and strategies in order to imitate them. Elements of other innovative and successful governance systems should be considered for adoption and incorporation.

5.3.3. Trans-Hierarchical Collaboration

Networks and groups of policymakers, regulators, stakeholders, and communities should be established—and encouraged to form—to address some issues and advise the regulating authorities on strategy, implementation, and major decisions. Such issues can be local-specific areas where a group of stakeholders may be able to reach consensus about a management strategy. This part of the model draws on the collaborative governance literature [41,42], recognizing that preferable outcomes may be reached on some specific issues through decentralized decision making processes and networks. It also draws from the literatures on multilevel governance and climate governance covering networks of various actors at various levels [21,22,25]. Major policy frameworks and central authorities should provide space and mechanisms to allow for interested parties to address select issues through such decentralized systems, voluntary measures, and other unique mechanisms. The trans-hierarchical approach provides that a central regulating entity may set up decentralized networks and task them with dealing with an issue, as well as allowing and encouraging decentralized collaboration to occur from the bottom-up. The same applies to creating a system to provide advice to the central authority. Interested parties can independently collaborate and generate ideas, recommendations, and critiques, for which the central authority should have a flexible system of taking and integrating in an ongoing manner. This goes beyond official comments on draft regulations and includes advice about other matters such as regulatory systems and new approaches. Thus, interested parties may have different and more valuable perspectives than the central authority.

6. Applying the Strategic Adaptive Governance Framework to AB 32

AB 32 created a comprehensive, economy-wide effort to reduce GHG emissions. The law requires that California reduce GHG emissions to 1990 levels by 2020 (similar to the Kyoto Protocol's standard

for the U. S. to reduce GHG emissions five percent below 1990 levels) [43]. Accompanying the law's passage, then Governor Schwarzenegger issued an executive order that California reduce emissions 80 percent below 1990 levels by 2050.

We chose to apply the strategic adaptive governance model to AB 32 for several reasons. We sought a case study that would provide insight into the viability of the strategic adaptive governance framework. First, AB 32 is arguably the most comprehensive climate change legislation enacted to date and, of such substantial programs in the United States, we believe that it is the most likely to be aligned with strategic adaptive governance. Indeed, Brunner and Lunch (2010) [6] cited AB 32 as a potential case of state action pointing toward adaptive governance. Given the comprehensive, economy-wide nature of AB 32, both its passage and its implementation draw together a broad group of actors, interest groups, and processes and interactions. Second, although AB 32 is only one of many pieces of climate change-related legislation in California, it has provided the overarching framework for the state's climate change governance since its adoption. Third, AB 32 is more than a decade old, providing time to evaluate key implementation systems and to see whether it has been effective. It is important to be able to evaluate the actual viability of a strategic adaptive governance-type approach. Lastly, AB 32 was passed in a period with notable political dynamics somewhat similar to the present moment. As a state, California was well ahead of the country on climate change action in 2006. Political leaders in California, including Governor Schwarzenegger, expressed frustration with the George W. Bush Administration's lack of national action on climate change. In July 2005, Schwarzenegger signed an agreement with the United Kingdom to collaborate on climate change, and stated that "California will not wait for our federal government to take strong action on global warming" [44] (p. 34). The Bush Administration's complacency on climate change and the political conditions in California at the time are similar to the dynamic between many states and the Trump Administration today, making it a very relevant case.

In reviewing and analyzing AB 32, detailed below, our primary method was to synthesize qualitatively and to examine whether and how the core tenets of the law, its framework, and its overarching implementation fit with the strategic adaptive governance framework. We find that the law and its implementation—delegated to the California Air Resources Board (ARB)—represent an impressively adaptive regime, aligning with several of the key components of strategic adaptive governance. Table 2 presents a summary of our evaluation of AB 32 and its alignment with the strategic adaptive governance framework.

In our evaluation, we found that AB 32 benefitted from the state legislature's substantial knowledge about the problem, clarity about the policy goal and operational mechanism, and from the legislature providing the regulatory entity (the ARB) broad and sweeping authority to implement the policy. Stemming from these strengths, AB 32 further benefited from a strong research and evaluation process in its implementation, providing the regulatory entity autonomy to adapt and offering an open process to involve diverse interests. Our assessment finds that AB 32 struggled from limited early knowledge about interested parties, the broad potential impacts, local-specific issues and effects, and limited means of integrating decentralized collaboration. It is possible a greater tactical analysis early in the development of AB 32, along the lines of the strategic adaptive governance model introduced above, could have mitigated some of the challenges implementation faced such as controversy and conflict surrounding environmental justice issues.

Table 2. Evaluation of AB 32 through the Strategic Adaptive Governance Model.

Model Area	AB 32 Alignment	Assessment
Problem Recognition	High	State legislature had extensive experience with climate change, clearly articulated the problem, and recognized potential impacts to people and parties involved.
Identification of Parties	Low	State legislature and hearings process identified some of the parties interested and potential impacts. They delegated additional such examinations to the ARB, but knowledge was limited when crafting overarching framework.
Historical Analysis	High	State legislature familiar with scope and seriousness of the problem and had institutional knowledge of prior attempts including inadequacies, and sought in part to address the lack of federal action.
Situational Analysis	Moderate	State legislature identified a clear policy goal and operational mechanism. Limited assessment of involved parties' strengths, weaknesses, resources, and motivations.
Party Analysis	Low	State legislature did not examine in depth the positions of and implications for parties involved and impacts on all areas. This was partly delegated to the ARB, but under constraints of AB 32's established framework.
Implementation Mechanism and Enforcement Determination	Moderate	State legislature dictated some early actions that were based on some, although limited, tactical analysis by the ARB. The legislature established a sound framework for the ARB to make determinations about other regulatory mechanisms.
Intensive Inquiry and Ongoing Evaluation	High	State legislature directed the ARB to engage in research and evaluation with experts and diverse interests and to conduct ongoing evaluation of effects.
Learning and Innovation	High	The ARB developed a solid system of evaluating policy impacts, making adjustments, and looking to other policies and systems for successes to mimic.
Trans-Hierarchical Collaboration	Moderate	State legislature pro-actively created advisory committees and encouraged involvement and a system for various entities to engage with the ARB. Although the ARB encouraged decentralized involvement to address areas of emissions, there are limited mechanisms to incorporate such a collaboration and solutions.

6.1. AB 32's Passage and Framework

Our evaluation begins by looking at AB 32's overarching framework, which is relevant to all three phases of strategic adaptive governance. Passage of AB 32 followed approximately two decades of other legislation and efforts in California to address climate change, and an even longer history of measures to reduce air pollution. California enacted the first vehicle emission standards in 1966. Since the late 1980s, California has taken actions to address climate change, ranging from a state inventory of GHG emissions, to a registry of emissions from businesses, to command-and-control regulation of GHG emissions from vehicles [43]. This history and clarity of the legislature on the issue demonstrates a high level of problem recognition. With these policies, the state legislature tasked various state agencies with responsibility for overseeing emissions reductions from specific sources and sectors of the economy. At least in general terms, the legislature provided some degree of specification about which GHG emissions would be reduced and how [43].

AB 32 marked a different approach, reflecting a high degree of historical analysis. The legislature did not specify from where or how GHG emissions would be reduced to meet the goal. Instead, the legislature directed the ARB to develop and implement plans to achieve the new GHG emission standards. The sweeping legislation gave the ARB a great deal of authority and discretion. Ostensibly, the legislature recognized the difficulty of reducing GHG emissions and the need for the enforcement body to have autonomy in order to investigate best practices and innovative strategies [45]. The legislature also provided the flexibility to undertake new measures and make changes based on emerging data, science, and technologies. These are important components of strategic adaptive governance.

While leaving a lot open to development processes in conjunction with research, the text of AB 32 provided some specific actions and methodological guidance for the ARB. Key components included: mandatory statewide GHG emission reporting, determination of the 1990 GHG emission level, early actions targeting known high-emitting sources, development of broader regulations to achieve the maximum technologically feasible and cost effective GHG reductions, that regulations be equitable and not disproportionately impact low-income communities, that ARB may include a market-based compliance system (cap-and-trade), that all state agencies will consider and implement GHG emissions reduction strategies, and that the ARB will convene an Environmental Justice Advisory Committee and an Economic and Technology Advancement Advisory Committee. Together, these components—described in more detail by Visick (2007) [43]—set up a foundational framework for comprehensive GHG reductions. Although the state legislature directed the ARB to work with other agencies and actors, which included the establishment of two advisory boards, the legislature did not thoroughly address these issues, a poor example of identification of parties and party analysis. Indeed, AB 32 has not been without controversy and has been challenged by industry and environmental interests alike. Among those who sued are members of the ARB's own Environmental Justice Advisory Committee [46]. The conflict with environmental justice groups centered around disagreements over the range of issues and scope of proposed regulations and measures enacted, particularly whether to include GHG co-pollutants such as particulate matter and ozone precursors that have more direct public health implications in low-income communities [46]. Some of the most intense conflict surrounded cap-and-trade, which environmental justice groups argue does not necessarily reduce harmful pollutants in low-income communities since high-pollutant sources will continue to operate in those areas due to the mechanisms of the policy and market forces [46]. These disagreements reflect differences in both priorities and values, and may reflect a lack of thorough knowledge about potential impacts and party interests in the initial creation of AB 32.

While AB 32's policy goal and operational mechanisms were well defined, the limited assessment of the motivations, resources, and strengths of the involved parties mitigated the effectiveness of the situational analysis. AB 32 provided the ARB with an effective framework to design and implement policy measured. It had only limited tactical analysis informing the framework, and overall it fits moderately with the implementation mechanism and enforcement determination component of the strategic adaptive governance model. The state legislature gave the ARB broad authority to tackle GHG emissions reductions, providing enough language about regulatory systems and areas of the economy to ensure that the ARB had broad statutory authority, with few constraints from specific directives.

While the extent of the authority and autonomy given to the ARB is rare compared to most environmental laws enacted in other states, the core components of AB 32 read largely as a command-and-control regulatory approach. In this area, AB 32 clearly diverges from traditionally-understood adaptive governance systems in that it does not create a bottom-up or decentralized form of governance, which does not conflict with strategic adaptive governance. As readers will see, however, some of the components of the implementation plan do include provisions and programs that encourage and facilitate certain decentralized efforts.

6.2. AB 32 Implementation and Changes over Time

Table 3 summarizes the key areas of AB 32 that deal with scientific inquiry and learning, adaptability, capacity development, and collaboration, representing characteristics aligned with strategic adaptive governance. The express integration of these components into the ARB's charge set the stage for the policy and the state's broader climate change approach to go beyond a traditional command-and-control regulatory system.

Table 3. Areas and Characteristics of AB 32 Potentially Aligned with Strategic Adaptive Governance.

AB 32 Area	Potential Strategic Adaptive Governance Characteristics
Intent about Findings and Declarations	"It is the intent of the Legislature that the State Air Resources Board coordinate with state agencies, as well as consult with the environmental justice community, industry sectors, business groups, academic institutions, environmental organizations, and other stakeholders in implementing this division."
Development of Findings and Regulations	Language throughout about the ARB implementing the law in an open, public process, holding public workshops, and taking public comments. "[The ARB] shall adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective [GHG] emission reductions...." Additional directions for regulations include that they should be equitable, take into account voluntary efforts, complement federal and state standards, and consider the overall benefit to society beyond GHG emissions reductions.
Engagement of Stakeholders	The ARB will consult with various groups, including state agencies and industrial groups that may be affected, and consider the impact on those parties and their interests. The ARB will convene an Environmental Justice Advisory Committee comprised of environmental and community groups, especially from low-income communities that will be affected, to participate in the process. The ARB will convene an Economic and Technology Advancement Advisory Committee of key stakeholders and experts to help with research and development, and innovative opportunities.
Scientific/Intensive Inquiry and Learning	The ARB will look to GHG emissions reduction programs in other localities, states, and nations. The ARB will rely on best available scientific, technological, and economic information in making findings, determining costs, and developing regulations. The ARB will be given substantial autonomy and flexibility to develop the regulatory program based on what it finds are best practices. The ARB will update its overarching plan at least once every five years, and periodically review and update as necessary certain requirements such as GHG emission reporting requirements.

The legislature certainly recognized the scope of the challenge and the need for intensive, expert inquiry paired with flexibility and adaptation over time to effectively address climate change. This may reflect the breadth of the issue of GHG emission reductions across the state and economy. It may also reflect awareness about the changing circumstances and needs that relate to GHG emission reductions including the presence of many uncertainties, changing technologies, varying economic and market forces, and potential federal measures—as Schwarzenegger was advocating [43]. Indeed, the text of AB 32 notes that it should have the effect of "encouraging other states, the federal government, and other countries to act." [47] (p. 4)

In its initial implementation of AB 32, the ARB spent 18 months developing a scoping plan that would serve as the GHG reduction system blueprint, including the development of regulations, voluntary programs, early actions on high-emitting sources, and detailing other measures and areas for collaboration. The ARB finalized the first scoping plan in December 2008 [48]. Implementation of most of the measures described in the 2008 scoping plan came in the form of traditional rulemaking procedures at the ARB (and other state agencies), as well as the discrete early actions targeting high-emitting sources as directed by the legislature.

In the 2008 scoping plan, the ARB states that the plan is a product of a transparent, wide-ranging public process that includes significant engagement with stakeholders, input from advisory committees, industrial and business groups, non-profit organizations, other agencies and experts, and public comments. In describing their approach to implementing the plan, the ARB states that, "As specific measures in the plan are developed, we will update and adjust our regulatory proposals as necessary to ensure that they reflect any new information, additional analyses, new technologies or other factors that emerge during the process." [48] (p. 1) The ARB sought out such information, in part, by including a diverse group of experts in the development and implementation of the scoping plan.

The development of the scoping plan demonstrates substantial intensive inquiry as well as a framework to facilitate learning and innovation, key components of strategic adaptive governance. Central to the plan's development was the Climate Action Team, a group of state agency secretaries and

the heads of boards and departments led by the Secretary of the California Environmental Protection Agency. The 2008 scoping plan notes that the Climate Action Team was involved in its development and that it was crucial to the success of AB 32, calling for unprecedented levels of cooperation and coordination across state government. Twelve subgroups of the Climate Action Team participated in the process, providing expertise in specific areas, each soliciting additional information and expertise and holding public meetings and workshops. As directed by AB 32, the ARB notes in the scoping plan that they "met and learned from experts" [48] (p. 9) from other countries and areas of the United States. The plan further notes that some measures may deliver more or less emissions reductions than expected, and that it is likely that the ARB "will figure out new and better ways" to reduce GHG emissions as they move forward [48] (p. 9).

In the 2008 scoping plan's conclusion, the ARB states that reaching the goals would require involvement and coordination of efforts among all levels of government in California and with other states, regions, and countries [48] (p. 121). The ARB further states that reaching goals requires flexibility, and that it must be prepared to make corrections throughout the process [48] (p. 121), calling GHG emission reductions a "shared challenge" and that participation and coordination from local governments, businesses and corporations, and individuals is critical. The ARB presents this shared challenge framework in putting forward policy proposals to support voluntary GHG emission reduction actions and in calling for participation from "the broadest array of the public and stakeholders" in the implementation of AB 32 [48] (ES.14). In this area, AB 32 demonstrates moderate fit with the trans-hierarchical collaboration component of strategic adaptive governance.

The 2014 First Update to the Climate Change Scoping Plan [49] provides a window to evaluate implementation of the 2008 scoping plan and the ARB's system for making changes, including ongoing inquiry, adaptation, and collaboration. The 2014 scoping plan update serves as a progress report and lays out a host of updates and new actions to meet both the 2020 GHG emissions reduction goal and to build toward the goal of reducing GHG emissions 80 percent below 1990 levels by 2050. To note, the 2014 scoping plan update came three years after Jerry Brown succeeded Arnold Schwarzenegger as governor, although the chair of the ARB (Mary Nichols) remained in place for both plans.

Development of the update followed a similar process as the 2008 scoping plan. It included consultation of advisory committees, involvement of the Climate Action Team and experts from state agencies, industries, and academia, along with public meetings and comments, and focus area workshops led by corresponding state agencies. This reflects ongoing intensive inquiry, ongoing evaluation, and learning and innovation. The ARB notes, for example, that they convened a panel of economic experts to provide advice about the economic impacts, and a group of scientists with expertise in climate change in California to consult about a section detailing the latest climate change science. Likewise in terms of trans-hierarchical collaboration, the 2014 scoping plan update retained and built on much of the 2008 scoping plan language about public and stakeholder participation. In an "Achieving Success" section, the ARB describes the importance of integrating and coordinating planning and doing so in concert with agency and academic experts to guide policies and adaptation actions [49] (p. 102). The ARB calls climate change a "great unifier" [49] (ES. 5) to stimulate new types and unprecedented levels of collaboration.

Implementation of AB 32 included substantial changes from 2008 to 2014 [49]. Many of the regulations and other measures evolved. Under the ARB's authority and coordinated by the agency, diverse groups of experts, stakeholders, and the public were brought into the process. Numerous working groups were established, utilizing expertise from relevant state agencies, to dive deeply into the issue and determine recommendations for regulatory measures and other actions. New data on emissions sources, and on the potency of emissions themselves, led to refinements in priorities and policy prescriptions. The ARB integrated other legislation into their climate change program and the broad framework that AB 32 established [49,50].

6.3. Potential for California to Utilize Strategic Adaptive Governance in Building on AB 32

In summation of AB 32, our evaluation demonstrates that its framework and implementation eclipse typical command-and-control oriented laws and regulations. Based off a variety of strategic decisions, AB 32 established a more flexible system that includes important components of inquiry, learning, and collaboration. As the overarching framework for California's governance of climate change, AB 32 allowed for and facilitated a substantial amount of adaptation. Overall, AB 32 and its implementation represent a moderate fit with the strategic adaptive governance model. Importantly, AB 32 demonstrates that a top-down approach to a major statewide policy can be adaptive based on research, evaluation, and learning, and in working together with various networks of stakeholders. This top-down system deviates from adaptive governance models but is in moderate alignment with strategic adaptive governance. Whereas adaptive governance envisions interested parties coming together primarily in a horizontal structure, the strategic adaptive governance model prescribes that a central authority carefully considers interested parties' roles in the problem and how potential policies will affect them, striking a balance according to values and goals but maintaining the authority to enact substantial change. AB 32 embodies strong recognition of the problem, the important starting place for strategic adaptive governance, but strays in its limited early assessment of all parties and their resources, motivations, nuances in their positions, and associated policy impacts. Yet, in alignment with strategic adaptive governance, AB 32 provided the ARB with substantial autonomy paired with clear goals and an implementation framework that allowed for adjustments over time.

In September 2016, Governor Brown signed into law SB 32, requiring California to reduce GHG emissions 40 percent below 1990 levels by 2030, thereby requiring a substantial increase in emissions reductions from the pace AB 32 established. The law builds on AB 32's framework, similarly providing broad regulatory authority to the ARB, without prescribing specifics. Going into detail about SB 32 is beyond the scope of this paper, but we believe that the ambitious nature of the goal underscores the importance of minimizing outside interference, maximizing compliance, and ensuring the greatest involvement and most efficient processes. The strategic adaptive governance model can help enhance policy gains and facilitate success, both as the ARB undertakes implementation of SB 32 and as the state legislature continues to tackle the issue of climate change. While there is certainly room for improvement, we are encouraged and believe that California in a strong position to make progress on climate change even in a period of uncertainty and political upheaval.

7. Conclusions

This paper presented a possible model for developing and instituting a strategic adaptive governance approach. We analyzed AB 32 through the model's lens as a case study and to evaluate California's effort to help control climate change, stemming from political conditions and upheaval in 2006 that are more broadly common across the entire nation today. The main objective of the strategic adaptive governance framework is to permit policymakers to achieve the highest rate of compliance possible under existing conditions and constraints involving state and local policy despite the extreme political upheaval surrounding the issue in the federal government. Each required step was discussed separately. In particular, this paper noted the importance of the policy planning and implementation process.

The model introduced in this paper leads directly to a set of identifiable steps policymakers can use in developing and implementing a strategic adaptive governance approach. This is especially relevant to state and local plans to control GHG emissions as they navigate around the Trump administration's efforts to roll back policies to reduce GHG emissions. The model places a heavy emphasis on the motivations, resources, and interdependencies of affected parties. Moreover, it directs policymakers to examine closely the legislative and regulatory goals and objectives. The overall aim is to fit the devised regulatory program with both the context from which it is authorized or enforced as well as the context in which it is implemented. Only by creating the best possible fit between strategy and context, particularly the political environment, will the behavior of the target population be

controlled efficiently and effectively despite efforts pursued at the federal level during a period of extreme political upheaval and strong opposition to addressing climate change.

The framework for adopting and implementing strategic adaptive governance outlined in this study serves as a guideline for tactical formulation of any regulatory issue; the model is both generic and universal, and should be applicable to other policy settings. What is important is that the recommended planning steps be considered a dynamic process. In other words, in designing plans to pursue strategic adaptive governance, policymakers should examine all steps of the planning process rather than considering only one or two steps within a static environment. Most importantly, the model requires policymakers to pay close attention to the politics surrounding the issues they wish to address. Future scholarship on adaptive governance should do the same.

The evolutionary nature of the policymaking process, where improvement over previous actions is often desired, will require government officials to return to the framework on numerous occasions. The structure of the framework is flexible enough to permit and even facilitate this activity until opposition politics disappears and compliance goals are eventually met.

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