

# A CONCEPTUAL MODEL OF POLYCENTRIC RESOURCE GOVERNANCE IN THE 2030 DISTRICT ENERGY PROGRAM

Erik Nordman, Associate Professor of Natural Resources Management, Grand Valley State University

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## Abstract

The 2030 District program encourages commercial building owners to make 50% cuts in building energy use, water use, and transportation emissions by 2030. Twenty cities have joined so far. Participating cities agree to the overall goals but each city develops its own method for monitoring progress and encouraging compliance. However, it is unclear how Districts are implementing monitoring and enforcement mechanisms. I analyzed the 2030 Districts using the “club theory” of voluntary programs and the Institutional Analysis and Development framework. Analysis of 2018 progress reports suggests that 2030 Districts have strict standards but low to moderate levels of monitoring and enforcement. Three Districts already achieved the interim energy target of a 20% reduction in building energy use by 2020. Additional research will investigate the mechanisms of monitoring and enforcement, the potential for positive “behavioral contagions,” and other issues.

Note: I submitted the book chapter recently but there is (probably) still time to make revisions.

Questions/topics for Workshop audience:

- Next research steps: survey 2030 District managers (district level) and building owners (participating/non-participating) about monitoring, enforcement, sanctions, influence
- Surveying participating business owners: how to deal with clustering within districts?
- Role of behavioral economics in IAD framework? Sanctions for non-compliance vs. positive “behavioral contagions”?

## Introduction

The conventional wisdom on collective action at a large scale suggests that a global problem like climate change must have a global, legally-binding solution.<sup>1</sup> Elinor Ostrom, however, wisely noted, “If ... we simply wait until the big guys make a decision, we are in deep trouble”.<sup>2</sup> Ostrom’s work on global commons, and climate change specifically, indicated that a top-down, legally-binding approach is not the only approach, and perhaps not even the best one, to manage a global commons. Action can be taken at various levels, from local to national, and by a range of actors such as governments, private companies, and civil society organizations.<sup>3</sup> She called this a polycentric approach to climate governance - a social system that has many centers of decision-making, each acting somewhat independently but under a common set of guiding principles.<sup>4</sup>

With the United States poised to withdraw from the Paris Agreement in 2020, cities, states, and civil society groups are attempting to fill the leadership void in a polycentric manner. One such effort is the 2030 District program created by the American Institute of Architects and managed by the 2030 District Network. Cities participate in the 2030 District program by drawing a downtown district boundary and inviting commercial building owners to make voluntary reductions in energy and water use. The goal, called the “Challenge for Planning,” is to reduce by half their building energy use, water use, and transportation-related greenhouse gas emissions by 2030. The 2030 District program is voluntary and led by the private sector – it is not a regulation or government policy, although governmental units can participate. To date, twenty cities across the US and Canada have established 2030 Districts comprising more than 44.59 million m<sup>2</sup> (480 million feet<sup>2</sup>) of commercial building space.<sup>5</sup>

The choice to invest in resource efficiency and decarbonization is ordinarily a firm’s private decision. The 2030 Districts, however, encourage building owners to work together to achieve the District-wide goals. The 2030 District, in effect, creates a collective action situation. It is unclear, however, if this form of collective action is an effective method for reaching the resource efficiency goals. This invites several research questions:

- Why would a city voluntarily join the 2030 District program?

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<sup>1</sup> Geoffrey Brennan, “Climate Change: A Rational Choice Politics View\*,” *Australian Journal of Agricultural and Resource Economics* 53, no. 3 (2009): 309–26.

<sup>2</sup> Elinor Ostrom, Big Think Interview With Elinor Ostrom, November 11, 2009, <https://bigthink.com/big-think-interview-with-elinor-ostrom>.

<sup>3</sup> Elinor Ostrom, *A Polycentric Approach For Coping With Climate Change*, Policy Research Working Papers (The World Bank, 2009); Andrew Jordan et al., *Governing Climate Change: Polycentricity in Action?* (Cambridge University Press, 2018).

<sup>4</sup> Paul D. Aligica and Vlad Tarko, “Polycentricity: From Polanyi to Ostrom, and Beyond,” *Governance* 25, no. 2 (2012): 237–62.

<sup>5</sup> 2030 Districts Network, “2030 District Network Charter,” 2017, <http://www.2030districts.org/toolkits/district-administration>.

- Why would a commercial building owner voluntarily join a 2030 District?
- Do participating building owners reduce resource use and emissions more than non-participants do?
- How do 2030 Districts hold their members accountable for meeting the voluntary goals?
- Are 2030 District cities improving resource efficiency more effectively than non-participating cities?

Voluntary programs like the 2030 Districts are one way that “public entrepreneurs” (as Ostrom called them) can promote the public good outside of either government regulation or the free market. This chapter examines the 2030 District program and the twenty cities that have established such districts. I use the club theory of voluntary programs<sup>6</sup> and the Institutional Analysis and Development framework<sup>7</sup> to develop a conceptual model of the 2030 District program—a polycentric, voluntary environmental agreement. In the first research phase, covered here, I reviewed the Districts’ annual reports to obtain information about monitoring, enforcement, and progress toward the 2030 District goals. Only the building energy use commitment was assessed. Additional phases will include data from more in-depth surveys of 2030 District program managers, building owners, and other stakeholders. Although a few papers have described the 2030 Districts, none has investigated the program from the perspective of the club theory of voluntary programs, the Institutional Analysis and Development framework, or polycentricity. This chapter therefore is a novel contribution to this emerging topic of polycentric climate governance.

### *The 2030 District Program*

The American Institute of Architects, one of the nation’s leading advocates for buildings and infrastructure, initiated its Architecture 2030 project in 2006. Architecture 2030 seeks to achieve the twin aims of dramatically reducing “energy consumption and greenhouse gas emissions from the built environment;” and advancing “the development of sustainable, resilient, equitable, and carbon-neutral buildings and communities.” Architecture 2030’s Challenge for Planning lays out a pathway to achieve these goals and challenges the global architecture and construction industry to meet specific efficiency targets (Table 1).<sup>8</sup> Consequently, Architecture 2030 established the 2030 District program as a means of encouraging cities and building owners to achieve Challenge for Planning targets. 2030 Districts draw boundaries around their downtown cores and invite commercial and other building owners to accept the challenge. Each local 2030 District is an independent private-public partnership that agrees to adopt the Architecture 2030’s Challenge for Planning resource reduction targets. The 2030 District

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<sup>6</sup> Matthew Potoski and Aseem Prakash, *Voluntary Programs: A Club Theory Perspective* (MIT Press, 2009).

<sup>7</sup> Elinor Ostrom, *Understanding Institutional Diversity* (Princeton University Press, 2005).

<sup>8</sup> Architecture 2030, “The 2030 Challenge for Planning,” 2019, [https://architecture2030.org/2030\\_challenges/2030\\_challenge\\_planning/](https://architecture2030.org/2030_challenges/2030_challenge_planning/).

Network, a separate organization, links the independent city-based districts. The 2030 District advertises the benefits of the collective, rather than individual, approach to resource efficiency:

Building owners, managers, and developers participating in a 2030 District understand that by working collectively toward shared goals they are improving not only their assets, but also those of their neighbors, and thereby increasing the entire District’s value and attraction to tenants, businesses, and patrons.<sup>9</sup>

Table 1: Challenge for Planning targets.

	Existing building 2020	Existing building 2030	New building immediate	New building 2030
Building energy	20% below national average	50% below national average	70% below national average	Carbon neutral
Water	20% below District average	50% below District average	50% below District average	50% below District average
Transportation CO <sub>2</sub>	20% below District average	50% below District average	50% below District average	50% below District average

A reduction target requires a baseline. Architecture 2030 established its standard building energy baseline as the national average reported in the 2003 Commercial Building Energy Consumption Survey from the US Energy Information Administration. The standard metric is energy use intensity (kBtu/ft<sup>2</sup>/year).<sup>10</sup> That metric, however, does not distinguish between fossil fuel and renewable sources. The Challenge for Planning goal for new buildings is carbon neutrality which cannot be measured using EUI as currently defined. Buildings can earn credits toward the energy goal, up to 20%, by using on-site and off-site renewable energy. The Pittsburgh 2030 District developed a methodology that enables buildings that generate more than their renewable allowances to share the extra credits with the entire District.<sup>11</sup> This efficiency-first approach encourages reducing energy needs as much as possible and then using renewable, carbon-free sources for the remainder. Architecture 2030 created the Zero Tool to help 2030 Districts and their members establish the energy baseline and reduction targets. The water and transportation baselines are established using local, rather than national, standards. Like energy, 2030 Districts measure progress toward the water goal using an intensity metric (gallons/ft<sup>2</sup>/year). The transportation metric varies by 2030 District and is generally less developed than the other two.

<sup>9</sup> 2030 Districts Network, “2030 Districts and Other District Approaches,” 2020, <https://www.2030districts.org/toolkits/learn-about-2030-districts>.

<sup>10</sup> “FAQs – Architecture 2030,” accessed February 4, 2020, <https://architecture2030.org/about/faq/>.

<sup>11</sup> Green Building Alliance, “Pittsburgh 2030 District Progress Report 2018,” 2019, <https://www.2030districts.org/pittsburgh>.

Although the 2030 Districts welcome diverse building owners such as government agencies, schools, and houses of worship, the primary membership is targeted at commercial building owners. The Districts also have membership opportunities for stakeholders, such as construction and technical service providers and community organizations. Twenty North American cities have established 2030 Districts and several more are in the planning stages. The Districts differ in population and climate, from the snowy college town of Ithaca to sunny San Diego (Figure 1).

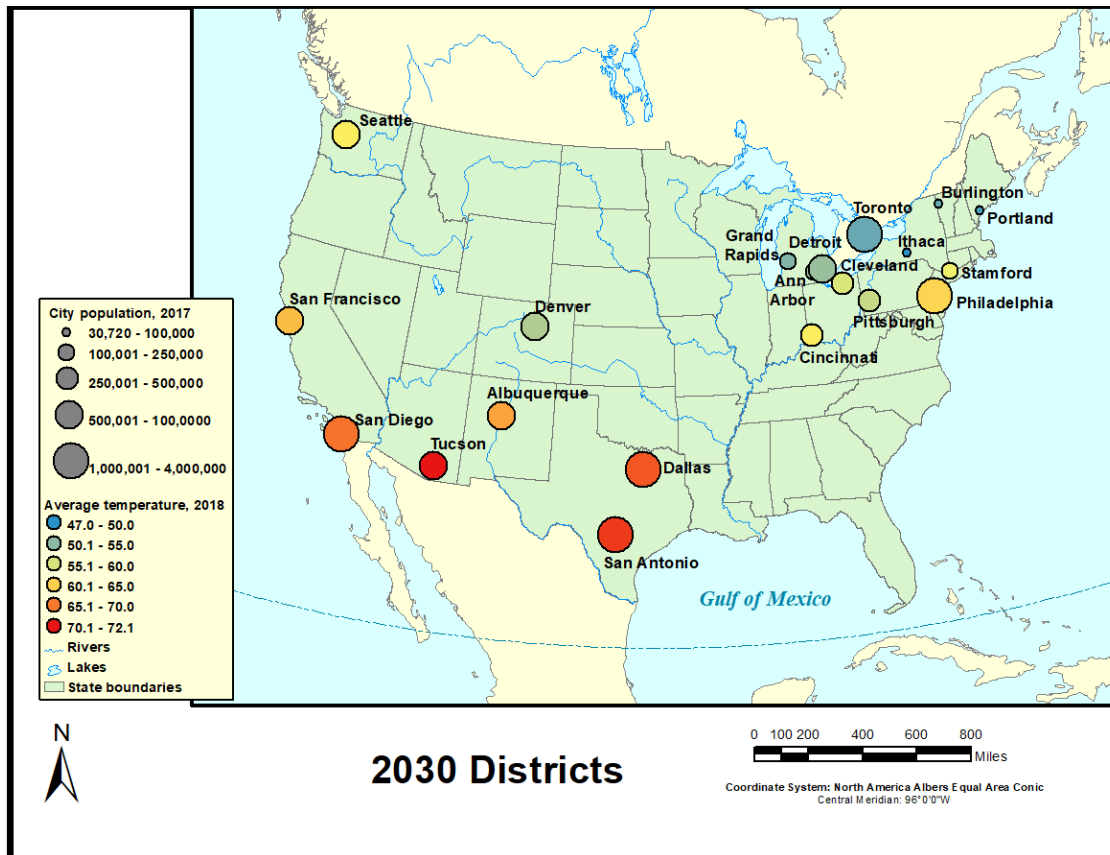


Figure 1: Established 2030 Districts as of February 2020.

To date, few scholars have analyzed the 2030 District program. The Pittsburgh 2030 District, an early adopter, developed a protocol for measuring building energy performance and encouraging cooperation.<sup>12</sup> Barnes and Parrish<sup>13</sup> developed a case study library and template for the 2030 District Network’s Small Commercial Toolkit. The authors identified several barriers

<sup>12</sup> M. D. Huddleston et al., “Pittsburgh 2030 District Energy Baseline: Motivation, Creation, and Implications,” *Journal of Green Building* 9, no. 4 (January 1, 2014): 79–104; Aurora L. Sharrard, Sean C. Luther, and Anna J. Siefken, “Pittsburgh 2030 District: Collaborating to Develop High-Performance Buildings,” *Global Business and Organizational Excellence* 34, no. 1 (2014): 18–31.

<sup>13</sup> Elizabeth Barnes and Kristen Parrish, “Small Buildings, Big Impacts: The Role of Small Commercial Building Energy Efficiency Case Studies in 2030 Districts,” *Sustainable Cities and Society* 27 (November 1, 2016): 210–21.

faced by small building owners seeking to achieve the 2030 District targets. Small business owners lack several key resources, including access to comprehensive and consistent information about how to achieve the targets; tools for measuring building performance; financial incentives; and models for effective collaboration. Their case study library shows how small building owners in the 2030 Districts can overcome these barriers.

As part of her master’s degree project, Eleanor Johnstone conducted a complete performance assessment for San Francisco’s 2030 District for the 2016 reporting year.<sup>14</sup> Johnstone found that the 31 buildings participating in the 2030 District had already achieved the 50% reduction in building energy use intensity compared to the national baseline. Although this did reflect some commitment on behalf of San Francisco’s building owners, it also revealed some quirks in the 2030 District standards. The standard is the CBECS national average energy use intensity. Buildings in the CBECS database are skewed toward the northeast which have relatively high energy needs (especially heating) and are relatively old and inefficient. San Francisco’s more temperate climate and newer building stock mean that its buildings, including 2030 District participants, already use substantially less energy than the national average. Cold weather cities with older building stocks may find meeting the 2030 District standards more challenging than cities like San Francisco in temperate climates and newer buildings stock.

#### Theoretical Framework: Club Theory and Institutional Analysis

##### *A Club Theory of Voluntary Programs*

Many government agencies and non-governmental organizations advocate for green building. However, such organizations typically focus on individual buildings. The 2030 District program is distinct in that it establishes a community of building owners and stakeholders that agree to work toward a common goal. The 2030 District can be considered, in the economic sense, a club.

Economic clubs produce goods and services that are non-rival and exclusive (Table 2). Like a movie theater, the club goods can be enjoyed by multiple users at once (non-rival) but the club owners can exclude people (usually those that don’t pay).<sup>15</sup>

*Table 2: Rival and exclusive framework for goods and services.*

	Rival (one user at a time, or depletable)	Non-rival (more than one user at a time, or not depletable)
Exclusive (Owners can exclude users)	Private goods	Club goods

<sup>14</sup> Eleanor Johnstone, “San Francisco 2030 District: Performance and Implications for Urban Energy Efficiency” (Master of Environmental Management, Durham, North Carolina, Duke University, 2017).

<sup>15</sup> Vincent Ostrom and Elinor Ostrom, “Public Goods and Public Choices,” in *Alternatives for Delivering Public Services: Toward Improved Performance*, ed. E.S. Savas (Boulder, CO, USA: Westview Press, 1977), 7–49.

Non-exclusive (Owners cannot reasonably exclude users)	Commons or open access	Public goods
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Potoski and Prakash<sup>16</sup> developed a club theory of voluntary programs in the environmental sector. The theory builds on the work of public choice theorists like Olson<sup>17</sup> and Buchanan and Tullock<sup>18</sup>. While firms may produce Buchanan-style club goods to turn a profit, like a movie theater, voluntary programs seek to enhance social welfare. Firms join the voluntary program to gain certain benefits that are only available to members. In return, the firm agrees to reduce some kind of defined social harm, such as pollution or dangerous working conditions. In an unregulated free market, firms would presumably not have an incentive to adopt these measures.

Potoski and Prakash identified three types of benefits from voluntary programs:

1. Promotion of positive social externalities (e.g. better working conditions or reduced pollution);
2. Private benefits accessible only to club members (e.g. information, clients);
3. Branding benefits that come with association in the club (e.g. “dolphin safe” tuna, Energy Star product labels).

Public entrepreneurs use club goods to solve a social problem. A rational firm would be expected to join the voluntary program if the membership benefits exceed the cost of resolving the social externalities. However, Potoski and Prakash also note several ways such voluntary programs could fail. First, the program could cast a “warm glow” of virtue over the entire industry. Firms could enjoy the warm glow benefits whether or not they actually joined the club. These “free riders” would undermine the program and reduce its social benefits. Second, firms may join the club to obtain the membership benefits but shirk their responsibilities. It’s critical, therefore, that the voluntary program excludes benefits from those who don’t join, monitors the members for adherence to the program’s rules, and sanctions those who do not comply.

The level of social benefits actually delivered may depend on the program’s standards and enforcement. Voluntary programs with lenient standards and lax enforcement have easy entry, but may fail to provide any social benefits. At the other extreme, programs with very high standards and strong enforcement may attract only a few members and provide few aggregate benefits. Therefore, there may be a “Goldilocks” level of standards and enforcement that is strict enough to provide reasonable social benefits without scaring away potential members.

Potoski and Prakash further describe voluntary programs using a number of additional attributes. These include participation cost, likelihood of shirking, branding benefits, and the

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<sup>16</sup> Potoski and Prakash, *Voluntary Programs*.

<sup>17</sup> Mancur Olson, *The Logic of Collective Action* (Harvard University Press, 2009).

<sup>18</sup> James Buchanan and Gordon Tullock, *The Calculus of Consent: Logical Foundations of Constitutional Democracy* (Ann Arbor: University of Michigan Press, 1962).

policy implication (how effective it is at addressing social externalities). The authors gave each type of club a name ranging from “sham” to “mandarin” (Table 3).

Table 3: Attributes of voluntary programs (from Potoski and Prakash 2009).

Club standards		Enforcement and Monitoring Rules		
		Weak	Medium	Strong
<b>Lenient</b>	<b>Participation cost</b>	Low	Low-Moderate	Low -Moderate
	<b>Shirking</b>	High	Moderate	Low
	<b>Branding</b>	Marginal	Low-Moderate	Low-Moderate
	<b>Social Benefit</b>	Low	Low-Moderate	Moderate
	<b>Name</b>	<i>Shams</i>	<i>Boy Scouts</i>	<i>Boot Camps</i>
<b>Stringent</b>	<b>Participation cost</b>	Moderate-High	Moderate	High
	<b>Shirking</b>	High	Moderate	Low
	<b>Branding</b>	Marginal	Moderate	High
	<b>Social Benefit</b>	Low	Moderate	High
	<b>Name</b>	<i>Country Clubs</i>	<i>Prep Schools</i>	<i>Mandarins</i>

Although sanctioning for non-compliance is important, voluntary clubs also offer an opportunity for a positive “behavioral contagion.” Behavioral economists have shown that an individual’s choice can be influenced, for better or worse, by the choices of those around them. In one example, home owners who installed solar panels soon saw many of their neighbors also installing panels.<sup>19</sup> Voluntary clubs may form a conducive environment in which positive behavioral contagions can flourish.

#### *The Institutional Analysis and Development Framework*

Club theory describes the incentives that may encourage a firm to go beyond what’s legally required to promote social welfare. But it does not describe the institutional structure of the voluntary program or its members. The Institutional Analysis and Development (IAD) framework is a useful tool in this regard.

Ostrom described the IAD framework as “a systematic method for organizing policy analysis activities that is compatible with a wide variety of more specialized analytic techniques used in the physical and social sciences.”<sup>20</sup> The IAD framework consists of 1) a set of external

<sup>19</sup> Robert H. Frank, *Under the Influence: Putting Peer Pressure to Work* (Princeton, New Jersey: Princeton University Press, 2020).

<sup>20</sup> Elinor Ostrom, “Background on the Institutional Analysis and Development Framework,” *Policy Studies Journal* 39, no. 1 (February 1, 2011): 7–27; Ostrom, *Understanding Institutional Diversity*; Margaret Polski and Elinor



variables (biophysical conditions, community attributes, and the set of rules that define the allowable actions); 2) an action situation in which actors use information to assess costs and benefits to obtain potential outcomes; and 3) interactions between the action situation, outcomes, and evaluative criteria. The outcomes can in turn affect the external variables and action situation. The action situation can be considered a dependent variable upon which a set of independent (external) variables act (Figure 2, Figure 3).

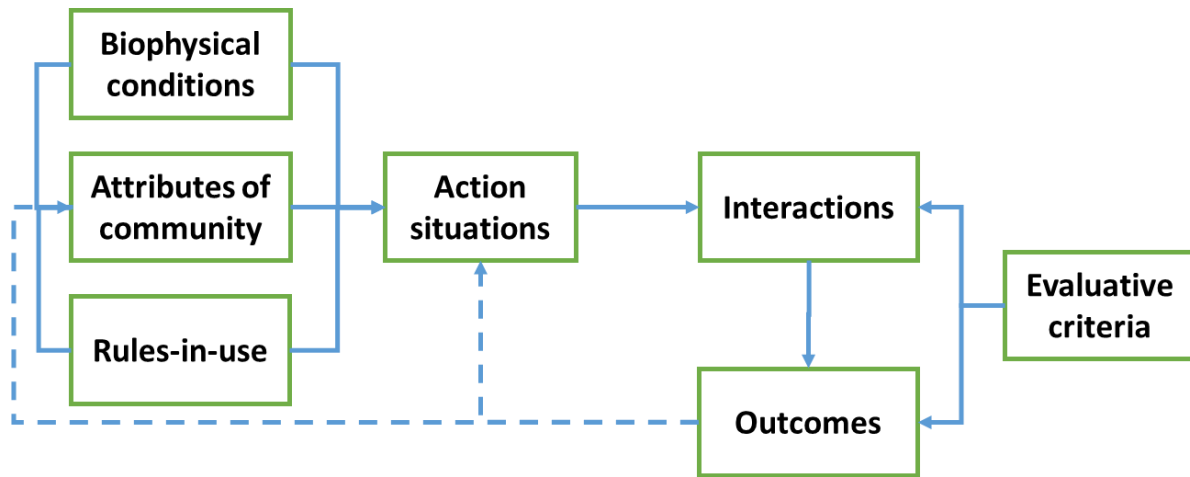


Figure 2: Institutional Analysis and Development framework.<sup>21</sup>

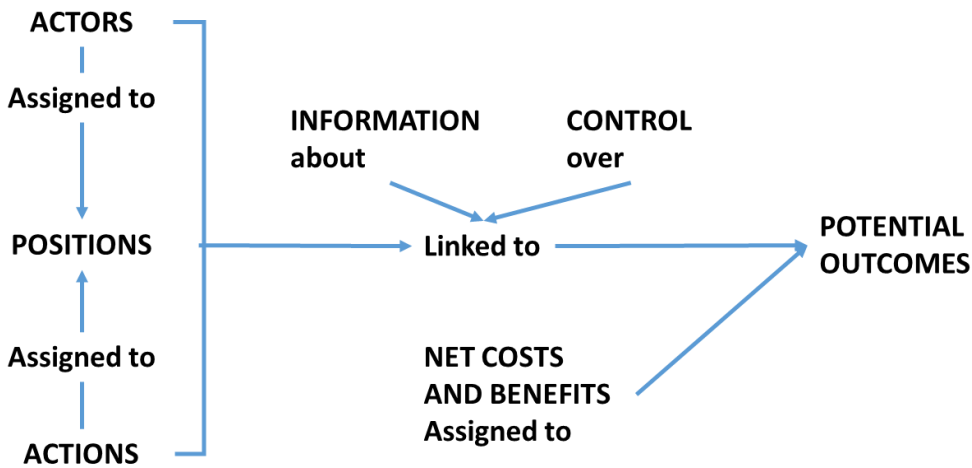


Figure 3: Action situation within the Institutional Analysis and Development framework.<sup>22</sup>

Ostrom, "An Institutional Framework for Policy Analysis and Design," in *Elinor Ostrom and the Bloomington School of Political Economy*, vol. 3: A framework for policy analysis (Lexington Books, 2017), 13–48.

<sup>21</sup> Ostrom, *Understanding Institutional Diversity*.

<sup>22</sup> Ostrom.

Taken together, club theory and the IAD framework suggest that monitoring and enforcement, through the rules-in-use and interactions among participants, will be essential if the 2030 Districts are to achieve their goals.

### *Data*

The first phase of this project focuses on the network and district (city) levels. Only the building energy portion of the 2030 Challenge for Planning was analyzed. The latest progress reports for each 2030 District was obtained from either the official program website (<https://www.2030districts.org/>) or directly from the program manager. Each progress report was analyzed for evidence of monitoring (baseline established, building data reported), enforcement (number of buildings reporting), and progress toward the 2020 interim goal of a 20% reduction in building energy use. I obtained some additional information about individual districts and the program as a whole from the 2030 District Network program manager.<sup>23</sup>

### Analysis

#### *Club Theory*

Club theory helps explain why building owners and other stakeholders would join the 2030 District. All 2030 Districts have the same relatively stringent standard – the 2030 Challenge for Planning goals. Success would involve significant energy and water retrofits for existing buildings, converting fleet vehicles to electric, and reducing single-driver commuting.

The 2030 District provides its members with certain direct and indirect benefits. The primary membership benefit is access to information about energy efficiency and renewable energy practices. The information facilitated by membership in the 2030 District reduces the search costs and may help overcome the energy efficiency gap. Implementing such practices could save the member money over the long run. Members may also receive discounts from contractors associated with the 2030 District. Additionally, members can enjoy the branding benefits from association with the 2030 District. This would be of most benefit to for-profit businesses looking for a marketing edge. The branding benefit may be of less direct benefit to NGO members, such as houses of worship. On the other hand, District membership may align with the NGO's values.

The cost of membership is the commitment to, and progress toward, the 2030 Challenge for Planning goals. There is no direct financial cost, such as dues, for joining the 2030 District and there is no direct financial cost for a city to establish a district. The cost comes in the form of the commitment to invest in resource efficiency projects. Creating a 2030 District requires considerable bureaucratic costs which occur across three phases. In Phase 1, the “prospective district” forms an exploratory committee and expresses its intent to the 2030 Districts Network. In Phase 2, the “emerging district” must continue the work of the exploratory committee with

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<sup>23</sup> David Low, “2030 District Operations,” 2020.

active participation from at least five different property owners or managers. The emerging district formally commits, in writing, to the Architecture 2030 Challenge for Planning goals. A local organization must agree to sponsor the district. Often it is a green building advocacy group, like a local chapter of the US Green Building Council. In Phase 3, the “established district” creates an advisory committee that is led by the private sector. It must have a detailed, two-year business plan including the organizational structure, staffing and financing information, and “a competitive analysis of local sustainability and green building efforts.” Finally, the district must have commitments from at least ten building owners or managers or ten million square feet of building space or 10% of the commercial real estate within the district boundary. At the building level, individual owners pay indirect costs by participating in the 2030 meetings and events, tracking and reporting resource use, and investing in efficiency projects.<sup>24</sup>

Club theory suggests that monitoring and enforcement is critical to prevent shirking and achieve the voluntary program’s goals. Each 2030 District establishes its own methods for monitoring and enforcement. The 2030 District Network does not, as yet, require individual 2030 District to submit annual or periodic progress reports. The 2030 District Network is considering making periodic progress reports a requirement in the future.<sup>25</sup> District leaders are expected to participate in regular conference calls with the 2030 District Network and attend the annual meeting. In 2019, two 2030 Districts (Austin and Los Angeles) were demoted to “emerging” from “established” status. In both cases, changes in the sponsoring organization and local leadership left an administrative vacuum. The Districts were unable to actively continue but members may reconstitute the Districts in the future.<sup>26</sup> This suggests that the current level of monitoring at the District level is low to moderate and the Network is able to enforce some degree of compliance among the Districts.

Of the twenty established 2030 Districts, eight published a progress report for 2018. Although San Francisco reported results in 2016, it did not submit one for 2018. Five of the progress reports included quantitative data about the District’s progress such as building energy use intensity. Other districts report progress in more general narratives without data. The five 2030 Districts that reported quantitative progress all used the Energy STAR Portfolio Manager to track building energy use intensity. By 2018, three 2030 Districts reported that they already exceeded the 2020 interim goal of a 20% reduction from the baseline. Two others were making significant progress (Table 4).

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<sup>24</sup> 2030 Districts Network, “Become a District,” 2020, <https://www.2030districts.org/become-district>.

<sup>25</sup> Low, “2030 District Operations,” 2020.

<sup>26</sup> Low.

Table 4: Three of the five 2030 Districts that reported results have achieved the interim energy goal of a 20% reduction.

District	# buildings participating	# buildings reporting	Energy reduction relative to baseline
Cleveland	281	108	24%
Dallas	42	35	17%
Philadelphia	47	43	29%
Pittsburgh	540	371	24%
San Antonio	86	44	14%

### IAD Framework

The 2030 District Network participating cities include a range of biophysical conditions and community attributes. Cities differ by climates, sizes, cultures, and economic environments. Although they share the same “rules-in-form”—the 2030 District goals—they may differ in their “rules-in-use.” Each individual District has autonomy in deciding how to encourage compliance (Figure 4).

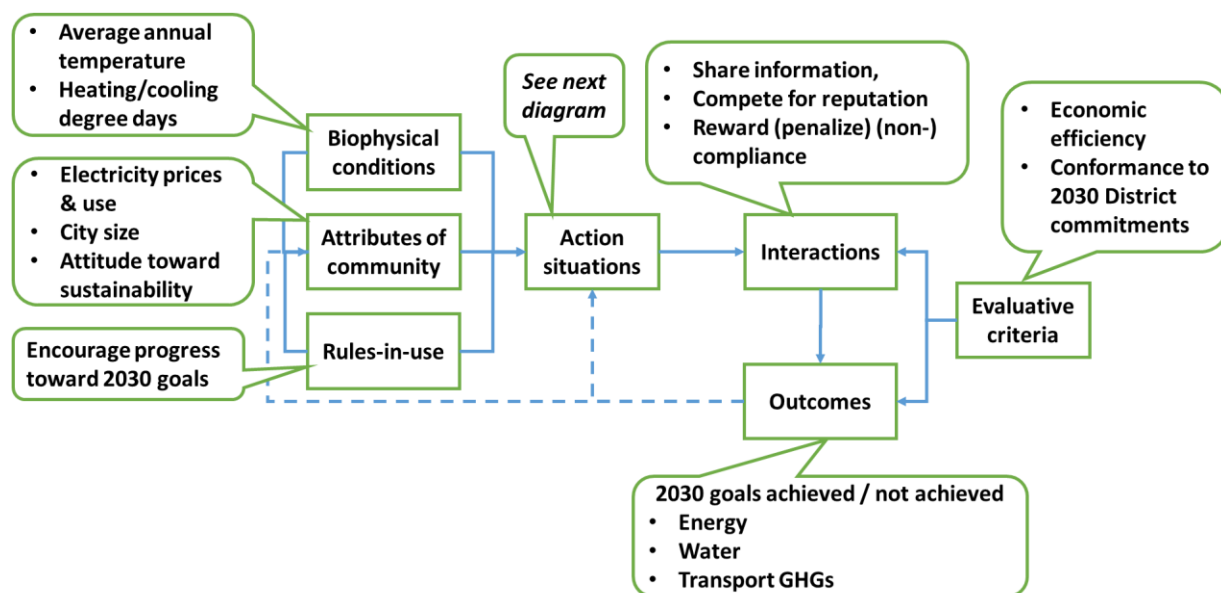


Figure 4: Institutional Analysis and Development framework annotated with 2030 District elements.

These biophysical conditions, community attributes, and rules-in-use affect the action situation where the key decisions are made (Figure 5). The IAD framework shows that what was

once a private, individual decision whether to invest in efficiency practices is now a socially-influenced decision within the 2030 District. The efficiency investment decision is influenced not only by the building owners and market prices, but also by the 2030 District sponsoring organizations, professional stakeholders, and community stakeholders. The stakeholders provide support by facilitating the flow of information, encouraging compliance, and setting behavioral norms (district sponsors); providing audits and other services (professional stakeholders); and providing institutional and policy support (community stakeholders). The annotated IAD and action situation clearly illustrate how the decision-making process within a club, like the 2030 District, differs from that of an individual firm. “Instead of making completely independent or autonomous decisions,” Ostrom wrote, “individuals may be embedded in communities where initial norms of fairness and conservation may change the structure of the situation dramatically. Within these situations, participants may adopt a broader range of strategies. Further, they may change their strategies over time as they learn about the results of past actions.”<sup>27</sup> As 2030 District members share knowledge and experiences at regular gatherings, they are also building trust that may help encourage action toward the shared goals. The 2030 District gatherings also present an opportunity for a positive “behavioral contagion” to spread among participants.<sup>28</sup>

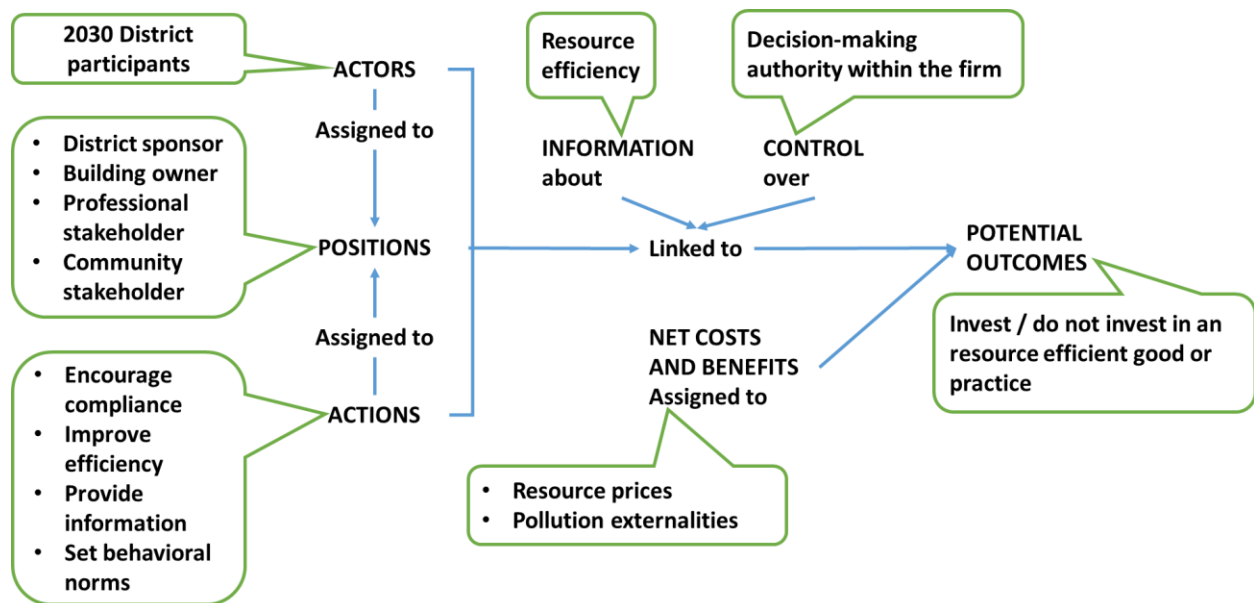


Figure 5: Action situation annotated with 2030 District elements.

<sup>27</sup> Ostrom, “Background on the Institutional Analysis and Development Framework.”

<sup>28</sup> Frank, *Under the Influence: Putting Peer Pressure to Work*.

The standard model of whether to invest in energy efficiency is framed as a one-time decision made by the building owner.<sup>29</sup> By expanding the analysis to include the community, the IAD framework allows us to consider how the other actors within the 2030 District can influence a building owner's decision about efficiency investments. The rules-in-use may influence the decision-making as well. This may happen through formal rules, such as the defined 2030 District goals, or informal norms and expectations of incremental progress. 2030 District building owners report progress on energy efficiency projects (outcomes) which in turn inform, in the short term, the decisions of other in the action situation and, in the long run, the attributes of the community and the rules-in-use.

Criteria can be used to evaluate a set of outcomes. Ostrom lists several commonly used evaluative criteria: economic efficiency, equity through fiscal equivalence, redistributive equity, accountability, conformance to values of local actors, and sustainability.<sup>30</sup> The 2030 District participants are likely to consider the economic efficiency of their investments. But as voluntary adopters of the 2030 District goals, they are also likely to consider those targets as well, which align with "conformance to values of local actors." Sustainability is also likely to be an evaluative criterion at the firm and District scales.

#### Discussion

Potoski and Prakash's club theory offers a systematic method for evaluating voluntary programs. The documentary evidence, although limited and preliminary, suggests that the 2030 District program, as a whole, can be described as a "Prep School" (Table 1). The expected 50% reduction in building energy use, water use, and transportation emissions is a stringent membership standard. The participation cost is moderate to high. The 2030 District Network established a rigorous three phase process for entry. The degree of shirking is low to moderate. Most 2030 Districts have not filed regular progress reports suggesting that enforcement is relatively weak. On the other hand, the 2030 District Network did sanction districts that failed to meet the basic requirements to maintain their "established district" status. Demoting a district, rather than withdrawing its charter entirely, is an example of a graduated sanction. Ostrom identified graduated sanctions as a key design principle in a well-managed commons.<sup>31</sup>

Of the five 2030 Districts that reported quantitative results in 2018, three have already achieved the interim energy goal of a 20% reduction (Table 4). This suggests that many of the participating buildings are more energy efficient than the national building stock. However, it is unclear whether this is actually due to participation in the 2030 District. Participating firms may strategically enroll their most efficient buildings to obtain branding benefits without investing in

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<sup>29</sup> Hunt Allcott and Michael Greenstone, "Is There an Energy Efficiency Gap?," *Journal of Economic Perspectives* 26, no. 1 (February 2012): 3–28.

<sup>30</sup> Ostrom, "Background on the Institutional Analysis and Development Framework."

<sup>31</sup> Elinor Ostrom, *Governing the Commons* (Cambridge University Press, 1990).

additional efficiency improvements. The high-achieving districts are all in the Northeast and did not have the advantage of a mild climate.

The IAD framework offers an opportunity to generate hypotheses that can be tested in future work. For example, the IAD framework suggests that biophysical conditions and community attributes may affect decisions within the action situation. The District's population size and composition may also influence relationships among members. It is possible that Detroit's district, which includes a large number of houses of worship, may behave very differently than office buildings in Dallas. The IAD framework emphasizes the role of interactions among decision-makers and stakeholders. This opens up the possibility of a positive behavioral contagion in which District members follow the lead of early adopters of efficient technologies and practices.

These research questions and hypotheses will be explored in the next phase of the research project. I will use a survey to obtain more detailed information about decision-making at the building and District levels. The results will shed light on how interactions among members of a 2030 District influence additional investments in energy efficiency.

### Conclusions

The concept of polycentric climate governance suggests that we do not need to wait for strong federal regulations to reduce greenhouse gas emissions. Most Americans live in cities and this is *where their energy*-using and emissions-generating activities happen. Cities, therefore, can take steps to reduce energy use and emissions. The 2030 District program is one such effort. The 2030 District program itself has polycentric properties with decisions being made at the Network, District, and building levels.

The club theory of voluntary programs suggests that the 2030 Districts must have strong monitoring and enforcement mechanisms if they are to achieve their goals. Documentary evidence shows that the 2030 District Network operates, in the vocabulary of Potoski and Prakash, as a "Prep School" with stringent standards and a moderate level of enforcement. Only about a third of 2030 Districts voluntarily submitted progress reports in 2018 which suggests that shirking could be a problem. Although three of the twenty Districts have already achieved the interim target for building energy efficiency, it is unclear if this is because of the 2030 District's influence or selection bias.

The IAD framework proved to be a useful tool for illustrating the institutional structure of a 2030 District member. The framework suggests that biophysical and community attributes may affect decision-making. The framework's action situation shows how decisions by a participating building owner may be influenced by other members of the 2030 District. These ideas will be explored in upcoming research efforts.