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Local Sustainability Innovation Through Cross-Sector Collaboration: Lessons from a Neighborhood Energy Competition

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Although public managers and nongovernmental actors play important roles in promoting sustainable communities, little is known about how these actors collaborate with each other across sectors when it comes to sustainability innovation. This case study illustrates how a policy entrepreneur partnered with local government, businesses, and community organizations to implement an innovative neighborhood energy competition that achieved community-wide energy savings and greenhouse gas (GHG) reductions. The outcome of this case suggests that local communities can promote bottom-up sustainability innovation through cross-sector collaboration that combines grassroots efforts led by policy entrepreneurs and nongovernmental actors with technical capacity provided by the government. The outcome also suggests that financial incentives are important, albeit with caveats, for motivating citizen participation in sustainability innovation. There are, however, a number of challenges associated with sustaining such innovation over time. This case offers useful insights into collaborative governance and practical recommendations for utilizing energy competitions as a sustainability policy tool.

Keywords: Cross-Sector Collaboration, Energy Competition, Local Government, Policy Entrepreneurship, Sustainable Communities

Introduction

Although prior research has shed light on the importance of public management in local sustainability efforts (Ji & Darnall, 2018; Wang, Van Wart, & Lebredo, 2014; Wang, Hawkins, Lebredo, & Berman, 2012; Zeemering, 2018), this research has also suggested that governmental actions alone are often insufficient for achieving sustainability gains. Indeed, nongovernmental actors such as nonprofits, businesses, and citizen groups can have an impact on sustainable communities in profound ways (Hawkins & Wang, 2012; Portney, 2005; Portney & Berry, 2016; Portney & Cuttler, 2010; Zeemering, 2014). Few studies, however, have focused on how cross-sector collaboration—or "the linking or sharing of information, resources, activities, and capabilities by organizations to achieve jointly an outcome that the organizations could not achieve separately" (Bryson, Crosby, & Stone, 2006, p. 44)—leads to local sustainability innovation.

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Collaboration is important in planning and implementing local sustainability policies and programs (Hawkins, Krause, Feiock, & Curley, 2018; Hawkins & Wang, 2012; Swann, 2017; Zeemering, 2014). Activities targeting greenhouse gas (GHG) emissions, energy savings, and sustainable development—and the consequences of these actions—cut across jurisdictions and functional areas of local government. This creates the need for integrating and coordinating activities across organizations and sectors (Feiock, Krause, & Hawkins, 2017; Feiock, Portney, Bae, & Berry, 2014).

Despite the need for such multisectoral and multiorganizational integration and coordination, existing scholarship has tended to overlook the process through which cross-sector collaboration promotes sustainability innovation. That is, we know little about how cross-sector collaboratives for sustainability form and develop or how they impact local communities. Thus, this case study is intended to provide an in-depth look at a bottom-up sustainability innovation initiated by a policy entrepreneur who partnered with local government, businesses, a nonprofit, and a host of other community organizations. The case, the Tallahassee Neighborhood Energy Challenge (TNEC), illustrates how cross-sector collaboration can lead to increased energy savings and reduced GHG emissions.

In the case, a policy entrepreneur pulled together city officials and community stakeholders to establish an innovative neighborhood energy-reduction competition in 2009. Households were asked to form teams within their neighborhoods and compete against other neighborhoods to determine who could achieve the largest reduction in electricity use over a six-month period. More than 1,000 households across 53 neighborhoods participated and collectively achieved about a 6% overall reduction in energy use compared with the same period the prior year. This was enough energy savings to power 18 homes in the city for one year (City of Tallahassee, 2009). Despite this success, the TNEC was never implemented again and failed to be the multiyear initiative community leaders had envisioned.

The questions this case study focuses on are: How can cross-sector collaborations involving policy entrepreneurship, local government, businesses, and community organizations produce sustainability innovation? And, how can communities design and implement a successful energy-reduction competition?

The outcome of this case shows that cross-sector collaborations can promote bottom-up sustainability innovation through combining grassroots efforts spearheaded by a policy entrepreneur and nongovernmental actors with technical capacity provided by government in the form of implementation. The case also shows that financial incentives can be important, albeit with caveats, for motivating citizen participation in sustainability innovation. There can, however, be a number of challenges associated with sustaining such innovation over time.

The following section provides an overview of energy-reduction competitions as a form of sustainability innovation. The section further provides an overview of how cross-sector collaborations can serve as a vehicle for introducing such innovation. Next, the case and the analytical framework are described, followed by a presentation of the methods and findings. A number of implications for collaborative governance and practical recommendations for implementing energy competitions are then discussed. A conclusion follows.

Background

Energy Competitions as Sustainability Innovation

Innovation can be broadly defined as "something different that has impact" (Anthony, 2012); and, it can be considered a "function of an interaction among the motivation to innovate, the strength of obstacles against innovation, and the availability of resources for overcoming such obstacles" (Mohr, 1969, p. 111). While sustainability innovations are probably too numerous to count, one innovation that has received little attention in the literature is the energy (reduction or efficiency) competition.

Energy competitions are voluntary mechanisms by which a competitive spirit drives actors to reduce their energy consumption within a rules and results tracking system. Usually participants compete for some reward or recognition (Vine & Jones, 2016). Although employed less frequently than more traditional sustainability programs (e.g., curbside recycling, green buildings, and renewable energy rebates), energy competitions have increasingly been used to engage, educate, motivate, and empower actors to reduce their energy use and carbon footprint (Petersen, Frantz, & Shammin, 2014; Vine & Jones, 2016).

Across the globe (at local, regional, and national scales), energy competitions have led to energy savings in city government operations, residential neighborhoods, university campuses, and businesses (Vine & Jones, 2016). One recent example is the Georgetown University Energy Prize (GUEP), a two-year competition where 50 local governments competed nationally to showcase their energy saving innovation and performance. The grand prize was $5 million toward an energy dream project. The competition was held from 2014 through 2016. Participating governments collectively saved 11.5 trillion British thermal units (BTUs) of energy, reduced carbon emissions by 2.76 million metric tons, and saved about $100 million from municipal and household budgets (GUEP, 2017).

While various policies and programs are available for enhancing sustainability based on economic, environmental, and equity considerations (Opp & Saunders, 2013), there are two general categories of sustainability tools relevant to energy competitions: those that provide education and those that provide financial incentives for residents (Roseland, 2012). Energy competitions, particularly at the local level, incentivize citizens to achieve cost savings on their energy bills while also encouraging them to learn about sustainable behavior through hands-on experiences and face-to-face exchanges with their neighbors and local energy experts.

Because climate protection is considered a public good (i.e., nonexcludable and nonrivalrous), co-benefits, or the indirect benefits, associated with climate protection (e.g., improved health and economic conditions) are important for incentivizing actors to adopt and implement climate policies and programs (Kousky & Schneider, 2003). Energy competitions produce co-benefits by allowing participants to reduce GHG emissions and energy consumption while also allowing them to achieve financial savings. As with most sustainability programs, however, such competitions demand capacity in the form of coordinated planning, commitment of time and resources, and support from political leaders, administrators, and the broader community. Therefore, cross-sector collaborations may be an effective strategy for building capacity to effectively implement these competitions.

Cross-Sector Collaboration and Policy Entrepreneurship

Achieving effective cross-sector collaboration is exciting but often difficult due to the complex, dynamic, and multilevel nature of collaboration (Bryson, Crosby, & Stone, 2015). Prior research has shown that antecedent conditions (or contingencies) are a critical determinant of cross-sector collaboration and its effectiveness; however, "[e]ven when environmental conditions favor the formation of cross-sector collaborations, these collaborations are unlikely to get under way without the presence of more specific drivers or initial conditions" (Bryson, Crosby, & Stone, 2015, p. 652). Bryson and colleagues (2015) found that one driver consistently shown to influence cross-sector collaboration is integrative leadership. Integrative leaders who champion or "sponsor" policies are catalysts for collaboration. These leaders are able to link actors across sectors and effectively frame issues for collective goal achievement (Bartlett & Dibben, 2002; Crosby & Bryson, 2010; Page, 2010).

Policy entrepreneurs have long been identified as key integrative leaders in cross-sector collaborations (Cornforth, Hayes, & Vangen, 2015; Lober, 1997; Takahashi & Smutny, 2002). These actors typically operate outside formal roles of government and attempt to introduce dynamic policy change by shaping policy agendas and building coalitions for their solutions (Kingdon, 1984; Mintrom, 1997; Schneider, Teske, & Mintrom, 1995). Because of their unique skills and characteristics, policy entrepreneurs are believed to be essential for initiating the collaboration necessary for achieving challenging sustainable development goals (Mintrom & Thomas, 2018). While the sheer presence of policy entrepreneurs appears to enhance local sustainability activity (Feiock & Bae, 2011; Krause, 2012), little research demonstrates *how* policy entrepreneurs work with governmental and nongovernmental actors to introduce sustainability innovation.

One exception is Zeemering's (2014) study of sustainability efforts in the city of Baltimore, Maryland. In this study, Zeemering (2014, p. 24) argues that policy entrepreneurs "offer new explanations for the causes of existing urban problems and also foster new ideas about the process necessary to change and improve the city." Zeemering finds that intermediary organizations such as nonprofits and civil society organizations play entrepreneurial and brokering roles that connect otherwise isolated governmental and nongovernmental actors across the community. This, he suggests, builds capacity for more effective policy implementation in sustainability.

The present case study of the TNEC contributes to this line of inquiry by illustrating how a nongovernmental policy entrepreneur partnered with a local government, businesses, and community organizations to introduce an innovative, bottom-up energy competition. This case also reveals the limitations of relying heavily on the organizational efforts of the policy entrepreneur and nongovernmental actors, as local government was not prepared to cultivate grassroots support for continuing the competition after the policy entrepreneur's exit.

Case Description and Analytical Framework

The Tallahassee Neighborhood Energy Challenge (TNEC)

The TNEC was initiated in 2009 by the president of the Council of Neighborhood Associations (CONA). The president of CONA partnered with local government, businesses, a nonprofit, and other local organizations to start a competition aimed at increasing energy savings and reducing GHG emissions. The TNEC was effective at generating grassroots interest in climate protection, which resulted in significant energy savings and GHG reduction. The competition, however, was

unable to continue after the policy entrepreneur exited and government was unable to sustain community-wide support for the innovation. A timeline of the TNEC is displayed in Figure 1, which outlines key activities and milestones.

The TNEC pitted neighborhood teams against one another in a friendly competition to determine which team would be the most energy-efficient. Winning teams received prizes, including a grand prize of a new neighborhood entrance sign. Neighborhoods directed the competition while local government played a peripheral role. Voluntary competition was the driving force whereby residents not only competed in teams for neighborhood prizes but could also see savings on their energy bills. Local government offered technical assistance, leaving the day-to-day organization, promotion, and sponsorship efforts to CONA and its nongovernmental partners.

Households signed up either in-person, at local libraries, or electronically through a dedicated website. Sign-up competitions were also held to incentivize participation. After signing up, households formed teams—either through independent coordination or administrative assignment—within their neighborhood. Each team pledged to reduce their electricity consumption by selecting at least one energy saving action such as unplugging electrical devices when not in use, installing energy-efficient lighting, or turning down hot water heaters.

During the TNEC, neighborhood teams competed in two categories: one for the total top savings of energy; the other for the largest percentage of energy savings over the prior year. A total of 53 neighborhoods representing over 1,000 households in Tallahassee and Leon County competed. Collectively, they achieved an overall reduction in electricity use of 218,997 kilowatt hours (kWh) over the prior year. This produced a corresponding reduction in CO_2 emissions of 208,529 pounds. According to the city of Tallahassee, this was about a 6% overall reduction based on the prior year's use during the same six-month period, adjusting for weather-related effects.

The city of Tallahassee provided the data for each neighborhood team's energy savings in the TNEC. While the majority of neighborhood teams reduced their energy use compared to the prior year's, nearly half of the teams *increased* their energy use. One explanation for this variation could be that some teams had more active neighborhoods than others. Indeed, the number of households per team is positively correlated with performance. Figure 2 shows a scattergram of the number of participating households per team and the total reduction in energy use (kWh) over the prior year (r=0.40, p<0.01).

To determine changes in energy use by a team's neighborhood activity level (i.e., size), I estimated a simple (bivariate) regression, with total reduction in energy use regressed on the number of households per team. The model is statistically significant at the 0.01 alpha level ($F(1, 51)=9.90$, $p<0.01$) and has an R^2 of 0.16. A neighborhood team's predicted reduction in kWh of energy use is equal to -831.87 + 253.70 (households per team). A neighborhood team's energy use increases by 253.70 kWh for each additional household.

For their efforts in establishing the TNEC, CONA received the 2009 "Sustainable Florida Best Practice Award." This is an annual statewide award for the most innovative sustainability management practice. After the competition, the president of CONA stepped down to run for local elected office, and a new president took over. Having invested in the technological infrastructure that undergirded the TNEC, the city wanted to run the competition annually to earn a return on its investment. However, a second TNEC never came to fruition despite best efforts to reimplement the competition.

Figure 1. Tallahassee Neighborhood Energy Challenge Timeline (2009)

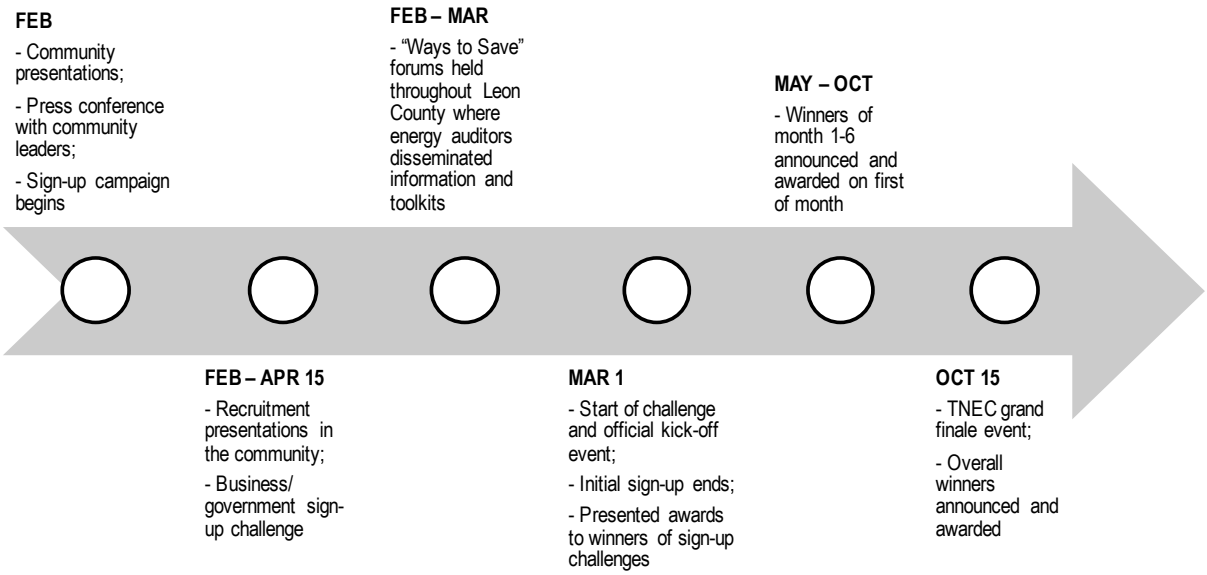
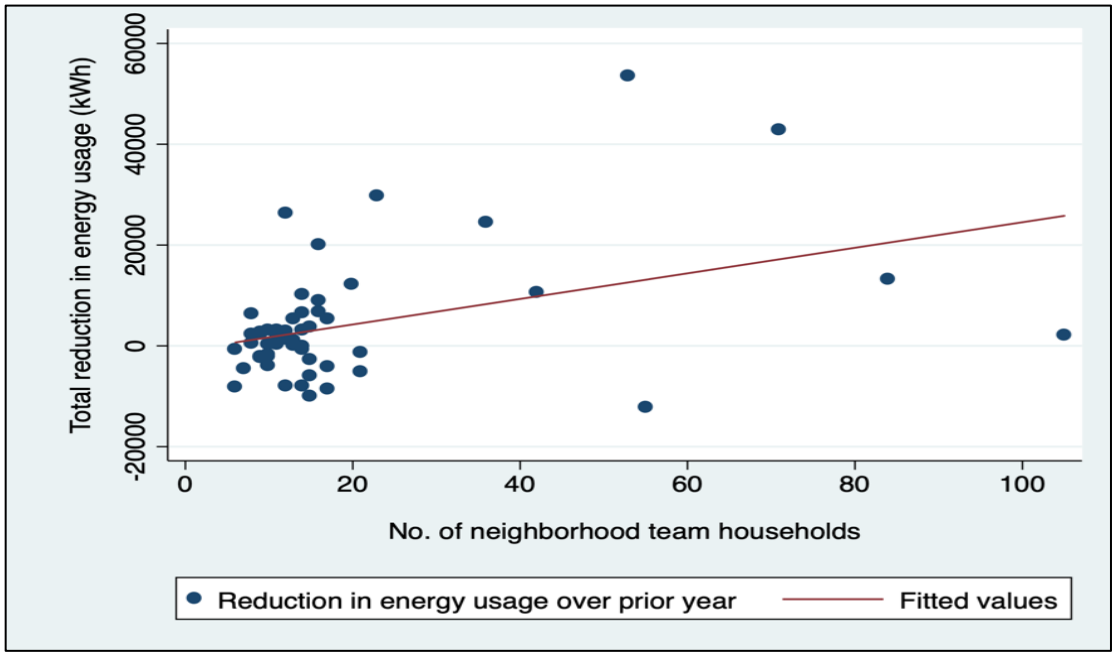


Figure 2. Relationship between Team Size and Energy Reduction (kWh)



Collaboration Formation and Development Framework

This case examines the TNEC within the framework of collaboration formation and development (Cornforth, Hayes, & Vangen, 2015; Lober, 1997; Takahashi & Smutny, 2002). This theory is built on the "multiple streams" approach first developed by Kingdon (1984) and later by Lober (1997) who argued that policies are formulated as four streams: the *problem stream*, which means issues are identified as problems; the *policy/solution stream*, meaning policies or solutions are suggested to address problems; the *political, social, and economic (PSE) stream*, referring to

influences of the political, social, and economic context; and, the *organizational stream*, referring to changes in organizational behavior in response to agenda issues. These streams converge and create windows of opportunity for policy change. Policy entrepreneurs play a leading role in this process and are adept at coupling streams, attaching problems to solutions, and persuading actors in the political system to support their ideas (Zahariadis, 2007).

Previous research has shown that entrepreneurs recognize and initiate the formation of collaboratives. However, this research has shown that collaboratives that are entrepreneur-initiated tend to fail due to organizational inertia, their time-consuming nature, and a lack of skills to maintain and adjust to changing circumstances (Takahashi & Smutny, 2002). More recent work by Cornforth, Hayes, and Vangen (2015) shows that entrepreneur-initiated collaboratives *can* adapt to changing circumstances, suggesting that previous research may have been overly pessimistic about short-lived collaborations. Adapting to change, however, is not easy and collaboratives face internal tensions over time (e.g., differences in goals and expectations, and achieving efficiency and inclusiveness).

To frame this study, the four streams and the policy entrepreneur in the TNEC are identified as follows:

- The *problem stream* concerns climate change in general and the economic incentives around climate change specifically. Local governments have been negatively impacted by climate change but have been leading contributors to GHG emissions, with estimates as high as 75% of total global emissions (UN Habitat, 2011). Despite many local governments leading climate protection efforts, they have incentives to free ride on the efforts of neighboring jurisdictions and not contribute to the cost of obtaining benefits (Olson, 1965). Environmental protection is also intertwined with other complex issues such as fostering economic development and social equality (Opp & Saunders, 2013). Thus, integrated approaches to improving the "three E's of sustainability" are important but hard to identify given the long recognized conflictual nature of local sustainable development (Campbell, 1996).

- The *policy/solution stream* concerns the broader set of policy tools for addressing climate change. These policy tools can be divided into two categories: command-and-control regulation that mandates behavior, and other tools such as market-based instruments, voluntary agreements, and information provision that attempt to realign economic incentives with individual behavior (Niles & Lubell, 2012). Prior to the TNEC, the city of Tallahassee used a combination of ordinances and market-based approaches to promote sustainable behavior. Consistent with the latter approach, the TNEC would voluntarily encourage households to reduce energy use by sharing information about energy savings with neighbors, achieving cost savings on energy bills, and competing against rival neighborhoods for bragging rights and coveted prizes.

- The *PSE stream* concerns the context in which policy innovation takes place. Sustainability policies are inextricably linked to local politics, social milieus, and economic conditions (Bulkeley & Betsill, 2005). Since it is a "college town," Tallahassee's education level consistently ranks high nationally as well as in the state of Florida. These rankings help to fuel the robust local economy. As a diverse, politically progressive, midsized capital city of approximately 190,000 residents, Tallahassee is also recognized as an international leader in urban environmentalism and has historically been on the leading edge of sustainability in the region and the state (City of Tallahassee, 2014). Tallahassee has implemented numerous sustainability policies and received a national best practice model award (US Conference of Mayors, 2009).

- The *organizational stream* consists of the organizations involved in the city's sustainability efforts. On the governmental side, there was the city environmental department where most of the sustainability practices were managed. The municipal utility was also instrumental in the free home-energy consultations where city energy auditors visited homes to conduct audits and inform residents about ways to save energy and obtain low-interest home-improvement loans for energy-efficiency. Other public agencies, including a local public research institute and Leon County, were involved in sustainability projects. A local nonprofit was involved in promoting and coordinating sustainability activities. Local businesses and media also supported previous sustainability efforts and extended their support for the TNEC.

- The president of CONA acted as the *policy entrepreneur*. An attorney by training, the president founded and operated a small public affairs consulting firm in Tallahassee and was embedded in the local political scene. He served on several nonprofit boards including the sustainability nonprofit. He had developed an avid interest in climate protection and believed a bottom-up voluntary model that could alter behavior through economic incentivization would be more effective than top-down command-and-control regulation.

Method

This case uses the method described by Yin (2009) to address the focal questions. According to Yin, case studies are most useful for understanding "how" and "why" questions for a set of real-life events. This study is descriptive and explanatory—that is, it describes *and* explains how cross-sector collaboration can introduce bottom-up sustainability innovation and how communities can design and implement a successful energy competition. The case was selected based on its applicability to the concepts of interest (George & Bennet, 2005). Similar to Takahashi and Smutny (2002) and Cornforth, Hayes, and Vangen (2015), the case focuses on a collaborative entrepreneur who was adept at forming and leading a cross-sector collaborative. After the TNEC was implemented, this collaborative experienced challenges adapting to the policy entrepreneur's departure and maintaining the community-wide support needed for a second iteration of the competition.

Data Collection and Analysis

A focus group and an in-depth key informant interview was used for data collection during 2015–2016. A semi-structured questionnaire was prepared prior to the focus group and interview. Nearly a dozen individuals were identified and asked to participate. In total, four employees working for the city of Tallahassee participated in a 60-minute focus group and the president of CONA participated in a 25-minute in-depth phone interview (he preferred not to be recorded). Of the four city employees who participated in the focus group, all were involved in the TNEC. They consisted of a senior administrator and two staff from the environmental department as well as a municipal utility manager. The confidentiality of the focus group and interview was assured; and, the study received prior internal review board approval.

The focus group audio recording was transcribed and coded by the author to identify main content themes. Notes taken during the phone interview with the president of CONA were also analyzed for key themes. To analyze the data, the author followed Yin's (2011) recommended coding process. In the "disassembling" stage, initial (Level 1) codes were assigned by hand, followed by the assignment of higher-level (Level 2) category codes. Patterns were then identified in the "reassembling" stage using concept mapping. The data were interpreted both descriptively and explanatorily. Finally, conclusions were drawn. City documents and news articles were also used

to compare against what participants said in the interviews and to obtain background information for developing a chronological description of the case.

There are some limitations that should be acknowledged. In particular, only a small proportion of those who were invited to participate actually participated. One reason could be that the TNEC occurred in 2009; in addition, some people may not have a reliable recollection of the event. They also may not have been as directly involved in the TNEC at that time. Thus, it is important to note that the time between the TNEC and data collection for this study is certainly a limitation. While this issue can be problematic, it should also be noted that those who did participate were likely the most knowledgeable about the TNEC.

Findings

This case aims to illustrate the complex process through which cross-sector collaboration forms and introduces a bottom-up sustainability innovation that can provide insight into how communities can implement a successful energy competition. Figure 3 displays a concept map of this process for the TNEC. The policy entrepreneur acted as the catalyst pulling together the problem, policy/solution, PSE, and organizational streams in a cross-sector collaboration that led to a sustainability innovation. Governmental and nongovernmental actors, connected by the policy entrepreneur, played different roles and offered unique strengths for cross-sector collaboration. Nongovernmental actors led the grassroots efforts while government provided technical capacity for implementation. Doing without one of these factors, as the case will show, impaired the ability of the TNEC to continue in the long term.

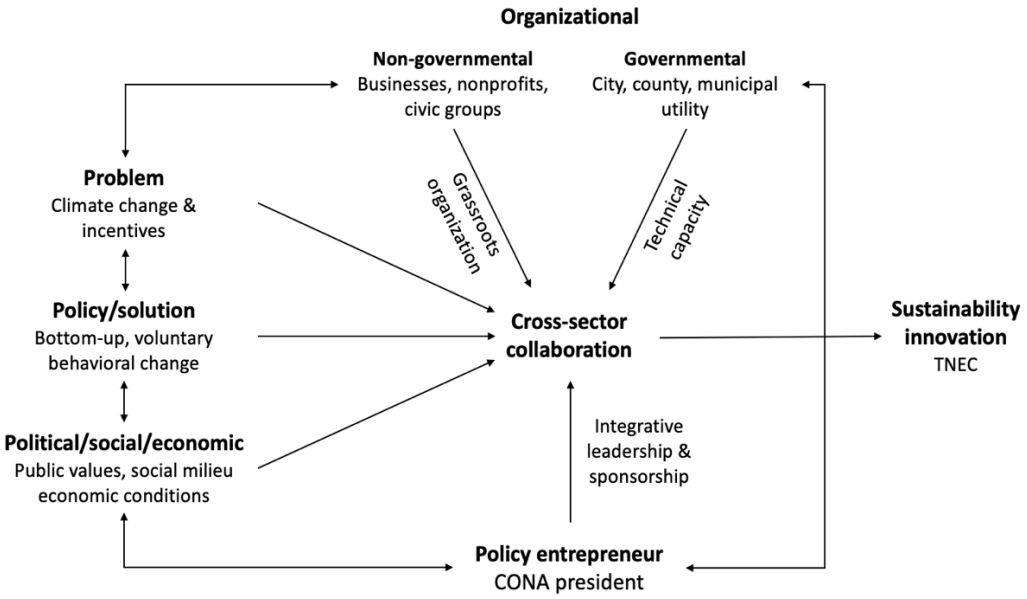
Grassroots Organization: The Role of Nongovernmental Actors

The role of nongovernmental actors in conceiving the idea, generating community awareness, and building grassroots support for sustainability innovation was a critical factor in the TNEC. The initial idea for the innovation was conceived of and put into motion by the policy entrepreneur who opened a collaborative window. According to the president of CONA, there was already a great deal of community attention on the problem of climate change prior to the TNEC. Indeed, local residents had been asking what government and individuals could do about it. Therefore, acting on the assumption that the actions of private citizens could be more impactful if incentivized through competition, the president of CONA began researching energy competitions around the country and ultimately decided that a voluntary bottom-up approach to hosting a competition would be more effective than a government-run program.

The interviews revealed that community awareness and education were the key mechanisms through which the cross-sector collaboration led to sustainability innovation. One city employee described how community awareness could enable the TNEC to achieve its aim of reducing energy use and GHG emissions:

> [CONA] was interested in creating an awareness and interest across their various neighborhoods in energy use. Their premise was that if we [the community] create a competition—a fun competition—where everybody becomes more aware of how much energy each of us is using the synergy from neighbors being aware of each other and the activities each other were involved in, that would then create more overall awareness of how energy is used and ideally bring down the use of energy.

Figure 3. Concept Map of Cross-Sector Collaboration for Bottom-Up Sustainability Innovation



The president of CONA and the city environmental staff realized that raising community awareness and educating citizens about climate change and sustainable behavior were not only mechanisms but major successes of the TNEC. As one staff member said, "For the city, the educational component was a very important part [of the TNEC]."

The grassroots approach to climate protection was another important mechanism for change prevalent in the data. The president of CONA believed the TNEC had to emanate from the bottom-up to be effective; and, the city understood the approach CONA wanted to take. According to the public utility manager:

> CONA wanted to involve the neighborhoods from their perspective…They wanted the responsibility to lie within each of the neighborhoods, rather than having a top-down approach…They wanted the energy from the neighborhoods and the excitement and the competition to be generated—to be heralded—by CONA, and then to be put into place by each of the local neighborhoods.

As a result, the core organization and awareness-raising efforts resided at the grassroots level, led by CONA and the neighborhoods. Because CONA had no staff, the president of CONA did most of the initial recruitment, reaching out to homeowners association presidents and other points of contact in the neighborhoods. These neighborhood leaders then created greater awareness of the program, which led to opportunities to educate citizens about ways to save on their energy bills. Indeed, the utility manager said, "I do remember quite a few of the neighborhood homeowners association presidents stirring up interest in order to bring people to the educational meetings that were city wide and then hosting parties in their homes."

This initial recruitment effort was driven at the neighborhood level with little involvement from the business, nonprofit, or government sectors. However, it soon became apparent that there was a need to formalize the TNEC and incorporate the business and nonprofit sectors in order to expand participation.

CONA established a citizen steering committee in partnership with a sustainability nonprofit and a public relations firm. While the nonprofit focused on the educational component of the TNEC, the public relations firm provided CONA with the capacity to reach neighborhoods all across the community. According to CONA's president, the private sector was "instrumental" to the TNEC. Local business sponsors were recruited through the social networks of citizens involved in the competition. A locally operated signage chain provided the advertising signs, banners were procured from a local print shop, local broadcasting stations provided media publicity, a website was designed by a local web media firm, and a large multinational bank with several local branches donated the prizes.

In all, the TNEC began to take shape at the grassroots level long before government became actively involved. Consistent with Lober (1997), CONA's president was the "critical catalyst" for the TNEC. The president "conceived of the project, selected participants, and lobbied them to participate" (p. 19). The president also worked with the neighborhoods, businesses, a nonprofit, and citizens in the planning, recruitment, and sponsorship efforts that generated community wide interest in the TNEC. It was not until implementation that the government's role became vital. At this time, the president of CONA acted as the intermediary between the neighborhoods and local government.

Technical Capacity: The Role of Governmental Actors

Realizing the need for technical capacity and policy expertise, CONA's president and the citizen steering committee encouraged local government to join them in implementing the TNEC. CONA's president said that having government involved in "raised the profile of the project." According to both city employees and the president, obtaining administrative and political buy-in was not difficult because there was a strong willingness on the part of local government to become involved and help improve the city's sustainability outlook. However, delineating governmental and nongovernmental tasks and boundaries was more complicated. As the utility manager stated:

> ...one of the complexities was that we [the city] announced that we're a part of this neighborhood energy challenge, our specialty is communications, so we'll send out press releases, we'll send a film crew. And we said, well, wait—in this case, CONA is taking the lead; they really want to take the grassroots approach. If [the city communication department] takes on the role of communications director, then it's going to be appear to be a city program. So, we really kind of had to step back from that.

According to the utility manager, the city had to "walk a fine line" when getting the administration involved. This was done so that it would not appear that it was running the TNEC like a government program, but that it was enabling the policy entrepreneur and nongovernmental actors to achieve their goal. The notion of balancing public and nongovernmental tasks and responsibilities in cross-sector collaboration was a common theme in the data. As the utility manager continued:

> So, [getting involved in the TNEC] was always a balancing act. We felt like we had the resources, the ability, and the experience to do it, but we really had to step back and say, you know, this has got to be a grassroots effort for it to be successful from CONA's perspective.

One area where the city had to "balance" administrative control with the grassroots approach was in regard to its educational component, which focused on educating citizens about ways to reduce energy consumption. According to the utility manager, the city "had to balance having the resources to provide education but not duplicate that in a way that [the city] had previously supported the community." The city engaged in this "balancing act" when collaborating with a local public research institute and the sustainability nonprofit to deliver informational public forums. Even though the city could have easily managed the forums alone, it was important for the city to be seen as a team player and achieve the broader aims and objectives of the TNEC.

Another theme in the data was interorganizational integration. For example, the city and the county had to coordinate in order to collect and record electricity use data for each neighborhood team. Because the municipal utility managed the monthly billing, the city had energy use data for households. To measure usage at the neighborhood level, however, the city partnered with the county to use its geographic information system (GIS) mapping technology to aggregate household data at the neighborhood level. This technology provides a way to manage and analyze geographic and spatial data. According to environmental staff, the city's information systems department worked with the county and the municipal utility to write a computer program that extracted energy use data for all participating households. It then aggregated the data at the neighborhood level using GIS.

Ultimately, local government provided the technical capacity that was needed to implement the TNEC. As one environmental administrator noted "[T]he infrastructure, the technological infrastructure, that really undergirded and supported the program was really provided by the city and governmental partners, more so the city." Continuing the administrator claimed that "[T]he real rudiments of the program, the core of the program in terms of tracking the [energy] use, was a function of the city." Although local government played a peripheral role in organizing the TNEC, it played an indispensable role in implementation and effectiveness of the TNEC.

Motivating Citizen Participation: The Role of Financial Incentives

One of the most challenging and least understood aspects of cross-sector collaboration is how to motivate citizen participants to get involved (Bingham & O'Leary, 2006). The case of the TNEC suggests that financial incentives are an important mechanism explaining how citizen involvement in cross-sector collaboration can lead to sustainability innovation. In addition to intrinsic benefits (e.g., the thrill of competing, self-discovery, and learning), most competitions involve some extrinsic reward—for example, a monetary prize or a championship ring. The TNEC was no different. Individuals in some households were likely motivated by intrinsic "warm glow" feelings that have been associated with pro-environmental behavior (Taufik, Bolderdijk, & Steg, 2015). However, extrinsic motivators—such as winning a new neighborhood entrance sign and lowering household energy bills—were also likely at play. As the environmental administrator explained:

> ...sometimes you'll try to get people to change behavior for the greater good of the community, the greater good of the environment, but here behavioral change led to economic savings for them. And all of us know that money is a great motivator for people.

Another environmental staff member also saw value in financial incentives. This employee, however, questioned the effectiveness of extrinsic incentives in promoting pro-environmental behavior over the long run:

> [The TNEC] proved to me that people will make changes if necessary. Unfortunately, they did it because it was a competition. If [they] continue those modifications, then we could reduce energy, water consumption, whatever. But there was a driving force behind it: again, [participants] were trying to win a new entrance to the subdivision...So, when [the TNEC] was over and [the participants] didn't win the new bricks for the entrance, do they still continue to implement those things?

This quote brings to the fore an important caveat about extrinsic incentives—that is, although financial rewards may have played a role in inducing citizens to participate in the TNEC, these rewards may also undercut pro-environmental behavior in the long run if citizens are responding only to short-term incentives. This caveat is discussed more in the practical recommendations section below. Suffice it to say, though, that while extrinsic incentives appear to be important for motivating participation, little is known about how (if at all) these types of incentives affect long-term behavior.

Aftermath and Lessons Learned

Sometime after the TNEC ended and the president of CONA stepped down, the city began discussing the possibility of a second TNEC. A second TNEC, the city believed, would help to recoup the investment in infrastructure that was provided during the inaugural run.

Although the city had the resources and expertise to initiate a second TNEC, the city was not well equipped to reinvigorate community-wide support without CONA and the work of its nongovernmental partners who had been the ones organizing in the neighborhoods. Thus, a second TNEC never came to fruition despite best efforts to reignite the competition. The biggest limitation of the TNEC, then, was its failure to become a multiyear initiative. As the environmental administrator explained:

> CONA did come back and talk with us about doing another energy challenge. But for one reason or the other trying to marshal the type of community support that was necessary to make it happen just didn't occur. We could have gone ahead and done another energy challenge, but then it would become city stuff. It wouldn't involve that grassroots effort, and it wouldn't involve the engagement of the neighborhoods in terms of participation.

The utility manager also echoed a similar sentiment, i.e., that failure to sustain a multiyear initiative was the main shortfall of the TNEC:

> ...the effort was intended to go on. It was intended to be a multiyear effort. And based on the volume of work for the one year, and the amount of effort that was put into it, CONA decided that there were other efforts that they wanted to undertake. That may be the only shortfall of the program, that it was a one-year effort. And a great experience, but I would have liked it to be a continued program.

Despite failing to continue, the TNEC offers an important lesson about the effectiveness of bottom-up approaches to sustainability innovation. The TNEC taught the city that motivating behavioral change can be achieved on a larger scale. Prior to the TNEC, the city had focused on

reducing in-home energy use through its one-on-one energy consultation and auditing program. The TNEC demonstrated, however, that achieving behavioral change is possible at the block level. According to the environmental administrator:

> ...many folks say [behavioral change] occurs on the block level, and the CONA energy challenge is a great example of a program that sought to address behavioral change on the block level—neighbor talking to neighbor, neighbor meeting in another neighbor's house to talk about [joining] this energy challenge, rather than, you know, the mayor—although [he] was involved—trying to get it done.

While the cross-sector collaborative did not take advantage of the momentum built during the first TNEC to successfully implement a second competition, the TNEC did provide important lessons for designing energy programs that scale up and have broader impact.

Discussion

One prevailing theory about collaboration is that collaborations are the result of collaborative windows opening due to the coupling of streams by collaborative entrepreneurs (Cornforth, Hayes, & Vangen, 2015; Lober, 1997; Takahashi & Smutny, 2002). The case of the TNEC supports this theory. Indeed, the president of CONA (acting as the policy entrepreneur) attached the problem of climate change to a solution that fit with the local political, social, and economic context and organizational activities around climate protection. The president was the catalyst, effectively bringing together a cross-sector collaboration for introducing sustainability innovation.

Collaboratives initiated by policy entrepreneurs can at times be unsustainable due to difficulties that collaboration members may have adapting to changing circumstances, collaborative inertia, a lack of collaborative skills, and internal tensions (Cornforth, Hayes, & Vangen, 2015; Takahashi & Smutny, 2002). The TNEC conforms to this scenario. Hopes to initiate a second competition were dashed after the president of CONA stepped down to run for elected office. At that time, local government was not prepared for stepping into the policy entrepreneur's role and mobilizing grassroots support. However, TNEC organizers appeared to have strong collaborative skills, and at least from the governmental side, there seemed to be some collaborative inertia or internal tension (considering how the city was interested in a second competition). The likely reason the TNEC did not continue is because government no longer had a nongovernmental partner that was motivated enough to mobilize in the neighborhoods once the entrepreneur left. Thus, cross-sector collaboratives relying heavily on the organizing efforts of policy entrepreneurs may be especially vulnerable to sustainability issues when these entrepreneurs move on to new endeavors.

Nonetheless, this case underscores the importance of entrepreneurial leadership and integration in initiating cross-sector collaboration for innovation (Bartlett & Dibben, 2002; Crosby & Bryson, 2010). Specifically, the case underscores how individual policy entrepreneurs from civil society can act as key intermediaries between community and governmental efforts for building capacity for sustainability (Zeemering, 2014). The case also demonstrates how governmental and nongovernmental actors bring different advantages—and limitations—to such collaborations and why commitment on both sides is crucial to sustaining collaboratives over time.

Practical Recommendations

Informed by the TNEC, this study offers practical insight for implementing energy competitions from the bottom-up as a tool for local sustainability. First, public managers should serve citizen leaders in an enabling role. Second, effective implementation requires leaders outside of government to champion initiatives and marshal community-wide support. Third, competitions should leverage financial incentives to promote pro-environmental behavior—but not at the expense of intrinsic motivators that may be more important for long-term gains in sustainability. Finally, governments should commit resources to tracking and evaluating performance to ensure success. These resources, though, should be committed with the intention of enhancing the longevity of competitions.

Lead by Enabling, Not by Controlling

Although the public managers in Tallahassee believed that they had the resources, capabilities, and experience needed to run the energy competition as a traditional program, they valued the grassroots approach that CONA wanted to take. In other words, the city opted to "serve and not steer" the TNEC. Denhardt and Denhardt (2000, p. 553) argue that the "role of the public servant is to help citizens articulate and meet their shared interests, rather than to attempt to control and steer society in new directions." With the TNEC, government was asked to play a peripheral role, so its efforts would not undermine the grassroots integrity of the competition. Government involvement, however, was still essential for providing the resources, expertise, and technology for effectively implementing the TNEC.

The TNEC demonstrates the importance of "lateral thinking" in collaborative governance. Bingham, O'Leary, and Carlson (2008) argue that collaborative public management should embrace the input, ideas, and inspiration from multiple organizations, sectors, and classes of people to achieve innovation that no single individual or organization can achieve alone. It has been suggested that public sector leaders should accept the inherent paradoxes of collaboration and see the "big picture" but also pay attention to the "details" (Connelly, Zhang, & Faerman, 2008). In the TNEC, public managers visualized the big picture that CONA wanted to achieve, but they also understood the details about how this idea could be put into action. They engaged in a collaborative "balancing act," providing a platform for citizen leaders to attain their goal but not venturing outside their role as enablers. These public managers were able to effectively balance their supporting role in coordination with their leading role in capacity provision.

Empower and Embolden Policy Champions

Research on cross-sector collaboration emphasizes the importance of policy champions acting as integrative leaders (Bartlett & Dibben, 2002; Borins, 2000; Bryson, Crosby, & Stone, 2015; Page, 2010). In the TNEC, cross-sector collaboration was achieved with someone external to government who could integrate across sectors and generate community-wide interest in hard-to-reach places for bureaucracy. The president of CONA and nongovernmental actors marshaled community support, led the steering committee, obtained sponsorship from local businesses, recruited participants, and partnered with government when it came to implementation. Government was ill-equipped to generate broad support across the neighborhoods (as described in the case) even though the city provided the infrastructure. Generating grassroots support was better left to CONA and its nongovernmental partners.

Governments likely have little control over the emergence of collaborative entrepreneurs and integrative leaders, but they can proactively identify and empower such actors who can champion

sustainability innovation. Identifying these entrepreneurs can begin by promoting a stronger civic environment where citizen leaders feel empowered and emboldened to make a difference. Governments do not need to start from scratch. As the TNEC demonstrates, citizen leaders often serve on nonprofit boards and public commissions. Governments can also seek out and partner with these individuals to foster and implement ideas for sustainability innovation.

Promote Intrinsic Incentives and Let Financial Incentives Speak for Themselves

Many residents may have participated in the TNEC because they were driven by altruistic "warm-glow" motivations associated with climate protection. Nonetheless, participants' competitive drive to win prizes was a key factor in altering short-term behavior and creating synergy around sustainable behavior. When perceived as positive feedback, prizes and rewards can work in energy competitions (Vine & Jones, 2016). Offering tangible incentives to motivate participation and engender a competitive spirit may help drive behavioral change. A new neighborhood entrance sign, for example, can enhance the physical attractiveness of a neighborhood and its economic value. Moreover, establishing a smaller competition within the main competition, as the TNEC did with its initial sign-up campaigns, can be an effective strategy for encouraging further participation.

Energy competitions not only offer opportunities to win collective prizes, they also provide the ability to generate individual cost savings. One of the most valuable leverage points for communities implementing energy competitions is the ability to tap into extrinsic motivations for generating immediate financial co-benefits associated with energy reduction. Financial incentives are not the only extrinsic motivator for voluntary energy savings and sustainable behavior. Individual and organizational actors are also driven by solitary factors associated with group identity (Curley & Swann, 2018). Vine and Jones (2016) found that some energy competitions effectively use social norming in marketing campaigns to drive greater participation.

It is also important for financial incentives not to crowd out intrinsic motivators for energy reduction, such as environmental concern (Vine & Jones, 2016). Emphasizing financial incentives in advertising energy programs has been shown to reduce participants' willingness to enroll and their level of environmental concern when enrolling (Schwartz, Bruine de Bruin, Fischhoff, & Lave, 2015). The practical message from Schwartz and colleagues (2015) is that "monetary incentives go without saying" (p. 162); and, designers of energy programs should let these incentives speak for themselves and they should emphasize the intrinsic motivators of climate protection. Given the short-lived effect of extrinsic motivators on behavioral change, energy competitions may be better off shifting focus to intrinsic incentives for promoting long-term behavioral change (van der Linden, 2015).

Finally, while awards are ubiquitous in energy competitions (Vine & Jones, 2016), they are often confirmatory in nature; that is, they are "more or less automatically given based on a clearly defined and observable achievement" (Frey & Gallus, 2017, p. 194). For example, in the TNEC neighborhood, teams with the largest overall and largest percentage reduction in energy use over the prior year were automatically awarded. While confirmatory awards can be effective, energy competitions may be able to achieve better outcomes by complementing them with discretionary awards in which "givers enjoy leeway in deciding whether and to whom to bequeath an award" (Frey & Gallus, 2017, p. 194). Research has shown that discretionary awards can be used to incentivize desired behavioral outcomes in the voluntary sector (Walk, Zhang, & Littlepage, 2018). The Georgetown University Energy Prize (earlier mentioned) is a recent example of an energy competition where a discretionary award was granted to one of 50 local communities for innovativeness and best practices in energy-efficiency (GUEP, 2019). Designers of energy

competitions should experiment with different types and combinations of awards to determine which are most effective (Vine & Jones, 2016).

Commit Resources to Tracking Performance and Consider Long-Term Prospects

Committing resources to measure and evaluate performance is critical to creating successful energy competitions and assessing their impact (Vine & Jones, 2016). With the TNEC, local government devoted substantial human and technical resources to ensure household energy use could be tracked and evaluated in an accurate, timely, and transparent manner. However, government organizations were unable to generate a higher return on this investment and assess long-term impact on behavioral change because CONA lost interest in continuing the TNEC.

Governments with scarce resources should thus consider the long-term viability and commitment of partners before investing in an energy competition. Failure to do so may be a costly decision when there is a low probability of sustaining the innovation over time. Recognizing the short-lived nature of energy competitions, Vine and Jones (2016, p. 171) recommend holding competitions over longer periods of time, conducting a series of shorter competitions, using follow-up activities, and emphasizing energy-efficiency habit development in competitions.

Conclusion

This case study of a neighborhood energy competition demonstrates how a local community promoted sustainability innovation through cross-sector collaboration that combined entrepreneurial and nongovernmental leadership composed of grassroots efforts with governmental provision of technical capacity in implementation. While the policy entrepreneur and the nongovernmental actors appeared more adept at building grassroots support, the governmental entity appeared to have greater technical capacity and policy expertise to put entrepreneurial ideas into action. This case offers practitioners with insight into the promises and perils of implementing energy competitions.

The limitations of this study offer opportunities for future research. First, there is no way to generalize these findings across cases. This study captures how an energy-efficiency innovation emerged in a single community with a strong track record for sustainability. Future research should, therefore, take a comparative approach to analyzing collaboration-motivated sustainability innovation in different locales with more and less favorable environments for sustainability policymaking. Second, there was no way to assess the long-term effect on energy use in this case. Comparing participants with nonparticipants over time should help to determine the long-term behavioral impacts associated with energy competitions.

Disclosure Statement

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