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Development of school energy policy and energy education plans: A comparative case study in three Wisconsin school communities

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HIGHLIGHTS

- School energy policy and complementary energy education plans can be successfully developed with guidelines for policy team membership.
- Teacher agency, including environmental literacy, helps overcome barriers in developing school policy and energy education plans.
- Administrative support of energy conservation is a key to the development of school energy policies and complementary energy education plans.

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ABSTRACT

Through a qualitative comparative case study, this investigation examined the process by which three school districts in Wisconsin, U.S.A., developed a school energy policy and complementary energy education plan. To guide the process, the researchers created an outline of recommended steps for the districts to follow. Although there were variations in the sequence and perceived ease of the steps, the Energy Task Force members involved in the process found the outline to be a supportive guide. Further analysis of the cases involved interviewing members of the Energy Task Forces to identify facilitating and obstructing factors. The study concluded that factors such as level of environmental literacy, along with aspects of the school culture and leadership, interacted to influence the successful drafting of school energy policies and education plans. In addition to introducing an outline of recommended steps that can be used by other school policy development teams interested in promoting energy efficiency, this study adds insights into the analysis of energy policy work within the context of a school setting.

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1. Introduction

America's primary and secondary schools spend more than \$6 billion annually on energy (Orth, 2009). With rising energy costs, school districts must find ways to effectively manage their energy consumption. One strategy is to develop a school policy to promote energy efficiency; another is to increase awareness of energy consumption through energy education. Ideally, administrators, energy resource managers, and teachers can be involved in both strategies in conjunction (Rickert, 2011). The Wisconsin K-12 Energy Education Program (KEEP), a statewide energy education program in Wisconsin, was interested in promoting the development of energy policy and education plans in the state's schools. To address this interest, KEEP created the school energy policy and education plan (SEP&EP) grant program and developed an outline for schools to utilize during their SEP&EP development. Three

school districts were awarded grants. KEEP sponsored a comparative case research study of the three districts – in particular their Energy Task Force members – to gain a better understanding of how the outlined steps were used. A primary focus of the study was to identify factors which the Energy Task Force members perceived facilitated or obstructed the school energy policy and education plan development, with the desired outcome of improving the process for other schools intending to do similar work. Although this study focused on specific cases in one state of the United States, there were lessons learned and research opportunities discovered for school energy policies and education plans in schools worldwide.

2. Energy education in schools

There are many approaches to energy education. These include classroom lessons, school-wide motivational presentations, teacher in-services, and school energy fairs. One approach in particular – using the school building as a learning resource – is especially

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germane to promoting school building energy efficiency. This approach aims to involve teachers and students in analyzing their school building's energy consumption. For example, in the United States, the National Energy Education Development Project (NEED) provides free energy education resources to K-12 teachers to help their students apply energy concepts while examining energy systems within the school (NEED, 2012). Another example in the United States is Alliance to Save Energy's *Green Schools Program*. This program works on a district level to create a customized plan for teaching about energy, saving energy in school, creating school-wide energy awareness, and taking the message home and into the local community. A team of teachers, custodial staff, administrators, and students carries out the program at each school. A Green School improves education through hands-on, real-world learning about energy and energy efficiency and strengthens schools by saving money on energy costs (Alliance to Save Energy, 2009). The recommendations for saving energy that result from these programs and others range from low cost initiatives, such as promoting lights-off campaigns for vacant classrooms, to more expensive endeavors such as upgrading boilers and furnaces. To further support the implementation of these recommendations, some schools develop energy policies.

3. School energy policy

Development of school energy policy is recommended by the U.S. Department of Energy's *EnergySmart Schools Program* (U.S. Department of Energy, 2009). A few of the Department of Energy's major conclusions include (1) high energy costs are not "fixed" and can be reduced five to twenty percent by effectively managing, maintaining, and operating school physical plants, regardless of school age, (2) distribution of school-specific information to building staff is essential, and (3) detailed energy policy should provide guidelines for operation and maintenance programs (Princeton Energy Resources International et al., 2004). A policy communicates consensual protocol and practices, and aids in decision making and goal setting. According to the U.S. Environmental Protection Agency (EPA, 2005), organizations that establish energy management policies and procedures outperform ones without such policies. Bontrager and Hubbard (1977) emphasized the importance of a school energy policy, largely in response to the energy crisis. By having practical, enforceable energy policies in place, school districts will likely realize a reduction in their energy consumption that translates into lower utility bills – which is increasingly important in today's economic climate.

In the field of education, school policy is usually established by the respective school board in order to convey goals and procedures about a myriad of topics, ranging from school lunches to curriculum development to bullying. Various aspects of the effectiveness and implications of policy have been researched, including how policy is influenced (Gittell, 1995), the importance of embedded research to policy (Allington, 1999; Superfine et al., 2010), and outcomes of interactions among policies (Chrispeels, 1997). For many years, researchers have been advocating effective policy development practices for schools. Stanley (1957) promoted employing teachers and community members in school policy development as a means of increased participation, and Stevenson (2006) urged engaging educators in policy discourse. Stevenson (2007) discussed relationships between policies and environmental rhetoric and practice, and recommends improving discourse in professional communities to enact meaningful environmental education in schools. Other studies have investigated the significance of teacher attitudes and involvement in school policy-making (Cavallo et al., 1998; Witcher, 2001). Braun et al. (2010) conducted a long-term qualitative study of school policy enactment and implementation. The study introduces their

policy enactment theory, which provides valuable insights into policy development. This theory stresses that "policy enactment involves creative processes of interpretation and recontextualisation – that is, the translation through reading, writing and talking of text into action and the abstractions of policy ideas into contextualized practices" (p. 549). In a related study, Ball et al. (2011) sought to further analyze the role of policy actors in policy work, identifying the positions of those involved, and labeling them with titles such as narrators, enthusiasts, and critics. Through interpretation and translation, the actors involved in policy work seek to understand the process in ways complementary to their roles and responsibilities.

The current study extends the analysis of policy work by means of an exploratory examination of teams focused on developing school energy policy and education plans. A constructive analysis of the policy actors' perspectives of factors that obstruct or support policy development builds an awareness of the complex nature of policy work. It is hoped that this analysis will facilitate the creation of teams that can work productively to develop school energy policies and education plans to help schools save energy and money.

4. Project background

The Wisconsin K-12 Energy Education Program (KEEP) was created by the Wisconsin Center for Environmental Education (WCEE) in 1995 to improve and increase energy education in Wisconsin. The WCEE developed KEEP largely in response to the results of a statewide environmental literacy assessment it conducted in 1992. The assessment revealed that students lacked an understanding of many important energy concepts (Champeau, 1997). The assessment was based on an environmental literacy framework developed by the WCEE after a comprehensive review of environmental literacy research (Peri, 1996). The assessment framework included four outcomes: Cognitive Learning Outcomes, Affective Learning Outcomes, Environmentally Responsible Behaviors, and Efficacy Beliefs. DeWaters and Powers (2011) used a similar framework to assess the energy literacy of students in New York in 2008.

As with many energy education programs, KEEP provides professional development and support materials for school-based energy education initiatives. In addition to offering courses, activity guides, and resources for teachers, KEEP was interested in helping schools create energy education planning that would enhance the development of school energy policies.

To help determine if schools in Wisconsin were interested in developing or updating their energy policies, the Wisconsin Green Building Alliance Green Schools Committee sent a *Green Schools Survey* to school district business officials in Wisconsin. Survey results indicated that 47 percent of responding districts had enacted an energy policy. When asked if their district would be interested in updating or creating an effective energy management policy, 79 percent responded affirmatively (Panaro and Rickert, 2011).

The results of the *Green Schools Survey* motivated KEEP staff to create a school energy policy and education plan (SEP&EP) grant program. The goal of the program was to help school districts (either one building or district-wide) form an Energy Task Force that would develop or update the school policy and create a plan to integrate energy concepts into the school or district curriculum. Through this program, schools would garner useful insights into the policy and plan development process; they would also explore the potential financial benefits of developing, adopting, and implementing wise energy policies that reduce energy consumption, minimize energy waste, and increase energy efficiency in all areas of the school. The Request for Proposals for the grants included an outline of steps for creating a school energy policy and education plan (see Appendix).

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