

**SCHOOL ENERGY POLICY AND EDUCATION PLANS:  
A CASE STUDY OF PLAN DEVELOPMENT IN  
THREE WISCONSIN SCHOOL COMMUNITIES**

By

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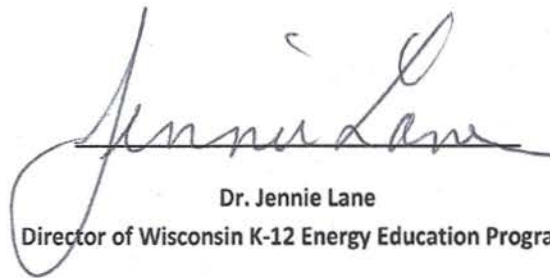
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*“[Developing a School Energy Policy and Education Plan] gives a school community a great opportunity to rally behind something that has significant educational, environmental and economic benefits. It also provides an opportunity for educators to work collaboratively with operations/facilities staff in facilitating a major cultural change in the school community.”*

*~District A Participant*

## **ABSTRACT**

America's schools are spending more than \$6 billion annually on energy (Orth, 2009). With rising utility costs and smaller operating budgets, schools need a plan to manage their energy use wisely. In addition, schools need a plan to improve the energy literacy of all building occupants, including staff, students, and administrators. Three Wisconsin school communities received grant funding through the Wisconsin K-12 Energy Education Program (KEEP) to develop a School Energy Policy and Education Plan (SEP&EP). Each school community spent between nine and eighteen months developing a plan that included energy management policies as well as an energy education plan for integrating energy concepts into the district-wide curriculum.

Using a case study research design, the researcher examined why SEP&EPs were developed and how a template, created by KEEP, was used in three different school districts. Data collection methods included observations of SEP&EP development meetings, interviews with primary participants, questionnaires for primary and secondary participants, and the review of supplementary documents (meeting notes, energy audit reports, School Board meeting minutes, etc.). The results show that the leading reasons individuals chose to be involved in this process included educating others, a desire to improve the school, and a general interest in the environment or 'being green'. Although each of the school districts went through a similar process to develop

their SEP&EP, there were many differences among districts. Even with different approaches, each district successfully completed its plan which is an indicator that this SEP&EP development process can be replicated in other Wisconsin school communities.

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## TABLE OF CONTENTS

|                          |      |
|--------------------------|------|
| ABSTRACT .....           | v    |
| ACKNOWLEDGMENTS .....    | vii  |
| LIST OF TABLES .....     | xiii |
| LIST OF FIGURES .....    | xiv  |
| LIST OF APPENDICES ..... | xv   |

|  |          |
|--|----------|
| <b>CHAPTER ONE: INTRODUCTION .....</b> | <b>1</b> |
| Project Background .....               | 1        |
| Project Rationale .....                | 3        |
| Case Studies .....                     | 5        |
| School District Descriptions .....     | 6        |
| District A .....                       | 8        |
| District B .....                       | 9        |
| District C .....                       | 10       |
| Research Questions .....               | 11       |
| Research Study 1 .....                 | 11       |
| Research Study 2 .....                 | 11       |
| Definitions .....                      | 12       |
| Abbreviations .....                    | 14       |
| Assumptions .....                      | 14       |
| Presentation of Data & Results .....   | 15       |

|  |           |
|--|-----------|
| <b>CHAPTER TWO: STRENGTHENING SCHOOL ENERGY POLICIES WITH<br/>ENERGY EDUCATION .....</b> | <b>16</b> |
| ABSTRACT .....   | 16        |
| INTRODUCTION .....   | 17        |
| Review of Related Literature .....   | 17        |
| Role of Energy Education in Environmental Education .....                                | 17        |
| Role of Energy Education in School Building Energy Efficiency .....                      | 19        |
| Relationship between Policy and Education .....  | 21        |

|   |    |
|---|----|
| Project Background .....  | 23 |
| Research Questions .....  | 25 |
| Limitations .....   | 25 |
| METHODOLOGY AND METHODS.....  | 26 |
| Case Study Research Design .....  | 26 |
| Qualitative Research .....  | 27 |
| Trustworthiness, Face Validity, and Reliability.....  | 28 |
| Data Collection.....  | 29 |
| Initial Interview .....   | 29 |
| Questionnaire .....   | 30 |
| Final Interview.....  | 30 |
| Data Management .....   | 31 |
| Data Classification .....   | 31 |
| Case Study Database.....  | 32 |
| Data Analysis .....   | 32 |
| Explanation Building .....  | 33 |
| Response Matrix.....  | 33 |
| Coding .....  | 34 |
| Illustrative Quotations .....   | 34 |
| RESULTS .....   | 35 |
| What is the purpose of developing a School Energy Policy and<br>Education Plan (SEP&EP)? .....        | 36 |
| What is the value in having both an energy policy and energy education<br>curriculum in place? .....  | 40 |
| How can developing an SEP&EP contribute to the energy literacy of school<br>building occupants? ..... | 44 |
| How can developing an SEP&EP contribute to conserving energy in a school<br>facility? .....           | 47 |
| DISCUSSION .....  | 51 |
| RECOMMENDATIONS .....   | 57 |
| LITERATURE CITED .....  | 58 |

|   |           |
|---|-----------|
| <b>CHAPTER THREE: CHANGING SCHOOL CULTURE: EXPLORING<br/>THE ENERGY POLICY AND EDUCATION PLAN DEVELOPMENT<br/>PROCESS .....</b> | <b>61</b> |
| ABSTRACT .....  | 61        |
| INTRODUCTION .....  | 62        |
| Review of Related Literature .....  | 62        |
| Energy Management in Schools .....  | 62        |
| Education Plan Development.....   | 63        |
| School Energy Policy and Education Plan (SEP&EP) Development .....  | 64        |
| Introducing New Initiatives in Schools.....   | 66        |
| Project Background .....  | 67        |
| Research Questions .....  | 69        |
| Limitations .....   | 70        |
| METHODS .....   | 71        |
| Methodology .....   | 71        |
| Data .....  | 71        |
| Trustworthiness, Face Validity, and Reliability.....  | 72        |
| Data Collection .....   | 73        |
| Observations.....   | 73        |
| Initial Interview .....   | 74        |
| Questionnaire .....   | 75        |
| Final Interview.....  | 76        |
| Supplementary Documents.....  | 77        |
| Data Management .....   | 78        |
| Data Analysis .....   | 79        |
| RESULTS .....   | 80        |
| What is the process used in developing an SEP&EP? .....   | 81        |
| District A .....  | 81        |
| District B .....  | 83        |
| District C .....  | 86        |
| What are the barriers and facilitators that influence the development of an<br>SEP&EP? .....                                    | 88        |

|  |                |
|--|----------------|
| Experiences .....  | 89             |
| Facilitators .....   | 92             |
| Concerns/Barriers .....  | 95             |
| What are the similarities and differences among various schools developing<br>an SEP&EP? ..... | 98             |
| Timeline .....   | 104            |
| Questionnaire Results .....  | 105            |
| DISCUSSION AND RECOMMENDATIONS.....  | 108            |
| LITERATURE CITED .....   | 116            |
| <br><b>CHAPTER FOUR: CONCLUSION.....</b>   | <br><b>119</b> |
| IMPLICATIONS .....   | 119            |
| RECOMMENDATIONS FOR FUTURE RESEARCH .....  | 122            |
| REFLECTIONS OF RESEARCH STUDY .....  | 123            |
| <br><b>LITERATURE CITED .....</b>  | <br><b>126</b> |
| <br><b>APPENDICES .....</b>  | <br><b>130</b> |

## LIST OF TABLES

|   |     |
|---|-----|
| Table A: Initial Interview Questions (Study 1) .....  | 29  |
| Table B: Questionnaire Questions (Study 1) .....  | 30  |
| Table C: Final Interview Questions (Study 1) .....  | 31  |
| Table D: Data Collection Method Used (Study 1) .....  | 36  |
| Table E: Purpose of Developing SEP&EP .....   | 37  |
| Table F: Category Descriptions and Illustrative Quotations for the Purpose of<br>Developing SEP&EP .....                              | 38  |
| Table G: Value of Energy Policy and Energy Education Curriculum .....   | 41  |
| Table H: Category Descriptions and Illustrative Quotations for the Value of<br>Energy Policy and Energy Education Curriculum .....    | 42  |
| Table I: SEP&EP Contributes to Energy Literacy .....  | 44  |
| Table J: Category Descriptions and Illustrative Quotations for How a<br>SEP&EP Contributes to Energy Literacy .....                   | 45  |
| Table K: SEP&EP Contributes to Conserving Energy .....  | 48  |
| Table L: Category Descriptions and Illustrative Quotations for How a<br>SEP&EP Contributes to Conserving Energy .....                 | 49  |
| Table M: Initial Interview Questions (Study 2) .....  | 75  |
| Table N: Questionnaire Questions (Study 2) .....  | 76  |
| Table O: Final Interview Questions (Study 2) .....  | 77  |
| Table P: Data Collection Method Used (Study 1) .....  | 81  |
| Table Q: Participant Experiences that Contributed to SEP&EP Development ..  | 89  |
| Table R: Category Descriptions and Illustrative Quotations for How Participant<br>Experiences Contributed to SEP&EP Development ..... | 90  |
| Table S: Facilitators that Contributed to SEP&EP Development .....  | 92  |
| Table T: Category Descriptions and Illustrative Quotations for Facilitators that<br>Contributed to SEP&EP Development .....           | 93  |
| Table U: Concerns/Barriers during SEP&EP Development .....  | 95  |
| Table V: Category Descriptions and Illustrative Quotations for<br>Concerns/Barriers during SEP&EP Development .....                   | 96  |
| Table W: Questionnaire Results Key .....  | 106 |
| Table X: Questionnaire Results Regarding Involvement and Ease/Difficulty ...  | 107 |

**LIST OF FIGURES**

Figure A: District A: Flow Chart of Development Process ..... 83

Figure B: District B: Flow Chart of Development Process ..... 85

Figure C: District C: Flow Chart of Development Process ..... 88

Figure D: Common Timeline for all Three Districts ..... 105

## **LIST OF APPENDICES**

|   |     |
|---|-----|
| APPENDIX A: School Energy Policy and Education Plan Template .....              | 130 |
| APPENDIX B: School Energy Policy and Education Plan Grant Application....       | 136 |
| APPENDIX C: Grant Award Acceptance Letter .....                                 | 141 |
| APPENDIX D: Steps and Funds Available for the Development<br>of an SEP&EP ..... | 142 |
| APPENDIX E: Initial Interview Questions .....                                   | 147 |
| APPENDIX F: Questionnaire .....   | 148 |
| APPENDIX G: Final Interview Questions .....                                     | 151 |
| APPENDIX H: Timeline .....  | 152 |
| APPENDIX I: Calculated Person-Hours Spent on Development Process .....          | 153 |

## CHAPTER ONE

### INTRODUCTION

We live in a world where *energy* is a popular buzzword and is often either misunderstood or undervalued. Although energy plays a significant role in Wisconsin school communities, many schools do not have energy policies in place, nor do many consciously include energy concepts in their curriculum.

#### **Project Background**

The Wisconsin K-12 Energy Education Program (KEEP) has been working to raise energy literacy in Wisconsin schools since 1995. Energy literacy refers to knowledge of energy concepts, and the possession of skills and motivation to analyze energy-related environmental issues (Koop, 1999). One of KEEP's primary program areas is *School Energy*, which involves educating teachers on how energy flows through their school buildings and identifying ways to incorporate the buildings themselves into classroom curriculums.

A series of programming decisions at KEEP led the researcher down this particular project path. To begin, KEEP began offering a graduate course called *School Building Energy Efficiency Education* in 2004. This course provided K-12 teachers an opportunity to explore energy systems used in a school building and develop curriculum connections using the building as a tool to teach core standards. In addition to the curriculum component, many course participants developed an energy action plan that outlined either how they would share



energy conservation information with their colleagues or how they would implement energy saving strategies in their respective buildings. Over the years, the course gained popularity and the positive effect the course was having in school communities was hard to ignore. More and more teachers from around the state began requesting this course be offered in their schools. Coupled with the growing interest from teachers who wanted to learn more about energy in their schools, there was an increase in development of school energy policies throughout the state. In response to these two independent movements, KEEP developed a School Energy Policy and Education Plan (SEP&EP) grant program. The goal of the program was to have schools (either one building or district-wide) develop a plan to integrate energy into the school or district curriculum to raise energy literacy while at the same time develop energy policies that would help the district reduce their energy consumption and save money. KEEP felt it was important to couple the two initiatives to achieve maximum success.

Since KEEP is primarily funded through Focus on Energy, the statewide energy efficiency and renewable energy program, there was a vested interest by the Schools and Local Government sector of the program to help reduce the energy consumed by Wisconsin's K-12 schools. It was funding from Focus on Energy that made the SEP&EP grant program possible, and subsequently this research project. With funding from Focus on Energy, KEEP was able to provide up to \$5,000 for each school community to develop an SEP&EP. During the first year of the SEP&EP grant program, eight Wisconsin school communities applied for

funding and four were granted. One school declined their award approximately six months after receiving it and the next applicant in line received funding. One school that was originally awarded funding never succeeded in making any notable progress on their SEP&EP and eventually funding was revoked, leaving three school districts that completed the SEP&EP development process.

A School Energy Policy and Education Plan Template was developed by KEEP for schools to utilize during their SEP&EP development process. This template can be found in Appendix A. The template outlines the six major components of an SEP&EP: Executive Summary, Energy Management Policy, Energy Education Plan, Monitoring & Reporting, Sustaining Energy Education Initiatives, and Appendix. KEEP will incorporate findings from this research project to update the SEP&EP Template for school communities to use as they go through the development process in the future.

### **Project Rationale**

The importance of this research project is threefold. First, the attributes of successfully developing a School Energy Policy identified during this study will be used to help Wisconsin schools develop policies or guidelines to manage their energy use wisely and reduce their energy consumption. As many Wisconsin schools are faced with fiscal limitations, an understanding of how to successfully develop a School Energy Policy will be a valuable resource for schools developing their own policies. Not only will schools garner useful insights into the

development process, they will also explore the potential financial benefits of developing, adopting, and implementing wise energy policies that minimize energy waste and increase energy efficiency in all areas of the school. 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.

Second, a School Energy Education Plan supports the improvement of energy literacy of all building occupants, including staff, students, and administrators. According to the Green Bay Area Public School District Energy Management Policy (2006), “Staff and students will be provided on-going education on energy saving measures through the Energy Committee.” It is important that all building occupants, in addition to facilities personnel, take responsibility for the energy they use at school. The better informed the building occupants are regarding energy use in the building, the easier the facilities managers’ jobs will be in ensuring that the building is operating most efficiently. With a school or district-wide curriculum that integrates essential energy concepts into classroom lessons and extra-curricular experiences, students will be well prepared with the knowledge to make difficult energy-related decisions in the future. The attributes that make a School Energy Education Plan successful will be identified and shared with school communities across Wisconsin.

Finally, it is important to illustrate the potential increase of effectiveness of developing a School Energy Policy in conjunction with a School Energy Education Plan for a school community. If only one is present in a school community, the maximum energy savings and energy literacy may not be realized. By developing both, they will likely reference and strengthen the richness of each other. Education enhances policy and policy is limited if it is not understood. The more educated the building occupants are, the more likely they will understand and follow the energy policies adopted by the school district. If teachers in particular do not understand the significance of the energy used in their classrooms as an important piece of the district's energy use, it will not be realistic to expect them to follow or enforce district energy policies, let alone set good examples of wise energy use for their students. If teachers are introducing energy concepts to students over their career in the building, those students will understand how their energy use behaviors impact the school as a whole.

### **Case Studies**

Case studies are a means to collect, present, and analyze data fairly (Yin, 2009). There are many appropriate applications to use case studies as a research method, such as working with school communities that are going through similar processes to develop a new policy or curriculum. According to Yin (2009), "A case study is an empirical inquiry that investigates a contemporary phenomenon in depth within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident." Case studies do not represent

a “sample,” however; they expand general theories that can lay the groundwork for further research (Yin, 2009). Case studies are a common qualitative research design that provides rich, thick detail so that readers can draw their own conclusions from the data presented (Leedy and Ormrod, 2009). One of the advantages of using a case study design to collect data is the ability to document feelings, attitudes, and emotions that the participants experience and incorporate those affective components into the case descriptions. These important affective domain characteristics may be overlooked in a more quantitative research design.

### **School District Descriptions**

To achieve the desired depth of understanding of the SEP&EP development process that occurred in the three school districts involved in this research project, a case study methodology was used. Although the findings may not be generalized across all schools in Wisconsin, they will be informative because of the thoroughness in which the data was collected and analyzed for each of the three school districts.

Three school districts were involved with this research project. Two of the three school districts were located in the northeast region of Wisconsin. One district was located in the south-central region of the state. Each of these three school districts were recipients of an SEP&EP grant of up to \$5,000 provided either by the Wisconsin Environmental Education Board (WEEB) or the Wisconsin K-12

Energy Education Program (KEEP). Each of the three school districts submitted a grant application (Appendix B) and they were selected by a panel of energy professionals. The project director for each school district agreed to a set of terms to receive the grant funding (Appendix C). The grant application was presented as a series of steps that were either required or recommended. Some of the applicants had completed one or more of the steps before applying for the SEP&EP grant. The steps outlined in the process were as follows (for a detailed description of each step, see Appendix D):

- Step A: Form an Energy Task Force and meet regularly  
(required)
- Step B: Form an Energy Committee and meet regularly  
(recommend)
- Step C: Review existing energy policies (recommended)
- Step D: Participate in energy audit (required)
- Step E: Draft School Energy Policy and Education Plan (required)
- Step F: Solicit administrative, faculty, and staff suggestions and  
feedback (required)
- Step G: Disseminate information to the community related to the  
project (required)
- Step H: Eight (8) teachers will participate in the KEEP *School  
Building Energy Efficiency Education* course (required)

- Step I: Two (2) members of the Energy Task Force or Energy Committee will attend a Practical Energy Management for Schools training (required)
- Step J: One (1) member of the facilities department will participate in the Building Operator Certification program (required)
- Step K: The Energy Task Force and Energy Committee members will review, finalize, and present SEP&EP to administering body for approval (required)
- Step L: Evaluate the SEP&EP development process (recommended)

For each school district, the number of participants and their level of involvement varied, especially during the first few months of the project. To differentiate between individuals who were very involved and invested in the project from start to finish and those that played a smaller role in the development process, the research identified the individuals very invested in each step of the process as primary participants and those who played a minor role as secondary participants.

### **District A**

School District A, located in northeast Wisconsin, had approximately 750 students and 55 staff members. There was a change in administration between the time the grant was written and work on the SEP&EP began. There were three primary Energy Task Force members involved in developing the SEP&EP. At the

time they began working on the plan, two of the Energy Task Force members were teachers in the high school and one was a member of the administration team for the district. The new District Superintendent was also a member of the Energy Task Force. In addition, there was a member of the School Board who had an interest in energy management and he was asked to join the Energy Task Force to be involved in the energy policy development process. The district did not have any formal energy policies in place before this project began. The Energy Task Force developed most of the energy policy and education plan during the summer of 2009. The grant was written by a high school teacher and the district received \$4999 to write their SEP&EP. There was no representation from the middle or elementary schools in the development process. There were two buildings in District A, located on the same property.

### **District B**

School District B, located in northeast Wisconsin, had approximately 5,700 students and 680 staff members. There were four primary Energy Task Force members involved in developing the SEP&EP including one elementary, one intermediate, one junior high, and one high school teacher. The district approved a District Energy Policy between the time the grant was submitted and when they began working on the SEP&EP. The district strongly supported the development of the energy education plan because of the recent adoption of the energy policy. The Energy Task Force met once a month for approximately eighteen months from August 2009 – December 2010, primarily working on the energy education



plan. The grant was written by an intermediate school teacher and the district received \$3,024 to write their SEP&EP. There were eight buildings in District B, located throughout the community.

### **District C**

School District C, located in south central Wisconsin, had approximately 6,000 students and 850 staff members. There were eight primary Energy Task Force members involved in developing the SEP&EP including the District Business Official, District Energy Manager, an energy education consultant, three elementary teachers, and two high school teachers. The district approved energy policies in 1986, but was interested in updating them. There was tremendous support from the administration to develop the SEP&EP. A District Sustainability Committee was formed to oversee the development of the SEP&EP and subcommittees were formed out of that committee to work on the energy policy and the energy education plan. The district was not originally awarded the grant, but due to available funding, they were notified in December 2009 that money was available and they accepted. The Energy Task Force met occasionally from May – November 2010. The grant was written by the district Energy Manager and the district received \$3,016 to write their SEP&EP. There were 10 buildings in District C, located throughout the community.

## **Research Questions**

The purpose of this project was to gain a better understanding of why SEP&EPs were developed and how a similar template was used in three school districts.

This project was divided into two studies. The first study focused on the purpose of developing an SEP&EP and the value of each component, the school energy policies and the energy education plan. The second study explored the process used to develop an SEP&EP, particularly factors that influenced development and similarities and differences among the three school districts.

### **Research Study 1**

- |            |  |
|------------|--|
| Question 1 | What is the purpose of developing a School Energy Policy and Education Plan?   |
| Question 2 | What is the value in having both an energy policy and energy education curriculum in place?                                  |
| Question 3 | How can developing a School Energy Policy and Education Plan contribute to the energy literacy of school building occupants? |
| Question 4 | How can developing a School Energy Policy and Education Plan contribute to conserving energy in a school facility?           |

### **Research Study 2**

- |            |   |
|------------|---|
| Question 1 | What is the process used in developing a School Energy Policy and Education Plan? |
|------------|---|

- Question 2      What are the factors that constrain and facilitate the development of a School Energy Policy and Education Plan?
- Question 3      What are the similarities and differences between how various schools develop their School Energy Policy and Education Plans?

### **Definitions**

Affective Domain: classification of factors comprising feelings, attitudes, emotion, etc. that affect learning and behavior. Common classifications commonly associated with affective domain include cognitive and behavioral domains.

Energy Audit: refers to an inspection, survey, and analysis of energy flows in a building, process, or system with the objective of understanding the energy dynamics of the system under study. Typically an energy audit is conducted to seek opportunities to reduce the amount of energy input into the system without negatively affecting the output(s).

Energy Education: refers to teaching energy concepts and energy-related environmental issues (Koop, 1999).

Energy Literacy: refers to knowledge of energy concepts, and the possession of skills and motivation to analyze energy-related environmental issues. An energy literate person is one who works individually or collectively to solve energy-related problems to prevent new ones (Koop, 1999).

Energy Task Force: is an active group of school community members committed to and directly involved in developing the School Energy Policy and Education Plan for their school community.

Environmental Education: is a lifelong learning process that leads to an informed and involved citizenry having the creative problem-solving skills, scientific and social literacy, ethical awareness and sensitivity for the relationship between humans and the environment, and commitment to engage in responsible individual and cooperative actions. By these actions, environmentally literate citizens will help ensure an ecologically and economically sustainable environment (WEEB, 1999).

Policy: is a deliberate plan of action to guide decisions and achieve rational outcome(s).

School Energy Policy and Education Plan (SEP&EP): a plan that is based on a template created by KEEP that includes energy management policies for areas such as lighting, temperature control, and plug loads, as well as the energy education plan for integrating energy concepts into the school or district-wide curriculum.

SEP&EP Development Meetings: any meeting including participants involved with developing an SEP&EP. Meetings included reviewing existing school energy policies and/or energy curriculum, touring a school facility on an energy audit, drafting policies and/or curriculum, School Board meetings, and KEEP courses.

Wisconsin Environmental Education Board (WEEB): Wisconsin's statewide environmental education board with a mission to provide leadership in the development of learning opportunities that empower Wisconsin citizens with the knowledge and skills needed to make wise environmental decisions and take responsible actions in their personal lives, workplaces, and communities.

Wisconsin K-12 Energy Education Program (KEEP): Wisconsin's statewide energy education program with the goal to improve and increase energy literacy in Wisconsin's K-12 schools through teacher education.

## **Abbreviations**

KEEP: Wisconsin K-12 Energy Education Program

NEED: National Energy Education Development Project

SEP&EP: School Energy Policy and Education Plan

WEEB: Wisconsin Environmental Education Board

## **Assumptions**

Assumption 1      The individuals from the three districts involved with this research provided honest answers and asked questions if they needed clarification during interviews and associated data gathering processes.

Assumption 2      The Energy Task Force was committed to working on the School Energy Policy and Education Plan.

- |              |   |
|--------------|---|
| Assumption 3 | Staff and students would be more energy literate if energy education was integrated into the school-wide curriculum.  |
| Assumption 4 | The School Energy Policy and Education Plan will be implemented as a result of the development process.   |
| Assumption 5 | The results of this research will include valuable information that other Wisconsin school communities, outside of the three involved, can utilize when developing their own School Energy Policy and Education Plan. |

### **Presentation of Data & Results**

The following two chapters will present the two studies separately. Both chapters will include a review of related literature, methodology, findings/results, discussions/recommendations, and literature cited relevant to that particular study.

The final chapter will present an overview of broader implications, recommendations for future research, and the researcher's reflections of the research project.

## **CHAPTER TWO**

### **STRENGTHENING SCHOOL ENERGY POLICIES WITH ENERGY EDUCATION**

#### **ABSTRACT**

Although some schools in Wisconsin have energy management policies in place, they may be outdated, ignored, or not enforceable. Energy education is often thought of only as something that is covered in science class. By coupling energy education with up-to-date energy management policies, school building occupants are more likely to comply with the policies.

Three Wisconsin school districts received grant funding from the Wisconsin K-12 Energy Education Program (KEEP) to develop a School Energy Policy and Education Plan (SEP&EP) to address both of these issues. Using a case study research design, the researcher explored the purpose of developing an SEP&EP and the value in having both an energy policy and energy education curriculum in place. Data collection methods included observations of SEP&EP development meetings, interviews with primary participants, questionnaires for primary and secondary participants, and the review of supplementary documents. The results show that education, a desire to improve the school, and a general interest in the environment or 'being green' were the leading reasons individuals chose to be involved in this process. The value in having an energy policy and an energy education plan in place was seen differently by various audiences. In general,

having both a policy and an education plan raised building occupant energy literacy which resulted in more energy saving behaviors.

## **INTRODUCTION**

### **Review of Related Literature**

#### **Role of Energy Education in Environmental Education**

According to Engleson and Yockers (1994), the goal of environmental education is to help students become environmentally aware, knowledgeable, skilled, dedicated citizens who are committed to work, individually and collectively, to defend, improve, and sustain the quality of the environment on behalf of present and future generations of all living things. Engleson and Yockers (1994) believe that education must consider all aspects of the environment and acknowledge their interdependence; they also believe that to accomplish this, environmental education must be integrated into all subject areas at all grade levels, and must offer students experiences that are concrete and direct.

Environmental education covers a large array of issues including, but not limited to, land use, water, and energy education. Energy education is an avenue that educators use to teach energy themes such as: we need energy, developing energy resources, effects of energy resource development, and managing energy resources (KEEP, 1997). The key to a successful energy curriculum is to keep it focused on basic principles that will endure (Marker, 1991).



Another key to developing a successful curriculum, energy-related or other, is to have a teacher champion leading the way. If energy education is ever to make substantial inroads in traditional school curriculum, enthusiastic change agents are necessary (Lawrenz, 1985). One way to improve the energy literacy of students, teachers, and staff is to develop a school or district-wide energy education plan. Energy literacy refers to knowledge of energy concepts, and the possession of skills and motivation to analyze energy-related environmental issues. An energy literate person is one who works individually or collectively to solve energy-related problems to prevent new ones (Koop, 1999). There may be a few teachers in a district that teach environmental education, particularly energy education, but a continuous, well planned series of experiences is essential in order for students to move through the stages of perceptual awareness and knowledge, forming attitudes and values, developing citizen action skills, and developing an environmental ethic that can serve as the foundation for action to improve the quality of the environment (Engleson and Yockers, 1994).

With the growing concern of climate change and the use of non-renewable energy resources, the need for energy education is growing at an unprecedented speed. Although it is growing, it is not a new idea. A nationwide survey (Energy: Knowledge and Attitudes) conducted by the National Assessment of Educational Progress in 1978 revealed that American students were very poorly informed about energy. Ninety-five percent of the participating young adults reported that

they wanted more information about energy and believed that energy should be a part of every school's curriculum (Holmes, 1978).

### **Role of Energy Education in School Building Energy Efficiency**

Shortly after the nationwide Energy: Knowledge and Attitudes survey was conducted, a group of individuals submitted a proposal to a small group of energy companies to develop a comprehensive nationwide K-12 energy education curriculum. As a result, Education Development Specialists developed an Energy Source Program originally consisting of seven instructional units for kindergarten through high school (Sullivan, Ice, and Niedermeyer, 2000). Since 1980, many groups have been trying to improve students' energy literacy; however, some organizations have focused their efforts on improving school building energy efficiency as well as students' energy literacy. According to Larry Schoff, president of Energy Efficient Solutions (E2S), a high performance school serves as a teaching tool for students, staff, and community and is included as part of the instructional program, incorporating energy efficiency/environmental elements in all subject areas (Schoff, 2002).

The National Energy Education Development (NEED) Project has a mission to promote an energy conscious and educated society by creating effective networks of students, educators, business, government and community leaders to design and deliver objective, multi-sided energy education programs (NEED Project, 2009). NEED provides free energy education resources to K-12 teachers

that have students examine their school building and apply energy concepts that are introduced.

The Alliance to Save Energy Green Schools 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 carry 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).

On a statewide level, Wisconsin's Focus on Energy Schools and Local Government program provides a range of services – at no cost – that promote energy efficiency, save money, and protect the environment (Focus on Energy, 2006). The Wisconsin K-12 Energy Education Program (KEEP) is another statewide program, created in 1995. KEEP's mission is to initiate and facilitate the development, dissemination, implementation, and evaluation of energy education programs within Wisconsin schools. KEEP has been providing professional development opportunities and energy education resources to K-12 teachers since 1997 (KEEP, 1997). In 2004, a *School Building Energy Efficiency Education* course was developed where K-12 teachers learn how energy flows through a school building and how to use the building as a resource to introduce

energy efficiency and conservation concepts to their students. An activity guide, *Energy and Your School*, composed of school building-related energy activities and support materials is distributed to each course participant. As an assignment for the course, teachers are encouraged to develop an Energy Action Plan, applying what they have learned to directly impact the energy literacy and energy efficiency in their school community.

In 2009, KEEP developed the School Energy Policy and Education Plan (SEP&EP) grant program for Wisconsin school communities. The primary goal of this program is to help school communities develop an SEP&EP that will improve both energy literacy and energy efficiency in the school community. KEEP developed a template for schools to follow when developing their SEP&EP (Appendix A). The template included the following components: Executive Summary, Energy Management Policy, Energy Education Plan, Monitoring & Reporting, Sustaining Energy Education Initiatives, and Appendix.

### **Relationship between Policy and Education**

There are several examples of how a policy, in conjunction with a training or educational campaign, can change human behavior. For example, the National Highway Traffic Safety Administration (NHTSA) *Buckle Up America* campaign was a large public health and safety campaign designed to increase safety belt use across the nation (National Highway Traffic Safety Administration, 2006). They used the following four-point strategy during their campaign: enact strong

legislation, build public-private partnerships at the local, State, and Federal levels, conduct active, high-visibility enforcement, and expand public education. The first point of this strategy emphasises the importance of having a policy in place. The fourth point of this strategy emphasizes the importance of education. Coupling education and policy has proven to be effective and the NHTSA continues to use this campaign design (National Highway Traffic Safety Administration, 2006).

This same line of reason can be used when developing an energy management strategy. According to the publication *Teaming Up to Save Energy: Protect Our Environment Through Energy Efficiency* by the U.S. Environmental Protection Agency (EPA), organizations that establish energy management policies and procedures outperform others (U.S. EPA, 2005). In the same publication, the EPA also discusses the value of building capacity within an organization to meet the energy management goals. Informal and formal training ideas were presented including energy summits, energy fairs, posters, intranet sites, surveys, competitions, and formal trainings. These are examples of how an organization can raise awareness of energy efficiency and transfer knowledge. Under the discussion of formal trainings, they say, "Informed employees are more likely to contribute to ideas, operate equipment properly, and follow procedures." It is extremely important to educate the individuals who will be required to follow policies and guidelines so they both understand what the policies are and why they are in place.

The need for energy education is clear, however, the need for a school or district-wide energy education plan is slowly starting to be realized. It is important that teacher champions are identified early in the process of developing curriculum since they are the ones who need to implement the curriculum after it is adopted. Managing a school's utility costs is very important in today's world. This can be realized by coupling energy management strategies with energy education. All building occupants should be responsible for the energy they use in a school facility. If students, teachers, and staff are energy literate, they will be more likely to support energy management policies put in place to save the school money and maintain a comfortable learning environment.

### **Project Background**

As mentioned earlier, KEEP developed and administered an SEP&EP grant program in 2009 to address both energy literacy and energy efficiency concerns in school communities. Funding for the program came from Focus on Energy, Wisconsin's statewide energy efficiency and renewable energy program. Grants of up to \$5,000 were awarded to three school districts to develop an SEP&EP (See Appendix B for the Grant Application). Each school district followed a series of steps (required or recommended), developed by KEEP, during their plan development. Some of the key steps in the process included: Form an Energy Task Force, Review existing energy policies, Draft an SEP&EP, Solicit feedback from administrators, faculty, and staff, Disseminate project information, Participate in a KEEP *School Building Energy Efficiency Education* course, and

Finalize SEP&EP and present to administering body for approval. For a detailed description of each step, see Appendix D).

The three school districts that were awarded funding agreed to be involved in this study. District A was located in the northeast region of Wisconsin. The district had approximately 750 students and 55 staff members. There were three primary Energy Task Force members, meaning they were very involved with the process from start to finish, and several other secondary participants. The majority of the SEP&EP development was completed during the summer of 2009. This district did not have any existing energy management policies in place, nor did they have any formal energy education curriculum.

District B was also located in the northeast region of the state. The district had approximately 5,700 students and 680 staff members. There were four primary Energy Task Force members involved in developing the SEP&EP. The Energy Task Force met monthly from August 2009 – December 2010 primarily working on the energy education plan since the district had adopted an energy policy right before they were awarded the grant funding.

District C was located in south central Wisconsin. The district had approximately 6,000 students and 850 staff members. There were eight primary Energy Task Force members involved in developing the SEP&EP. The Energy Task Force met occasionally from May to November 2010. The district reviewed and updated

an existing energy policy that was in place prior to this project in addition to developing an energy education plan.

### **Research Questions**

The purpose of this project was to identify factors that influence the development of a School Energy Policy and Education Plan and to analyze the development process of such a plan in three Wisconsin school communities. The research questions associated with this aspect of the study were as follows:

- |            |  |
|------------|--|
| Question 1 | What is the purpose of developing a School Energy Policy and Education Plan?   |
| Question 2 | What is the value in having both an energy policy and energy education curriculum in place?                                  |
| Question 3 | How can developing a School Energy Policy and Education Plan contribute to the energy literacy of school building occupants? |
| Question 4 | How can developing a School Energy Policy and Education Plan contribute to conserving energy in a school facility?           |

### **Limitations**

- |              |  |
|--------------|--|
| Limitation 1 | The study was limited by the time the researcher had to gather and analyze data.                       |
| Limitation 2 | The participants may not have expressed all of their thoughts during the interviews and questionnaire. |



Limitation 3      The results from this study cannot be generalized across all Wisconsin school communities.

## **METHODOLOGY AND METHODS**

### **Case Study Research Design**

The research design was a case study with embedded units because this project followed three different school districts as they developed similar SEP&EPs.

Qualitative researchers, like all researchers, seek a better understanding of complex situations. Their work is sometimes (although not always) exploratory in nature (Leedy and Ormrod, 2009). Since this was the first study conducted regarding the development of SEP&EPs in Wisconsin, the researcher was open to new theories as the process unfolded.

Although each school district approached the development process a little differently, there were many overlapping characteristics that will be presented in the Results section. The researcher wanted to gather as much qualitative data as possible during the SEP&EP development process to create a thick description of the case, allowing the reader to draw his or her own conclusions.

Observations, interviews, questionnaires, and supplementary documents were the methods used to gather data to answer the research questions presented above.

There were three different districts that were analyzed, with approximately three to ten individuals in each district. Each of the three districts were similar in that they were all located in Wisconsin and had all received grant funding, up to \$5,000, to develop an SEP&EP. Each school district had to use their grant funding and submit a final SEP&EP to KEEP by December 31, 2010.

### **Qualitative Research**

Although the research method of administering a questionnaire was used in this research to collect some quantitative data, the overall case study design was primarily qualitative. According to Strauss and Corbin (1990), qualitative research attempts to uncover the nature of peoples' experiences with phenomenon.

Qualitative methods can be used to uncover and understand what lies behind any phenomenon about which little is yet known and give the intricate details of phenomena that are difficult to convey with quantitative methods. Following the three school districts throughout their SEP&EP development process was unique and the clearest way to communicate the events that took place during that process was to use data acquired through qualitative methods and thick descriptions.

In addition to using the SEP&EP Template (Appendix A) designed by KEEP, each district also used the SEP&EP Steps and Funds Available document (Appendix D) to aid in the development of their plans. Since each district followed the same steps, perhaps in a different order, similarities and differences among

the three districts could be explored. For example, each district met on multiple occasions for SEP&EP development meetings. The researcher observed nearly every one of these meetings to gather data that would help inform the final case description.

### **Trustworthiness, Face Validity, and Reliability**

Extreme effort and care was put into designing the interview and questionnaire questions (Appendix E, F, G) to make sure they were specifically addressing the research questions. Each interview and questionnaire question was directly correlated to a research question before the interviews or questionnaires were administered. To improve the trustworthiness of the data, the researcher utilized the multiple sources of evidence mentioned above to triangulate data on the same set of research questions. The interview and questionnaire questions were also reviewed by a panel of experts prior to use to ensure their face validity. The researcher also conducted self-reflection throughout the entire SEP&EP development process to assess her own bias and evaluate her role in the study. This ongoing self-reflection aided the researcher in identifying her role in the development process, which was primarily advisory.

To ensure reliability, the researcher identified categories for the responses for a particular research question (Research Question 1: Study 1) then provided the same responses to Dr. Jennie Lane, Director of KEEP and Graduate Advisor, to

categorize. The results from Dr. Lane's categorization and the researcher's were similar, strengthening the reliability of the category development.

### **Data Collection**

The researcher gathered information from individuals participating in the process of developing an SEP&EP for their school or district. The researcher obtained these data by observing the development process (i.e., attending SEP&EP development meetings, conducting interviews, administering a questionnaire, and reviewing secondary documents such as minutes from School Board meetings and energy audit reports).

### **Initial Interview**

Initial interviews were conducted with primary Energy Task Force members near the beginning of the process. Interviews were recorded digitally and later transcribed. A list of the interview questions is provided in Table A.

| <b>Table A: Initial Interview Questions (Study 1)</b>  |
|--|
| 1. Who is leading the SEP&EP development process for your school/school district?  |
| 2. Why did you choose to be a part of the SEP&EP development process for your school/school district?  |
| 3. What experiences do you bring to the SEP&EP development process?  |
| 4. On a scale of one to five, to what extent do you see yourself being involved with the overall process of developing the SEP&EP? Five (5) being to a large extent and one (1) being to a minimum extent. |
| 5. Who will benefit from the implementation of the SEP&EP?   |
| 6. What, if any, are your concerns regarding this development process?   |
| 7. Is there anything else you would like to add?   |

## Questionnaire

The questionnaires were distributed to primary and secondary Energy Task Force members via email by the researcher near the end of the process. The questionnaire questions are found in Table B.

| <b>Table B: Questionnaire Questions (Study 1)</b>  |
|--|
| 1. To what extent were you involved with each step of the SEP&EP development process? (Not Involved, Somewhat Involved, or Very Involved)          |
| 2. With what level of ease or difficulty did each step take to accomplish? (Not Involved/Not Applicable, Easy, Somewhat Difficult, Very Difficult) |
| 3. How did you disseminate information to others, outside of the Energy Committee, regarding the SEP&EP?   |
| 4. Would you recommend that other school communities in Wisconsin develop an SEP&EP? Why or why not?   |

## Final Interview

Final interviews were conducted with primary Energy Task Force members near the end of the process, after participants had completed their questionnaire. Interviews were recorded digitally and later transcribed. The final interview questions are listed in Table C.

| <b>Table C: Final Interview Questions (Study 1)</b>  |
|--|
| 1. What barriers affected the SEP&EP development process?  |
| 2. What facilitators aided in the development process? How?  |
| 3. Would your school/school district have developed the SEP&EP if funding was not available? Why or why not? |
| 4. How would you change the process in which your school's Energy Policy and Education Plan was developed?   |
| 5. What is the relationship between your school's/school district's energy policy and energy education plan? |
| 6. How did developing an SEP&EP contribute to the energy literacy of school building occupants?              |
| 7. How did developing an SEP&EP contribute to conserving energy in the school facility?                      |
| 8. Is there anything else you would like to add?   |

For more information on the tools used to gather information in this study, see Chapter 3.

### **Data Management**

Data management strategies included data classification and the development of a case study database.

### **Data Classification**

The data were classified based on the method used for data collection:

Initial Interview (II)

Questionnaire (Q)

Final Interview (FI)

Observations (O)

Supplementary Documents (SD)

Each school district was assigned a different letter of the alphabet to identify them (A, B, or C).

Each participant was also assigned a number so they could be identified by their school district and participant number (e.g., A1, B3, C12).

### **Case Study Database**

Once all of the data were collected, they were brought together and organized in a fashion that would allow easy access for the researcher during the analysis process (Merriam, 1988). With a digital case study database, other investigators can review the evidence directly and not be limited to the written case study reports, increasing the reliability of the entire case study (Yin, 2009). Due to the variety of data collected, similar data were placed in groups.

A spreadsheet with all of the relevant sources of data listed in chronological order was created for each school district. Digital folders were developed comprised of various documents containing data. There were a few instances where data were not available electronically (e.g., news articles) so those data were placed in a binder along with paper copies of many of the data.

### **Data Analysis**

The overall data analysis is based on the general strategy of developing a case description (Yin, 2009). The researcher used the research questions to develop

the data collection tools and establish the framework for how each school district would be described. Explanation building, response matrix, coding, and identifying representative quotations were all analysis techniques utilized to develop a case description.

### **Explanation Building**

One component of developing the case description included the technique of explanation building (Yin, 2009). The researcher started out trying to answer the first research question using response summaries from the various data collection tools from District A. An initial response was formed, then data from District B were analyzed and the response, or explanation, was revised based on the added evidence. Finally, data from District C were added and the explanation, or response, to the research question was revised once again based on the data from all three districts. In this way, the explanation became richer with deeper meaning as more evidence was incorporated into the description.

### **Response Matrix**

After transcribing the initial interview, questionnaire open-ended questions, and the final interview responses, the researcher created a response matrix. The matrix was the first tool used to identify categories and common themes among responses. The responses from participants from each school district were paraphrased to reduce the volume of data required to conduct analysis. In this



format, the researcher could more easily begin the coding process of identifying five to ten response categories for each question.

### **Coding**

To utilize the bountiful qualitative data collected, the researcher developed a system to code and categorized the responses. The researcher read the responses at least three times, once when transcribing for the initial and final interviews, once when creating the response matrix for both interviews and questionnaire, and again for all three collection tools when the coding began. For each question analyzed, patterns in participant responses were identified and categories were developed using all three school district participant responses. The categories were arranged in order of most common responses to least common responses. The number of respondents was tabulated as well as which school districts the respondents came from.

Initial categories were combined with others after the true meaning of the participant responses was more clearly understood. The categories and category descriptions for select questions are presented in the *Results* section.

### **Illustrative Quotations**

Illustrative quotations are another way to help present the data that was collected and analyzed. The researcher used pieces of the transcribed interviews and questionnaires to illustrate key concepts that were either common throughout

one district or common across all three districts. The quotation below suggests how quotations can be useful in conveying affective domain characteristics.

“The power of illustrative anecdotes often lies not in how well they present reality, but in how well they reflect the core beliefs of their audience.”

*~ David P. Mikkelsen, Creator of Snopes.com, April, 2004*

The researcher observed key elements during the many hours spent with the research participants that may not have been captured during the two brief interviews and a questionnaire. It is possible that some of the important feelings, attitudes, and beliefs may have been overlooked if a reader only reviewed the transcribed materials. A brief statement can often summarize a large concept and it was the researcher’s intent to use as many of the participants own words as possible to present the clearest picture.

## **RESULTS**

For each of the four research questions, the associated data from all three school districts are presented together. Categories related to the research question, the number of respondents (n) for each category, and the districts from which the responses came are presented in a table. Each table is followed by a description of each category and illustrative quotations to help interpret the responses follows. A summary of observation notes and secondary documents for each district follows the category descriptions and quotations.

Table D identifies the data collection methods that were used to explore each research question. The total number of respondents (N) for each tool is identified for each district.

| Research Question | Table D: Data Collection Method Used (Study 1) |                     |   |   |  |
|-------------------|--|---------------------|---|---|--|
|                   | Observations                                   | Secondary Documents | Initial Interview<br>A (N=4)<br>B (N=5)<br>C (N=10)<br>TOTAL (N=19) | Questionnaire<br>A (N=7)<br>B (N=5)<br>C (N=10)<br>TOTAL (N=22) | Final Interview<br>A (N=3)<br>B (N=3)<br>C (N=8)<br>TOTAL (N=14) |
| 1 (Purpose)       |  | X                   | X   | X   |  |
| 2 (Value)         | X  | X                   |   |   | X  |
| 3 (Literacy)      | X  |                     | X   |   | X  |
| 4 (Conserve)      | X  |                     | X   |   | X  |

### Research Question 1: What is the purpose of developing a School Energy Policy and Education Plan?

Data related to the purpose of developing an SEP&EP were collected from the Need Statement of grant applications and from responses to the following two questions:

1. *Why did you choose to be a part of the SEP&EP development process?*
2. *Would you recommend that other school communities develop an SEP&EP? Why or why not?*

| <b>Table E: Purpose of Developing SEP&amp;EP</b> |                               |                           |
|--|-------------------------------|---------------------------|
| <b>Category</b>                                  | <b>Respondents<br/>(N=22)</b> | <b>District (A, B, C)</b> |
| Educate others                                   | 18                            | A, B, C                   |
| Improve school (save energy)                     | 12                            | A, B, C                   |
| Money-related (save money)                       | 10                            | A, B, C                   |
| Personal interest/growth                         | 9                             | A, B, C                   |
| Personnel-related                                | 8                             | A, C                      |
| Increase responsibility                          | 4                             | A, B, C                   |
| Save the environment                             | 3                             | A, C                      |
| Leadership role                                  | 3                             | A, C                      |
| Good timing                                      | 2                             | A, B                      |
| Gain education                                   | 2                             | B, C                      |
| Job responsibilities                             | 2                             | C                         |

| <b>Table F: Category Descriptions and Illustrative Quotations for the Purpose of Developing SEP&amp;EP</b>   |
|--|
| <p><b>Educate others</b> – includes educating students, staff, parents and community members about energy concepts and conservation behaviors that result in saving energy at school and at home.</p> <p><i>“I think it’s important that kids are aware of energy use, energy consumption, how to save money. If they see the big picture in a school because they will eventually be a taxpayer, I think it will have a trickledown effect into their homes as it has for myself.” ~District A</i></p> <p><i>“I honestly cannot see that energy education would be anything but beneficial to include in the education of students and staff.” ~District B</i></p> <p><i>“We want to do more to integrate it [energy education] into our curriculum.” ~District C</i></p> |
| <p><b>Improve school (save energy)</b> – includes reducing energy consumption in the school, developing energy policies, addressing a need, and preparing the school for the future.</p> <p><i>“I think it is a great project that makes everyone aware of what effects we have on the building... simple habits can cost a ton of money. The younger we can ingrain this into our children, the better our world will be.” ~District A</i></p> <p><i>“... I wanted to be a part of a team that led teachers to be aware that they can... reduce and save energy.” ~District B</i></p>   |
| <p><b>Money-related (save money)</b> – includes saving the district money on utility bills, developing grant programs to fund resources and future energy projects, and receiving compensation to work on developing the SEP&amp;EP.</p> <p><i>“I wanted specifically to earmark and use that money [energy savings] to support the curriculum which is part of the policy but also support internal grants for kids, for teachers, and for the community.” ~District A</i></p>  |
| <p><b>Personal interest/growth</b> – includes having a general interest in energy and/or the environment, valuing sustainability efforts, and looking for an opportunity to be creative.</p> <p><i>“... as a personal interest to kind of help push the institution towards more awareness about energy policy and more responsible energy policy at the district level.” ~District C</i></p>  |

|  |
|--|
| <p><b>Personnel-related</b> – includes working with other staff members (familiar and new), being requested by a colleague, and increasing involvement within the school.</p> <p><i>“It gives a school community a great opportunity to rally behind something that has significant educational, environmental and economic benefits. It also provides an opportunity for educators to work collaboratively with operations/facilities staff in facilitating a major cultural change in the school community.” ~District C</i></p> |
| <p><b>Increase responsibility</b> – includes the desire to have all building occupants, especially faculty and staff, take more responsibility for the energy they consume at school.</p> <p><i>“Everyone within the school &amp; district should be responsible for energy conservation.” ~District A</i></p>   |
| <p><b>Save the environment</b> – relates to the idea that reducing energy consumption will reduce the impact on the environment as a result of using fewer non-renewable resources.</p>  |
| <p><b>Leadership role</b> – includes feeling obligated to set an example for other schools in the district and/or surrounding communities and being in a position of power where leadership is expected.</p>   |
| <p><b>Good timing</b> – includes being available to work on SEP&amp;EP and project coincides with other district initiatives related to energy.</p>  |
| <p><b>Gain education</b> – interested in learning more about energy concepts to stay connected with subject matter and earning a graduate credit for completing the KEEP course.</p>   |
| <p><b>Job responsibilities</b> – energy education is considered part of contracted work and is obligated to contribute toward this effort.</p>   |

### Observation Notes and Supplementary Documents

In District A’s grant application, they emphasized a need to move their schools in a direction where energy is used more efficiently and energy education is integrated district-wide.

In District B's grant application, they indicated that the district needs to improve how their facilities are managed and use the schools as examples of the responsible use of energy resources.

In District C's grant application, they stated that even though all of the district buildings have received the Energy Star label, they realize there is more that can be done to improve the district's energy conservation efforts. They wanted to engage more staff, students, and community in this effort.

***Research Question 2: What is the value in having both an energy policy and energy education curriculum in place?***

Data related to this question were gathered through observations and from responses to the following question:

*What is the relationship between your school district's energy policy and energy education plan?*

| <b>Table G: Value of Energy Policy and Energy Education Curriculum</b> |                               |                           |
|--|-------------------------------|---------------------------|
| <b>Category</b>  | <b>Respondents<br/>(N=14)</b> | <b>District (A, B, C)</b> |
| Policy and education plan enhance each other                           | 7                             | A, B, C                   |
| Policy and education plan reference each other                         | 4                             | A, B, C                   |
| Energy education improves teacher understanding and policy compliance  | 4                             | B, C                      |
| Energy education saves energy and money                                | 3                             | C                         |
| Savings realized from policy used to purchase educational resources    | 2                             | A                         |
| Use policy to teach energy education                                   | 1                             | A                         |



| <b>Table H: Category Descriptions and Illustrative Quotations for the Value of Energy Policy and Energy Education Curriculum</b>  |
|---|
| <p><b>Policy and education plan enhance each other</b> – whether the two components were developed simultaneously or in isolation, they have been incorporated into one document and go hand-in-hand, benefiting each other.</p> <p><i>“I think they both create a balance... We can combine forces so it’s not just one, it’s not just the custodian and the maintenance people and the energy manager, now it’s those individuals as well as the educators and students. We’re all in this together.” ~District C</i></p>   |
| <p><b>Policy and education plan reference each other</b> – the language used in the energy policy references the energy education plan and the language used in the energy education plan references the energy policy.</p>   |
| <p><b>Energy education improves teacher understanding and policy compliance</b> – one of the objectives for staff development outlined in the energy education plan is to raise the staffs’ energy awareness level, including understanding the energy policy and how it relates to them so they will be more inclined to follow the policies and include energy themes in their curriculums.</p> <p><i>“What the district is trying to do with their energy policy I think is not common knowledge and I think through this, the teachers and students will become more aware of simple things that can be done and how important those simple things will be in making a difference in our energy use.” ~District B</i></p> <p><i>“I think that our energy education plan is there to get students educated and they can go out and make a difference with asking faculty to do different things in energy conservation. And then, because the students are out there, the teachers are aware of energy and therefore, they might be more apt to do what’s being asked for in the energy [policy].” ~District C</i></p> |
| <p><b>Energy education saves energy and money</b> – there are teachers that have facilitated student energy conservation projects that have resulted in a change in staff behavior (i.e., reducing the time classroom or hallway lights were left on). The result of the projects not only saved energy, but money on the district utility bills as well. Their findings and recommendations have also helped inform the energy policy.</p>   |
| <p><b>Savings realized from policy used to purchase educational resources</b> – as more teachers comply with the energy policies and see a reduction in the utility bills, some of that ‘savings’ will be available to purchase classroom resources.</p> <p><i>“We are trying to get, through the internal grant program... educational materials.” ~District A</i></p>   |

**Use policy to teach energy education** – Teachers can use data gathered from utility bills to teach their students about the impact the energy policies have had in saving energy.

*“We can use very specific examples of material we would like to teach based on the savings that came from the policy.” ~District A*

### **Observation Notes and Supplementary Documents**

In District A, during an SEP&EP development meeting, one participant said that the District Buildings and Grounds Committee currently does not follow any energy policies or energy plan but they would definitely use the adopted SEP&EP to develop a plan for implementing more energy-efficient projects.

In District B, with the newly passed energy policies in place, this district was very supportive of efforts to develop an SEP&EP to change staff and student behaviors, resulting in energy conservation. The Director of Buildings and Grounds even commented that they were in need of the educational component to compliment their energy policy. The timing was perfect for the Energy Task Force to fulfill that need.

District C originally adopted an energy policy in 1986 and they were interested in making some overdue updates. There were also a handful of teachers integrating energy education into their curriculums on a case by case basis. Most teachers in the district were unaware of the energy-related activities taking place in other buildings. Several participants expressed an interest in having a plan that

incorporated the district energy policy and the district energy education curricular framework into one document.

***Research Question 3: How can developing a School Energy Policy and Education Plan contribute to the energy literacy of school building occupants?***

Data related to this question were gathered through observations and responses from the following two questions:

1. *Who will benefit from the implementation of the SEP&EP?*
2. *How did developing an SEP&EP contribute to the energy literacy of school building occupants?*

| <b>Table I: SEP&amp;EP Contributes to Energy Literacy</b>                     |                               |                           |
|---|-------------------------------|---------------------------|
| <b>Category</b>   | <b>Respondents<br/>(N=19)</b> | <b>District (A, B, C)</b> |
| Raised awareness on student level   | 18                            | A, B, C                   |
| Raised awareness on district level  | 15                            | A, B, C                   |
| Raised awareness on community level (including parents, taxpayers)            | 11                            | A, B, C                   |
| Hasn't had much impact  | 7                             | B, C                      |
| Educators exposed to energy lessons which supports education in the classroom | 4                             | A, C                      |

| <b>Table J: Category Descriptions and Illustrative Quotations for How an SEP&amp;EP Contributes to Energy Literacy</b>  |
|---|
| <p><b>Raised awareness on student level</b> – includes change in student attitudes &amp; behaviors, identifying energy lesson plans to integrate into curriculum, and using the school building as a learning resource.</p> <p><i>“... [students] also get the benefit of getting those lesson plans and having hands-on experiences with some of those activities and know that it’s just not for science teachers to do it, it’s not. You just don’t learn it one day... it’s a life lasting curriculum that they’re going to keep growing with.” ~District A</i></p>   |
| <p><b>Raised awareness on district level</b> – includes making Energy Task Force members, teaching staff, custodial staff, and administration more aware of what they can do to conserve energy and getting them more involved with the SEP&amp;EP development process.</p> <p><i>“I think it was eye opening for custodial staff and administrative staff.” ~District A</i></p> <p><i>“I think it contributed to those of us who were more a part of the group right now and making us more aware of it and what we’re going to be able to take back to our schools and make them aware of it. It probably didn’t have as much of an impact on the other occupants at the [other] schools yet.” ~District B</i></p> <p><i>“... it will be really good for the teachers to learn about stuff that they haven’t necessarily thought about or taught about in the past. I do think it will help with the energy use in the building.” ~District C</i></p> |
| <p><b>Raised awareness on community level</b> – includes making parents and taxpayers more aware of energy concepts and conservation efforts that are happening at the school.</p> <p><i>“Certainly the students who are immediately affected by the teachers who are trying out energy concepts, the teachers themselves, and then that reaches out to the entire community through kids taking exciting ideas home and so forth.” ~District C</i></p>   |
| <p><b>Hasn’t had much impact</b> – some of the participants involved with the SEP&amp;EP development process were very familiar with energy concepts and conservation strategies and felt their energy literacy had not improved as a result of the project. In addition, some participants felt the impact of the SEP&amp;EP development process was limited to those within the Energy Task Force.</p>  |

*“... I’m much more aware, but I’m only one person.” ~District C*

*“... I was very knowledgeable about KEEP and the KEEP lessons, and I have been doing energy education for a long time, so I can’t say that I was more educated by going through the process.” ~District C*

**Educators exposed to energy lessons which supports education in the classroom** – including materials they received during the KEEP course, lessons collected by the Energy Task Force members, and exchanging ideas with experienced staff that have been teaching energy concepts for years.

*“... the people that took the KEEP class, I think that was very helpful in coming up with new lessons to implement energy education.” ~District A*

*“The one or two or three teachers that do actually use the curriculum we developed, they enjoy that because they also teach several different grades. It’s something they can go back to well and use in sixth grade, seventh grade, eighth grade, ninth grade, there’s stuff there for each year.” ~District A*

### **Observation Notes and Supplementary Documents**

In District A, when participants were walking through the school buildings during the energy audit, there was a sense that they were ‘getting it’ for the first time.

They seemed to understand how energy was being used in the building and how simple changes in mechanical systems and building occupant behavior could really impact energy savings. This exposure, facilitated by an energy expert, really set the stage as far as truly comprehending energy use in school buildings and raising the energy literacy of the members of the Energy Task Force.

In District B, when assessing the environmental education curriculum a few years ago, a gap or need for energy education was identified. After outlining some energy concepts for the energy education curricular framework, the Energy Task

Force members solicited feedback from their co-workers. Several of them commented on how few of their colleagues understood basic energy concepts and emphasized the need for improving the energy literacy not only of the students, but of the teaching staff as well.

Although the energy education component of the SEP&EP is designed primarily for students and district staff in District C, many participants commented on how the energy concepts introduced in school will trickle down (out) to the students' parents and the community at large. A few people stated that society and the earth in general will benefit from increasing energy literacy because using less energy will result in reducing the world's carbon footprint.

***Research Question 4: How can developing a School Energy Policy and Education Plan contribute to conserving energy in a school facility?***

Data related to this question were gathered through observations and responses from the following two questions:

1. *Who will benefit from the implementation of the SEP&EP?*
2. *How did developing an SEP&EP contribute to conserving energy in the school facility?*

| <b>Table K: SEP&amp;EP Contributes to Conserving Energy</b>   |                               |                           |
|---|-------------------------------|---------------------------|
| <b>Category</b>   | <b>Respondents<br/>(N=19)</b> | <b>District (A, B, C)</b> |
| New energy policies will reduce energy use at district level  | 12                            | A, B, C                   |
| Energy education will contribute to changes in behavior that will reduce energy use at individual level | 8                             | A, B, C                   |
| Hasn't affected others outside Energy Task Force yet  | 4                             | B, C                      |
| Made on the spot changes during audit to maximize efficiency (minimize use)                             | 1                             | A                         |

| <b>Table L: Category Descriptions and Illustrative Quotations for How an SEP&amp;EP Contributes to Conserving Energy</b>  |
|---|
| <p><b>New energy policies will reduce energy use at district level</b> – including manage facilities more effectively, fund future energy projects, and fund internal grant program.</p> <p><i>“I think what the policy did was it made it very clear that the Board was segregating those funds and they could monitor every year and what they saved would go directly back into these internal grants that are going to be given to students, to faculty, and to the community. So there are three different pools of money here and I think that’s the piece that really started to make it work within our district.” ~District A</i></p> <p><i>“... projects were already started... the energy star program was started by a teacher who is on our committee. So already we’re seeing indicators that energy is being saved.” ~District C</i></p> <p><i>“We are going to have an opportunity to save energy not only after hours during the unoccupied periods, but look at areas where savings can be obtained during daytime, during operational hours and this will involve students and teachers.” ~District C</i></p> |
| <p><b>Energy education will contribute to changes in behavior that will reduce energy use at individual level</b> – including shutting off lights and turning off computers when not in use.</p> <p><i>“I, myself, turn off lights every time I see them now. When no one is in there, I turn off the lights.” ~District B</i></p> <p><i>“... increased awareness led people to change habits.” ~District C</i></p>   |
| <p><b>Hasn’t affected others outside Energy Task Force yet</b> – some participants felt there hasn’t been much impact on energy savings outside of the working group.</p> <p><i>“I think those of us on the committee have done certain things to try to cut back, but I’m not sure if it’s affected others yet.” ~District B</i></p>   |
| <p><b>Made on the spot changes during audit to maximize efficiency</b> – including reducing the amount of fresh air being brought into a gymnasium when unoccupied, turning off lights in unoccupied rooms, and identifying an air leak in a thermostat that was promptly repaired.</p>   |



*"We made a lot of on the spot changes when we were going through our Focus on Energy audit. I think we made a lot of changes right on the spot that ended up saving a lot of money." ~District A*

### **Observation Notes and Supplementary Documents**

In District A, the way the district structured a new internal grant program, staff now have an incentive to conserve energy because a portion of those diverted energy costs will be available to them through this grant program. Many believe this will 'win over' the reluctant faculty members who may otherwise not be inclined to make conserving energy at school a priority.

Although District B has been successfully cutting back on their energy use over the past few years, based on observations and the District Energy website, members of the Energy Task Force felt it was important that more people in the district take responsibility for conserving energy at school.

There are a few faculty members in District C that are teaching energy conservation in their classes resulting in real energy savings. Developing an SEP&EP was a way to introduce those who are currently teaching about energy conservation to others who are interested in bringing energy conservation into their classrooms. They discussed how staff members changed their behavior and were sustained based on a student research project evaluating the use of lights in various parts of a building.

## **DISCUSSION**

Each of the four research questions will be discussed individually followed by general recommendations regarding this particular study.

### **Question 1: What is the purpose of developing a School Energy Policy and Education Plan?**

The three primary reasons for developing an SEP&EP were expected. They included educating others, improving the school (saving energy), and saving money. There were several levels of education that participants wanted to reach as a result of this process. Similar to what was presented in the literature review by Schoff (2002), some teachers were focused on educating their students, enhancing their lesson plans, and learning how to use the building to teach about energy concepts. Many felt strongly about not just teaching energy concepts in science, but integrating energy education into other subjects as well. Engleson and Yockers (1994) also pointed out the importance of integrating environmental education into all subject areas at all grade levels, and providing students hands-on experiences.

Some participants were focused on educating their peers and colleagues, as suggested by the U.S. EPA publication *Teaming Up to Save Energy: Protect Our Environment Through Energy Efficiency*. They wanted to establish a plan to raise teacher and staff awareness so they felt more comfortable teaching energy concepts in their classes. Several teachers learned about how their building uses

energy by talking to the facilities staff during SEP&EP development meetings. As a result, they felt more comfortable discussing this information with their co-workers. Some looked outside of the school itself and saw an opportunity to educate parents and community members. Since the majority of the participants were teachers, it seemed appropriate that education was a driving force for many of them. This was a great opportunity to educate so many different people on so many levels, again, reflecting the goal of environmental education (Engleson and Yockers, 1994). It's difficult to teach what you don't understand and by going through this process many participants either learned a lot or were exposed to resources that could be used to educate the school community.

The second major purpose for developing an SEP&EP was to improve the school in one way or another. They wanted to work in a building that had policies in place to make sure the space was both comfortable and energy efficient. By having a school energy policy with clear guidelines to follow, they felt they were more likely to realize the energy efficiency and energy literacy they desired.

For the most part, participants saw the value of conserving energy in the school. They understood that using less energy would reduce the impact the school has on the environment. They also understood that, in most cases, a decrease in energy consumption results in smaller utility bills. The money 'saved' by being more energy efficient could be spent on resources, salaries, or future energy projects.

A few unexpected reasons for developing an SEP&EP included increasing the responsibility of building occupants, fulfilling a leadership role, and transferring knowledge to save energy in the home. Many participants thought that it was important to increase the responsibility of building occupants to use energy wisely. They felt that this increase in responsibility would help the district reach their energy conservation goals.

Many of the participants from District C expressed a strong sense of responsibility as leaders in the community to develop an SEP&EP. As a fairly progressive school district, they wanted to set a good example for other districts in Wisconsin to follow.

Many energy conservation and management strategies that are applied in a school setting can be transferred to the home. A few participants recognized this as one of the reasons to be involved with the process. If an action or change in behavior will save energy in school, there is a good chance it will save energy at home as well.

**Question 2: What is the value in having both an energy policy and energy education curriculum in place?**

There are several different perspectives when discussing the value in having both an energy policy and energy education curriculum in place. Similar to the *Buckle Up America* campaign designed to increase safety belt use by the

National Highway Traffic Safety Administration, enacting strong legislation and expanding public education were important components of this successful campaign (NHTSA, 2006). First, as a teacher, it is extremely important to understand why the energy policy was written and how the guidelines directly impact them if the district wants them to comply. Without the energy education piece, some teachers think that the district energy policies do not involve them. If teachers do not understand the important role that they play in the district's plan to save energy, the district will be fighting an uphill battle. By including staff development in the energy education plan, there is a strategy to make sure that the staff understands the energy policy and the expectation that the district has of them to use energy wisely.

From a facilities perspective, having both an energy policy and energy education curriculum in place makes their job a little bit easier. Similar to enforcing a seatbelt law, it is much easier to enforce an adopted policy than it is to enforce suggestions from either the facilities department or the administration. With an increase in energy literacy, facilities personnel will receive less resistance from staff because they will have a better understanding of why the policies were written and how they help save energy in the district.

From an administration point of view, the more the building occupants understand energy and how to use it wisely at school, the more likely they are to comply with the policies. According to the U.S. EPA (2005), "Informed employees

are more likely to contribute ideas, operate equipment properly, and follow procedures.” The more they comply with the policies, the more energy will be saved. This leads to lower utility bills in most instances which is extremely important to administrators in this time of drastic budget cuts.

The final perspective to explore is that of the students. In some cases, the money that would normally be paid to the utility company will be used to buy resources to enhance their education. In addition, as they proceed through school, the energy concepts that they learn will build upon each other until they are able to make their own informed decisions about how to use energy wisely. Energy education has traditionally only been taught by a few teachers here and there throughout a district; a comprehensive energy education plan will ensure that students are getting a more complete energy education. Without the energy policy in place, the likelihood of teachers not including energy education in their curriculum is greater.

### **Question 3: How can developing a School Energy Policy and Education**

#### **Plan contribute to the energy literacy of school building occupants?**

For most participants, their energy literacy increased as a result of developing an SEP&EP. There were a couple of instances where the participants were very knowledgeable before starting the process; therefore, their energy literacy level did not increase. For each of the three districts, there was an interesting relationship between those that had experience teaching energy education and

those that had no experience at all. Lawrenz (1985) suggested that enthusiastic change agents are necessary for energy education to make substantial inroads in traditional school curriculum. In this case, the 'experts' were more than willing to share their experiences with the 'novices' which led to a more informed energy education curricular framework. The 'experts' could draw from their own experiences and it gave the 'novices' something to shoot for in their own classrooms.

Outside of the Energy Task Force, there really was only a minimal increase in the energy literacy as a result of the SEP&EP development process. Some participants shared what they were doing with colleagues during staff meetings or with family members, but not as large of a scale as the researcher had expected.

**Question 4: How can developing a School Energy Policy and Education Plan contribute to conserving energy in a school facility?**

Many of those directly involved with developing an SEP&EP were exposed to ways to conserve energy that were immediately implemented. For example, during the energy audit in District A, several inefficiencies were identified by the Focus on Energy Advisor and some changes were made right on the spot. By having Focus on Energy conduct an audit at no cost, the school realized immediate energy savings (Focus on Energy, 2006). In addition, many

participants commented on how they had changed their energy use behavior as a result of working on the SEP&EP.

The idea of educating others to change behaviors came up time and time again. With a change in behaviors comes a change in school culture. It won't happen overnight, but as more and more building occupants buy into the energy policies and energy education plan put in place, using energy wisely will become the norm.

## **RECOMMENDATIONS**

As discussed above, the purpose for developing an SEP&EP is mainly tied to educating others and improving the school by saving energy and money. One recommendation would be for KEEP to market the SEP&EP grant program as an opportunity for schools to show leadership in the field of environmental education and sustainability. Some school districts are natural leaders and this could be a way for them to set a good example for neighboring districts to follow. Related to the idea of leadership is instilling a sense of stewardship in the school community. If part of a school district's mission is to teach responsibility and stewardship, this would be a great opportunity to work toward that goal. Getting staff, administrators, and students to all take responsibility for the energy they use at school could be a great selling point with returns that not only include increased responsibility, but a more energy-efficient school with lower utility bills.



A second recommendation would be to encourage school districts that already have an energy policy in place to develop an energy education plan that will enhance the policy. There may be a large portion of the school community that is not aware of the energy policy or how it relates to them. Updating an energy policy to include an energy education component would most likely increase policy compliance and help the district realize the energy savings they had originally set out for when the first energy policy was adopted.

It would be valuable to conduct further research to determine the correlation between developing an SEP&EP and the increase in energy literacy and energy conservation. Although this study is not designed to draw those conclusions, the results suggest that a correlation could be made. A longitudinal study that followed a school district through the development, implementation, and evaluation of an SEP&EP would be one way to determine if there truly is a correlation between the plan and increased energy literacy and energy conservation. Utility bills could be analyzed over the same time period to identify trends in energy use that might correlate with energy education efforts.

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## **CHAPTER THREE**

### **CHANGING SCHOOL CULTURE: EXPLORING THE ENERGY POLICY AND EDUCATION PLAN DEVELOPMENT PROCESS**

#### **ABSTRACT**

Three Wisconsin school districts developed a School Energy Policy and Education Plan (SEP&EP) with the assistance of grant funding through the Wisconsin K-12 Energy Education Program (KEEP). SEP&EPs provide guidelines on how energy should be used wisely to save school districts money and resources and outlines how energy education should be integrated into school or district-wide curriculum to improve the energy literacy of students. The plan also addresses how to improve the energy literacy of staff, administrators, and community members so they can take an active role in changing the culture of the school.

Using a case study research design, the researcher explored the development of the SEP&EPs and the factors that constrained and facilitated the process. Similarities and differences among the three school districts were also explored. Data collection methods included observations of SEP&EP development meetings, interviews with primary participants, questionnaires for primary and secondary participants, and the review of supplementary documents. The results show that although each district took a slightly different approach, they all successfully completed their SEP&EPs. Common facilitators of the process included a general interest and experience in the subject and strong support from

the administration. Common concerns included the implementation of the final SEP&EP and lack of representation for various grade levels and subjects during the design.

## **INTRODUCTION**

### **Review of Related Literature**

#### **Energy Management in Schools**

America's primary and secondary schools spend more than \$6 billion annually on energy (Orth, 2009). With rising energy costs, school districts must find a way to effectively manage their utility bills. There are a number of organizations in Wisconsin taking great strides to assist school districts in managing their energy use more efficiently. Focus on Energy's Schools and Local Government program provides a range of services – at no cost – that promote energy efficiency, save money, and protect the environment (Focus on Energy, 2006).

The Cooperative Educational Service Agency (CESA) in Region 10 is another non-profit organization in Wisconsin with a goal to help schools manage facility energy use. They save schools energy by optimizing the equipment that they already own and changing human behaviors by informing staff members of how they can contribute to saving energy every day (Cooperative Educational Service Agency Region 10, 2011).

According to Larry Schoff (2009), president of Energy Efficient Solutions (E2S), “Energy education at all levels of the school community is essential for the success of any energy management program.” Schoff goes on to say that providing energy education in the classroom will serve as a foundation for energy management and sustaining the goal of energy independence (Schoff, 2009). In an article regarding high performance design written in 2002, Schoff states, “Energy education, regardless of the level at which it is delivered, will be the mortar securing the cornerstone for the nation’s educational facilities well into the 21<sup>st</sup> century.”

### **Education Plan Development**

To integrate energy education into a school’s culture, a plan must first be developed. A process for developing a curriculum plan was outlined by Engleson and Yockers (1994) in *A Guide to Curriculum Planning in Environmental Education*. These ten steps could easily be applied to developing an energy education plan. (1) form a District-wide Environmental Education Committee with representatives from many subject areas and grade levels, (2) prepare the committee so they understand what level of involvement will be required of them throughout the development process, (3) develop a philosophy statement that reflects the district’s overall educational philosophy, (4) conduct a needs assessment of what is already being done to teach about the environment, or energy in this case, (5) establish goals that relate directly to the needs identified during the assessment, (6) develop a curricular framework with objectives, (7)

educate staff members so they have a minimum level of expertise in the subject matter, (8) provide additional inservice preparation for those staff members who are deficient in the required competencies, (9) develop instructional strategies that help achieve the objectives outlined in the curricular framework, and (10) develop and implement an evaluation plan as a way to monitor the program.

Schools that are interested in raising energy awareness with their staff and students can use these steps to successfully plan their energy education curriculum.

### **School Energy Policy and Education Plan (SEP&EP) Development**

Schools should develop a district-wide plan to improve the energy efficiency of buildings (Sample School Board Resolution, 2009). A publication prepared for the U.S. Department of Energy provides technical and organizational information on the opportunities, challenges, and steps related to integrating energy management with school operation and maintenance practices. A few of their 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, 2004). When developing an

environmental or energy policy, it is important to clearly define the roles and responsibilities of the individuals involved (Environmental Policy, 2007).

In July 2009, the Wisconsin Green Building Alliance Green Schools Committee sent a Green Schools Survey to school business officials representing public school districts in Wisconsin. When asked if their district had an energy management policy in place, preliminary results indicated that only 47 percent of respondents did in fact have a policy in place. Furthermore, when asked if their district would be interested in updating or creating an effective energy management policy, an overwhelming 79 percent responded yes (Panaro & Rickert, 2011). With preliminary results such as these, school districts in Wisconsin clearly have an interest in creating or updating school energy management policies.

Also in 2009, the Wisconsin K-12 Energy Education Program (KEEP) developed a new School Energy Policy and Education Plan (SEP&EP) grant program for Wisconsin school communities. The primary goal of this program was to help school communities develop an SEP&EP that would improve both energy literacy and energy efficiency in the school community. To assist school communities who were awarded an SEP&EP grant, KEEP developed a template (Appendix A) they could follow. The template includes the following components: Executive Summary, Energy Management Policy, Energy Education Plan, Monitoring & Reporting, Sustaining Energy Education Initiatives, and Appendix. KEEP



recommended that policies be as detailed as possible and cover all areas of the school building (classrooms, kitchen, pool, offices, gymnasium, etc.). The policies should address the following areas: lighting, heating, ventilation, and air conditioning, computers, office machines, food service, building improvements, hot water heaters, personal appliances, vending machines, and how to communicate problems that may arise.

### **Introducing New Initiatives in Schools**

New programs and school initiatives are introduced regularly (Fullan, 1991). Some new initiatives succeed and others fail. There are many reasons this occurs. A study conducted in the UK examined the non-technical factors that led to successfully integrating Information and Communications Technology (ICT) into a school's curriculum. The four personnel factors that were identified include: (1) teachers' attitudes prior to the innovation, (2) the role of the ICT coordinator, (3) the attitude of senior management, and (4) the existence of adequate support and training (Lawson & Comber, 1999). The results of this study can be transferred to any number of new initiatives taken on by a school, including energy efficiency. According to a study that looked at primary teachers' literacy and attitudes on education for sustainable development, a large percentage of teachers who hesitated to engage in environmental programs can be related to their limited environmental knowledge and literacy that they obtain from their pre-service training (Spiropoupou, Antonakaki, Kontaxaki, & Bouras, 2007). Teachers who are unfamiliar with environmental education, specifically energy concepts,

would likely support professional development opportunities that would help them gain the knowledge required to teach their students.

## **Summary**

The need for energy management in schools is clear and many schools in Wisconsin are interested in developing or updating their school energy management policies. KEEP has developed an SEP&EP grant program to help Wisconsin school communities develop not only energy policies, but also an energy education plan that will increase energy literacy and ensure that energy policies are followed. If students, teachers, and staff are energy literate, they will be more likely to support energy management policies put in place to save the school money and maintain a comfortable learning environment. If a school community is interested in being more energy efficient, sustainable, or 'green', they are going to have to form a district-wide committee to facilitate a change in their school culture.

## **Project Background**

As mentioned earlier, KEEP developed and administered an SEP&EP grant program in 2009 to address both energy literacy and energy efficiency concerns in school communities. Funding for the program came from Focus on Energy, Wisconsin's statewide energy efficiency and renewable energy program. Grants of up to \$5,000 were awarded to three school districts to develop SEP&EPs (See Appendix B for the Grant Application).

Each school district followed a series of steps (required or recommended), developed by KEEP, during their plan development. Some of the key steps in the process included: Form an Energy Task Force, Review existing energy policies, Draft an SEP&EP, Solicit feedback from administrators, faculty, and staff, Disseminate project information, Participate in a KEEP *School Building Energy Efficiency Education* course, Finalize SEP&EP and present to administering body for approval. For a detailed description of each step, see Appendix D.

The three school districts that were awarded funding agreed to be involved in this study. They allowed the researcher to observe SEP&EP development meetings, conduct interviews, administer a questionnaire, and review supplementary documents related to the SEP&EP development process.

District A was located in the northeast region of Wisconsin. The district had approximately 750 students and 55 staff members. There were three primary Energy Task Force members, meaning they were very involved with the process from start to finish, and several other secondary participants who played a minor role in the development process. The majority of the SEP&EP development was completed during the summer of 2009. This district did not have any existing energy management policies in place, nor did they have any formal energy education curriculum.

District B was also located in the northeast region of the state. The district had approximately 5,700 students and 680 staff members. There were four primary Energy Task Force members involved in developing the SEP&EP. The Energy Task Force met monthly from August 2009 – December 2010 primarily working on the energy education plan since the district had adopted an energy policy right before they were awarded the grant funding.

District C was located in south central Wisconsin. The district had approximately 6,000 students and 850 staff members. There were eight primary Energy Task Force members involved in developing the SEP&EP. The Energy Task Force met occasionally from May to November 2010. The district reviewed and updated an existing energy policy that was in place prior to this project in addition to developing an energy education plan.

### **Research Questions**

The purpose of this multi-study project was to identify factors that influence the development of a School Energy Policy and Education Plan and to analyze the development process of such a plan in three Wisconsin school communities. The research questions associated with this aspect of the study were as follows:

- |            |   |
|------------|---|
| Question 1 | What is the process used in developing a School Energy Policy and Education Plan? |
|------------|---|

- Question 2      What are the factors that constrain and facilitate the development of a School Energy Policy and Education Plan?
- Question 3      What are the similarities and differences between how various schools develop their School Energy Policy and Education Plans?

### **Limitations**

- Limitation 1      The study was limited by the time the researcher had to gather and analyze data such as observations, interviews, and secondary documents.
- Limitation 2      The study was not designed to prove that energy literacy will result from developing a School Energy Policy and Education Plan.
- Limitation 3      The study was not designed to prove that energy savings will result from developing a School Energy Policy and Education Plan.
- Limitation 4      The researcher was an informed participant, as well as an observer, which may have influenced decisions made by the participants.
- Limitation 5      The participants may not have expressed all of their thoughts during the interviews and questionnaire.
- Limitation 6      The results from this study cannot be generalized across all Wisconsin school communities.

## **METHODS**

### **Methodology**

A case study with embedded units was used as the research design because this project followed three different school districts as they developed similar SEP&EPs. Since this was the first study conducted regarding the development of SEP&EPs in Wisconsin, the researcher was open to new theories as the process unfolded. Each of the three school districts were similar in that they were all located in Wisconsin and all received grant funding, up to \$5,000, to develop an SEP&EP.

The overall case study design was primarily qualitative. Qualitative methods can be used to uncover and understand what lies behind any phenomenon about which little is yet known and give the intricate details of phenomena that are difficult to convey with quantitative methods (Strauss and Corbin, 1990).

For more details regarding the methodology of this study, see Chapter 2.

### **Data**

The three school districts that were included in this study were the only school districts that met the research requirements of completing an SEP&EP during the July 2009 – December 2010 grant cycle. They were not selected from a larger sample; they make up the entire sample.

The researcher gathered information from individuals participating in the process of developing an SEP&EP for their school or district. The researcher obtained this data by observing the development process (i.e., attending SEP&EP development meetings, conducting interviews, administering a questionnaire, and reviewing secondary documents such as minutes from School Board meetings and energy audit reports). The researcher looked for common themes or trends among individuals from the same school district and then also looked for commonalities across the three school districts during each step of the process.

### **Trustworthiness, Face Validity, and Reliability**

To improve the trustworthiness of the data, the researcher utilized the multiple sources of evidence mentioned above to triangulate data on the same set of research questions. Great care was taken to organize the case study documents in a way that will facilitate examination of results if needed. Extreme effort and care was put into designing the interview and questionnaire questions (Appendix E, F, G) to make sure they were specifically addressing the research questions. Each interview and questionnaire question was directly correlated to a research question before the interviews or questionnaires were administered. The interview and questionnaire questions were also reviewed by a panel of experts prior to use to ensure their face validity.

The researcher also conducted self-reflection throughout the entire SEP&EP development process to assess her own bias and evaluate her role in the study. This ongoing self-reflection aided the researcher in identifying her role in the development process, which was primarily advisory.

To ensure reliability, the researcher identified categories for the responses for a particular research question (Research Question 1: Study 1) then provided the same responses to Dr. Jennie Lane, Director of KEEP and Graduate Advisor, to categorize. The results from Dr. Lane's categorization and the researcher's were similar, strengthening the reliability of the category development.

### **Data Collection**

Data collection began in July 2009 with observations of District A's first SEP&EP development meeting and concluded in January 2011 with the submission of District B's final SEP&EP. In between, the researcher followed each district as they went through the steps outlined in the *Project Background*. Each method used to collect data will be discussed in detail in the following section.

### **Observations**

The researcher attended between ten and fifteen SEP&EP development meetings for each district to observe their step-by-step progress throughout the development process. SEP&EP development meetings included reviewing existing school energy policies and/or energy curriculum, touring a school facility



on an energy audit, drafting policies and/or curriculum, and attending School Board meetings and teacher inservices. The researcher took notes by hand during the meetings. After some of the meetings, especially in the beginning of the process for each district, the researcher also wrote a reflection of the meeting. These observation and reflection notes were then transcribed and used to verify interview and questionnaire responses, as well as develop the case study descriptions.

### **Initial Interview**

Initial interviews were conducted with the primary individuals involved in the development process near the beginning of the process (See Table M for a list of the Initial Interview Questions). These individuals were members of the Energy Task Force formed to develop the School Energy Policy and Education Plan, and subsequently members of a larger Energy Committee, if one was established in their school district. The interviews took place in the school district at a time that was convenient to the participants. The researcher used a digital voice recorder and the interviews were later transcribed.

| <b>Table M: Initial Interview Questions (Study 2)</b>  |
|--|
| 1. Who is leading the SEP&EP development process for your school/school district?  |
| 2. Why did you choose to be a part of the SEP&EP development process for your school/school district?  |
| 3. What experiences do you bring to the SEP&EP development process?  |
| 4. On a scale of one to five, to what extent do you see yourself being involved with the overall process of developing the SEP&EP? Five (5) being to a large extent and one (1) being to a minimum extent. |
| 5. Who will benefit from the implementation of the SEP&EP?   |
| 6. What, if any, are your concerns regarding this development process?   |
| 7. Is there anything else you would like to add?   |

### **Questionnaire**

A confidential questionnaire was given to individuals that were considered primary or secondary participants in the development process after the majority of the SEP&EP had been developed. These individuals included Energy Task Force members that were initially interviewed as well as individuals that played a more supportive role during the development process. The questionnaire was distributed and collected before the final interviews took place so that participants who were interviewed a second time would have already spent some time reflecting on the SEP&EP development process. The questionnaires were comprised of four questions that collected both quantitative and qualitative data (see Table N). The questionnaires were distributed via email by the researcher. Participants had two weeks to complete the questionnaire and return it to the researcher electronically.

| <b>Table N: Questionnaire Questions (Study 2)</b>  |
|--|
| 1. To what extent were you involved with each step of the SEP&EP development process? (Not Involved, Somewhat Involved, or Very Involved)          |
| 2. With what level of ease or difficulty did each step take to accomplish? (Not Involved/Not Applicable, Easy, Somewhat Difficult, Very Difficult) |
| 3. How did you disseminate information to others, outside of the Energy Committee, regarding the SEP&EP?   |
| 4. Would you recommend that other school communities in Wisconsin develop an SEP&EP? Why or why not?   |

### **Final Interview**

A final interview was conducted with the primary individuals involved in the development process at the end of the process. Again, these were members of the Energy Task Force that were very involved with developing the SEP&EP.

Again, the interviews took place in the school district at a time that was convenient to the participants and were recorded for later transcription. In a few instances where participants were unavailable to meet in person, interviews were conducted over the phone and recorded in a similar manner as if there were done face-to-face. The final interview questions are listed in Table O.

| <b>Table O: Final Interview Questions (Study 2)</b>  |
|--|
| 1. What barriers affected the SEP&EP development process?  |
| 2. What facilitators aided in the development process? How?  |
| 3. Would your school/school district have developed the SEP&EP if funding was not available? Why or why not? |
| 4. How would you change the process in which your school's Energy Policy and Education Plan was developed?   |
| 5. What is the relationship between your school's/school district's energy policy and energy education plan? |
| 6. How did developing an SEP&EP contribute to the energy literacy of school building occupants?              |
| 7. How did developing an SEP&EP contribute to conserving energy in the school facility?                      |
| 8. Is there anything else you would like to add?   |

## **Supplementary Documents**

Supplementary documents, such as minutes from SEP&EP development meetings that the researcher was not able to attend, School Board meeting minutes and agendas, energy audit reports, and energy education plan development documents were reviewed throughout the development process.

## **Summary**

Each and every data collection method and tool used was critical in answering the research questions in this study. The overlap of questions in the different interviews allowed participants more than one chance to voice their thoughts and feelings. Some of the attitudes and beliefs of the participants were not captured on tape during the interviews, so observation notes could be used to supplement the recorded responses. With such a robust toolbox of data collection methods, the researcher is confident that the process of how an SEP&EP was developed

in these three districts is presented accurately. Likewise, using multiple methods give a complete look at the barriers and facilitators identified in the development process. Finally, similarities and differences among individuals within a district or across all three districts are more clearly defined because of the array of data gathering instruments used throughout this study.

### **Data Management**

Data management strategies included data classification and development of a case study database. The data were classified based on the method used for data collection: Initial Interview (II), Questionnaire (Q), Final Interview (FI), Observations (O), or Supplementary Documents (SD). Each school district was assigned a different letter of the alphabet to identify them (A, B, or C). Each participant was also assigned a number so they could be identified by their school district and participant number (e.g., A1, B3, C12).

Once all of the data were collected, they were brought together and organized in a fashion that would allow easy access for the researcher during the analysis process (Merriam, 1988). A case study database, or digital spreadsheet, with all the relevant sources of data listed in chronological order was created for each school district.

For more information regarding the data management of this study, see Chapter 2.

## **Data Analysis**

The data collected were analyzed by the researcher, looking for common themes or trends. Explanation building was the overall analysis method used to develop case descriptions (Yin, 2009). Data from District A were initially used to answer the research questions, and then data from District B were incorporated, followed by District C. In this way, the explanation became richer with deeper meaning as more evidence was incorporated into the description.

The analysis of the data also included the use of chronologies, a response matrix, coding, and illustrative quotations. According to Yin (2009), the compiling of chronological events is a frequent technique in case studies. This technique was used to compare the steps outlined in the SEP&EP grant application (found in Appendix B) with the actual development process of the three school districts. The researcher used both a flowchart and a timeline of events showing how each of the three districts progressed through the process and attempted to explain conditions that either facilitated or constricted the SEP&EP development process. The flowcharts for the three school districts can be found in the *Results* section of this chapter. The timeline of events can be found in Appendix H.

After transcribing the initial interview, questionnaire open-ended questions, and the final interview responses, the researcher created a response matrix. The matrix was used to identify categories and common themes among responses.

To utilize the bountiful qualitative data collected, the researcher developed a system to code and categorized the responses. For each question analyzed, categories were identified using all three school district participant responses. The categories were arranged in order of most common responses to least common responses. The number of respondents was tabulated as well as which school districts the respondents came from.

For more information regarding the data analysis of this study, see Chapter 2.

## **RESULTS**

For **Research Question 1**, the data are presented by individual district (A, B, and C). A flow chart (Figure A, B, C) illustrates how various components of the process were carried out over time for each district. For **Research Question 2**, there are three sections of data (experiences, facilitators, concerns/barriers). Each section includes a table of relevant categories related to that concept, the number of respondents (n) for each category, and the districts from which the responses came. Each table is followed by a description of the categories and illustrative quotations to help interpret the responses. Finally, a summary of data from observations and secondary documents related to each of the three sections is presented for each district. For **Research Question 3**, a single narrative will be used to compare the similarities and differences between the three districts for each step of the development process. Following the narrative, a questionnaire summary will present participant responses to their level of

involvement and level of difficulty for each step of the development process.

Finally, Figure D illustrates how each district worked on various steps of the process along the same timeline.

Table P identifies the data collection methods that were used to explore each research question. The total number of respondents (N) for each tool is identified for each district.

| Research Question            | Table P: Data Collection Method Used (Study 2) |                     |   |   |  |
|------------------------------|--|---------------------|---|---|--|
|                              | Observations                                   | Secondary Documents | Initial Interview<br>A (N=4)<br>B (N=5)<br>C (N=10)<br>TOTAL (N=19) | Questionnaire<br>A (N=7)<br>B (N=5)<br>C (N=10)<br>TOTAL (N=22) | Final Interview<br>A (N=3)<br>B (N=3)<br>C (N=8)<br>TOTAL (N=14) |
| 1 (Process)                  | X  | X                   |   |   |  |
| 2 (Barriers)                 | X  | X                   | X   |   | X  |
| 3 (Similarities/Differences) | X  | X                   | X   | X   | X  |

***Research Question 1: What is the process used in developing a School Energy Policy and Education Plan?***

Data related to the process used in developing an SEP&EP were collected from observations and secondary documents.

**District A**

The overall approach to writing the SEP&EP for District A was to complete it quickly over a couple of weeks during the summer. The Energy Task Force members had time to meet and were very diligent, always trying to keep things



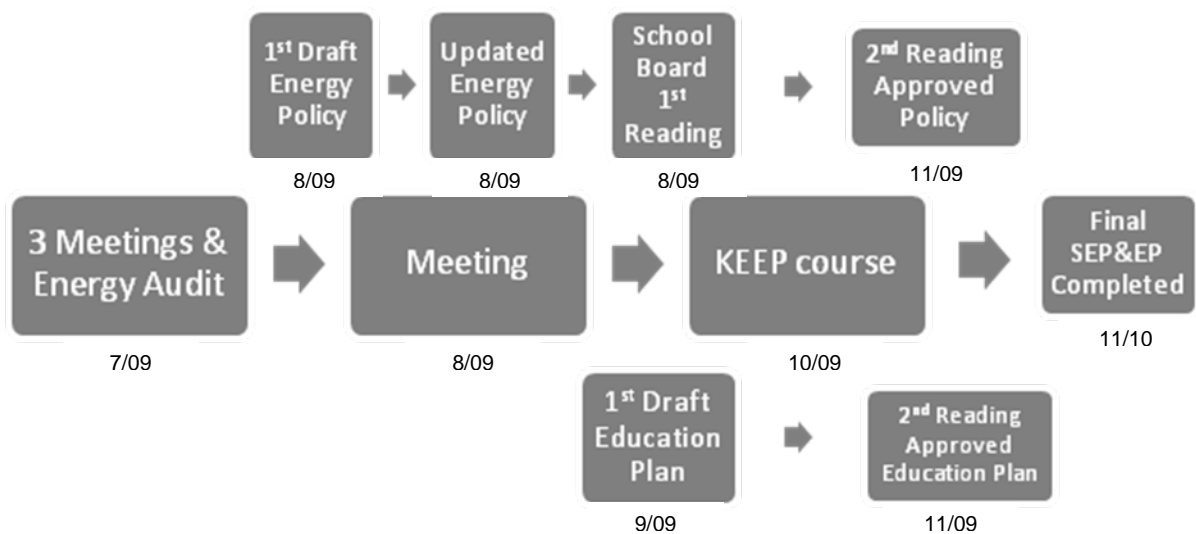
moving forward. The Energy Task Force spent approximately 384 person-hours developing their SEP&EP. Calculations for person-hours for each district can be found in Appendix I.

Their approach to writing the energy management policies was to review other school districts' policies and pull from them – not reinvent the wheel. The key players involved in deciding which policies should be included and how they should be worded were all present when the actual policies were being discussed to get their input (superintendent, head custodian, and School Board representative on the Building and Grounds committee). This was mostly drafted in one day. After going on a walk through the buildings, it was evident that there was energy to be saved in the district. The policies were presented to the staff at the beginning of the school year and many resisted. There are a few reasons that might explain this – a new administration, poor communication between the Energy Task Force and staff, and staff thought the energy savings was going to go to fund projects that would only benefit the Energy Task Force members. The School Board approved the policy in November 2009.

The energy education plan was developed by dividing the plan into three sections by grade level (K-5, 6-8, and 9-12). Each Energy Task Force member was responsible for finding three activities for each grade level. They selected the activities in isolation and before the *KEEP School Building Energy Efficiency Education* course was taught in the district. The majority of the lessons came

from the National Energy Education Development (NEED) Project or the U.S. Energy Information Administration which offer free and downloadable resources from the Internet. There was no formal approval process for the energy education plan to be included in the district curriculum, only that it is mentioned in the adopted policy by the School Board.

**Figure A: District A: Flow Chart of Development Process**



NOTE: The top row illustrates progress of the school energy policy development, the center row illustrates general SEP&EP progress, and the bottom row illustrates progress of the energy education plan.

## **District B**

The overall approach to writing the SEP&EP for District B was to spend a few hours working on it each month over the course of eighteen months. Initially, there were close to eight teachers interested in the Energy Task Force, but soon after they started getting to work, a core group of five people were working on the

SEP&EP. By the end of the project, three of those five were still very involved.

The Energy Task Force spent a total of approximately 173 person-hours developing their SEP&EP.

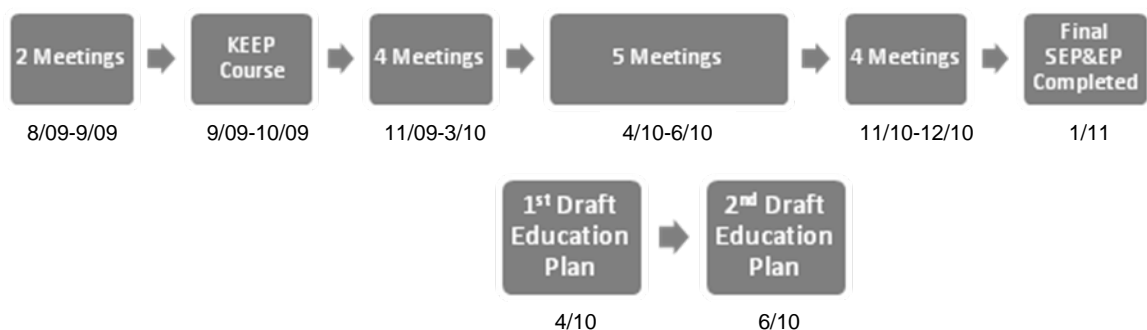
The School Board had approved the District School Energy Policy in April 2009, before the grant was awarded, so the Energy Task Force focused on the energy education component of the SEP&EP.

The Energy Task Force met once before participating in the *KEEP School Building Energy Efficiency Education* course. After the course, they met once a month during the school year to work on the plan. They used two basic approaches to develop the curricular framework. The first was to identify existing science units/lessons and pull in energy content that would fit appropriately. The second was to add new content, primarily in the science curriculum, focusing on energy conservation and using the school building as a teaching tool. To do this, they divided the workload and each took a few grade levels that they were comfortable working with. They first identified 'power standards' for each grade (K-8). For example, one of the second grade power standards is "Understands forms of energy that cannot be touched (light, heat, sound, and magnetism)." They then used the KEEP conceptual framework to identify concepts that correlated to the identified power standards. The KEEP conceptual framework includes energy concepts identified by energy professionals and educators that ensure a comprehensive energy education (KEEP, 2003). They selected one

concept to focus on for each grade and then identified energy-related activities that could be done to enhance the existing curriculum. In addition to correlating activities to the power standards and the KEEP conceptual framework, they also identified how several of the activities would help develop 21<sup>st</sup> century skills (e.g., students will communicate clearly).

The activities they included in the plan were primarily from the KEEP activity guides and the NEED website. The Energy Education Plan is currently awaiting approval by the Assistant Superintendent of Teaching and Learning.

**Figure B: District B: Flow Chart of Development Process**



NOTE: The top row illustrates general SEP&EP progress and the bottom row illustrates progress of the energy education plan.

## **District C**

The overall approach to writing the SEP&EP for District C was to break the Energy Task Force up into three working groups. One group worked on updating the energy policies and two groups worked on the energy education component. A total of approximately 254 person-hours were spent developing their SEP&EP; 14 hours were spent on the SEP&EP by non-Energy Task Force members (administrative assistant and webmaster).

The district had a school energy policy in place prior to receiving this grant; however, they did elect to update the policy as part of this process. The district energy manager led the efforts and identified areas of improvement for the policy. He solicited feedback first from the custodians and facilities manager, then from the larger Energy Task Force working on the energy education plan. The School Board approved the updated policy when they approved the SEP&EP in its entirety in October 2010.

The School Business Official initiated a District Sustainability Committee and the first task for that group was to develop the SEP&EP. There were several teachers and one energy consultant involved with developing the school energy education plan. The energy education working group initially met and identified where district Essential Learner Outcomes (ELOs) addressed KEEP energy concepts, using the KEEP conceptual framework. This group then split into two working groups, a team of elementary teachers worked on the elementary level

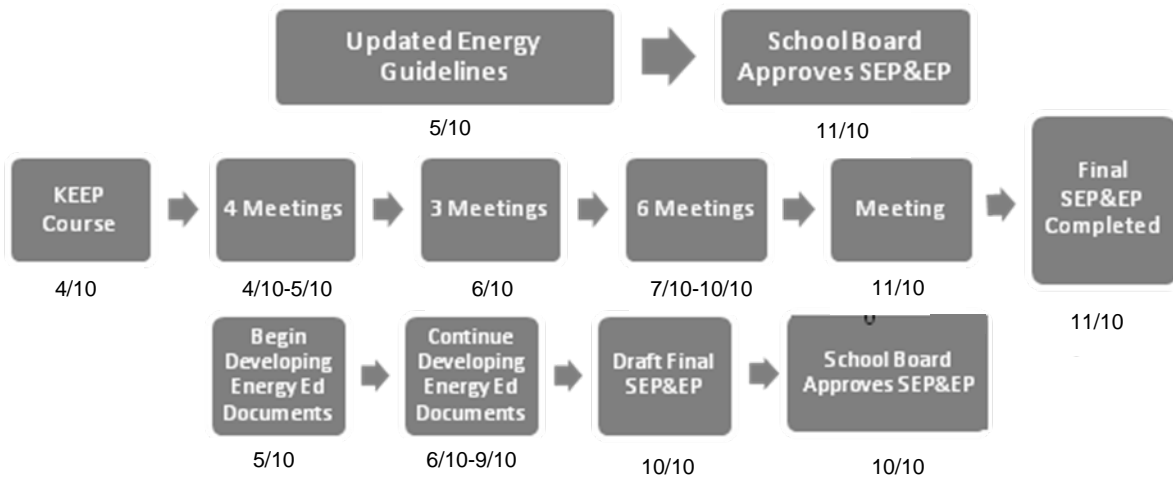
energy education curricular framework and a team of high school teachers, along with the energy consultant, developed a curricular framework for high school level science and social studies. There were no middle school teachers involved in the process; therefore the energy education plan only covers grades K-5 and high school science and social studies.

The elementary group looked at the KEEP activity guides and assigned activities to different grades. Then they made sure that each grade level had a good progression of activities that covered various energy themes. They primarily used KEEP activities and some NEED materials.

The high school group identified KEEP concepts and activities for science, and then social studies. They included activities that teachers currently are doing with their students as well as identified new activities from KEEP activity guides. They also identified which science class the activities would be most appropriate (e.g., chemistry, physics).

There was some attempt to solicit feedback from other teaching staff at the high school level to find out what they are currently teaching related to energy; however, the responses they received were limited. The School Board approved the energy education plan when they approved the SEP&EP in its entirety in October 2010.

**Figure C: District C: Flow Chart of Development Process**



NOTE: The top row illustrates progress of the school energy policy development, the center row illustrates general SEP&EP progress, and the bottom row illustrates progress of the energy education plan.

**Research Question 2: What are the barriers and facilitators that influence the development of a School Energy Policy and Education Plan?**

Data related to the barriers and facilitators that influenced the development of an SEP&EP were collected from observations, secondary documents, and from responses to the following questions asked either during the initial interview or the final interview:

1. *What experiences do you bring to the SEP&EP development process?*
2. *What facilitators aided in the development process?*
3. *What, if any, are your concerns regarding this development process?*
4. *What barriers affected the SEP&EP development process?*

The results will be presented in three sections: Experiences, Facilitators, and Concerns/Barriers.

## Experiences

| <b>Table Q: Participant Experiences that Contributed to SEP&amp;EP Development</b> |                           |                           |
|--|---------------------------|---------------------------|
| <b>Category</b>  | <b>Respondents (N=19)</b> | <b>District (A, B, C)</b> |
| Positive affective domain  | 12                        | A, B, C                   |
| Received formal education  | 8                         | A, B, C                   |
| Have taught energy education in classroom  | 7                         | A, B, C                   |
| Leadership experience  | 6                         | B, C                      |
| Computer/research skills   | 4                         | A, B, C                   |
| Familiar with school buildings   | 4                         | A, C                      |
| Influential role in school district  | 4                         | A, C                      |
| Curriculum development   | 3                         | A, B, C                   |
| Grant writing experience   | 3                         | A, C                      |



| <b>Table R: Category Descriptions and Illustrative Quotations for Participant Experiences that Contributed to SEP&amp;EP Development</b>  |
|---|
| <p><b>Positive affective domain</b> – includes being passionate about the environment, interested in energy conservation, and values work done to improve the environment.</p> <p><i>“... my general outlook on life is kind of green.” ~District C</i></p> <p><i>“I get passionate, there’s no stopping me.” ~District C</i></p>   |
| <p><b>Received formal education</b> – includes energy education, such as KEEP courses, business education, environmental studies, engineering, and building systems.</p> <p><i>“I’ve taken KEEP classes in the past...attending the previous KEEP classes has helped.” ~District A</i></p>  |
| <p><b>Have taught energy education in classroom</b> – includes informally teaching students about energy conservation and formal energy curriculum.</p> <p><i>“... I teach my own students at school about saving energy and ways we can save the planet...” ~District B</i></p> <p><i>“I have been teaching the environment class since 1978. We’ve been teaching energy in that class for all those years.” ~District C</i></p> |
| <p><b>Leadership experience</b> – includes leading a school nature site project, environmental/nature club, and management experience.</p> <p><i>“I do [lead] an environmental club at the school that I’m at and I think it’s just a passion of mine and if it’s something that you’re interested in and you’ll want to be a part of, you’re going to do better.” ~District B</i></p>  |
| <p><b>Computer/research skills</b> – includes experience in data collection and management, using excel to make spreadsheets, and designing web-based platforms for students and teachers to display energy data.</p>   |
| <p><b>Familiar with school buildings</b> – includes understanding the mechanical systems, how energy flows through buildings, and how to use a school as a learning laboratory.</p>   |
| <p><b>Influential role in school district</b> – includes being in a position of power, such as an administrator or a tenured teacher with respect among colleagues, and a historical perspective with respect to new initiatives.</p>   |

*“... to serve as the liaison between the superintendent and our group.”  
~District A*

*“I have taught for 25 years. I kind of have a historical perspective to bring to it and [have] seen lots of different programs that have been brought into the classrooms over the years.” ~District C*

**Curriculum development** – includes understanding cognitive levels, identifying appropriate lessons, and experience in developing benchmarks, standards, and assessments.

*“I also have a background in curriculum development with being able to look at benchmarks and standards and assessments and that type of thing.” ~District B*

**Grant writing experience** – includes energy education grants for classroom resources and forestry education planning grants.

### **Experiences: Observation Notes and Supplementary Documents**

In District A, all three of the primary Energy Task Force members had taken at least one KEEP course prior to starting this project so they all had a general understanding and value of energy education curriculum. One of the Energy Task Force members had recently led the district through a similar project developing a School Forest Education Plan.

In District B, the Energy Task Force was made up entirely of teachers and the three that followed the project all the way to completion possessed a passion about the environment and getting staff and students to do the right thing. They all had some experience with teaching their students about energy and the environment and wanted to share that knowledge with the rest of the district. One of the Energy Task Force members had extensive experience in writing grants and developing curriculum.

In District C, the variety of people on the Energy Task Force brought a lot of different experiences to this group, from classroom teachers to facilities personnel. There were several teachers that had first-hand experience teaching energy education in their classrooms and an Energy Manager with over six years of experience working in the district to reduce energy consumption.

### Facilitators

| <b>Table S: Facilitators that Contributed to SEP&amp;EP Development</b> |                               |                           |
|---|-------------------------------|---------------------------|
| <b>Category</b>   | <b>Respondents<br/>(N=19)</b> | <b>District (A, B, C)</b> |
| Supportive Administration/School Board                                  | 7                             | A, B, C                   |
| Outside consultants were helpful  | 7                             | A, C                      |
| Experience/interest in energy education                                 | 6                             | B, C                      |
| Good team   | 6                             | A, C                      |
| Strong leadership   | 5                             | B, C                      |
| KEEP class  | 4                             | A, C                      |
| Financial compensation/energy savings                                   | 3                             | A, C                      |

| <b>Table T: Category Descriptions and Illustrative Quotations for Facilitators that Contributed to SEP&amp;EP Development</b>   |
|---|
| <p><b>Supportive Administration/School Board</b> – includes having a supportive District Superintendent and School Board committed to developing and approving an SEP&amp;EP.</p> <p><i>“The willingness [of School Board] to approve a policy to take money out of the general fund and put it into a fund to pay for an internal grant process.”</i><br/>~District A</p>  |
| <p><b>Outside consultants were helpful</b> – includes the KEEP School Energy Education Specialist and Energy Education Consultant who shared their experiences with the Energy Task Force members.</p> <p><i>“... there was an extra pair of eyes [KEEP consultant] that had expertise who could give a little bit of guidance when we were going into the ditch...”</i><br/>~District C</p>  |
| <p><b>Experience/interest in energy education</b> – includes teachers who have been teaching energy education for years sharing their teaching strategies with others and an opportunity to try out energy lessons with students during the SEP&amp;EP development process.</p> <p><i>“... I share something and the kids [students] end up getting excited or they end up saying things down the road like, ‘oh, those lights should be off,’ and things like that. They kind of just help give you the spark once in a while to keep going.”</i> ~District B</p> <p><i>“I think that it helped having people that worked on energy lessons and had an idea of what they did and they could share that with others...”</i> ~District C</p> |
| <p><b>Good team</b> – the Energy Task Force was comprised of positive, passionate people who managed their time well, communicated clearly, worked well together, were accepting of new ideas, and completed their tasks.</p> <p><i>“I think we worked really well together. We always found time to come in together. We did our fair share outside of the time we were together. I think we didn’t have any weak links. I just think we were a very good team.”</i> ~District A</p>   |
| <p><b>Strong leadership</b> – includes having a strong Energy Task Force leader who was dedicated to keeping the team moving forward as well as leadership from the administration level to help guide the way throughout the process.</p>  |

**KEEP class** – includes the information, experiences, and resources acquired as a result of participating in the KEEP *School Building Energy Efficiency Education* course and other KEEP courses.

*“We used a lot of the information that had been provided from KEEP and from having KEEP classes in the past.” ~District A*

**Financial compensation/energy savings** – includes being paid a stipend to work on the SEP&EP as well as realizing energy savings at the school. Seeing savings on the utility bills helped motivate participants to continue to work on the SEP&EP.

### **Facilitators: Observation Notes and Supplementary Documents**

In District A, the Energy Task Force was comprised of a very good mix of key players (School Board member, custodian, superintendent, Focus on Energy Advisor, and teachers). They also had an extremely supportive staff of administrative assistants and custodians that were happy to answer questions and provided documents as needed.

District B, in general, was very supportive of this group’s effort to develop an SEP&EP. The School Board had recently adopted a District Energy Policy and they were looking to develop the education component of the policy.

The Assistant Superintendent for Business Services for District C played an integral role in the SEP&EP development process for this district. He displayed passion and enthusiasm as he led the group through the process.

## Concerns/Barriers

| <b>Table U: Concerns/Barriers during SEP&amp;EP Development Process</b> |                               |                           |
|---|-------------------------------|---------------------------|
| <b>Category</b>   | <b>Respondents<br/>(N=19)</b> | <b>District (A, B, C)</b> |
| Implementation/follow through   | 17                            | A, B, C                   |
| Lack of representation or interest/support                              | 10                            | A, B, C                   |
| Conflicting personalities   | 9                             | A, C                      |
| Scheduling meeting times  | 8                             | B, C                      |
| Poor communication  | 6                             | A, C                      |
| Compressed timeline   | 4                             | C                         |
| Unfamiliarity with SEP&EP development process                           | 3                             | B, C                      |
| Change in administration  | 1                             | A                         |
| Change in state standards   | 1                             | B                         |

| <b>Table V: Category Descriptions and Illustrative Quotations for Concerns/Barriers during SEP&amp;EP Development Process</b>  |
|--|
| <p><b>Implementation/follow through</b> – includes teachers not using the energy education plan when completed because they are overloaded or do not feel confident teaching energy concepts, concerns about who will conduct follow up to make sure SEP&amp;EP is being used and updated, and time requirements needed to implement.</p> <p><i>“...it’s difficult to change people and if they’re already comfortable teaching; it’s always more work to implement new ideas.” ~District A</i></p> <p><i>“... they’re [teachers] going to think it’s one more thing to do or to add to our plate.” ~District B</i></p> <p><i>“... I’m not sure that there is a budget, either psychological or dollars, for people’s time [to implement]....” ~District C</i></p> |
| <p><b>Lack of representation or interest/support</b> – including teachers from many of the grade levels and subject areas, lack of interest and involvement from building principals, and curriculum coordinators not involved with development process.</p> <p><i>“We weren’t represented by all schools which is not the best.” ~District C</i></p> <p><i>“... it was hard to get people involved. There’s no one from middle school, that’s kind of why I was involved in it, that in and of itself was a major obstacle.” ~District C</i></p>  |
| <p><b>Conflicting personalities</b> – includes personality differences on the Energy Task Forces and differences between those involved with the development process and those who were not involved (i.e., other faculty and staff). Energy education may not be the same priority for all members of the school community.</p> <p><i>“... people and attitudes and culture, getting people to adjust, adapt, to change to what is needed is probably the most difficult part...” ~District C</i></p>   |
| <p><b>Scheduling meeting times</b> – includes time of day, length of meetings, and time of year. It was difficult for many staff to meet after school because of other commitments and short meetings made for a lot of starting and stopping which some felt was inefficient.</p>   |

|  |
|--|
| <p><i>“If we’re able to get [schedule] ... larger chunks of time where we can just get into it, get at it, keep going, and get done versus starting and stopping and having to figure out where you are.” ~District B</i></p> <p><i>“Summer is very busy, but the school year is ten times as busy...” ~District C</i></p> |
| <p><b>Poor communication</b> – includes poor communication between Energy Task Force and district staff as well as poor communication among district staff. The working group may not have communicated what they were doing with the rest of the staff adequately.</p>  |
| <p><b>Compressed timeline</b> – one group had less than one year to complete the SEP&amp;EP development process and many felt that was a barrier.</p>  |
| <p><b>Unfamiliarity with SEP&amp;EP development process</b> – with this being the first year of the SEP&amp;EP grant program, some felt unsure about what direction they should be heading.</p>  |
| <p><b>Change in administration</b> – one school had a change in administration between the time they wrote the grant and began working on their SEP&amp;EP. The new administrator was unfamiliar with the school buildings when the process began.</p>   |
| <p><b>Change in state standards</b> – the Wisconsin Model Academic Standards are in the process of being updated; any reference to the existing standards will be outdated once the new standards are adopted.</p>   |

### **Concerns/Barriers: Observation Notes and Supplementary Documents**

One of the largest concerns that arose for District A during this process was the opposition the Energy Task Force received by the district staff when they presented the SEP&EP for the first time in the fall 2009. Many teachers felt uncomfortable with some of the policies and felt like they did not have enough opportunity to provide input into the plan. Other concerns that were observed throughout the process included not having an example SEP&EP to follow as a guide since this was a new program at KEEP. Also, without having an elementary teacher on the Energy Task Force, one member was concerned that the activities she selected may not be age appropriate.



A common concern for District B was finding a time for the Energy Task Force to meet consistently. A few members could attend the majority of the meetings, but many missed quite a few because they were involved with other activities.

Another concern was if the energy education curriculum would be required to teach or not. Many felt that teachers would be less inclined to introduce something new if it was not required.

In District C, a major barrier for the two energy education working groups was lack of leadership. The larger Energy Task Force had a clear leader identified, but no one was willing to step into the leadership role for either the elementary level or high school level working groups. Some participants were uncomfortable with this situation and felt like they were not getting as much accomplished during their meeting times as they had wanted.

***Research Question 3: What are the similarities and differences between how various schools develop their School Energy Policy and Education Plans?***

Data related to the similarities and differences between how the different school districts developed their SEP&EPs will be presented as each step of the development process is explored.

**Step A: Form an Energy Task Force and meet regularly** (required)

*Similarities:* All three districts formed an Energy Task Force that included teacher representatives. Each district met at least five times to work on the SEP&EP (District B met 15 times). All of the development meetings took place on school property, either in one of the teachers' classrooms or in a common space such as a media center or conference room.

*Differences:* District B's Energy Task Force was comprised solely of teachers where District A's Energy Task Force included teachers, the Superintendent, School Board Member, Head Custodian, Dean of Students, and a Focus on Energy Advisor and District C's Energy Task Force included the Assistant Superintendent for Business Services, District Energy Manager, Energy Education Consultant, Director of Facilities, a custodian, and a principal, in addition to teachers.

**Step B: Form an Energy Committee and meet regularly** (recommended)

*Similarities:* Each district was unique in the formation of an Energy Committee or lack thereof.

*Differences:* District A didn't form an Energy Committee. District B had formed an Energy Committee in fall 2008, a year before applying for the SEP&EP grant. District C formed a District Sustainability Committee which, among other topics of interest, includes the roles and responsibilities typically addressed by an Energy Committee.

### **Step C: Review existing energy policies** (recommended)

*Similarities:* Each district was unique in the reviewing of existing energy policies or lack thereof.

*Differences:* District A did not have any existing policies to review. They discussed how current energy management practices were initiated, implemented, and updated with the custodian to gain an understanding of what the current practices are to better inform the development of district energy policies or guidelines. The School Board from District B had recently adopted a District Energy Policy so the Energy Task Force was already familiar with the policies. They were occasionally referenced during the SEP&EP development process. District C designated a few of the Energy Task Force members to review the existing energy policies that were adopted by the School Board in 1986. The Energy Manager facilitated those discussions and solicited feedback from a couple of custodians and the Director of Facilities.

### **Step D: Participate in energy audit** (required)

*Similarities:* At least two members of each Energy Task Force for the three districts participated in the KEEP *School Building Energy Efficiency Education* course where they were led on an energy audit of a building in their district by a Focus on Energy Advisor.

*Differences:* District A had a separate energy audit prior to the KEEP course and a few members of the Energy Task Force who did not participate in the KEEP course joined that audit.

### **Step E: Draft School Energy Policy and Education Plan (required)**

*Similarities:* All three districts drafted the energy education component of the SEP&EP. They all used the School Energy Policy and Education Plan Template created by KEEP.

*Differences:* District A used other Wisconsin school energy policies found either on the Internet or provided by KEEP to model their new school energy policy.

### **Step F: Solicit administrative, faculty, and staff suggestions and feedback (required)**

*Similarities:* All three districts solicited feedback from faculty and staff with varying degrees of success.

*Differences:* The Energy Task Force from District A presented the draft SEP&EP to the district at a staff meeting at the beginning of the school year with some opposition. Although the group requested feedback, most staff were displeased with how the draft SEP&EP was shared with them that they provided little input initially. Over time, they were more willing to provide feedback and that was incorporated into the final SEP&EP. The Energy Task Force for District B gathered feedback from their colleagues regarding the energy education plan somewhat successfully. They were able to identify what energy concepts were already being taught in the elementary grade levels. It was more difficult to obtain reliable feedback for the middle school and high school levels. The Assistant Superintendent of Teaching and Learning met with a member of the Energy Task Force to discuss the SEP&EP and provided some feedback. Some members of

the Energy Task Force for District C attempted to solicit feedback electronically from their colleagues via a survey and many were disappointed with the lack of response. They found it more useful to ask for feedback during a department meeting. The draft SEP&EP was made available on the district website for the school community to review and provide comments.

**Step G: Disseminate information to the community related to the project**  
(required)

*Similarities:* All three districts used staff meetings and email to disseminate information regarding the SEP&EP development project at school. In addition, they all discussed the project with their co-workers, community members, and their students to some extent. Districts A and C both presented at School Board meetings and posted information on their school website.

*Differences:* Unique to District A, members of the Energy Task Force wrote articles for the local newspaper describing their SEP&EP development efforts.

**Step H: Eight (8) teachers will participate in the KEEP School Building**

***Energy Efficiency Education course*** (required)

*Similarities:* A KEEP School Building Energy Efficiency Education course was offered at each of the districts involved with this study. The majority, if not all, of the Energy Task Force members from Districts A and B participated in the KEEP course. Districts B and C had the KEEP course before they began to meet regularly to develop the SEP&EP.

*Differences:* Only two of the Energy Task Force members from District C participated in the KEEP course, neither of them were teachers working on the energy education curriculum development. District A had their KEEP course after the majority of their SEP&EP had already been drafted.

**Step I: Two (2) members of the Energy Task Force or Energy Committee will attend a Practical Energy Management (PEM) for Schools training (required)**

*Similarities:* Each district was unique in the attendance of a PEM for Schools training or lack thereof.

*Differences:* No one from District A attended a PEM for Schools training. Two individuals from District B attended a PEM for Schools training before the SEP&EP project began. Two members from the Energy Task Force for District C attended a PEM for Schools training near the beginning of the SEP&EP development process.

**Step J: One (1) member of the facilities department will participate in the Building Operator Certification (BOS) program (required)**

*Similarities:* One person from both Districts B and C had participated in the BOC program prior to the SEP&EP project.

*Differences:* No one from District A participated in the BOC program.

**Step K: The Energy Task Force and Energy Committee members will review, finalize, and present SEP&EP to administering body for approval (required)**

*Similarities:* Districts A and C both finalized their SEP&EPs and presented in front of the School Board for approval.

*Differences:* District B is currently waiting for final approval from the Assistant Superintendent of Teaching and Learning.

**Step L: Evaluate the SEP&EP development process (recommended)**

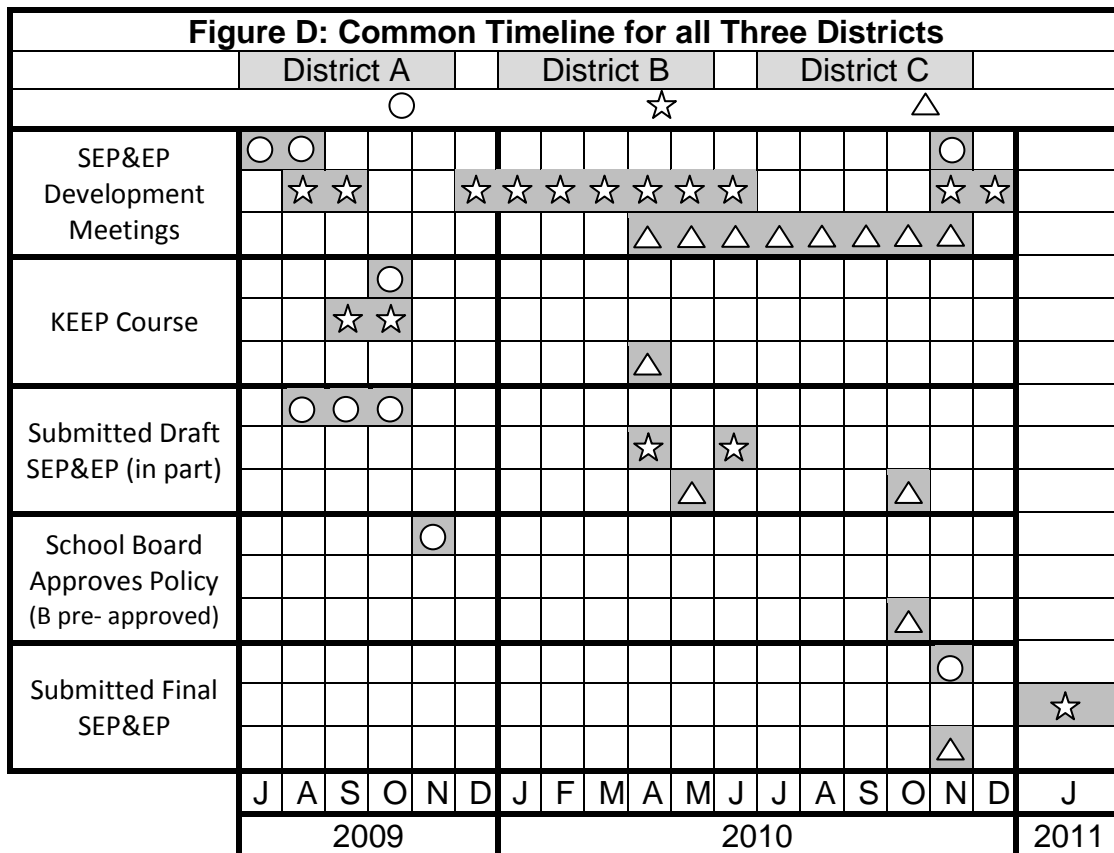
*Similarities:* All three districts participated in an evaluation of the development process when the researcher conducted interviews and administered a questionnaire about the process. None of the districts conducted any evaluation of the process aside from the above mentioned methods.

*Differences:* Districts B and C kept typed minutes for most of the meetings held during the SEP&EP development process.

## **Timeline**

Figure D illustrates when each district worked on various steps of the SEP&EP development process. The timeline runs from July (J) 2009 through January (J) 2011 and each month and year is listed on the bottom of the table. For each step of the process, the month(s) that each district was working on that step is illustrated on the timeline (District A = circle, B = star, and C = triangle). For example, District A held SEP&EP development meetings in July and August

2009, as well as November 2010. NOTE: District C did not accept grant funding until late December 2009.



## Questionnaire Results

Participants indicated the extent they were involved with each step of the SEP&EP development process and with what level of ease or difficulty each step took to accomplish. The number of participants (N) who completed the questionnaire for each case study is indicated in the top row. The results in Table X present the steps of the development process along the left most columns, followed to the right by the number of participants (n) with the associated response for each of the three districts. Within each group of district results there are four columns and each step consists of two rows (level of involvement and



level of ease or difficulty). Refer to Table W for a description of each possible response.

| <b>Table W: Questionnaire Results Key</b> |                         |                   |                                      |
|---|-------------------------|-------------------|--------------------------------------|
| VI = Very Involved                        | SI = Somewhat Involved  | NI = Not Involved |                                      |
| VD = Very Difficult                       | SD = Somewhat Difficult | E = Easy          | N/A = Not Involved or Not Applicable |

For example, for District A, two out of seven participants were very involved with forming the Task Force or Energy Committee (steps A/B). One participant indicated that step was very difficult and two participants indicated it was easy.

| Table X: Questionnaire Results Regarding Involvement and Ease/Difficulty |   |                  |    |    |     |                  |    |    |     |                   |    |    |     |
|--|---|------------------|----|----|-----|------------------|----|----|-----|-------------------|----|----|-----|
| Step   | Description                                   | District A (N=7) |    |    |     | District B (N=5) |    |    |     | District C (N=10) |    |    |     |
|  |   | VI               | SI | NI |     | VI               | SI | NI |     | VI                | SI | NI |     |
|  |   | VD               | SD | E  | N/A | VD               | SD | E  | N/A | VD                | SD | E  | N/A |
| A/B  | Forming Task Force/ Energy Committee          | 2                | 2  | 3  |     | 1                | 1  | 3  |     | 3                 | 3  | 4  |     |
|  |   | 1                | 0  | 2  | 4   | 0                | 1  | 0  | 4   | 0                 | 3  | 3  | 4   |
| C  | Reviewing existing policies                   | 4                | 2  | 1  |     | 1                | 2  | 2  |     | 2                 | 5  | 3  |     |
|  |   | 0                | 0  | 5  | 2   | 0                | 1  | 1  | 2   | 0                 | 0  | 5  | 5   |
| D  | Energy audit                                  | 4                | 3  | 0  |     | 0                | 1  | 4  |     | 2                 | 2  | 6  |     |
|  |   | 0                | 5  | 1  | 1   | 0                | 0  | 1  | 4   | 0                 | 1  | 3  | 6   |
| E1   | Drafting policies                             | 3                | 3  | 1  |     | 1                | 1  | 3  |     | 3                 | 4  | 3  |     |
|  |   | 1                | 5  | 0  | 1   | 1                | 1  | 1  | 2   | 0                 | 2  | 3  | 5   |
| F1   | Gathering draft policy feedback from others   | 2                | 2  | 3  |     | 1                | 0  | 4  |     | 2                 | 3  | 5  |     |
|  |   | 1                | 2  | 1  | 3   | 1                | 0  | 1  | 3   | 0                 | 2  | 2  | 6   |
| E2   | Drafting energy education plan (curriculum)   | 3                | 1  | 3  |     | 3                | 2  | 0  |     | 5                 | 3  | 2  |     |
|  |   | 0                | 3  | 0  | 4   | 1                | 4  | 0  | 0   | 1                 | 6  | 0  | 3   |
| F2   | Gathering education plan feedback from others | 1                | 1  | 5  |     | 2                | 2  | 1  |     | 2                 | 5  | 3  |     |
|  |   | 1                | 2  | 0  | 4   | 1                | 2  | 0  | 2   | 2                 | 3  | 1  | 4   |
| G  | Disseminating information                     | 1                | 4  | 2  |     | 2                | 3  | 0  |     | 1                 | 7  | 2  |     |
|  |   | 0                | 2  | 2  | 3   | 0                | 2  | 2  | 1   | 1                 | 2  | 5  | 2   |
| H  | KEEP Course                                   | 4                | 1  | 2  |     | 5                | 0  | 0  |     | 3                 | 3  | 4  |     |
|  |   | 0                | 0  | 3  | 4   | 0                | 3  | 2  | 0   | 0                 | 1  | 5  | 4   |
| I  | Practical Energy Management (PEM) Training    | 0                | 1  | 6  |     | 0                | 0  | 5  |     | 2                 | 0  | 8  |     |
|  |   | 0                | 0  | 1  | 6   | 0                | 0  | 0  | 5   | 0                 | 0  | 2  | 8   |
| J  | Building Operator Certification (BOC) Program | 0                | 0  | 7  |     | 0                | 0  | 5  |     | 1                 | 0  | 9  |     |
|  |   | 0                | 0  | 1  | 6   | 0                | 0  | 0  | 5   | 0                 | 0  | 1  | 9   |
| K1   | Final draft of plan                           | 2                | 4  | 1  |     | 2                | 3  | 0  |     | 5                 | 4  | 1  |     |
|  |   | 1                | 4  | 0  | 2   | 2                | 2  | 1  | 0   | 0                 | 3  | 5  | 2   |
| K2   | Approval (School Board, etc.)                 | 3                | 2  | 2  |     | 0                | 0  | 5  |     | 1                 | 3  | 6  |     |
|  |   | 0                | 1  | 4  | 2   | 0                | 0  | 0  | 5   | 0                 | 0  | 3  | 7   |
| L  | Evaluation of process                         | 3                | 4  | 1  |     | 0                | 2  | 3  |     | 2                 | 4  | 4  |     |
|  |   | 0                | 2  | 1  | 4   | 0                | 0  | 1  | 4   | 0                 | 3  | 3  | 4   |

## **DISCUSSION AND RECOMMENDATIONS**

A variety of data collection methods were used to explore the research questions for this study. Interviews, observations, secondary documents, and questionnaire responses were analyzed and a discussion of those findings, along with recommendations, for each research question follows.

### **Research Question 1: What is the process used in developing a School Energy Policy and Education Plan?**

Each of the three districts used the KEEP SEP&EP Template (Appendix A) and the Steps and Funds Available for the Development of an SEP&EP document (Appendix D) to help them develop their plans. Although both documents were very useful, several districts expressed an interest in having a sample SEP&EP to reference. Since this was the first year of the SEP&EP grant program, there were no samples. In future years, completed SEP&EPs should be made available to school communities going through this process. With that being said, it is also recommended that KEEP continue to fund the SEP&EP grant program. In addition, the KEEP consultant played a big role in making sure that the districts' questions were answered and they were headed in the right direction throughout the process. KEEP staff should continue to be available to future school communities undergoing the same process.

Although each of the districts approached the SEP&EP development process a little differently, they all successfully completed their SEP&EP in less than

eighteen months. There was staff turnover in District A during the process resulting in one of the Energy Task Force members that started the project moving to a different district before the SEP&EP was finished. To address this issue, KEEP could encourage school communities to complete the process within one school year, reducing the chance of someone not being able to complete their tasks because they no longer work in the district.

In addition, it should be noted that the districts that already had a school energy policy in place spent fewer person-hours developing their SEP&EPs than the district that did not have an existing policy. District B spent the fewest person-hours. They had an adopted district energy policy before they began working on their plan. District A spent the most person-hours developing their SEP&EP. Their school district did not have any energy policy in place before beginning the SEP&EP development process. District C spent more person-hours than B, but less than A. They updated a district energy policy that was in place before beginning the SEP&EP development process. This should be taken into consideration when school communities are trying to estimate the time commitment required to successfully complete their SEP&EP.

A final comment regarding the SEP&EP development process is that it is very important to make sure that every Energy Task Force member completely understands what their roles and responsibilities are at the beginning of the process. One of the major conclusions from a publication by the U.S. Department

of Energy states that distribution of school-specific information to building staff is essential to integrating energy management with school operation and maintenance (Princeton Energy Resources International, 2004). In District C, most of the participants did not participate in the KEEP course and felt they were not given enough information about their facilities to properly develop an energy education plan. Many of them were frustrated at the beginning because they didn't know what they were supposed to be doing or what the big picture was. According to Engleson and Yockers (1994), step seven of developing an environmental education plan is to prepare staff members so they have a minimum level of expertise in the subject matter. To improve this part of the process, KEEP should conduct a short introductory training on how to develop an SEP&EP for each school community that receives a grant. In addition, the KEEP course should be scheduled after the Energy Task Force is established to make sure that as many participants as possible attend the course. Those that participate in the KEEP course receive valuable resources that aid in the development of the energy education curricular framework.

**Research Question 2: What are the factors that constrain and facilitate the development of a School Energy Policy and Education Plan?**

One of the biggest concerns for each of the districts was the implementation of the final SEP&EP. According to Schoff (2009), "Energy education at all levels of the school community is essential for the success of any energy management program." Although this study did not explore the success or failure of

implementing SEP&EPs, one recommendation would be for KEEP to follow up with these three school districts in six months or a year to find out the status of the plans. Information regarding plan implementation should then be made available to school communities working on new SEP&EPs.

The lack of representation from different grade levels and subjects was also a concern for some of the participants. Again, according to Engleson and Yockers (1994), the first step in developing an environmental education plan is forming a district-wide committee with representatives from many subject areas and grade levels. In District A, there were only high school teachers on the Energy Task Force because they had difficulty trying to recruit middle and elementary school teachers. There was a similar situation in District C where there were no middle school representatives. District B had a good variety of grade levels and subjects represented on their Energy Task Force. In the future, schools could identify teachers from different grade levels and subjects before beginning the process rather than waiting until the Energy Task Force is already formed.

Another large concern for District C was the lack of leadership in the energy education plan working group, a subgroup of the Energy Task Force. In this case, the grant was written by members of the administration and the teacher who was closely associated with the project at the time the grant was submitted was out on maternity leave over the summer when the majority of the energy education plan was written. With the lack of leadership, time was often wasted at

the beginning of each meeting because no one knew exactly what direction the group should be headed. A recommendation to prevent this in the future would be to have schools identify multiple teachers who are committed to seeing the project through before submitting their grant application.

In District B, scheduling a time to meet after school was the largest barrier during the SEP&EP development process. Several participants recommended using teacher inservice time or early release time so that the group could spend several hours at a time working on the plan, rather than one hour here and there.

The support the Energy Task Force members received from their administration, energy consultants, and energy professionals was common among all three districts. Similar to the study conducted by Lawson and Comber (1999), the attitude of senior management played an important role in the success of the project. This should not come as a surprise because part of the grant application requires the administrator's signature and a list of Energy Task Force members committed to developing an SEP&EP. Without support from multiple sectors in a school community, it would be difficult for one group, such as teachers, to successfully accomplish such an endeavor.

All of the districts used a laptop at some point during SEP&EP development meetings to take notes and projected the working document onto a screen so everyone in attendance could see. This technique seemed especially helpful

when facilitating the process of writing the goals, objectives, and philosophy statement for the energy education plan.

The individuals that were involved with this process from start to finish were all very passionate and dedicated to improving energy literacy and conserving energy at school. Again, similar to what Lawson and Comber (1999) found, teachers' attitudes prior to the project contributed to their success. Although they may have had some setbacks here and there, the majority of the participants continued to move the process forward. The fact that there was compensation for their time definitely encouraged participation of those who otherwise may not have been involved. It is important that KEEP continue to fund the SEP&EP grant program to help other school communities go through the same process.

**Research Question 3: What are the similarities and differences between how various schools develop their School Energy Policy and Education Plans?**

Although many of the similarities and differences among the various districts were presented in the *Results* section, there is a need to discuss some of the conflicting data from the questionnaire results. To begin with, there were several occasions where participants from the same Energy Task Force responded quite differently to the level of ease or difficulty needed to accomplish each step of the SEP&EP development process. This illustrates how different people from within the same working group can have varying perceptions of the same task. For



example, in District A, two participants felt that forming an Energy Task Force was easy and one felt the same task was very difficult. In another example, five participants from District C felt disseminating information about the SEP&EP development process was easy, two people felt that task was somewhat difficult, and one person felt dissemination was very difficult.

There was also quite a difference in which steps were considered the most difficult and the easiest among the three districts. For District A, the energy audit, drafting policies, and drafting the final plan were the most difficult steps. Since this district did not have any existing policies before they began this process, these results were expected. For Districts B and C, drafting the energy education plan and gathering feedback from others was the most difficult step. As illustrated in the *Results* section, some Energy Task Force members from these districts had a hard time getting their colleagues to provide feedback regarding the energy education they teach because they either didn't understand the energy concepts presented or they were too busy to complete a survey. For District B, the final draft of the plan was also one of the most difficult steps.

The easiest steps for District A were reviewing existing policies and getting the School Board to adopt the SEP&EP. Since this district did not have any existing policies to review, that step was simple. The Superintendent and a School Board member were involved in the Energy Task Force which helped facilitate the SEP&EP adoption process by the School Board. For Districts B and C, the KEEP

course and disseminating information were the easiest steps. For District C, reviewing existing policies and drafting the final plan were the easiest steps.

When looking at which steps of the process had the most people involved, each district was different. For District A, everyone was either somewhat or very involved with the energy audit. For District B, everyone was either somewhat or very involved with drafting the energy education plan, disseminating information, and taking the KEEP course. For District C, the most people (all but one) were involved in drafting the final SEP&EP.

When looking at which steps of the process had the least number of people involved, the districts also varied somewhat. The common steps with the least involvement were the Practical Energy Management for Schools training and the Building Operator Certification. For District A, five of seven people were not involved with gathering education plan feedback from others. This may have contributed to the poor reception the district staff had when the Energy Task Force presented the SEP&EP. For Districts B and C, both participating in the energy audit and getting approval of the SEP&EP from the School Board had the fewest Energy Task Force members involved. For District B, only one person reported that they were involved in gathering draft policy feedback from others. Since the district had already approved an energy policy before the grant was approved, this was an expected result.

A final recommendation for KEEP would be to promote the SEP&EP grant program during the Practical Energy Management for Schools and the Building Operator Certification trainings. There would be a captive audience interested in improving the energy management of their school facilities.

Overall, the three school districts successfully completed the SEP&EP development process – each in their own way. Although the composition of the Energy Task Force and the order in which they completed the steps involved in the process varied, they all walked away with a complete SEP&EP.

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## **CHAPTER FOUR**

### **CONCLUSION**

Following these three school districts throughout their SEP&EP development process has proven to be a very valuable experience, for both the researcher and the field of environmental education. The results have shown that it is possible to successfully develop an SEP&EP in a variety of school settings. From a somewhat larger district with multiple buildings to a smaller district with only two buildings, the key is having the right people involved in the process. People with passion who care about the environment and are dedicated to educating themselves and others about ways they can reduce their impact. The results of this research also illustrate the potential increase of effectiveness of developing a School Energy Policy in conjunction with a School Energy Education Plan for a school community. Implications, reflections, and recommendations for future research follow.

### **IMPLICATIONS**

The implications this research has on the field of environmental education, particularly energy literacy and school energy efficiency, are discussed in this section.

#### **Energy Literacy**

The development of an SEP&EP will outline steps that schools can take to ensure that staff, students, administrators, and others who spend time in a school

facility understand the importance of using energy wisely. The identification of energy lesson plans for K-12 students is a step in the right direction when it comes to increasing student energy literacy. However, teachers must first be comfortable teaching about energy concepts themselves to pass those important concepts on to their students. It is critical to have a staff development plan in place that helps those teachers who are not at ease with basic energy concepts feel empowered to bring energy concepts into their classroom. This is where KEEP can provide the needed energy education courses for teachers. Wisconsin teachers are fortunate to have a program like KEEP to provide them with grants, classroom resources, activity guides, professional development opportunities, and ways to engage their students in energy-related activities.

In most districts, the SEP&EP development process brought together two groups of people that might not normally interact; teachers and facilities personnel. There was a 'visible' transfer of knowledge as teachers asked facilities personnel how the school building used energy. The SEP&EP development process created an opportunity for the facilities personnel to share their insights into how the school buildings were maintained and operated, widening a conversation with teachers that may not otherwise have ever taken place. In a few instances, teachers realized how much information the facilities personnel had regarding energy use in the school and wanted to have them come and talk to their students. This illustrates how teachers can use the building and the people 'behind the scenes' to teach energy concepts. In addition, there were several

side conversations between teachers and facilities personnel regarding simple things that teachers and students could do to make the custodians work a little easier. Both groups of people gained more respect for the other because the teachers understood more of what the facilities personnel did to try to conserve energy and the facilities personnel learned what teachers are also trying to do to save energy.

With a greater understanding of what energy is, where it comes from, and how to use it wisely, school communities will be a part of an energy conservation movement that will help reduce their carbon footprint. As long as school communities are interested in sustainable initiatives and teaching students to care for the environment, the SEP&EP grant program will attract people that want to take a proactive role in improving the condition of the environment.

### **School Energy Efficiency**

The increase in number of school energy management policies that provide guidelines for school facilities to operate and maintain buildings more efficiently are only going to help the conservation movement. With the development of SEP&EPs, schools can take the time to review old energy policies and update them to include a number of newer technologies and energy saving strategies. Also, they can include information regarding how energy education will be a part of the updated policy. The key is communicating with building occupants what is currently being done to manage energy use wisely, and what can be done in the



future. If the school culture is going to change, there has to be buy-in from the school community. With a successful SEP&EP, it is possible to increase school energy efficiency because part of the plan is making sure that all school building occupants understand their roles and responsibilities as energy users in the school. By coupling those two components together, policy and education, schools have a greater chance of reaching their energy management goals, similar to the way the *Buckle Up America* campaign has been successful in increasing safety belt use across the nation (National Highway Traffic Safety Administration, 2006).

## **RECOMMENDATIONS FOR FUTURE RESEARCH**

There are many research opportunities that have been identified as a result of this project. As mentioned earlier, the concept of coupling education and policy to maximize output or results could be explored more in-depth. Another recommendation for future research on this subject would be to follow up with the three school districts after six months or a year to determine the status of their SEP&EP and how the implementation process was completed. Questions that could be asked of the districts would include: what would you do differently, what would you do the same, and how did the districts ensure sustainability of their plans? A related study could evaluate the same school districts over a longer period of time, five or six years, and explore the correlation between developing an SEP&EP and an increase in energy literacy in building occupants. In addition,

the same study could evaluate the trend in energy use to see if developing an SEP&EP did contribute to conserving energy in the school facilities.

Future research could explore the motivations for being involved in the SEP&EP process more in-depth. For example, if Energy Task Force members identify themselves as passionate about energy or the environment, where did their passion originate? What else are they passionate about? Is passion critical for project success? How does one's passion inspire others? Did people not participate because they were not passionate about the subject or were they unaware of the benefits? Why would a school decide not to apply for SEP&EP development funding?

A final recommendation for future research would be to study if there is a correlation for success in schools who have implemented other policies/plans (forest, wellness, etc.). If a school community is well versed in implementing new initiatives, would they have a better chance of successfully developing and implementing an SEP&EP?

## **REFLECTIONS OF RESEARCH STUDY**

When I look back over this whole research process, a few special moments come to mind. The first happened when I was visiting with District A in the summer of 2009. They had just received approval to begin working on their SEP&EP and I was there to observe it all. One of the first things the group did

was schedule an energy audit with the Focus on Energy Advisor for their area. I joined them on the audit and it was amazing how eye opening that three hour tour actually was for everyone present. I heard teachers comment that they had never expected to learn so much visiting the boiler room of their school. I could see the light bulbs (compact fluorescent, of course) turning on above their heads. I couldn't help but smile because I was the one who brought them together. I facilitated the series of events that led up to that moment. I felt like I was in the right place at the right time. Now there were moments where I didn't feel like that at all; sometimes I felt like the group was driving off the road and there was nothing I could do to stop them. But, I would think back to that special 'A-HA' moment and it would help me get through the tough patches.

Another realization I had during this process was that I wasn't the only one who was passionate about energy. Usually when I am in a room full of people, I am the one who can't stop talking about how to save energy in schools, or neat activities that students can do to use their school building as a learning laboratory. Over the last couple of years, I met people that were just as passionate as me or even more so because some of them had been teaching about energy for over 30 years. There were times when I felt I was a one woman army and I was charged with taking on the world, one school district at a time. When I realized that there are people out there filled with as much passion as I am, I could sort of sit back and watch, letting things happen before my eyes. When I gave up control of the situation, it was clear that these school districts

would do just fine. They got it, they understood the importance of developing an SEP&EP, and my job was to simply observe the process and occasionally do a little redirecting to keep them on the road. I knew I wasn't going to do anything for them; I was just pleased to see so many people that wanted to get it done for themselves.

The last memory I would like to comment on was when I was putting together the response matrix for the questionnaires. I had been receiving completed questionnaires via email for a few months and had been tucking them into a file until I was ready to start analyzing the data. Once I began that process, I couldn't stop. There was one question in particular that brought a smile to my face every time I read a response: *Would you recommend that other school communities in Wisconsin develop a School Energy Policy and Education Plan? Why or why not?* Every single person who responded said yes. Some even said absolutely with an exclamation point! I couldn't help but smile, not only because I was happy that the grant program was such a success, but because this meant that all the ups and downs, concerns and barriers, were not too insurmountable that people didn't think the effort was worth it. Many said that even though it was a lot of hard work and that it required a lot of time, they would still recommend that others follow their footsteps, their more carbon neutral footsteps.

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## APPENDIX A

### School Energy Policy and Education Plan Template



# School Energy Education Grant Program

### School Energy Policy and Education Plan Template

A school building is more than just a set of classrooms and offices; it is a living structure. Energy flows through a school building just like any living thing. Some schools are managing their energy use wisely and efficiently, others are not. School buildings are an excellent resource for students to explore when learning about energy. To utilize a school building to its fullest potential, a connection between energy education and the school curriculum should be made. The School Energy Policy and Education plan is the tool to make these connections.

This document provides an outline, as well as a brief description, to develop a School Energy Policy and Education Plan. The components of the outline identified below are required to develop an approved plan.

The outline was developed in collaboration with educators and energy professionals from across the state and was reviewed by energy and resource management professionals.

If you have any questions about this School Energy Policy and Education Plan outline, please contact Melissa Rickert, the outreach specialist with KEEP at: 715.346.4320 or [mricket@uwsp.edu](mailto:mricket@uwsp.edu).

#### Structure:

1. Executive Summary
  - a. Goals
  - b. Objectives
  - c. Rationale
  - d. Plan Development Process
2. Energy Management Policy
  - a. Background
  - b. Purpose
  - c. Policies
3. Energy Education Policy
  - a. Philosophy Statement
  - b. Goals
  - c. Curricular Framework
  - d. Staff Development Plan
  - e. Involving Building Occupants

4. Monitoring & Reporting
  - a. Energy Management Plan
  - b. Energy Education Plan
5. Sustaining Energy Education Initiatives
6. Appendix
  - a. Energy audit report
  - b. Additional supporting documents

**KEEP expects the resultant School Energy Policy and Education Plan to be a unique document based on the strengths and needs of the district (e.g., human, site, equipment, and local curriculum).**

## **Acknowledgements**

The School Energy Policy and Education Plan template was created through the efforts of many individuals and organizations. The Wisconsin K-12 Energy Education (KEEP) and Focus on Energy were the coordinators for this project.

Participants directly involved with the development of the School Energy Policy and Education Plan template:

Lisa Fox, Wisconsin Energy Conservation Corporation & Focus on Energy

Jennie Lane, KEEP

Patricia Marinac, UW-Stevens Point & KEEP

Melissa Rickert, KEEP

Charlie Schneider, Focus on Energy's Schools & Local Government Program

### **1. Executive Summary (1-2 pages)**

The executive summary will provide an overview of the School Energy Policy and Education Plan, including why and how the plan was developed.

#### **Goals**

Explain the **desired outcomes** of developing a School Energy Policy and Education Plan; what will be different after the School Energy Policy and Education Plan is implemented.

#### **Objectives**

Explain the **knowledge and skills** that the school building occupants (students, teachers, administration, and staff) will acquire as a result of the School Energy Policy and Education Plan.

#### **Rationale**

Explain the **importance** of having the school building occupants learn the concepts or skills outlined in the School Energy Policy and Education Plan; why is it important to develop energy management and energy education policies.

### **Plan Development Process**

Describe **who was involved** in the development of the School Energy Policy and Education Plan. Explain any **challenges** that arose during the process and what **strategies** were used to overcome them. Describe any unexpected things learned along the way that may be of interest to future School Energy Policy and Education Plan developers. Also include a statement acknowledging KEEP for funding, in part, the development of your School Energy Policy and Education Plan.

## **2. Energy Management Policy (recommended number of pages: 5)**

An energy management policy articulates the school's commitment to energy conservation and efficiency by defining energy management protocol for school energy systems such as lighting, temperature control, and personal appliances.

You may either use an existing energy management policy or use the planning time provided through this grant to create a new policy or update an existing policy. New or revised policies may need to be presented to the School Board for proper approval. The policy should reflect recommendations from the Focus energy audit and best energy management practices discussed in the Commercial or School Practical Energy Management (CPEM or SPEM) or during the Building Operator Certification training.

### **Background**

Describe when the school's energy management policies were first approved by the School Board and explain any significant changes that were made over the years.

### **Purpose**

Provide a statement explaining the importance of a thorough, well planned, accepted energy management policy.

### **Policies**

Policies should be as detailed as possible and cover all areas of the school building (classrooms, kitchen, pool, offices, gymnasium, etc.).

- **Lighting**
- **Heating, Ventilating, and Air Conditioning** (if applicable)
- **Computers/Office Machines**
- **Food Service**
- **Building Improvements**
- **Other** (hot water heater settings, use of personal appliances, complaints, vending machines, etc.)

NOTE: If you would like to see samples of existing energy management policies, contact Melissa Rickert at [mricket@uwsp.edu](mailto:mricket@uwsp.edu) or 715.346.4320.

### 3. Energy Education Policy (recommended number of pages: 7)

An energy education policy articulates the school's commitment to energy conservation and efficiency by outlining how energy education will be integrated into the curriculum school-wide.

Whether you are updating an existing energy education policy or developing a new one, please make sure the following components are included.

#### **Philosophy statement**

Develop a philosophy statement regarding energy education that reflects the school's overall educational philosophy.

#### **Goals**

Explain the desired outcomes of integrating energy education into the school's curriculum; how will the students, teachers, and building occupants think, feel, and act differently as a result.

#### **Curricular framework**

This will outline how energy education will be incorporated into each grade level or class and how the school building will be used as a resource. Many of the key concepts found in energy education will likely be addressed in other subject areas; therefore, it is important to involve representatives from as many subject areas and grade levels as possible when designing the framework.

There is no set format for the design and look of the curricular framework; however, the following components must be included for each grade level (use a different sheet for each grade). A minimum of three activities must be included for each grade or subject. A sample layout is provided on page 5.

- **Key concepts**

Use [A Conceptual Guide to K-12 Energy Education in Wisconsin](#) (KEEP) to identify key energy education concepts.

- **Activities – Classroom connections**

Use KEEP activity guides or other energy education guides to identify classroom activities that will be used to address the key concepts; or create your own activities.

- **Site connections**

Describe how you will use the school building as a resource during the activity. It is encouraged to modify activities to use the school building to its fullest potential.

- **Alignment with state standards**

Correlate each activity with the [Wisconsin Model Academic Standards](#) developed by the Wisconsin Department of Public Instruction.

- **Assessment**

Describe how students will be assessed for the knowledge or skills gained during or after the activity, or both.

- **Resources**

Identify the major resources that will be used to conduct the activity (watts-up meter, hand crank generator, Pedal Power, light meter, etc.). Visit the KEEP website [www.uwsp.edu/keep](http://www.uwsp.edu/keep) for classroom resource ideas.

### **Staff development plan**

List the names and grade level or subject of current staff members that have taken a KEEP course in your school. Identify any gaps in grade level or subject that should be covered.

Describe how your teaching staff is planning to enhance their energy literacy in order to conduct the above mentioned energy activities (i.e., KEEP courses, Energy Fair, Solar Tour of Businesses).

### **Involving building occupants**

Describe three energy education initiatives that involve building occupants beyond teachers and students. Explain how each building occupant will be involved in the energy education initiative. Be thorough and include as many building occupants as possible. For example, if a school has an Energy Fair during Earth Week, explain how the kitchen, office, and custodial staff will participate.

## **4. Monitoring & Reporting (recommended number of pages: 2)**

Monitoring and reporting are critical components of a successful School Energy Policy and Education Plan. A baseline of energy use and energy literacy must first be established to determine the success of energy management and energy education policies. There are two areas of monitoring and reporting that must be addressed in this plan: energy management and energy education.

The monitoring and reporting plan for the **energy management** of the school must include:

- The utility bills that have been identified as the baseline for future monitoring efforts, including the month, year, and utility – electric, natural gas, water, etc.;
- who will be responsible for comparing future utility bills to the baseline data;
- what specific information will they be monitoring ;
- how often will they gather or compare data;
- who will they share their results with;
- how will they share their results;
- who is the target audience for each method of reporting; and
- who will be responsible for developing, proofreading, and disseminating the reports?

The monitoring and reporting plan for the **energy education** initiatives of the school must include:

- Who will be responsible for monitoring energy education in the school;
- what specific information will be monitored ;
- how often data will be gathered/compared;

- who results will be shared with;
- how results will be shared;
- who is the target audience for each method of reporting; and
- who will be responsible for developing, proofreading, and disseminating the reports.

## 5. Sustaining Energy Initiatives (1 page)

Developing a School Energy Policy and Education Plan is one of the first steps in managing a school's energy use more effectively, improving operational productivity, reducing costs, and integrating energy education into the school-wide curriculum.

When the plan has been developed, the implementation phase must follow. Describe how you intend to implement your School Energy Policy and Education Plan in a sustainable manner, considering the teachers, students, staff, and community perspectives.

Consider the following:

- How can your school redirect cost savings from utilities to resources used to improve energy literacy?
- If funding is needed to fulfill any of the components above, explain how your school intends to meet that fiscal responsibility.

## 6. Appendix

- a. Energy audit report
- b. Additional supporting documents

## Sample Curricular Framework Layout

### Grade 1

| Key concepts | Activities – Classroom connections | Site connections – Use of building | Alignment with state standards | Assessment | Resources |
|--------------|------------------------------------|------------------------------------|--------------------------------|------------|-----------|
|              |                                    |                                    |                                |            |           |
|              |                                    |                                    |                                |            |           |
|              |                                    |                                    |                                |            |           |
|              |                                    |                                    |                                |            |           |
|              |                                    |                                    |                                |            |           |

## APPENDIX B

### School Energy Policy and Education Plan Grant Application



# School Energy Education Grant Program

### School Energy Policy and Education Plan Grant Application

#### Eligibility

School energy education **funds are restricted to schools within the Focus on Energy territory.**

Email [mrickett@uwsp.edu](mailto:mrickett@uwsp.edu) or call 715.346.4320 to determine eligibility.

#### Instructions

Download this document to your computer and complete the shaded boxes below. Print out your completed application and obtain the required signatures. Keep a copy of the completed application for your records.

#### Fax or mail complete application to:

2009 School Energy Education Grant Program  
Wisconsin K-12 Energy Education Program  
403 LRC, WCEE, UWSP  
Stevens Point, WI 54481  
Fax: 715.346.4698

**Deadline: Fax or Postmarked by May 18, 2009**

**Maximum Grant Request: \$5,000**

#### Contact Information

|   |             |               |
|---|-------------|---------------|
| <b>Name of school:</b>  |             |               |
| <b>Project Director (Contact Person):</b>   |             |               |
| <b>Address:</b>   |             |               |
| <b>Phone:</b>   | <b>Fax:</b> | <b>Email:</b> |
| <b>Name of school electric utility:</b><br>(must be within Focus on Energy territory to be eligible)  |             |               |
| <b>Name of school gas utility:</b><br>(must be within Focus on Energy territory to be eligible)   |             |               |
| <b>Name of the Administering Body:</b><br>(individual or group that will oversee the adoption and enforcement of the School Energy Policy and Education Plan such as the School Board, District Administrator, Principal, etc.) |             |               |

## Signatures

|                                   | Print Name | Signature | Date |
|-----------------------------------|------------|-----------|------|
| Administering Body Representative |            |           |      |
| District Administrator            |            |           |      |
| Principal                         |            |           |      |
| Project Director                  |            |           |      |

## Need

Provide evidence (e.g., energy audit results such as electricity use/sq. ft. or heating BTUs per Heating Degree Day, utility bill data, teacher requests) that there is a need for developing a School Energy Policy and Education Plan:

Describe any previous efforts that have been made towards developing a School Energy Policy and Education Plan (e.g., adopted energy management policies, adopted energy education curricula):

## Goals and Objectives

**Goal:** Develop or enhance a School Energy Policy and Education Plan that will improve a school's operational productivity, reduce costs, and integrate energy education into the school-wide curriculum.

**Objective:** By December 2010, the Administering Body will have adopted a School Energy Policy and Education Plan.

## Activities

The activities described below will require a significant amount of staff time to accomplish. These grant funds are intended to compensate a portion of the time required to carry out the activities and meet the project goals and objectives. By submitting this grant application, it is understood that the activities outlined below will be completed unless otherwise indicated.

Following are some required\* and *recommended* steps for developing an Energy Policy and Education Plan for your school or school district. For each step you are asked to 1) indicate if you propose to complete the step, 2) provide supportive information, 3) note the expected date of completion, and 4) enter the funding amount requested. More information about what is involved in these steps and the maximum funds available for each step are provided in the document [Steps and Funds Available for the Development of a School Energy Policy and Education Plan](#).



**NOTE:** If any of the steps outlined below have already been completed, indicate the date of completion and provide a brief description of the activity in the space provided under the **2. Supportive information/explanation** column. Funding will not be granted for activities that have already been completed.

| Step  | 1. We propose to complete this step (Project Director initials) | 2. Supportive information/explanation | 3. Expected date of completion | 4. Funds requested |
|---|---|---------------------------------------|--------------------------------|--------------------|
| <b>A. *Form a Task Force and meet regularly (required - please list members in the table below)</b> |   |                                       |                                | N/A                |

**Task Force Members**

| Name | Title | Sector Represented (e.g., Administration, Faculty, Facilities) |
|------|-------|--|
|      |       |  |
|      |       |  |
|      |       |  |
|      |       |  |
|      |       |  |

**NOTE:** One of the most important criteria for determining which applications will be funded will be evidence that this Task Force is motivated and able to develop this plan. Please provide a statement that reflects the Task Force's interest and dedication:

|  |
|--|
|  |
|--|

| Step   | 1. We propose to complete this step (Project Director initials) | 2. Supportive information/explanation | 3. Expected date of completion | 4. Funds requested |
|--|---|---------------------------------------|--------------------------------|--------------------|
| <b><i>B. Form an Energy Committee and meet regularly (recommended)</i></b> |   |                                       |                                | N/A                |
| <b><i>C. Review existing energy policies</i></b>                           |   |                                       |                                |                    |

|  |  |  |  |     |
|--|--|--|--|-----|
| <i>(recommended)</i>   |  |  |  |     |
| <b>D. *Participate in an energy audit</b><br>(required)  |  |  |  |     |
| <b>E. *Draft School Energy Policy and Education Plan</b><br>(required)   |  |  |  |     |
| <b>F. *Solicit administrative, faculty, &amp; staff input and feedback</b><br>(required – describe how you will do this in column 2)                           |  |  |  |     |
| <b>G. *Disseminate information to the community related to the progress of the project</b> (required – describe dissemination strategies in column 2)          |  |  |  |     |
| <b>H. *A minimum of eight (8) teachers will participate in the <a href="#">KEEP School Building Energy Efficiency Education</a> course</b> (required)          |  |  |  | N/A |
| <b>I. *Two (2) members of the Task Force or Energy Committee will attend a <a href="#">Practical Energy Management (PEM) - Schools</a> training</b> (required) |  |  |  | N/A |
| <b>J. *One (1) member of the facilities department will participate in the <a href="#">Building Operator Certification (BOC)</a> program</b> (required)        |  |  |  | N/A |
| <b>K. *The Task Force and Energy Committee members will review and</b>   |  |  |  |     |

|   |  |  |  |            |
|---|--|--|--|------------|
| <b>finalize the School Energy Policy and Education Plan and present it to the administering body (required)</b> |  |  |  |            |
| <b><i>L. Evaluate the process of developing the School Energy Policy and Education Plan (recommended)</i></b>   |  |  |  | <b>N/A</b> |
| <b>TOTAL funds requested</b>  |  |  |  | <b>\$</b>  |

If you have any questions regarding this grant application, please contact Melissa Rickert, KEEP outreach specialist, at [mricket@uwsp.edu](mailto:mricket@uwsp.edu) or 715.346.4320.

## APPENDIX C

### Grant Award Acceptance Form



Wisconsin K-12 Energy Education Program  
Wisconsin Center for Environmental Education  
Learning Resources Center, UW-Stevens Point  
Stevens Point, WI 54481  
715.346.4770; energy@uwsp.edu; www.uwsp.edu/keep

### GRANT AWARD ACCEPTANCE FORM

Project Title: School Energy Policy and Education Plan for the [REDACTED] School District

Grant Award: \$4,000

The undersigned hereby accepts a grant in the amount indicated above, and certifies that:

- 1) The activities described within the applicant's 2009-2010 School Energy Policy and Education Plan grant proposal to the Wisconsin K-12 Energy Education Program (KEEP) will be carried out as proposed with the following changes:
  - a. Since this is the pilot year for this grant program, please inform the KEEP Outreach Specialist of ALL Task Force and Energy Committee meetings. The Outreach Specialist will attempt to attend as many meetings as possible to observe the process and act as a consultant as needed.
- 2) The enclosed *School Energy Policy and Education Plan Template* will be used to develop the School Energy Policy and Education Plan.
- 3) No grant funds will be used to replace or supplant existing funding.
- 4) No grant funds will be used to **implement** the School Energy Policy and Education Plan.
- 5) No funds will be encumbered or expended prior to July 1, 2009 and the receipt of the official *Notification of Grant Award* form. All funds will be expended and a final invoice will be submitted to KEEP on or before December 1, 2010.
- 6) The final School Energy Policy and Education Plan will be submitted to KEEP on or before December 1, 2010.
- 7) Budgetary changes not to exceed 10% of a budget item may be made without the advance approval of KEEP. Budget variances over 10% must be approved in writing in advance by KEEP.
- 8) Original receipts and documentation for expenditures will be kept by grant recipient for 5 years after grant period ending date.
- 9) A final report will be prepared and submitted within 60 days of the end of the project or January 31, 2011 whichever is earlier. The final report will include a copy of:
  - The End of Project Summary Report form
  - The final Budget Expense Summary form
  - A minimum of two photographs of representative activities. Photos must be at least 3" x 4". Digital images submitted must be at least 300 DPI resolution. A signed photo release, allowing KEEP and Focus on Energy to reproduce the image within KEEP and Focus on Energy publications, must be submitted for any and all recognizable person(s) within the submitted images.
  - Copies of all written, visual, or audio materials produced
- 10) All materials produced under the grant shall be copyright of the Wisconsin K-12 Energy Education Program and Focus on Energy, and bear the citation "Produced under a 2009 grant from the Wisconsin K-12 Energy Education Program and Focus on Energy." This statement applies to print, audio, electronic and all other media.

Date

Please sign and return this form by June 15, 2009

## APPENDIX D

### Steps and Funds Available for the Development of a School Energy Policy and Education Plan Grant Application



## School Energy Education Grant Program

### Steps and Funds Available for the Development of a School Energy Policy and Education Plan

Eligibility: School energy education funds are restricted to schools within the Focus on Energy territory. Email [mrickett@uwsp.edu](mailto:mrickett@uwsp.edu) or call 715.346.4320 to determine eligibility.

#### Instructions

Download the School Energy Policy and Education Plan grant application to your computer and complete the shaded boxes. Print out your completed application and obtain the required signatures. Keep a copy of the completed application for your records.

#### Fax or mail complete application to:

2009 School Energy Education Grant Program  
Wisconsin K-12 Energy Education Program  
403 LRC, WCEE, UWSP  
Stevens Point, WI 54481  
Fax: 715.346.4698

**Deadline: Fax or Postmarked by May 18, 2009**

**Total Funds Available: \$5,000**

**NOTE:** If any of the steps outlined below have already been completed, indicate the date of completion and provide a brief description of the activity in the space provided under the **2. Supportive information/explanation** column on the grant application. Funding will not be granted for activities that have already been completed.

#### **A. Form a Task Force and meet regularly (\*required) (suggested timeframe: Summer 2009)**

The working group or School Energy Policy and Education Plan Task Force should be formed by September 2009, consisting of teachers, administrators, facility personnel, etc. This group should have regular meetings to make sure that the activities are being conducted as outlined on the grant application.

The Task Force should be in regular communication with the KEEP outreach specialist and the Energy Advisor from Focus on Energy working with their district to help coordinate the group's

efforts. The task force should be responsible for arranging consulting meetings (via face-to-face, conference call, or email) with the Energy Advisor and the KEEP outreach specialist quarterly, or as needed.

**NOTE: This step is critical in ensuring the success of your School Energy Policy and Education Plan development. Grant reviewers will look closely at the statement that reflects the Task Force's interest and dedication.**

Funds Available: **\$0**

**B. Form an Energy Committee and meet regularly (*recommended*) (suggested timeframe: Summer 2009)**

It is recommended that an energy committee is formed, if one does not exist, with representatives from the various sectors of the school community. The purpose of this committee is to review and present the School Energy Policy and Education Plan developed by the Task Force (identified above) to the Administering Body. Individuals to include on the Energy Committee may include, but are not limited to, School Board officials, Energy Advisor from Focus on Energy, utility representative, District Administrator, School Business Official, District Facilities Manager, maintenance personnel, Principals, Teachers, office staff, Curriculum Coordinator, food service representative, and KEEP outreach specialist.

The Energy Committee should help guide the Task Force as they develop the School Energy Policy and Education Plan and offer insights as needed. The Task Force should provide regular updates to the Energy Committee to not only let them know how the project is progressing, but to also solicit feedback and support as needed.

Funds Available: **\$0**

**C. Review existing energy policies (*recommended*) (suggested timeframe: Summer 2009)**

The Task Force and Energy Committee members should review the School Energy Policy and Education Plan requirements and existing energy-related documents (e.g., utility bills, existing energy management policies, existing energy education activities and curricula). These documents should be used to develop a baseline of energy use and energy education in the school. NOTE: It may be useful to conduct the energy audit (D.) in conjunction with reviewing existing energy policies.

Anyone from the school community that has a history with energy education initiatives or energy management policies should be invited to share their insights during this review time.

Funds Available: up to **\$500** (salary compensation for time spent by district staff outside of contracted time)

**D. Participate in an energy audit (\*required) (suggested timeframe: Summer 2009)**

The Task Force and Energy Committee members will participate in an energy audit of the school conducted by the Energy Advisor from Focus on Energy. The Task Force can work with the KEEP outreach specialist and the Energy Advisor to arrange a time when the majority of the Task Force and Energy Committee members are available. Allow a minimum of one month to schedule an energy audit and receive a final report.

The energy audit should last approximately 2 hours and should cover energy use related to lighting, HVAC systems, pool, kitchen equipment, computer labs, personal appliances, vending machines, etc. NOTE: It may be useful to reviewing existing energy policies (C.) in conjunction with conducting the energy audit.

Funds Available: up to **\$500** (salary compensation for time spent by district staff outside of contracted time)

**E. Draft School Energy Policy and Education Plan (\*required) (suggested timeframe: Summer 2009 – Spring 2010)**

The Task Force will meet numerous times to draft and revise the School Energy Policy and Education Plan. A [School Energy Policy and Education Plan template](#) will be provided by the KEEP outreach specialist to facilitate the drafting process.

Funds Available: up to **\$2,000** (salary compensation for time spent by district staff outside of contracted time)

**F. Solicit administrative, faculty, & staff suggestions and feedback (\*required) (suggested timeframe: Summer 2009 – Spring 2010)**

The Task Force will use strategies such as teacher inservices or school-wide surveys to collect information and suggestions from staff (e.g., effectiveness of current energy policies, suggestions from various sectors of school community regarding the plan, teacher input regarding energy education).

Funding Available: up to **\$1,250** (survey development, administration, and analysis; salary compensation for time spent by district staff outside of contracted time)

**G. Disseminate information to the community related to the progress of the development of the project (\*required) (suggested timeframe: Summer 2009 – December 2010)**

The project director (or other identified person) will disseminate information to the community related to the progress of the development of the School Energy Policy and Education Plan (e.g., school newsletter, Web site, local newspaper).

Funds Available: up to **\$250** (salary compensation for time spent by district staff outside of contracted time)

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**Activities H, I, & J relate to trainings that will support the development and implementation of the School Energy Policy and Education Plan. If the trainings are not available in the fall 2009, they should be by May 2010. Click on the links below for more information about each training.**

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**H. A minimum of eight (8) teachers will participate in the [KEEP School Building Energy Efficiency Education](#) course (\*required) (suggested timeframe: Fall 2009)**

Visit the KEEP Web site to find more information regarding this course. KEEP will coordinate with the Project Director to arrange the dates, location, and guest speakers for the course. Teachers from the school applying for grant funds will have priority when registering for the

course; however, if space is available, teachers from other schools within the district will be allowed to register (up to a maximum of 20 teachers in all).

Funds Available: **\$0** (teachers will receive a scholarship to cover a majority of the graduate tuition and materials fee; however, they will be responsible for the \$75 teacher co-pay)

**I. Two (2) members of the Task Force or Energy Committee (at least one administrator or facilities personnel), will attend a [Practical Energy Management \(PEM\) - Schools](#) training (\*required) (suggested timeframe: Fall 2009 – May 2010)**

Visit the Focus on Energy Web site to find more information regarding this training. KEEP will work with the Project Director to coordinate logistics related to attending this training.

Funds Available: **\$0** (committee members will be responsible for the \$75 registration fee for each person)

**J. One (1) member of the facilities department will participate in the [Building Operator Certification \(BOC\)](#) program (\*required) (suggested timeframe: Fall 2009 – May 2010)**

Visit the Focus on Energy Web site to find more information regarding this training. KEEP will work with the Project Director to coordinate logistics related to attending this training. If the Facilities Director has already received this training, a different facilities staff member may participate in the program.

Funds Available: **\$0** (facility personnel will receive a scholarship to cover \$700 of the \$775 registration fee; however, they will be responsible for a \$75 co-pay and any associated transportation expenses)

**K. The Task Force and Energy Committee members will review and finalize the School Energy Policy and Education Plan and present it to the Administering Body (\*required) (suggested timeframe: Summer 2010 – Fall 2010)**

The Administering Body will need to adopt the final School Energy Policy and Education Plan by December 2010. The Task Force and Energy Committee will be responsible for making sure that the plan is ready for approval.

The Task Force will work with the KEEP outreach specialist to make sure that the final School Energy Policy and Education Plan has all the required components to ensure that funds will be granted as requested.

Funds Available: up to **\$500** (salary compensation for time spent by district staff outside of contracted time)

**L. Evaluate the process of developing the School Energy Policy and Education Plan (recommended) (suggested timeframe: Summer 2009 – December 2010)**

Keep notes or take minutes during meetings throughout the entire process of developing the School Energy Policy and Education Plan. You might ask the Task Force, Energy Committee, or school community members to take a survey to evaluate the success and/or challenges of the process of developing the plan. Identify what worked well and what you might do differently in the future (perhaps with another school in your district).



The KEEP outreach specialist will also be evaluating the development process as part of a larger research project.

Funds Available: **\$0**

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If you have any questions regarding this grant application, please contact Melissa Rickert, KEEP outreach specialist, at [mricket@uwsp.edu](mailto:mricket@uwsp.edu) or 715.346.4320.

## **APPENDIX E**

### **Initial Interview Questions**

1. Who is leading the School Energy Policy and Education Plan development process for your school district?  
  
>Clarifier: Who set s up meetings, emails reminders to the committee, etc.
2. Why did you choose to be a part of the School Energy Policy and Education Plan development process for your school district?
3. What experiences do you bring to the School Energy Policy and Education Plan development process?  
  
>Clarifier: Experiences include strengths, talents, skills, etc.
4. On a scale of one to five, to what extent do you see yourself being involved with the overall process of developing the School Energy Policy and Education Plan? Five (5) being to a large extent and one (1) being to a minimum extent.
5. Who will benefit from the implementation of the School Energy Policy and Education Plan?
6. What, if any, are your concerns regarding this development process?  
  
>Clarifier: Do you foresee any barriers?
7. Is there anything else you would like to add?

## APPENDIX F

### Questionnaire

1. Below are listed the steps of the School Building Energy Policy and Education Plan development process. Please bold/highlight/circle to what extent you were involved with each step. One (1) not involved at all, two (2) somewhat involved, and three (3) very involved. If there are other steps that you were involved in that are not listed, please write them in the space below labeled *Other* and bold/highlight/circle the corresponding number. If you would like to explain any answers, there is a space provided at the bottom of the list for any comments.

|   | Not involved at all | Somewhat involved | Very involved |
|---|---------------------|-------------------|---------------|
| Forming Task Force/<br>Energy Committee             | 1                   | 2                 | 3             |
| Reviewing existing policies                         | 1                   | 2                 | 3             |
| Energy audit  | 1                   | 2                 | 3             |
| Drafting policies                                   | 1                   | 2                 | 3             |
| Gathering draft policy<br>feedback from others      | 1                   | 2                 | 3             |
| Drafting energy education<br>plan (curriculum)      | 1                   | 2                 | 3             |
| Gathering education plan<br>feedback from others    | 1                   | 2                 | 3             |
| Disseminating information                           | 1                   | 2                 | 3             |
| KEEP Course   | 1                   | 2                 | 3             |
| Practical Energy<br>Management (PEM)<br>Training    | 1                   | 2                 | 3             |
| Building Operator<br>Certification (BOC)<br>Program | 1                   | 2                 | 3             |
| Final draft of plan                                 | 1                   | 2                 | 3             |
| Approval (School Board,<br>etc.)                    | 1                   | 2                 | 3             |
| Evaluation of process                               | 1                   | 2                 | 3             |
| Other:  | 1                   | 2                 | 3             |
| Comments:   |                     |                   |               |

2. Below are listed the steps of the School Building Energy Policy and Education Plan development process. Please bold/highlight/circle with what level of ease or difficulty did each step take to accomplish. One (1) easy to accomplish, two (2) somewhat difficult to accomplish, and three (3) very difficult to accomplish. If you were not involved during one of the steps, bold/highlight/ circle N/A. If there are other steps that you were involved in that are not listed, please write them in the space below labeled *Other* and bold/highlight/circle the corresponding number. If you would like to explain any answers, there is a space provided at the bottom of the list for any comments.

|   | Not involved/<br>Not<br>Applicable | Easy to<br>accomplish | Somewhat difficult<br>to accomplish | Very difficult to<br>accomplish |
|---|------------------------------------|-----------------------|-------------------------------------|---------------------------------|
| Forming Task Force/<br>Energy Committee             | N/A                                | 1                     | 2                                   | 3                               |
| Reviewing existing<br>policies                      | N/A                                | 1                     | 2                                   | 3                               |
| Energy audit  | N/A                                | 1                     | 2                                   | 3                               |
| Drafting policies                                   | N/A                                | 1                     | 2                                   | 3                               |
| Gathering draft policy<br>feedback from others      | N/A                                | 1                     | 2                                   | 3                               |
| Drafting energy<br>education plan<br>(curriculum)   | N/A                                | 1                     | 2                                   | 3                               |
| Gathering education<br>plan feedback from<br>others | N/A                                | 1                     | 2                                   | 3                               |
| Disseminating<br>information                        | N/A                                | 1                     | 2                                   | 3                               |
| KEEP Course   | N/A                                | 1                     | 2                                   | 3                               |
| Practical Energy<br>Management (PEM)<br>Training    | N/A                                | 1                     | 2                                   | 3                               |
| Building Operator<br>Certification (BOC)<br>Program | N/A                                | 1                     | 2                                   | 3                               |
| Final draft of plan                                 | N/A                                | 1                     | 2                                   | 3                               |
| Approval (School<br>Board, etc.)                    | N/A                                | 1                     | 2                                   | 3                               |
| Evaluation of process                               | N/A                                | 1                     | 2                                   | 3                               |
| Other:  | N/A                                | 1                     | 2                                   | 3                               |
| Comments:   |                                    |                       |                                     |                                 |

3. How did you disseminate information to others, outside of the Energy Committee, regarding the School Energy Policy and Education Plan?

>Clarifier: Others include family, friends, co-workers, media, etc.

4. Would you recommend that other school communities in Wisconsin develop a School Energy Policy and Education Plan? Why or why not?

## **APPENDIX G**

### **Final Interview Questions**

**Final interview Questions** to be asked of the key Energy Committee members working on the grant

1. What barriers affected the School Energy Policy and Education Plan development process?

>Clarifier: Barriers may include challenges, hurdles, obstacles, etc.

2. What facilitators aided in the development process? How?
3. Would your [school/school district] have developed the School Energy Policy and Education Plan if funding was not available? Why or why not?
4. How would you change the process in which your school's Energy Policy and Education Plan was developed?

>Clarifier: Would you add, omit, or change the sequence of any of the steps during the process?

5. What is the relationship between your [school's/school district's] energy policy and energy education plan?

>Clarifier: Does one enhance or reference the other?

6. How did developing a School Energy Policy and Education Plan contribute to the energy literacy of school building occupants?
7. How did developing a School Energy Policy and Education Plan contribute to conserving energy in the school facility?
8. Is there anything else you would like to add?

## **APPENDIX H**

### **Timeline**

Spring 2009 – All three school districts submitted their School Energy Policy and Education Plan grant applications

May 2009 – Districts A and B were awarded grants to develop SEP&EP

Summer 2009 – Began observing plan development process in Districts A and B

December 2009 – Conducted initial interviews in District A and transcribed interview material, District C awarded grant to develop SEP&EP

Spring 2010 – Conducted initial interviews in District B and transcribed interview material, began observing plan development process in District C

Summer 2010 – Conducted initial interviews in District C and transcribed interview material

Fall 2010 – Administered questionnaires and conducted final interviews for Districts A and C

November 2010 – Final SEP&EPs for Districts A and C were submitted to KEEP

January 2011 – Administered questionnaire and conducted final interviews for District B, final SEP&EP for District B was submitted to KEEP

# **APPENDIX I** **Calculated Person-Hours Spent on Development Process**

## **District A**

| <b>Participant</b> | <b>Paid Hours</b>       | <b>Volunteer Hours</b> |
|--------------------|-------------------------|------------------------|
| A1                 | 85                      | 30                     |
| A2                 | 76                      | 25                     |
| A3                 | 76                      | 25                     |
| A5                 | 0                       | 20                     |
| Various            | 0                       | 47                     |
| Subtotal           | 237                     | 147                    |
| <b>Total</b>       | <b>384 Person-Hours</b> |                        |

## **District B**

| <b>Participant</b> | <b>Paid Hours</b>         | <b>Volunteer Hours</b> |
|--------------------|---------------------------|------------------------|
| B1                 | 30                        | 50                     |
| Various            | 82.5                      | 10                     |
| Subtotal           | 112.5                     | 60                     |
| <b>Total</b>       | <b>172.5 Person-Hours</b> |                        |

## **District C**

| <b>Participant</b>       | <b>Paid Hours</b>          | <b>Volunteer Hours</b> |
|--------------------------|----------------------------|------------------------|
| C1                       | 0                          | 36                     |
| C2                       | 28                         | 6                      |
| Various teachers         | 83.25                      | 36                     |
| Administrative assistant | 10.5                       | 0                      |
| Webmaster                | 3                          | 0                      |
| Subtotal                 | 124.75                     | 126                    |
| <b>Total</b>             | <b>253.75 Person-Hours</b> |                        |

District B spent the fewest person-hours developing their SEP&EP. They had an adopted district energy policy before they began working on their plan.



District A spent the most person-hours developing their SEP&EP. Their school district did not have any energy policy in place before beginning the SEP&EP development process.

District C spent more person-hours than B, but less than A. They updated a district energy policy that was in place before beginning the SEP&EP development process.