



**Ohio's Race to the Top Innovative Programs Grant Application**

**Application Period- March 11-April 8, 2011**

**Please ensure that ALL questions are answered completely in each of the four sections as incomplete applications will not be returned for modifications or completion.**

**Section A**

**1. General School Information**

<p>a) <b>Name of Applicant (LEA):</b></p>	<p>b) <b>Name of School(s):</b> <b>Kenston Local Schools</b></p>
<p>c) <b>Superintendent of Schools:</b> <b>(or equivalent)</b> Name: Robert A. Lee</p> <p>Address: 17419 Snyder Rd. Chagrin Falls, OH 44023</p> <p>Telephone: 440-543-9677</p> <p>Fax: 440-543-8634</p> <p>Email: Bob.lee@kenstonlocal.org</p>	<p>d) <b>LEA RttT Contact:</b></p> <p>Name: Jack Thompson</p> <p>Address: 17419 Snyder Rd. Chagrin Falls, OH 44023</p> <p>Telephone: 440-543-3057</p> <p>Fax: 440-543-8634</p> <p>Email: jack.thompson@kenstonlocal.org</p>
<p>e) <b>School Vision:</b> The Kenston Local School District believes that to sustain and exceed its exemplary status, there must be a clear sense of goals in which all stakeholders have an investment. In order to transform ideals into reality, the following Vision Statement is intended to provide the standards that the Kenston Local School District shall strive to achieve and continuously seek to improve.</p> <p><u>Student Achievement</u></p> <p>An exemplary school district provides opportunities for all students to achieve individual academic excellence and maximize</p>	<p>f) <b>School Mission:</b> <i>The Mission of the Kenston Local School District is for each student to achieve individual academic excellence and to maximize personal growth in a community which demonstrates and develops mutual respect, responsibility, and life-long learning.</i></p>

personal growth by:

- Providing instruction to ensure all students achieve established standards of excellence
- Inspiring students to develop their individual academic, career and personal goals
- Developing and implementing procedures by which students' behavior, academic progress, and emotional well-being are continually monitored and appropriate services are initiated as needed
- Teaching all students to accept responsibility for learning, decisions, and behavior and to become problem solvers and critical thinkers
- Providing a dynamic curriculum that includes mastery of academic content and integrates acquisition of essential life skills

#### Community Partnerships

An exemplary school district is committed to establishing and maintaining effective partnerships with its community – parents, residents, businesses, government agencies and other educational systems. It continuously develops the community's allegiance, ownership and support. Such a district:

- Establishes and promotes active two-way communication
- Initiates, sustains, and is receptive to collaborative efforts among all partners
- Provides access to the district's resources
- Develops programs to engage members of the community
- Provides continuing education for life-long learners
- Works with parents to have an active role in the education of their children

#### Culture/Climate

An exemplary school district is a community,

which demonstrates and develops mutual respect, academic excellence, and life-long learning. The schools of such a district:

- Promote relationships based upon mutual respect and consideration
- Achieve a sense of pride through recognition of student and staff accomplishments
- Provide an emotionally and physically safe environment
- Establish and administer an effective discipline policy that promotes a safe and positive learning environment
- Maximize instructional time

### Leadership

An exemplary school district requires effective leaders who facilitate academic excellence and maximize collaborative progress towards the district mission, vision and goals. In such a district the leaders:

- Facilitate stakeholder participation in an effective decision-making process
- Are committed to continuous improvement with high expectations for students, staff and community
- Create an environment focused on planned, sustained professional development aligned with district goals
- Foster leadership in others and develop effective communication among community members, parents, staff, students and faculty

### Resources

An exemplary school district continuously evaluates the effectiveness of its resources to optimize their impact on maximum student achievement and personal growth by:

- Demonstrating fiscal responsibility by providing resources that enable long-range financial planning to safeguard the community's investment in education
- Rigorously utilizing and maintaining

<p>facilities, transportation, and food services by providing an emotionally and physically safe, supportive environment that meets the needs of the students, staff, administration and community, creating pride in the district</p> <ul style="list-style-type: none"> <li>• Continuously planning, evaluating and providing for future facility needs</li> <li>• Providing and utilizing technology to impact student achievement and preparing students to use the tools of the modern world</li> <li>• Pursuing and securing financial resources to supplement operating funds (donations, grants, etc.)</li> <li>• Supporting the courses of study with appropriate texts, materials and supplies</li> </ul>	
<p>g) <b>Primary Goals of School:</b>  <i>To provide for the individual academic, physical, social, and emotional needs of all students that will ensure they reach their full potential. Serve as a model for other districts in developing programming that will enable our students to gain the knowledge and skills necessary to succeed in the 21<sup>st</sup> century global economy.</i></p>	<p>h) <b>Teacher/Student Ratio: 16/1</b></p>

**PLEASE NOTE: In you enter into a collaboration with another LEA, please mark with an \* who the FISCAL AGENT will be if selected for one of the competitive grants.**

**Names and titles of individuals who participated in the March 10<sup>th</sup> Innovation Symposium :**

Mrs. Kathleen Poe, Principal Timmons Elementary School

**2. SCHOOL PROFILE**

STUDENT INFORMATION	
<b>Grades served:</b>	
<b>Enrollment (total number of students served in school applying for Innovative Program):</b>	
Grade Level	Enrollment
Pre K-5	1383
6	253
7	247
8	247
9	249

STUDENT INFORMATION		
10		267
11		278
12		261
<b>Ethnicity and gender data (% of enrollment):</b>		
Black: 4%	White: 92.1%	Male: 52%
Asian/Pacific Islander: 0.9%	American Indian/Alaska Native: 0%	
Hispanic: 0.7%	Multi-Racial: 2.3%	Female: 48%
<b>Percent of students eligible for free/reduced lunch: 13%</b>		
<b>Percent of students identified as special education: 10%</b>		
<b>Names of current competitive grants LEA has been awarded (2010-2011):</b>		
Carol M. White Physical Education Program Grant; ARRA		
<b>Please attach 2009-2010 school Report Card:</b>		
 2009-2010 District Report Card.pdf		

## **Section B**

1. Please check circle(s) next to the specific Innovative Program(s) for which you are applying. Prioritize your preference order to the right of the program, with "1" being your first priority. **A separate application must be submitted for each Innovative Program.**

- Asia Society (International Studies Schools Network)** \_\_\_\_\_
- AVID \*** \_\_\_\_\_
- Early College High School** \_\_\_\_\_
- New Tech Network** \_\_\_\_\_
- STEM\*** 1

**\*Priority may be given to the lowest-achieving schools**

## **Section C**

**Questions Addressing Innovation Selected-** Please answer these questions in the text boxes provided. Provide as many details as possible so that the reviewers can gain a good picture of your school.

1. Identify your selected Innovative Program and the reasons for selection.

With the support of the Innovative Programs Grant, we will install a utility net-metered data interactive 20 kilowatt solar photovoltaic array on the campus of Kenston Local Schools. This array will be broken up into two main sub-arrays; one larger array designed to be a fully functional example of a typical modern commercial net-metered array and a smaller student interactive array specifically designed to maximize student direct interaction and learning. A second equipment purchase, using the grant funds would be the installation of solar panels for student evaluation as well as a viable clean energy resource for heating water at our high school. Both systems would be interfaced with our district's network for real time data evaluation and manipulation by our students and faculty. This benefit would be further enhanced through data availability and sharing for the community at large; local, state, national and international, through the schools participation in the Kilowatts for Education Consortium and its "Real Kids Doing Real Science" program. This program puts the same data that the "pros" get into the hands of our students both locally and through distant learning applications. In this way an investment on one campus can be multiplied to benefit many campuses all while fostering real-world engagement of students across age groups and location from k-12 through college. In addition, opportunities would now exist for our students to meaningfully work and interact with the scientist who design, monitor and maintain these systems, while addressing real world work projects and real world challenges. The Kilowatts for Education Consortium strives to build upon and magnify existing and new educational institution sustainability and renewable energy initiatives through the sharing of lessons learned, curriculum, fund raising initiatives, program development, public awareness and the interdisciplinary experiential engagement of students across age groups and geographical boundaries in real world time-relevant projects.

Beyond the direct educational benefit of these systems, they will also offset existing utility costs freeing up funds for long-term program support. These savings will be further supplemented by revenues generated through the sale of the system REC's (Renewable Energy Credits). In this way, the program's educational investment can be leverage into a long-term financially returning program supporting investment and an innovative model that can be replicated for other districts to follow.

To fully maximize the educational potential of our clean energy options, a critical component of our Innovative program is the addition of a STEM curriculum into both our current elementary science lab program and into required Middle School technology courses. This commitment includes: developing customized STEM units through a digital learning environment,

creating relevant problem-based learning experiences using our authentic energy sources, providing faculty professional development for content, computer and technology, science lab teacher training, and identifying an internal/district "mentor", or Resident Leader Fellow, to champion and ensure our STEM curricular efforts are fully accomplished. Creating a model for our students and other school districts with the inclusion of solar energy as a part of our broader K-12 alternative energy vision is powerful. The authentic materials and methodologies will create learning opportunities for students to read, understand and evaluate real-world data and inspire increased engagement, understanding, dialogue and problem solving around real-world problems such as the ever-increasing importance of our energy use and sourcing decisions.

The Kenston Local School District has demonstrated a commitment to the education and application of renewable energy in its curriculum and in its operations. Kenston purchased the first hybrid bus in the state of Ohio two years ago to provide a cleaner alternative to the traditional school bus and modeled for the parent and student community the District's desire to be responsible to our environment. The application and award of a federal grant for the installation of a utility scale wind turbine on the school campus communicated our district's interest to be financially prudent, but also re-enforced the priority for our school community to support the use of clean, renewable energy. To align with the commitment to educate our students in a most engaging manner, a high school course, Alternative Renewable Energy, was created on the premise that the students would engage in real-time, data collection and evaluation. As we continue to develop a rigorous and enriched vertical curriculum that reflects a respect for our environment, our natural and financial resources, and the need for our students to develop a broad knowledge base on energy consumption and a problem-solving to aspire to responsible citizenship, we are seeking to expand our renewable energy sources available for study. We are requesting support to enhance our curriculum, provide authentic data collection capability, by introducing solar energy as an additional and important clean energy source for our school community. The Kenston School District would like to increase its capacity to more holistically model for our community and educate our students on the critical need for our learners to be future problem-solvers in the area of renewable energy sources by adding solar and thermal solar education to our curriculum experience. Our grant request includes both the equipment and instructional components necessary to add authentic solar power to our practices, our culture and our curriculum. Our proposed approach will magnify the positive impacts of our STEM initiatives beyond our campus through our participation in the Kilowatts for Education Consortium. Further,

these initiatives have a direct link to our students professional futures as sustainability and renewable energy related careers represent some of the fastest growing job sectors in the US and across the world.

**2. Describe the capacity your LEA/school has to ensure a successful implementation.**

Over the last several years, energy studies and investigation into alternative energy sources has been an emerging focus area in our district throughout the various buildings and grade levels. All efforts are creating a synergy and an instructional structure which will support a dedicated scope of study and a substantial project-based experience for students.

The Kenston School District was one of three school districts in the state of Ohio to be awarded a federal ARRA grant dedicated to renewable energy. In addition to receiving this grant, Kenston was also awarded an Ohio Department of Development grant; combined, exceeding a million dollars. This funding will be used to install a 750 kW wind turbine on the Kenston school district campus. The benefit of this project is twofold. First, it will power a large portion of our high school with a projected savings for the district of over \$100,000 annually. Secondly, and no less significant, the addition of a wind turbine will serve as a powerful learning tool for our entire student body. As an example, even in the earliest phases of the project, students were immediately involved in the required project validating data collection. Through a collaborative effort, instrumentation, provided by Green Energy Ohio and a long-term initiative partner, The Renaissance Group, was connected to our existing 140 foot radio station tower for students and district personnel to conduct the necessary wind study. Once the turbine is erected, data generated from this energy source will interface with technology to allow real-time data to be studied by students, faculty, parents, private industry and the larger academia.

Kenston has demonstrated a local commitment to incorporate renewable energy study into district curriculum, fully recognizing our obligation as a school community to educate our learners on the fragility of our environment. After actively pursuing the wind turbine project for several years, in late March, the advertisement for bids has been completed. While a major addition to our campus and school culture, the turbine is just one component of a larger vision. The Kenston Local Schools has also received state grant dollars to add the first hybrid school bus to our traditional fleet of buses. A district-wide paper and aluminum recycling program, which includes efforts by all students and participation by all buildings, has extended to composting by our contracted food service provider. The

addition last year of a renewable energy course in our high school has attracted student and parent interest. The inclusion of weather, wind power, and clean energy practices to our elementary science lab class, as well as an extended school-wide renewable energy unit (in cooperation with Case Western Reserve University and the Great Lakes Science Center) has created a fundamental awareness of the powerful interplay between the environment and people as consumers. Additional partnerships exist with the Cleveland State University Technology Department, an education consortium, Kilowatts for Education, and with other recipients of the federal ARRA grant. These collaborative efforts have allowed Kenston to continue to more meaningfully align our efforts and actions in pursuit of a comprehensive educational approach to guiding our students to be problem-solvers in the areas of data collection, mathematics, technology and environmental science.

Understanding clean energy has not only become a consistent focus district wide, but has also been specifically targeted by each building in the following developmentally appropriate ways.

### **Kenston High School**

The addition of a renewable energy science course at the high school level has peaked student interest in this topic as a critical area of study for the 21<sup>st</sup> century learner. Concurrently, the wind turbine project has created additional enthusiasm and has established a reality of an alternative energy source that is accessible to our students and within reach of the common community. The structure of the class and the availability of real-life applications provide a strong foundation for STEM enhancements.

A popular and active Environthon Club has provided students with a passion for preserving our environment, opportunities to demonstrate their commitment to action. Over thirty club members assisted elementary students this year in building Lego wind turbines as a part of a larger wind energy unit.

### **Kenston Middle School**

An existing Middle School course, Technology Education, offers students a hands-on experience with an emphasis on building (engineering), science, math and technology. This course is currently required for all 7<sup>th</sup> and 8<sup>th</sup> grade students. Testing and evaluating wind speed using a wind tunnel is one of the units included in this course. This past year, the county gifted education coordinator has created a science club for girls at the middle school. Both existing programs would provide the necessary framework for the inclusion of STEM curriculum, enhancing the learning experiences for all students. A strong Science Olympiad club that carries on throughout high

school offers students the opportunity to immerse themselves in major project-based science activities. Students then showcase and network with other schools through regional, state, and national competitions. Although Science Olympiad is competitive, most events are team competitions requiring teamwork, group planning, and cooperation.

### **Kenston Intermediate School**

Taught by a licensed teacher, the science lab program is available to 730 elementary students each week. The lab is innovative for the elementary school as it focuses on experimentation and building functional competency with scientific measurement tools. Students think most capably in a concrete manner and therefore are engaged in a very physical, hands-on experience with a focus on the relevance of precise measurement and data interpretation in the evaluation of experimental outcomes. The lab translates abstract concepts into concrete learning through the application of scientific processes of observation, measurement, hypothesis, experimentation, and organization of data. Learning outcomes are aligned with State standards and district courses of study. Over the last several years, the science lab has evolved into an integrated learning experience where technology, mathematic, and science are combined into lesson activities designed to promote evidenced based problem-solving and hands-on discovery. The teacher of this program was a 2011 recipient of the Vernier Technology Award and was honored in early March at the NSTA conference held in California. The award will support the purchase of additional technology to increase student capacity to measure and evaluate data. The Science Lab program is currently structured to support the addition of an extensive renewable energy unit and STEM instructional methodologies within its existing curriculum framework.

### **Timmons Elementary School**

In response to the construction of a wind turbine on campus, Timmons Elementary students participated in a six week school-wide unit earlier this year as an extension of their classroom instruction. At the conclusion of this unit, our primary students gained an understanding of the clean renewable energy that wind power produces as well as learned about the operational function of a wind turbine.

In collaboration with the Great Lakes Science Center, Case Western Reserve University and with financial support from our Parent/Teacher Organization and the Walmart Foundation, the Timmons student body (680 students) were engaged in standards-based/project – based learning through Lego turbine construction, science lab simulations, related math lessons, literature connections, interactive websites reinforcing renewable

energy lessons, a custom field trip to the Great Lakes Science Center for hands-on learning experiences and opportunities to work with high school and college students. This extensive unit can be duplicated and further enhanced with STEM instructional design.

**Gardiner Early Learning Center**

In Kindergarten and the early primary grades, standards related to understanding weather, the sun, the impact of the sun on wind power and direction, will provide an excellent foundation for further investigation into our potential clean energy sources. Additions to the science course of study with application in our elementary science lab, required for all grade 1-5 students, would support the instructional component of this new equipment. Continued collaboration with the Great Lakes Science center and Case Western Reserve University will assist the faculty in creating meaningful elementary opportunities for problem-based learning with respect to the carbon footprint we are destined to leave if changes in thinking and behavior do not occur in our youngest learners.

3. In what other school transformation strategies has your school been engaged and its/their status.

Kenston Local School District has demonstrated financial stability for many years from consistent support from our community and will remain stable in the future. We also have the human resources and a skilled leadership team to provide the necessary experience needed to successfully implement federal and state grants initiatives. Most recently we were awarded a Physical Education Program grant for over \$750,000. This three year grant required the development of local community partnerships that were willing to supply an increasing percentage of matching funds, which we successfully secured. We currently have over 33 people volunteering to serve on the Physical Education Program grant project team to ensure the grant goals are properly implemented for the benefit of our students' health and wellness. Our community rallied together to raise over \$450,000 in private donations to install all weather turf in our athletic stadium that now permits the district and community to maximize student use. Projects like these demonstrate how, over the years, our school district has developed a culture that is accustomed to and expects to be at the forefront of new initiatives. Time and time again the Kenston community shows they will do whatever it takes to ensure endeavors such as these are successful and leveraged to maximize the benefits for our youth.

4. How will you integrate the specific Innovative Program into your school culture and current transformation plan/Scope of Work?

Being able to research and study wind, solar, and other alternative and renewable energy sources in an authentic setting utilizing problem base learning fits seamlessly within the culture that currently exists in our district. For example, we currently operate an FM radio station on campus where our students develop an understanding of broadcast law, work to develop an online personality, script, and create the programming through a two year entertainment marketing curriculum that gives the students hands on experience. Much of what we do as a district is captured on our award winning web site for which we have been recognized nationally. It is widely known through our community and the surrounding area that information can be easily accessed on the Kenston school web pages. The Kenston website represents a true depiction of what is important to our district and part of our school district culture. Upon receiving this innovative program grant, a web page would be created that would be dedicated to encapsulating the progress being made on this STEM initiative. The main goal of our scope of work in the transformational plan is to develop an innovative evaluation system part of which will be based on student input of teacher effectiveness. A STEM curriculum, creating real life experiences that allow students to learn through problem- based projects and discovery can serve as a model for teachers to learn from as they work to improve their instructional effectiveness. As the multi-faceted evaluation system becomes an accepted tool for teacher improvement, curriculum design emphasizing problem based learning will become the norm and continue to spread from science, technology, engineering and math to all of the disciplines.

5. How will implementation of this Innovative Program increase student achievement and progress in your LEA/school for ALL students?

All students in the Kenston School District will be impacted by the expansion of solar energy to our existing priority of "going green" in our school community. Exposure to authentic science and technology experiences will naturally create an enthusiasm for an increased number of our students pursuing rigorous science, math and engineering careers that will position them as leaders in the global economy. This enthusiasm will be further enhanced within our campus and beyond through real-world interactions and collaborations within and outside of the Kilowatts for Education Program facilitated by our programs infrastructure.

Using a STEM framework for instruction provides enriched learning

experiences for increased student performance and achievement. At the elementary level, the standards related to understanding weather, the sun, the impact of the sun on wind power and direction, provide an excellent foundation for further investigation into our potential clean energy sources. Additions to the science course of study, access to authentic wind and solar equipment, and use of interactive whiteboards and other scientific equipment and application of STEM methodologies within our elementary science lab challenge students to integrate multiple content areas for expanded problem-solving. Similar to the elementary focus, a required middle school course would combine math, technology and science in a hands-on STEM environment and highlight the critical topic of energy for our future. Our current high school Renewable Energy course will expand its mathematical, technology and engineering focus to reflect the synergistic balance of a STEM approach.

Having access to authentic clean energy sources and real-time data, combined with STEM aligned pedagogy, students in the Kenston School District will be prepared to meet and exceed Core standards and state expectations. Providing necessary training and ongoing mentoring to teachers responsible for STEM instruction will instill a district-wide understanding of how students apply and synthesize material presented to them. Engaging students in relevant work, identifying real life problems, empowering students to explore solutions, and planning for connections in multiple content areas are all strategies used to promote more complex thinking processes that also encourage incidental and lifelong learning in our students.

**6. How will you sustain this Innovative Program post RttT?**

Incorporating meaningful and sustained professional development throughout the grant period will ensure sustainability, and growth, of the initial renewable energy innovative program. Planned training for core participants (selected administrators and science, technology, mathematics, science lab teachers) on use of the equipment, the various technology components and STEM curriculum design, will subsequently create a powerful structure of internal experts to provide high-quality support and mentoring for teachers as new STEM units are identified and new activities are planned. Using the Ohio Stem Learning Network model, a designated "champion", the trained Resident Leader Fellow, will monitor the vertical articulation of the curriculum and the professional growth needs of participating faculty. Monthly visits to a local platform school, the National Inventors Hall of Fame School in Akron, on-site coaching by

STEM-trained consultants, and ongoing evaluation of STEM implantation will provide the support and focus for our Resident Leader Fellow. Use of waiver days, extended days, designated professional meeting time and faculty meetings will permit this leader to structure formal training opportunities, collaborative planning, and professional dialogues to best sustain the integrity of the STEM approach and expand teacher understanding of our data collection capacity and application.

Being a leading district in the field of education will help not only attract the best teachers dedicated to the field of science, math and technology, but will also provide the opportunity to embed high level professional development in the everyday practices of our teachers. Further, although unique to an educational program, the renewable equipment associated with this initiative will actually offset the schools long-term energy costs freeing up scarce resources for long-term program support. The savings realized by the use of alternative energies will be reinvested in the educational programming established by this grant and dedicated to the upkeep and continuous improvement of the schools educational programs. In addition, Kenston Schools will continue to seek out and create partnerships with universities and companies to expand opportunities for learning in the STEM areas.

Our long-term partner The Renaissance Group, a local renewable energy implementation company, has agreed to mentor the technology and technology integration portions of the project. In addition, the increasing regional activity and industrial growth in the area of alternative energy sources will afford Kenston the opportunity to create long standing partnership with leading companies and other initiatives for which there are numerous examples. Lincoln Electric is in the midst of erecting the largest wind turbine in Ohio as a symbol of their commitment to making this region a center for wind energy in North America. The Lake Erie Energy Development Corporation and the General Electric Company have announced plans to build five wind turbines north of the Cleveland Browns stadium. The Cleveland Freshwater Wind Conference brought international attention to the plans for the wind industry in the Great Lakes. Case Western Reserve University and its industry partners received approval from city officials and the planning commission to erect three wind turbines as part of their Wind Turbine Innovation and Education Research Center.

Established partnerships and extensive opportunities for wind energy are available for curriculum enrichment and real-life application for our students. The renewable energy commitment and momentum in northeastern Ohio provides fertile ground for the addition of other clean energy development such as solar energy. With the inclusion of solar energy into Kenston's curriculum through this Innovative grant, our students will have a well-rounded exposure to research, study and problem-solving

in the renewable energy arena. Our current engagement through the Kilowatts for Education Consortium will facilitate long-term connections and infrastructure through an ever-increasing network multiplying the impacts of the original initiatives.

7. Describe any potential challenges or barriers with the mandatory professional development and Innovative Program requirements for the framework that you have selected. What strategies will your LEA/school implement to overcome these potential obstacles ?

As we have experienced with our other awarded grants, there are always potential problems with zoning and issues related to construction projects. Our ongoing process to gain approval for the wind turbine, afforded us the opportunity to better understand local zoning restrictions, the Ohio Historical Society guidelines, and the Ohio Fish and Wildlife requirements. Already understanding and responding to these construction issues will prove to be invaluable in keeping the project timeline on schedule.

Finding the avenue for districts to provide time for teachers to engage in needed high quality professional development is always a challenge. To address this important component of a STEM curricular approach, our workday and calendar is structured to foster teacher training and support. Our District has carved out time during the school day and after students leave to provide the necessary professional development that will be needed to successfully facilitate this innovative project. Not only are extended days part of our negotiated agreement with the teachers association, we also have a long history of utilizing waiver days throughout the school year to provide intensive targeted professional development that cannot be accomplished in the collaboration time during the school day or during our weekly after school professional development time. In addition, Learning.com, a web-based software company, has developed a comprehensive program that will facilitate the necessary training for our teachers to integrate this web-delivered STEM solution. As part of the partnership with Kenston Local Schools, Learning.com will provide a K-8 digital learning environment SKY as a portal for our project-based learning modules, which will include Solar Panel units and Wind Turbine units. Our participation in the Kilowatts for Education consortium will allow for the advances made and lessons learned to be shared across the participating districts. This will permit our learning teams to focus their efforts on improving and advancing these initiatives, and not on reinventing what is already working elsewhere.

8. How will the implementation of this Innovative Program increase college and career readiness of all students?

Having sophisticated energy sources and technology applications available to our students through our wind and solar energy program provides a vital cornerstone of a comprehensive plan to prepare our students for success in our competitive global environment. Additionally, as a District, we need to ensure that the education our students receive integrates renewable energy content with other critical competencies such as problem-solving, collaboration, creativity, and technological literacy. This will ensure our graduating seniors possess the 21<sup>st</sup> century skills and the advanced content needed to maximize workforce and post secondary options.

According to the Ohio Engineering and Science Technologies Technical Content Standards, competencies that are common and/or are critical for success in the Engineering and Science Career Field include: developing effective collaboration and teamwork skills; providing a broad –based knowledge with integrated skills in mathematics, communication; and developing skills in a specialty area. Using the fuel-based technology course outline developed through a collaborative effort with the Ohio Board of Regents, the Ohio Department of Education and other professional partnerships, the Kenston High School team will model curricular changes to our science coursework to include both general competencies for our students, along with the specific knowledge of the selected specialty area of renewable energy.

The National Science Board issued a report in May of 2010 titled, Preparing the Next Generation of Stem Innovators: Identifying and Developing our Nation's Human Capital, which argues that the educational system is the most logical avenue to impact future innovation in the areas of science, math, engineering and technology. The three keystone recommendations for maximizing student potential as future leaders and contributors in these fields include: providing opportunities for excellence, casting a wide net, and fostering a supportive ecosystem. The coordinated development of a K-12 vertical curriculum, focused on renewable energy sources, with equipment that generates usable energy and provides real-time data will be a catalyst for engaged learning and "opportunities for excellence". Exposing all Kenston students to integrated curriculum, energy conservation materials and hands-on experiences at a young age will "cast a wide net" as recommended by the National Science Board. We can begin to develop interest and nurture talents in content, professions, and post secondary options for the younger student who might not recognize their skills if exposure to such opportunities is limited to more traditional secondary opportunities. Involving segments of our entire student

population, our faculty, and parents in our renewable energy education will facilitate our ability to “foster a supportive ecosystem” in our community. It is advantageous that the foundation of our innovative program, the wind turbine and solar panels, are visible and concrete representations of a course of study and philosophy of learning we wish to recognize, celebrate and share.

At Kenston, we recognize that our curriculum framework for this innovative program must inspire creative problem solving and intellectual curiosity by engaging the student in authentic experiences with contemporary “texts” by trained teachers. A STEM curriculum will be paired with the capital materials and technical equipment necessary to replicate real life situations and solutions in pursuit of advancement in maximizing clean energy options. By beginning with a STEM approach at a young age, our graduating seniors, including students from lower-income backgrounds and minorities traditionally underrepresented in STEM-related fields, will be equipped with competencies that will compliment a 21<sup>st</sup> century skill set as they approach their post secondary choices, and ultimately, careers in the science, mathematics, engineering or technology professions.

A STEM curriculum will be paired with the capital materials and technical equipment necessary to replicate real life situations and solutions in pursuit of maximizing student potential while maximizing clean energy options. By beginning with a STEM approach at a young age, our graduating seniors will be equipped with problem solving and digital literacy competencies that will compliment a 21<sup>st</sup> century skill set as they approach their post secondary choices, and ultimately, careers in the science, mathematics,

9. Identify a timeline to achieve a successful implementation.

1-3 months

Using an outside resource, learning.com and organizing professional visits to a local STEM program, The Inventors Hall of Fame School (Akron city School District), initial training of the core participants will occur in the first three months of receiving the grant award. A lead teacher will be designated as the point person to coordinate the support from the Inventors Hall of Fame School and plan for web-based communication and site visits from learning.com. Participating teachers will be acclimated to the STEM philosophy and provided frequent opportunities to dialogue as a vertical team and plan for the instructional implementation of this program.

The compelling component of the innovative program is the equipment that will allow the curriculum and learning to come to life. Bid openings have recently been scheduled to allow completion of the wind turbine installation no later than in the early spring of 2012. Once notification of the grant award is received, local governmental permission will be secured and specifications will be prepared for the installation of solar photovoltaic and

solar thermal panels.

### 3-6 months

During this time period, in collaboration with learning.com consultants and the designated district coordinator, initial STEM curriculum units will be developed for use in the existing science lab structure grades 1-5. Using a STEM approach, adjustments to local courses of study and the Middle School and High School course descriptions will be modified. Participating teachers will receive release time to collaborate vertically with colleagues and plan for unit development.

Once all local restrictions have been addressed and the bid process has been completed, the District will purchase and install the solar panels. Training will be offered to the designated team of teachers on the features of the solar panels.

Ongoing consultation will exist with our technology department to ensure the installation of the data collection instrumentation and the creation of the interfacing capabilities within our district network. Specific training with our teacher team on the capacity of our technology to accrue and monitor real time data for instructional purposes will be essential to the program's success.

### 9-18 months

During this time period, continued structured professional development for STEM teacher leaders will be provided to expand unit offerings to our students and increase our understanding of the potential of this program to reach all students in a meaningful way.

Communication with families and the entire district faculty on STEM education and the wind and solar equipment used to support the curriculum will be provided through local media, district newsletters, and a website link dedicated to the innovative grant and STEM programs.

Through District sponsored activities (Science Nights, Open Houses, etc.) community members will be afforded opportunities to hear about the curricular enhancements added to Kenston's course of study.

Additionally, our Kenston Community Education Program will collaborate with the STEM team to offer structured education courses, which will allow community members to access and utilize the data to generate important dialogue on our current problems and potential solutions regarding energy sources.

### 20-24 months

During this period of time, district administration will explore the feasibility of adding additional and progressive high school courses on sustainable energy. In conjunction with the rigorous coursework added, partnerships will be actively pursued with local universities for our students to receive dual credit for this coursework. Additionally, relationships with local energy businesses can lead to onsite training programs for their employees and externship opportunities for our students by matching students with field

professionals in the related science, mathematics, technology and engineering careers.

Throughout the development of our instructional enhancements using on-site wind and solar equipment, a continued emphasis throughout the District will be the pursuit and support of student-centered conservation efforts. Added components to our recycling programs, student activism, and responsible citizenship will be encouraged through our student groups and building-wide programs.

**10. Why should your LEA/school be awarded an Innovative Programs grant?**

Awarding Kenston Local School with an Innovative Program grant is a low risk investment that is guaranteed to maximize the benefits to students that will transcend beyond the school district by serving as a model for other districts to replicate. Kenston has secured financial awards for the advancement of programs that will not only support to core values behind STEM programs, but offer a unique culmination of STEM ideals with alternative energy initiatives for the preservation of our environment. We have a strong track record of success in maximizing the impact of our limited resources and already have significant initiatives in place that will magnify the success of the program. Further, our existing relationships through the Kilowatts for Education Consortium will only enhance the replica ability of the proposed initiatives. We can hit the ground running. Established progression of authentic learning and authentic application of operational energy sources will become common place across school districts in Ohio. We are committed to being leaders and to educating our students on responsible citizenship as stewards of our environment.

## SECTION D

Please include LEA Name, IRN#, and proposed Innovation Program information at the top of this table. Include a breakdown of the annual expenditures anticipated in each budget category during each grant-year that equals the total dollar amount of the innovation program selected.

Proposed Innovation:					
Budget Categories	FY2011	FY2012	FY2013	FY2014	Total
Salaries (100)		15,000	15,000	15,000	\$ 45,000-
Retirement/ Fringe Benefits (200)		2,550	2,550	2,550	\$ 7,650-
Purchase Services (400)		42,000	8,000		\$ 50,000-
Supplies (500)		2,500			\$ 2,500-
Capital Outlay (600)		125,000			\$ 125,000-
Other (800) Technology		19,850			\$ 19,850-
9. Total Costs	\$ -	\$ 202,400-	\$ 25,550-	\$ 23,800-	\$ 250,000-

**RttT Innovative Programs grant applications may be found on the Ohio Department of Education website under Race to the Top at:**

<http://www.ode.state.oh.us/GD/Templates/Pages/ODE/ODEDetail.aspx?page=694>

**Interested LEA/Schools are required to submit the requested grant information electronically to [jay.keefer@ode.state.oh.us](mailto:jay.keefer@ode.state.oh.us) no later than **Friday, May 20, 2011**.**

**Questions may be directed to**

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