

## 2014-2015 School Nominee Presentation Form

### ELIGIBILITY CERTIFICATIONS

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#### School and District's Certifications

The signatures of the school principal and district superintendent (or equivalents) on the next page certify that each of the statements below concerning the school's eligibility and compliance with the following requirements is true and correct to the best of their knowledge. *In no case is a private school required to make any certification with regard to the public school district in which it is located.*

1. The school has some configuration that includes grades Pre-K-12.
2. The school has been evaluated and selected from among schools within the Nominating Authority's jurisdiction, based on high achievement in the three ED-GRS Pillars: 1) reduced environmental impact and costs; 2) improved health and wellness; and 3) effective environmental education.
3. Neither the nominated public school nor its public school district is refusing the U.S. Department of Education Office of Civil Rights (OCR) access to information necessary to investigate a civil rights complaint or to conduct a district wide compliance review.
4. OCR has not issued a violation letter of findings to the public school district concluding that the nominated public school or the public school district as a whole has violated one or more of the civil rights statutes. A violation letter of findings will not be considered outstanding if OCR has accepted a corrective action plan to remedy the violation.
5. The U.S. Department of Justice does not have a pending suit alleging that the public school or the public school district as a whole has violated one or more of the civil rights statutes or the Constitution's equal protection clause.
6. There are no findings of violations of the Individuals with Disabilities Education Act in a U.S. Department of Education monitoring report that apply to the public school or public school district in question; or if there are such findings, the state or public school district has corrected, or agreed to correct, the findings.
7. The school meets all applicable federal, state, local and tribal health, environmental and safety requirements in law, regulations and policy and is willing to undergo EPA on-site verification.

### U.S. Department of Education Green Ribbon Schools 2014-2015

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Charter
  Title I
  Magnet
  Private
  Independent

Name of Principal: Mr. Mike Maziarz

Official School Name: Academy of Engineering and Green Technology

Official School Name Mailing Address: **55 Forest Street, Hartford CT 06105**

County: **Hartford** State School Code Number \*: **72**

Telephone: **860-695-1315** Fax: **860-722-6602**

Web site/URL: **www.AoEGT.org** E-mail: **mangd001@hartfordschools.org**

I have reviewed the information in this application and certify that to the best of my knowledge all information is accurate.



Date: 12/24/2014

(Principal's Signature)

Name of Superintendent: Dr. Beth Schiavino-Narvaez

District Name: Hartford Public Schools

I have reviewed the information in this application and certify that to the best of my knowledge all information is accurate.



Date: 12/24/2014

(Superintendent's Signature)

### **Nominating Authority's Certifications**

The signature by the Nominating Authority on this page certifies that each of the statements below concerning the school's eligibility and compliance with the following requirements is true and correct to the best of the Authority's knowledge.

1. The school has some configuration that includes grades Pre-K-12.
2. The school is one of those overseen by the Nominating Authority which is highest achieving in the three ED-GRS Pillars: 1) reduced environmental impact and costs; 2) improved health and wellness; and 3) effective environmental and sustainability education.
3. The school meets all applicable federal civil rights and federal, state, local and tribal health, environmental and safety requirements in law, regulations and policy and is willing to undergo EPA on-site verification.

Name of Nominating Agency: Connecticut State Department of Education

Name of Nominating Authority: Dr Dianna R. Wentzell, Interim Commissioner

I have reviewed the information in this application and certify to the best of my knowledge that the school meets the provisions above.



Date: January 22, 2015

(Nominating Authority's Signature)

## SUMMARY AND DOCUMENTATION OF NOMINEE'S ACHIEVEMENTS

Academy of Engineering and Green Technology (AoEGT) is located in Hartford CT. Our Academy is a positive learning environment focused on student success. The school serves 438 students in grades 9-12. More than 95% of our students are eligible for free and reduced lunch. 28% are English language learners and more than 96% are minority students. AoEGT is housed at Hartford High School, the second oldest high school in America.

The Academy of Engineering and Green Technology is an outstanding candidate to be chosen for the U.S. Dept. of Education Green Ribbon Honors. At AoEGT, we have created and participated in many activities using the CT Green LEAF School mission as a model including a school-wide recycling of classroom and cafeteria materials to serve as a city model for other schools; e-waste recycling resulting in 20 tons of e-waste removed from Hartford Public High School (HPHS) basement storage; green waste sustainability composting project which has resulted in several tons of leaf/plant debris being composted and used for bird habitat reconstruction; hosting an Environmental Summit on Sustainability; and hosting community outreach anti-litter campaigns and cleanups in association with the City of Hartford, Knox Parks, and UTC Aerospace.

AoEGT is the CT Green Building Council's 2014 Student Award of Merit recipient. This prestigious award



**Figure 1 Green Apple Day of Service, 2014. 174 AoEGT students and community members worked together.**

was given to the academy for its nationally acclaimed Nepal Project, a wind/solar hybrid power system designed and built by AoEGT students for the village of Saldang Nepal. AoEGT has been a national site for Green Apple Day of Service for the past three years. During these events, over three hundred volunteers have completed 1200+ hours of community service. See the following link for more info on Green Apple Day

of Service <http://aoegt.org/news/> . On Green Apple Day 2014, 174 volunteers showed up from the school, the community, and UTC Aerospace (UTAS).

This group planted four hundred bulbs; built 10+ community garden beds, picked up over 1000 lbs. of Litter from the community, repaired and repurposed broken tables, and renovated 2 large landscaping beds. AoEGT has hosted an Earth Day Cleanup and Celebration for six years running. Hundreds of volunteers have participated in this event over the years. This year, Earth Day Cleanup at AoEGT was a kickoff event for the Clean Hartford Anti-Litter Campaign, a partnership with the city of Hartford and Knox Parks foundation. AoEGT has a Green Team formed of Students and Mentors. In 2013 and 2014, AoEGT's Green Team has chaperoned "Cub Scout" day for 200+ Cub Scouts and their families at the CRRRA Trash Museum in Hartford CT. The Academy of Engineering and Green Technology is best known for its Nepal project program which involves AoEGT students in the design and building of off grid power systems for third world countries.

### **Step 1: Green and Healthy Outlook**

At AoEGT, we have created and participated in many activities using the CT Green LEAF School mission as a model including the following: a school-wide recycling of classroom and cafeteria materials to serve as a city model for other schools; e-waste recycling resulting in 20 tons of e-waste removed from Hartford Public High School (HPHS) basement storage; green waste sustainability composting project which has resulted in several tons of leaf/plant debris being composted and used for bird habitat reconstruction; hosting an Environmental Summit on Sustainability; and hosting community outreach anti-litter campaigns and cleanups in association with the City of Hartford, Knox Parks, and UTC Aerospace.

AoEGT has a Green Team mentored by teacher David Mangus. It is composed of students from the academy and operates at the club level. The schools' Green Team has coordinated two major clean ups within the school and community, annually for the past three years. The Green Team established the academy's classroom recycling program. About every two weeks, AoEGT staff work with students to empty the classroom bins into our central container located in the secondary administrative office. The Green Team also helps build, plant, harvest, and maintain the newly established community garden at the school which supports the cafeteria. The Green Team initiated and coordinated the largest e-waste collection and removal event ever at the school. The Green Team created a lunch waste recycling

program that removes vegetables and fruit from the waste stream and converts them into compost. The Green Team models “green” behavior by demonstrating conservation of lights on school building, and by promoting recycling.

For the past three years, the AoEGT located within HPHS, has been a nationally registered clean-up site and participant in the Green Apple Day of Service, sponsored by the Center for Green Schools at the U.S. Green Building Council. We are one of the largest national sites with 174 volunteers participating this year. Our involvement is registering, organizing, and running this event annually as a nationally recognized and registered site. When considering our efforts on sustainability, our school is at the forefront among schools in the area for recycling, community outreach, and production of solar energy.

The Environmental Science Class at AoEGT is taught by Environmental Engineer Tom Scheuermann. The course meets or exceeds the guidelines for excellence as outlined in the NAAEE report. In the nation, about 5 percent of the graduating class of a high school go on to study Engineering in college. At AoEGT, over 10 percent of each graduating class over the last two years have gone to a four year college to study Engineering. This is twice the national average. All of the students from the Nepal Project entered post-secondary training which is a testament to the program’s success.

Our school has a Green Executive Committee composed of leaders from all three academies at HPHS: AoEGT (David Mangus), Nursing (Deborah Blazys), Law and Government (Genna Waltvogal), CBIA (Adam Ney), community organizer Hyacinth Yenny, and Knox Parks Foundation. KPF is a recent newcomer in the Asylum Hill Association which is a neighborhood group within the target clean-up sites of the Clean Hartford Anti-litter Campaign. This group sponsors two annual green activity days each year at the school. In the fall there is the Green Apple Day of Service, and in the spring, the Committee coordinates Earth Day activities. The group also coordinated grant money to create a community garden in the Great Court Yard at HPHS. At the student level, AoEGT has had a Green Team since 2012. This student team has been an integral part in coordinating green related activities at the school and in the community.

For the past six years, AoEGT has partnered with the Connecticut Business and Industry Association’s (CBIA) sustainability outreach program director Adam Ney, to promote sustainability initiatives in the school, in businesses, and the community. This includes training sessions and literature distribution on

sustainability. Our other critical partnership is with Knox Parks Foundation, which provides tools and expertise for clean-up events and sustainability projects. The school also partners with the City of



**Figure 2 AoEGT Students Assemble the Wind Turbine Components**

Hartford, Department of Public Works and office of the Mayor in promoting and modeling the Clean Hartford Campaign and the Hazardous Waste Disposal Program.

The Academy has received numerous awards and recognitions for the Nepal Project, where students constructed and shipped a solar/wind hybrid electricity generation system

to the remote village of Saldang, in the Dolpa region along the Himalayan

Mountains in Nepal. Because of the efforts of dedicated AoEGT students and through a generous donation made by the Werth Family Foundation, people half a world away were given a gift of a solar and wind powered turbine to electrify computers and a birthing center. AoEGT's Nepal project and team were recognized at

the 2013 CBIA annual meeting for this amazing project. The Connecticut Green Building Council presented the prestigious 2014 Student Design Award of Merit to the eight students from the Academy



**Figure 3 Connecticut Green Building Council's 2014 Student Design Award of Merit, AoEGT's Nepal Project teams was recognized for their work**

of Engineering and Green Technology who worked on

the Nepal Project. Presently, the students are participating in a project known in our community as "Nepal 2.0". This project will complete the same objectives in two additional villages.

The school has hosted a sustainability fair for Greater Hartford area businesses and organizations to collaborate and assess the current issues and practices surrounding the local green agenda. The school's Green Team has networked with neighboring academies by inviting them to take part in sustainability events. One example is providing volunteers at the City of Hartford's annual hazardous waste collection days. Our students pass out flyers on recycling and reducing waste. The school has also collaborated with CBIA, the Knox Park Foundation, and the City of Hartford to participate in the "Clean Hartford Anti-litter Campaign." Students are assigned to neighborhoods and take part in cleanup projects. CBIA News, a monthly newsletter distributed to CBIA's 7,000 plus members, has also highlighted several of AoEGT's sustainability efforts. The school's Green News Club also publishes a quarterly magazine promoting sustainability efforts.

AoEGT educators and staff have created a pipeline for students with intellectual disabilities to learn valuable work skills in preparation for the workforce after graduation. Three students have participated in this program which is supervised by AoEGT and CRRA staff. Students assist the CRRA staff in setting up the museum for events. There are over 50 job skills that are emphasized with this training. Students also develop an understanding of recycling, reducing, and reusing materials. The newest upcoming collaboration is a partnership with Environmental Sciences Magnet at Mary Hooker, a 2013 Green Ribbon honoree, where each school will send students to the other school to educate the students. Mary Hooker Students will work with AoEGT students on Composting and AoEGT students will educate Mary Hooker students on Alternative Energy and Energy conservation using the Project Learning Tree Curriculum.



**Figure 3 Hybrid Wind/Solar Power System built by AoEGT students for the village of Saldang, Nepal**

Please see the links below for info on the Nepal Project:

<http://www.cbia.com/edf/nepalwindturbine.htm>

<https://www.youtube.com/watch?v=6elTgqI-KdI&feature=youtu.be>

<http://www5.cbia.com/cbianews/article/dont-stop-believing-in-us/>

<http://www5.cbia.com/cbianews/article/hartford-high-races-to-power-a-school-in-nepal/>

<http://foxct.com/2013/10/24/hartford-school-harnessing-renewable-energy/>

<http://aoegt.org/nepal-wind-turbine-project/>

## **Step 2: Environmental and Sustainability Literacy**

### Curriculum and Instructional Practices

Each classroom teacher sets and achieves theme based goals which integrate sustainability into each subject area and the course design. The science department uses word lists, reading, projects, and reports, as methods to achieve this goal. Mastery level tracking is utilized as a measurement tool. Students complete pre and post –tests for which are tracked to show growth and demonstrate an eighty five percent or greater understanding of the material (mastery benchmark).

Environmental and sustainability concepts are integrated into the curriculum in all subject areas through department and grade level meetings. All teachers at the Academy of Engineering and Green Technology are required to integrate the four practices of: Reduce, Re-use, Recycle, and Renew into their curriculum. CT standards are used.

The AoEGT created an outdoor classroom in the Great Court of the HPHS campus. This allows teachers to take students outside to demonstrate and experience sustainability concepts such as composting and organic gardening. The students can experience the practice of planting in the garden, harvesting the crop, and returning the plant debris to the compost piles. The school created a habitat for small woodland birds by piling up branches to form a pile in front of one of the leaf compost areas. The birds use the pile for cover and to perch while feeding off of the compost area.

Joan Coleman is the mentor for the Green News Club. This club publishes a short magazine called *The Green News*; it comes out quarterly. The Green News promotes STEM literacy and careers in Green Technology.

The Academy of Engineering and Green Technology has conducted many field trips that focus on Green Technologies and relevant careers in Green Technology. This includes trips to the Waste Water Treatment facility, the Trash Museum, the Yale Peabody museum, guest speakers from UTC aerospace, visits to UTC

Aerospace in Windsor Locks CT. Our school has one of the largest summer internship programs in the state of CT. This program places students in STEM fields for the summer. Since its inception in 2010, over 200 students have participated in AoEGT's summer internship program. In the summer of 2014, students had paid internships at UTC Aerospace, GEI Consultants (Environmental and Engineering Consultants), Pratt & Whitney, UConn Health Center among other companies. All interns prepare for their internships by attending our Youth Employability Skills (YES) workshops, led by business volunteers. The YES workshop takes place over Spring Break. Participating students give up their vacation time in order to receive this training. See this link for more information: <http://www5.cbia.com/cbianews/?cat=7> including the article, "Next Generation Internships Work for Connecticut Businesses". AoEGT students also participate in job shadowing programs in STEM as well as connecting with mentors from STEM fields. All of this encourages students to become more literate and comfortable in their use of STEM terminology and concepts.

Through the Green Team, the school has participated as chaperones in CRRA's Cub Scout Day held every year at the CRRA Trash Museum in Hartford, Connecticut. Green Apple Day of Service and the Annual Earth Day Cleanup both focus on sustainability topics and have been well attended.



**Figure 4** AoEGT Students at the Earth Day Cleanup, 2014. Volunteers worked for three hours in the rain to pick up trash in 3 targeted neighborhoods and school grounds.

The students built the Green Classroom Tables as an extracurricular activity. Each student is required to complete 60 hours of community service. Many of the hours focus on sustainability, or relevant environmental issues. Most students participate in the two semi-annual clean-up events for their community service requirement. This also includes sending students to events on sustainability and safe

disposal of hazardous waste. Students may also join the Green News Club where they write articles on the school activities related to sustainability and the environment.

#### Measuring Outcomes and Student Assessment

Students at AoEGT must have a score of three or better on the Connecticut Science CAPT test to graduate from the school. Students will eventually be taking a different assessment to measure scientific literacy but it has not yet been developed. The Academy of Engineering and Green Technology offers College Credit for participation in an Environmental Science course taught through the UCONN Early College Experience (ECE). Eighty five percent of the students earn college credit by taking this course. This course is considered an equivalent alternative to offering an AP course in Environmental Science.

#### Professional Development for All Staff

Environmental and Sustainability professional development is currently available through a DVD collection, by loan to all teachers. Teachers are also invited to “lunch and learn” presentations as well as the Sustainability Summit held at the school. Resources are also available to teachers via the advisory board. Teachers can also get training through the GK-12 UCONN partnership and ECE program which offers professional development in how to teach Environmental Science. Teacher David Mangus is the lead Mentor for the Green Team and acts as a mentor for staff. He coordinates and disseminates resource materials to staff members such as curriculum, literature, videos, and professional development materials.

### **Step 3: Healthy School Environment**

AoEGT has conducted surveys and held meetings on school climate annually. Information is generated from the feedback of students, parents and staff. Improvement plans and goals are generated annually. All staff are encouraged to communicate any environmental concerns to the principal who then addresses the concerns appropriately. The school system conducts tests on air quality and the school has its own health clinic which monitors the health of the students in the school building.

Environmental quality is important at AoEGT. All buses must park on the street away from entrances. The exception is the special needs bus which does park in the lot near the entrance but only for a short period of time. The DATCO bus company handles all compliance with CT law. Pesticides are rarely used

in the school and only during the summer. The school does use safe traps for mice. There are no chemicals (fertilizers or herbicides) used on the school grounds. The school system contracts with companies for annual replacement of filters. The building has air conditioning which helps minimize asthma triggers.

#### **Step 4: Healthy Nutrition**

Healthy, nutritious food and drink options are available to all students and staff. There are vegetarian/vegan choices available each day, including entrees as well as the daily salad choice. Students are also given fresh fruit and vegetable choices as part of the daily breakfast and lunch. The district conducts an annual healthy foods demonstration at our school for parents, students, and staff to taste and critique healthy choices for our food program. The school uses local and/or organic foods from a local Farm-to-School program in order to better incorporate healthy nutrition into the school day. Our Health teacher pursues a relevant curriculum on nutrition and healthy choices. Our school garden program provides fresh vegetables for students to take home to their families. Two of our teachers pick and purchase fresh apples each year to give to our students who may not have access to locally grown produce. Students are given seeds and seedlings for home gardens. In 2014, tomato plants were given to 12 students to take home to plant. Another half dozen students took home garden seeds provided free to the school from Master Gardeners with the UCONN master gardener program. The goal of the home garden program is to encourage students to grow some of their own fresh food at home and make home gardening more available to our students. Eighteen students were taught to make raised beds, and how to plant, weed, water, and maintain a community garden. Thirteen additional beds were constructed in the fall of 2014 for the 2015 growing season. These beds will include more tomatoes and peppers which were popular with the students. Additional eggplant seedlings will also be planted due to popularity and demand. Also 5 new herb garden beds will be planted in the spring of 2015 to supplement the kitchen at Hartford Public High School.

#### **Step 5: Physical Well-Being**

Our school has an extensive athletic program available to all students as a part of the unified Hartford Public High School Athletics Teams. HPHS has: girls' softball, boys' baseball, boys and girls basketball, football, boys and girls soccer, boys and girls indoor/outdoor track, co-ed cross country, girls' volleyball; and boys and girls swimming. Roughly, 400 student athletes participate annually in at least one sport.

All students enrolled in physical education have four hours per week of school supervised physical education. Weather permitting, the physical education classes are outside. Students often use the outdoor classroom in the Great Court yard for classroom and lunch use. On nice days, as many as two dozen students can be seen eating lunch outside.

Our school has had various programs including dance, Zumba, open weight room, open indoor and outdoor track available to students, staff and the public for walking. One of our staff members, Jill Reid, has organized a lunch walking program. We have also had fitness groups engage in before and after school exercise. Students are instructed about the importance of well-being in health, physical education, and advisory classes. Students are invited to participate in the Outdoor Classroom experience. Coaches mentor students on the importance of self care, both physical and emotional. Our school clinic called the Body Shop provides services on wellbeing to students.

#### **Step 6: Energy Efficiency and Water Conservation**

The school district requested the services of a local firm to perform an energy audit of our HVAC system in 2013. A staff member was trained to monitor the HVAC system. Through strategic programming of temperature and the use of sector sensors, energy usage was reduced. Exact figures are not known. This was a system wide initiative designed to save hundreds of thousands of dollars. All of the faucets in the bathrooms have automatic shut off controls to conserve water. Students at AoEGT have been involved in making signs to remind people to turn off the lights when they leave the classroom. Most of the classrooms have sensors to turn off the lights after a certain period of time has passed.

The AoEGT has two 5.5 kW solar arrays on our roof top that were installed in 2012. Dean Dennis Wehrly of our Academy was instrumental in getting the systems installed. As of Nov 1, 2014, they have produced 32,000kW of Electricity and have saved 54,000 lbs. of Carbon dioxide from entering the atmosphere. It is very difficult to determine the exact percentage since our school is one of three academies in the building and the data is not available for our use in this application.

Our school does have water saving faucets with automatic shut off valves. All outside spigots are controlled by key to prevent unauthorized or excessive use of water. Mulch was added to landscaped beds to reduce watering of annual flowers. Our water comes from the City of Hartford. The water does

get tested per regulations. All of the school's old water lines were replaced with copper during the 2000 renovation.

Our school recently installed a bike rack for students to lock up their bikes safely. This encourages more students to use bicycles. We also encourage the use of public transportation by providing our students with Bus tokens.

AoEGT students go on field trips to the water and sewer treatment plants. This year, we will be visiting the Waste Water treatment plant in early spring. Water issues are discussed in our 10<sup>th</sup> grade Biology class and our 12<sup>th</sup> grade Environmental Science class. The 10<sup>th</sup> graders construct posters on the water cycle as part of one of their units of study. We take our students to the Trash Museum where one of the discussion panels concerns water conservation and usage. Students are also trained to understand that run off sewers empty into the CT River, and to be personally responsible about what they dump into the street.

### **Step 7: Green Purchasing and Waste Management**

At our school, we can influence both the quality and quantity of the trash that is disposed into the waste stream and are learning about the challenges of environmentally preferable procurement. We attempted to get the school system to stop using Styrofoam lunch trays and switch them for compostable trays but were blocked by current policies. We have found success with an internal program initiated by one of our colleagues to create a paperless classroom that encourages staff to make fewer copies, and have students submit assignments online.

Several teachers are testing it this year using Google Classroom and other online assessment tools. The program will

conservatively save \$10,000 next year and reduce the waste stream for the Academy.



**Figure 5 Clean Hartford Anti-Litter Campaign: AoEGT partners with the City of Hartford Department of Public Works and office of the Mayor to promote and model the Clean Hartford Campaign and the Hazardous Waste Disposal Program**

AoEGT participates in purchasing to minimize chemical waste. The chemistry teachers from all three academies work cooperatively and responsibly against ordering chemicals and conducting experiments that will create hazardous waste. We have a centralized storage facility of chemicals for safety and efficiency. We order as a group to cut costs and reduce waste and redundancy. Most of the experimental kits that are ordered for use at AoEGT are “micro scale” experiments which minimize waste and eliminate the need to store chemicals. All supplies ordered by AoEGT for classroom use are controlled. All empty printer cartridges must be returned and placed in the recycle container before a new replacement is issued. This keeps cartridges out of the waste stream and earns money for additional supplies upon redemption.

The AoEGT is one of the few schools in CT that has an active student facilitated classroom single stream recycling program where bins from the classroom are placed in a central bin in the office. This allows students to take ownership in recycling in the school and not depend on custodial staff to recycle. The central bin is taken by students or staff to the pickup site outside of the building. AoEGT students also help keep the large blue outside bins clean and free of comingled trash material placed in the bins by the public who often mistake the clearly marked recycling bins as trash cans. AoEGT also initiated the “Fix It, Don’t Pitch It” program that takes broken desks, tables, etc. out of the trash stream, fixes them and puts them back in to service. To date the program has repaired or repurposed about \$15,000 in school furniture that otherwise would have been thrown away and created a ton or more in trash to be incinerated. All leaf and plant debris that used to be comingled with the regular trash in the trash dumpster is now diverted to two large compost piles at the corners of the HPHS campus. This has saved many tons of natural compostable material from entering the trash stream. In the corner by the Mark Twain museum, branches were piled up to create a sheltered habitat for small woodland birds.