



Curriculum & Material Development

Coding & Renewables Program Development

KidWind is seeking funds to develop curricular materials and kits to support a renewable energy and coding program for middle and high school students. The objective of this curriculum would be for teams of students to learn basic coding skills in order to program automated devices in their renewable energy constructions.

All modern wind turbines and solar arrays utilize a variety of automated devices to ensure the efficiency and productivity of the system. Some examples of these automated systems include:

- **Yawing System:** Large wind turbines use mechanized systems to point the nacelle of the turbine into the wind.
- **Blade Pitch System:** On large wind turbines, the pitch of turbine blades is adjusted for variable wind speed through a highly automated system.
- **Solar Tracking:** For optimal performance, solar arrays should track the sun.
- **Power Conditioning & Storage System:** The voltage and current that a wind turbine produces can be erratic based on variable wind speeds. All wind turbines have power conditioning systems to “clean up” the power and store the energy produced.
- **Bird Awareness Sensors:** Some turbines have developed sensors that notice when rare and endangered birds are approaching and automatically shut down the turbine.

We seek to develop a 5-lesson module and associated package of materials that will allow students to use existing microcontroller tools (Lego, Microbit, Hummingbird, Arduino) to develop working models of an automated system of their choice.

Support for the development of the Renewable Energy & Coding Module would allow for the following:



Curriculum and material development of the Renewables & Coding Module



Facilitation of 5 Teacher Workshops, training 150 educators



Distribution of curriculum guides and resource kits to each trained educator



Individualized instructional support for educators as they implement the curriculum

All materials developed as a part of this program would be open sourced and available on the KidWind website. Our long term goal is to include this coding component in our existing KidWind Challenge, allowing advanced students to program aspects of their devices and present this automation at the competition.



Overall Programming Budget: **\$70,000**

Item	Cost	Cost Breakdown	Details
Curriculum Development	\$25,000	250 hours at \$100 per hour	Support the development of open sourced materials. This includes: designing and writing lessons, pilot testing in classrooms, material development and/or procurement, and website design and creation
Workshop Development	\$5,000	50 hours at \$100 per hour	Support the development of teacher training workshops that will introduce educators to the elements of the new curriculum. This development will include: training guides, video and photo to support training, and how-to guides to support implementation in the classroom
Workshop Facilitation	\$15,000	\$3,000 per workshop	5 Workshops in the summer of 2021, held in locations across the U.S. each training 30 educators, reaching a total of 150 middle and high school educators. Funds will be utilized for trainer travel and time, printing materials, food for participants, and site-based costs like security and custodial staffing
Workshop Travel	\$5,000	\$1,000 per workshop	Travel and lodging for the KidWind staff facilitating the workshops
Material Distribution	\$15,000	\$100 per kit for 150 teachers	It is critical to provide educators with ample materials so that their projects can succeed in the classroom. Each teacher will receive a Coding and Renewables Curriculum Guide and Resource Kit to ensure they have everything they need to bring this learning into their classrooms
Instructional Support	\$3,000	100 hours of support at \$30 per hour	100 hours of instructional support to educators as they work on their projects in the form of webinars, mentorship, and email, phone, and video support
Administration Fee	\$2,000	40 hours of support at \$50 per hour	KidWind support in administering the project including communication, assigning trainers and REcharge instructors, designing and launching website, and evaluating implementation

