




NATIONAL SOCIETY OF BLACK ENGINEERS

 Think Green! Please do not print unless absolutely necessary

2014-2015
KIDWIND Rule Book

LAST UPDATED

AUG. 2014



Welcome to the 2014-2015 KidWind Program!

What an exciting year we have in store for the KidWind Program. I am truly excited to be able to impact the lives of students in such a unique way. This year we are excited to present the KidWind Program nationally.. The goal of this program is to ignite the inherent creativity in the field of renewable energy and engineering.

Founded in 2002, KidWinds has established itself as a leader in renewable energy STEM Curriculum and teacher training throughout North America. Last year, several teams were given the opportunity to participate in the KidWind Challenge Event. This year, we are able to give the opportunity for all teams to participate across each region in hopes of making it to the National Finals.

I welcome your feedback throughout the upcoming year to better serve the membership and ultimately provide our youth with an amazing opportunity. I would like to conclude with a reminder that KidWind is supposed to be a fun learning experience for the participating students. The most important aspect of the program is the coaching and collaboration that takes place. This is what will make a difference in student progress and achievement. Thank you for your participation and dedication to the academic excellence of the participating students.

Morgan German
National Professional PCI Chairperson
National Society of Black Engineers Professionals



***National Society of Black Engineers
2014-2015 KidWind Challenge Program
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Due to the nature of our programming and the partnerships involved, this rulebook is subject to change at any time. Changes may include but are not limited to rules, implementation, awards criteria/categories and procurements on behalf of the participants. NSBE will remain to be diligent in providing necessary information for our programming and limit any inconveniences that may occur.



THE MISSION OF NSBE

The Mission of NSBE is to increase the number of culturally responsible Black engineers who excel academically, succeed professionally and positively impact the community.

THE PURPOSE OF THE KIDWIND CHALLENGE

The purpose of the KidWind Challenge is to engage minds in hands on activities which are exciting and teach basic science and engineering principles to 9th -12th grade students.

CONTRIBUTIONS TO NSBE KIDWIND CHALLENGE

Contributions to the NSBE KIDWIND CHALLENGE will help us continue to make this an effective NSBE program available to NSBE 9th -12th grade students nationwide. NSBE PCI will use contributions for program-wide support to give all participants the opportunity to have access to STEM resources.

Financial Contributions

To become a NSBE KIDWIND CHALLENGE partner, send your financial contributions to:

National Society of Black Engineers
ATTN: NSBE-PCI KIDWIND CHALLENGE Program
205 Daingerfield Road
Alexandria, Virginia 22314
Phone: 703.549.2207

Volunteers

If you would like to become a NSBE KIDWIND CHALLENGE volunteer, please contact us at pci@nsbe.org.

ACKNOWLEDGEMENT - NSBE CONTRIBUTIONS

Heartfelt gratitude and deepest thanks to the Professional PCI committee.

Katrina Hill, WHQ Programs Coordinator
Elizabeth Gomez, Convention Planning Committee Pre-College Initiative Chair
Noral Walker, National Pre-College Initiative Chair



INTRODUCTION TO NSBE

NSBE

The National Society of Black Engineers (NSBE) was founded in 1975 by six black engineering students at Purdue University nicknamed the Chicago 6. The original aspiration was to establish a student organization to help improve the recruitment and retention of black engineering students. NSBE is now the largest student-managed organization in the United States with more than 25,000 members.

NSBE is comprised of more than 300 chapters on college and university campuses, 75 professional chapters nationwide and 298 NSBE Jr. chapters. These chapters are geographically divided into six regions. The NSBE mission is to increase the number of culturally responsible Black engineers who excel academically, succeed professionally and positively impact the community. For more information on NSBE, please visit www.nsbe.org.

In fulfillment of the NSBE objective to “stimulate and develop student interest in the various engineering disciplines”, the various programs and competitions were created for pre-college students.

PCI

The Pre-College Initiative (PCI) Program is the focus of the NSBE effort to promote college, academics, technology, and leadership to pre-college students. Our primary focus is to encourage students in grades 6-12 to develop interest in Science, Technology, Engineering and Mathematics (STEM).

The mission of PCI is to lead the world in enhancing the pre-college students' academic, technical, and leadership skills in order to maximize their success in life. The vision is to establish PCI as an incubator for our youth, where they can be nurtured and guided in their academic careers.

NSBE Chapters support PCI through the multiple programs.

NSBE Jr.

A vital component of the PCI program is NSBE Jr., which serves as the membership category for pre-college students and institutions that are officially chartered with NSBE. NSBE Jr. members and chapters are at the core of PCI, as they are the primary focus and beneficiaries of PCI programs.

NSBE Jr. focuses on enhancing the education received by African-American and other minority pre-college students, as well as influencing these students to become tomorrow's corporate executives, entrepreneurs, and leaders. In this spirit, NSBE Jr. is the quintessential recruitment, teaching, and preparation device for the NSBE.



When students participate in a KidWind Challenge they will:

When students participate in a KidWind Challenge they will:

- **Discover** the promise and limitations of wind energy technology
- **Design** a functional wind turbine based on their knowledge of wind energy
- **Create** a wind turbine of their own and test its performance
- **Compete** against peers for the most creative and functional turbine

INTRODUCTION TO NSBE KIDWIND RULE BOOK

The NSBE KidWind Rule book should be used to guide for coaches/advisors in preparation for teams for the Annual Convention competition. NSBE Jr. KidWind Challenge coaches/advisors are encouraged to prepare their teams as early as possible, and use the internet as a valuable tool for resources for the KidWind Challenge program for preparatory materials.

NSBE Jr. KidWind Challenge coaching can begin as soon as their application is approved and they are in receipt of the team materials and can continue through March of the next year.

NSBE KIDWIND REGISTRATION INFORMATION

Team Requirements

Every NSBE Jr. KidWind team must:

- Consist of a minimum of two up to a maximum of four participants.
- Be a combination of students in grades 9th through 12th grade who are paid NSBE Jr. members.
- **Attending the 41st Annual Convention in Anaheim, CA**
- Be participants of an active NSBE Jr. Chapter
- Have a current advisor/coach that is a paid NSBE Professional member
- Completed Application Request before deadline.



NSBE Jr. KidWind Challenge teams that do not meet all the above criteria will not be allowed to participate in the program year.

Cost

There is no cost to participate in the NSBE Jr. KidWind Challenge competition. Teams are responsible for raising funds for attendance at the 41st Annual Convention in Anaheim, CA.

Application Procedure

NSBE Jr. KidWind registration is completed via an application process. Each team interested in participating for the 2014-2015 program year must submit an application to assess the team's ability to be successful participants in the program and to meet all of the team requirements. Completing all of the information in the application is vital for the application committee to be able to assess your team's readiness for participation.

IMPORTANT NOTE: A NSBE Jr. KidWind Challenge coach can prepare more than one NSBE Jr. KidWind Challenge team for the Annual Convention competition.

CRITICAL 2014-2015 DATES

For quick reference, the following target dates are listed to ensure your participation in the NSBE Jr. KidWind Challenge competition. For further information on the upcoming NSBE conferences, please visit www.nsbe.org.

Team Responsibility And Events	Target Timeframe (No later than)
NSBE Jr. KidWind Team Application	Final submission deadline is Friday, Sept. 12, 2014 by 11: 59 PM (EST) . Complete your chapter's form early for priority consideration. An application does not guarantee your chapter's participation.
NSBE Jr. KidWind Challenge access to team materials	Teams will receive their kit on a rolling basis as their application is accepted, and a formal invitation for participation is received.
NSBE Jr. KidWind Challenge Team Training	Held throughout most of the school year, September 2014 – April 2015



<p>Fall Regional Conferences</p>	<p>Depending on how many applications and registrations are received, a workshop may be conducted at your Fall Regional Conference to give more tips in regards to the KidWind Challenge programming year.</p> <table border="1" data-bbox="467 445 1421 877"> <tr> <td data-bbox="467 445 987 516">Grand Hyatt Tampa Bay, Tampa, FL, – R3</td> <td data-bbox="987 445 1421 516">October 31 - November 2</td> </tr> <tr> <td data-bbox="467 516 987 588">Hilton Cincinnati Netherland Plaza, Cincinnati, OH, – R4</td> <td data-bbox="987 516 1421 588">November 14-16</td> </tr> <tr> <td data-bbox="467 588 987 659">Crowne Plaza Baton Rouge, Baton Rouge, LA – R5</td> <td data-bbox="987 588 1421 659">November 14-16</td> </tr> <tr> <td data-bbox="467 659 987 730">DoubleTree Pittsburgh, Pittsburgh, PA – R2</td> <td data-bbox="987 659 1421 730">November 15-16</td> </tr> <tr> <td data-bbox="467 730 987 802">Hyatt Regency San Francisco Airport, Burlingame, CA, – R6</td> <td data-bbox="987 730 1421 802">November 21-24</td> </tr> <tr> <td data-bbox="467 802 987 877">Hyatt Regency Long Island at Wind Watch Golf Club, Hauppauge, NY– R1</td> <td data-bbox="987 802 1421 877">November 20-24th</td> </tr> </table>	Grand Hyatt Tampa Bay, Tampa, FL, – R3	October 31 - November 2	Hilton Cincinnati Netherland Plaza, Cincinnati, OH, – R4	November 14-16	Crowne Plaza Baton Rouge, Baton Rouge, LA – R5	November 14-16	DoubleTree Pittsburgh, Pittsburgh, PA – R2	November 15-16	Hyatt Regency San Francisco Airport, Burlingame, CA, – R6	November 21-24	Hyatt Regency Long Island at Wind Watch Golf Club, Hauppauge, NY– R1	November 20-24th
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<p>National Competition</p>	<p>Held at the NSBE National Conference, Anaheim, CA March 25, 2015 – March 29, 2015</p>												

NSBE JR. KIDWIND CHALLENGE OVERVIEW

Each team that registers must build and design their own turbine. You will not be allowed to modify another team’s turbine and use it for testing. You cannot have one turbine shared between teams and simply change blades or other parts for each team.

Your team’s turbine must be able to fit inside the wind tunnel and must be able to operate within the 48” × 48” internal dimensions of the wind tunnel. It is highly recommended that you design your turbine to fit with plenty of room within these dimensions. Sand bags or other weights will be available to hold the turbine in place in the tunnel if required. There are no budgetary restrictions for your turbine design, but it is important to keep in mind that part of the judging process is the economical use of resources. Please use materials responsibly.

There are two divisions teams can participate in for the competition. Teams must choose which division they will be competing in prior to the Annual Convention.

KidWind Generator Division



- Your turbine must use the generator provided by KidWind as the sole power generator for your wind turbine. The judges must be able to verify that the correct generator is being used on your turbine. If the judges cannot verify that the generator is the correct one, your team may participate but will be unable to win prizes.
- Your turbine can have only one of these generators.
- Power must be generated solely by wind generated by the wind tunnel.
- Your turbine can either be on a vertical or horizontal axis.
- You may attach whatever you want to the generator to increase how fast or hard it spins (e.g. gears, bearings, supports, etc.).
- Your wind turbine must be free standing. A tower/stand will not be provided.
- You cannot use premade gearboxes, airfoils or blades

Open Generator Division

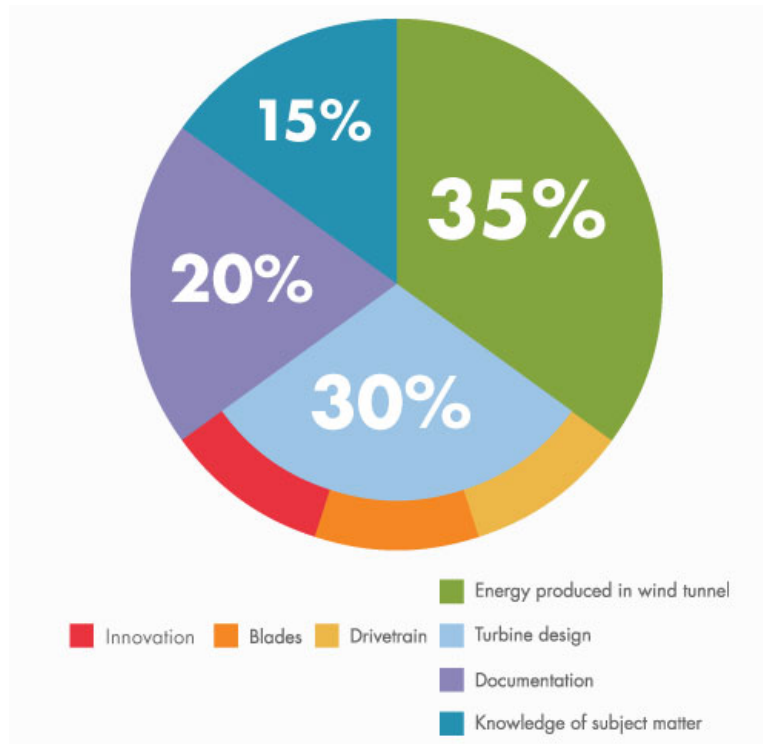
- The basic rule of this division is: If it fits in the tunnel, AND you built it, AND the judges think it is safe, we will run it!
- You can build your own generator based on plans you find from any source. You can use other generators that you purchase (e.g. the KidWind SimpleGen, the KidWind GenPack, Jameco, etc).
- Power must be generated solely by wind from the wind tunnel.
- Your turbine can either be vertical or horizontal axis.
- You may attach whatever you want to the generator (e.g. gears, bearings, supports, etc.).
- You can use a premade gearbox or a generator with a gearbox built in.
- You cannot use premade blades or airfoils.
- Your wind turbine must be free standing. A tower/stand will not be provided.
- You must rectify AC output to DC output for KidWind to use with our testing equipment.

In both divisions you cannot use pre-manufactured wind turbine blades or airfoils/sheets that have been manufactured. You can, of course, attempt to make your own airfoils out of a variety of materials.



NSBE JR. KIDWIND JUDGING INFORMATION

Your team's turbine will be assessed by four categories, each weighted differently as you'll see in the diagram below. So brush up on your turbine knowledge, find the best materials and parts you can get your hands on, and have some fun along the way.



Turbine Judging Rubric

- 35% Energy Produced in Tunnel
- 30% Turbine design
- 10% Blades
- 10% Drivetrain
- 10% Innovation
- 20% Report/Engineer's Notebook/Documentation
- 15% Knowledge of Wind Energy Subject Matter



1. Energy Produced

The judges will use data logging software to record the total energy output of each turbine over a 60-second trial period. They collect this data in milliwatt-seconds or joules. Your team's energy output will be ranked relative to other competing teams and you'll receive points corresponding to this rank.

2. Turbine Design

Judges will inspect the parts of your wind turbine closely. They will also conduct a brief interview with your entire team to understand why you chose the parts you did and why you think they work.

A panel of judges will examine your wind turbine design before testing it in the wind tunnel. You must be prepared to discuss/defend the choices you incorporated into the design. The design criteria you will be judged on include:

- The choices and mechanisms by which you maximized power output
- Craftsmanship of your design, creativity, and environmental decisions (eg. did you use recyclable materials? Can you take your turbine apart after the competition and reuse the parts?).

The judges will be very interested in how you developed and constructed specific parts of your turbine. Make sure you understand the decisions you made when constructed the following components.

- 10% Blades
- 10% Drivetrain
- 10% Innovation

3. Documentation of Design

You must produce some type of documentation that reflects your design process and your knowledge of wind energy science. It's up to each team to determine how to document this part of your project. We've seen short reports, engineer's notebooks, videos, Powerpoints, posters, and so on.

Students must provide the means to play a video or DVD, or run a slide show/power point, etc. We will not provide a computer or other device. Please keep videos to four minutes!



4. **Knowledge of Subject Matter**

Throughout the Challenge Event, the judges will come around to each team to ask some general questions about wind and renewable energy. They are doing this to see if your team has gained some real wind energy knowledge while you created your wind turbine.

NSBE JR. KIDWIND CHALLENGE AWARDS

The top three places will be awarded in each division. However, each team must receive greater than 85% by all judges to receive an award. In some cases, all awards might not be given if the minimum scoring is not achieved.

An overall winner will be picked by the judges to represent NSBE at the National KidWind Challenge.