<u>**Guide to Energy Apps**</u>

The North Wind and the Sun

Educational: 3/10
Interactive and Fun: 6/10

This interactive book tells the story of The Sun and The North Wind. The two argued about who was stronger, so The Sun decided they would have a contest to see who could make a traveler take off his coat. When The North Wind tries the traveler gets cold and clings to his coat, however The Sun warms the air and in the heat the traveler takes off his coat. During this book there are certain interactive elements such as blowing on the microphone to simulate wind and drawing a circle to warm the air. This story is made for children of young ages (preK-2nd grade). Overall, this app is not too educational with regards to wind and how it works, but it does expose children to elements of weather.

WingWhackers

Educational: 5/10
Interactive and Fun: 7/10

This game allows students to explore the impacts of bind turbines to different species of birds in an interactive way. The player is a bird (Captain Eagle, Dr. Hoots, Count Vlad, Admiral Pelicanous, or Lieutenant Habicht) trying to navigate through a field of wind turbines, some of which are functioning, to get their nest. In addition, predators like Hugh Belly the feral hog, Sandy Dune the snake, and J.A. White the shark are lurking on the ground. If you fly to low or hit a wind turbine and fall to the ground these predators are there to eat you up. Players can customize locations (California, Texas, or Cape Cod), as well as power level (100-1000 Mega Watts). Players control their bird through a series of tapping to maneuver through the obstacles. In the same way it is not always easy to for birds to navigate wind turbines and other environmental obstacles, it is also not easy to navigate through the levels of this game!

Tesla Town

Educational: 7/10
Interactive and Fun: 5/10

In Tesla town there are many types of operating energy plants. From a hydroelectric power dam to wind turbines to nuclear energy plants to traditional coal burning power plants, Tesla town has it all. Start by going to the Edison School of Energy to learn about electrical current through Faraday's experiment. Then visit each type of energy plant to learn more about how energy is made, converted, and later transported to building for use. Then stop by the Equinox House to learn about a zero-energy project. Overall Tesla town is a pretty easy way to explore different types of energy and even has some interactive elements.

Cross Winds

Educational: 2/10
Interactive and Fun: 6/10

In cross winds your objective is to use wind to direct a balloon towards a set of spikes in order to pop the balloon. This app offers children a chance to experiment with how wind direction affects objects. Be careful though as the wind must be placed in the exact right location or the balloon will get stuck. Overall the educational value of this app is pretty low.

Predict Wind

Educational: 7/10
Interactive and Fun: 1/10

Predict wind was designed for sailors and boaters to use. The app gives forecasts of wind speed and direction, as well as wave height, period, and direction, temperature, rainfall, and cloud cover where applicable. This info is displayed in tables, graphs, and on animated maps. The app can also be used to plan trips across bodies of water, accounting for waves, wind, and storm patterns. In an educational setting this app would aid in the explanation of wind patterns locally and globally. It would also be beneficial when discussing potential locations for wind turbines or to teach about wind in general. Check it out!

Aero!

Educational: 7/10
Interactive and Fun: 6/10

This simple app follows the flight of a seagull over the ocean. Players can control the bird by tilting each wing of the wind. Players can experiment with how tilting one or both wings affects altitude, turning, etc. Green arrows show how the wind hits the wings and allows the bird to glide. In addition you can switch views to see how with each flap of a wing the bird is affecting the position of wind on its' feathers, allowing it to fly. As you experiment info boxes will pop up with explanations of the forcing that affect a birds flight. This app has a lot of potential in wind energy education. Designers of wind turbines have studied birds in order to engineer more effect ways of catching the wind. Use this app prior to your creative design of turbines lesson to allow children to think about how to best create blades. Aero! is looking to be even bigger and better. Check out http://www.kickstarter.com/projects/181123828/aero-3d-bird-flight-game-with-bill-nye-and-gamedes for more info!

Wind Tunnel Lite and Full Version and Pro HD

Educational: 7/10
Interactive and Fun: 6/10

This colorful app shows how wind moves around objects of various shapes. Wind can be displayed either as particles or as smoke. In the lite mode there are four modes: car, airfoil, rocks, and free mode. In the full version you can do all of this plus more. For example you can also draw your own obstacles for the wind to flow around. For many reasons the full version is worth the $1.99 for all the added functions. The Pro HD version adds elements of physics like speed, pressure, etc. as well as more visual dynamics, but is more expensive at $5.99. In all versions you can disrupt the path of the wind with a swipe of a finger similar to a crosswind. This app can be used to explain how wind flows around turbine blades and can aid in the creation of better blade designs!

Energy Hogs

Educational: 4/10
Interactive and Fun: 6/10

A silly game that attempts to teach about areas of the house that are "Energy Hogs" and how they can be fixed to save money and energy loss. Think Angry Birds meets energy conservation. Use a caulking gun to shoot money at flying hogs. Each hog you hit will reveal a fact about an appliance/area of the house etc and how to improve energy usage in this area. This can be used to teach about conservation of energy in our own houses, classrooms, etc.

Oresome World

Educational: 7/10
Interactive and Fun: 4/10

Oresome World is not intuitive to use, but offers a lot of information, videos, quizzes, and activities, as well as teacher resources on coal, energy, gas, low-emissions, and mining. Once you figure out features like sideswiping to get to more pages and using the information tool, this information becomes available. The information is rather advanced, so beware.

Cool South West

Educational: 4/10
Interactive and Fun: 6/10

Features 7 Mini games (matching, whack-a-item, and catch) to teach kids about ways to reduce energy consumption. The app encourages use of energy efficient products over energy hogging appliances. It also encourages certain energy habits. In the end the player must take a pledge to fight climate change as an individual. Is a little juvenile, but the use of games is something.

iWindTurbine

Educational: 7/10
Interactive and Fun: 5/10

This is a simple app that allows you to customize a 1 MW or 1 kW wind turbine conditions like rotor diameter, air density, wind speed, aerodynamic efficiency, and electro-magnetic efficiency. The app then reports the output energy and equates this to how many approximate houses could be powered. At $0.99 it is not as cool as a KidWind turbine kit, but it could be used as an intro into a turbine design lesson.

LLNL Flow Charts

Educational: 6/10
Interactive and Fun: 3/10

This app has made flow charts of all energy sources and uses by state and year. For example, you can get a data from 2009 in Minnesota of how many BTUs of energy were used, the source of that energy (geothermal, coal, etc.), and how that energy was used (residential, transportation, waste), all in a nice colorful flow chart. Data is also available for countries other than the United States.

HDenergy

Educational: 7/10
Interactive and Fun: 3/10

This app is an encyclopedia of energy, offering information and beautiful graffics on Energy, Electricity, and Heat. All figures, pictures, and text can easily be copied, making this a nice resource for teachers at only $0.99.

GreenUtopia

Educational: 4/10
Interactive and Fun: 4/10

In this game you collect resources (carbon, iron, wood, and silicon) and money (diamonds) to build wind, solar, and hydroelectric plants. You must travel around and collect these resources and find the plants in order to build new facilities. The faster you go and the more you collect the higher you score. Educationally this app is pretty useless other than explaining that energy resources are needed to produce renewable energy generators (solar, wind, etc.).

Anemometer Apps: Wind Meter, Wind Speed, and Wind Sensor

Educational: 7/10
Interactive and Fun: 6/10

These apps all act as real anemometers, with varying accuracy. They use the microphone to measure the volume of wind flowing and convert this to effective wind speed. Is usually accurate between 4 mph and 28 mph for Wind Meter and Wind Speed. Wind Sensor is accurate between 4 and 115 mph. Wind Sensor also offers a compass for finding wind direction. Both Wind Meter and Wind Speed are only $0.99, while Wind Sensor is a little bit more at $1.99.

Al Gore – Our Choice: A Plan to Solve the Climate Crisis

Educational: 8/10
Interactive and Fun: 4/10

This is a visually dynamic and interactive book about the causes and solutions of global warming. It uses narratives, photography, interactive graphics, animations, documentary footage and more. This app takes books to a whole new level. It is a little costly at $4.99, but it is a good investment.

A list of apps not worth your time!
Here is a list of apps that are either poorly made or have little to no educational value.
- CrossWindsRC
- Inside Energy
- Energy UFO+ (requires Visible Energy products)
- Hydronics APPtitude
- Games that have little to no educational opportunities
    - Centrosolario- Photovoltaics made easy!
    - Pilot Winds
    - LostWinds
    - PowerPup
    - Four Winds Fantasy DX
    - Magic Energy Free