

# 10 Big Questions About Energy

Here are some questions to get you thinking about renewable energy in broader terms. You will likely need to draw on your understanding of these questions to be successful at instant challenges, knowledge tests, and in the judging room!

You do not need to become an expert! Just make yourself knowledgeable.

## 1. How do we generate and use electricity — and how do we move it around?

From what sources do we generate most of our electricity in the U.S.? How does a generator work? What are the primary sources of electricity in your region of the U.S.? What are some of the ways we transform energy from one form to another? How much of the electricity that is used in your country is generated by wind, solar, or other renewable energy? How has this changed over the last ten years? How do we move electricity from power plants to our homes? What is distributed generation?

## 2. How do we measure and quantify electricity?

What are the units we use to measure electrical energy consumption? How much does it cost to power your house each month? What is the difference between energy and power? How much power and energy do common objects like toasters, TV, cell phones and other devices use? Can you read a power bill? How can we reduce our electrical consumption or make it more efficient? How does electrical energy usage vary between countries?

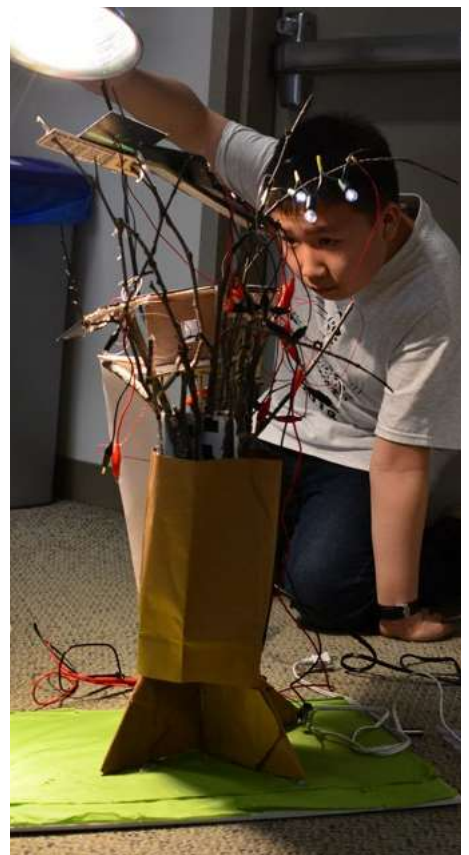
## 3. What is climate change and how can renewable energy impact this phenomenon?

What is climate change? What are the environmental benefits of generating electricity using wind or solar power? What are some of the tradeoffs? What challenges might we face in generating over 50% of electricity from renewable resources in the U.S.? How does efficiency and conservation play a role in reducing the climatic impact of electricity generation?

## 4. What kinds of devices transform the power of the wind and the sun?

What types of devices have been used to harness wind or solar power, apart from being used to generate electricity, and what were their uses? What are the various styles of windmills and turbines? What are the various types of solar thermal and solar photovoltaic panels. What is the equation that defines how much power is in the wind and what are the most important variables? How do we measure the power coming from the sun? What components of wind turbines are undergoing rapid change and development? Which changes seem to be having the most impact in improving turbine performance? How has the performance of solar panels been improved?

Wondering where to start exploring these questions? Check out the KidWind website for important links and resources: [KidWind.org](http://KidWind.org)





**5. How does weather and geography impact renewable energy production?**

What causes wind? What are the windiest or sunniest parts of the U.S.? Where are most of the wind turbines or solar farms located in the U.S.? How does an offshore wind farm work, and where are they located? How do the seasons affect wind or solar energy production? How could the science of meteorology impact and improve the performance of solar or wind farms?

**6. How can we store electricity?**

What is electrical storage? How can storage impact the “variability” of renewable energy resources? What are the challenges of implementing small or large scale storage? What kinds of technologies are used in the storage of electricity? Electric vehicles have huge batteries in them — can we use them for storage in our homes?

**7. What are local impacts of a wind and solar powered future?**

What are some of the physical and social impacts of solar and wind farm construction and operation? How can we reduce these impacts? Which impacts seem most concerning to local communities? How do these impacts compare to those of fossil fuel generating facilities?

**8. How do we pay for renewable energy?**

How do we financially subsidize renewable energy resources? How does this compare to fossil fuel and nuclear subsidies? Do you feel that subsidies are appropriate in the energy industry? If you feel that subsidies are okay, what energy sources would you subsidize and why? How can we provide affordable, clean energy to all communities around the globe?

**9. What does a renewable energy powered future look like?**

Is it realistic to think we can power the grid with 100% renewable energy? What role does nuclear have to play in a clean energy future? What are smart grids and microgrids and how could they be an improvement over the power grid we currently have? How would large numbers of Electric Vehicles impact the power grid? How can we use less electrical energy but still have all the modern conveniences we want?

**10. What are renewable energy careers?**

Developing and installing renewable energy components and systems like wind turbines and solar panels, requires professionals and experts from many different fields of study. What are some of the careers and jobs that make renewable energy possible? What do you need to study to work in these fields?

*\*The development of these questions was guided by the DOE Energy Literacy and NGSS Energy Standards.*