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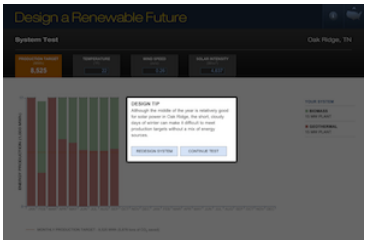
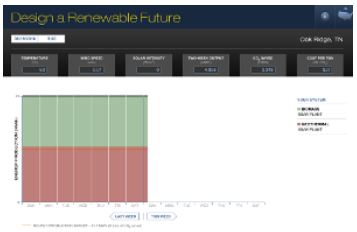
NOVA LABS

NOVA Labs

ENERGY LAB

The **Energy Lab** (pbs.org/nova/labs) uses real-time environmental data to help students design renewable energy systems. Students will learn how to weigh the pros and cons of each energy source and assess the energy availability and needs of a specific location.





The **Design a Renewable Future** activity has four parts:

- **The Challenge:** Students select a city and review the city's energy needs, renewable energy resources, budget, and production target. The challenge is to design a system that meets the production target as cheaply as possible.
- **Design:** Students design their system by using sliders to select the energy sources they want, and how much of the budget to spend on that energy source. Potential energy maps are available to inform the design.
- **Test Your System:** Students test their design against yearly historical data, get feedback, and have an opportunity to redesign the system.
- **Power Up:** Students power up their renewable energy system to find out if they met their production goals. This simulation is powered by real-time environmental and solar data.

As the demand for energy swells, the stores of fossil fuels we currently depend on are dwindling and becoming more costly to obtain. In NOVA's Energy Lab, students will design a city's renewable energy system by analyzing data from the U.S Energy Information Administration and the National Renewable Energy Laboratory.

For a lesson plan, discussion questions, and other educator resources, visit the **Energy Lab Collection** on PBS LearningMedia.

Please contact NOVA Education and Outreach Manager Ralph Bouquet for more information on NOVA Labs.
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The **Energy Lab** includes several short videos explaining what energy is and our renewable energy alternatives to fossil fuels. These videos are also available in a YouTube playlist.

Growing Appetites, Limited Resources
With worldwide energy consumption on the rise, we have a growing need for alternative energy sources and innovative technologies.

Energy Defined
What is energy, and why are we on a never-ending search for new sources?

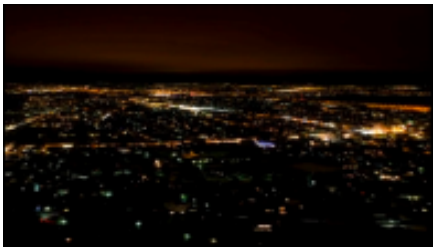
Putting Energy to Use
Scientists look for new energy sources to power our lives as fossil fuels become harder to find.

A Never-Ending Supply
What makes an energy source renewable, and how can we use these sources to power our societies well into the future?

Solar Power
The Sun is a reliable energy source that we can harness and convert into electricity. So why are solar energy systems not used more widely?

Wind Power
Modern wind turbines generate electricity but several engineering puzzles must still be solved to make wind power available in all communities.

Solving the Storage Problem
Storing energy for future use isn't so easy. Why is this the case and what strategies are engineers using to solve the storage problem?



Toward a Smarter Grid
Our electric power grid is a 20th-century system providing electricity to a 21st-century world. What can be done to make the grid more reliable and efficient?

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