



# Green Tips for Education



## Green Tip of the Month

### How to switch to LED lighting in 5 easy steps

If you haven't already switched to LED lighting, it's time. Lighting accounts for as much as 40% of a school's energy costs, and LED can save up to 70% of that, as well as labor costs on bulb replacements.

It's an obvious and easy change. LED bulbs are now available for almost every type of fixture, including the T8 and T12 fluorescents used in classrooms.

If you're using the newer T8 fixtures, you can buy plug-and-play LED tubes to fit them without any rewiring.

That said, you will save more energy if you rewire the fixtures so the ballasts are no longer connected. (If you have the older T12 fixtures, you must rewire them.)



Any electrical contractor can do the work, but your maintenance staff may be able to do it in-house.

The process may vary with the type of tube, but this is typical:

1. With the power off, remove the old tubes and reflector to get at the wires.
2. Remove the ballast and the wires from the ballast to the lamp holders.
3. Install new "non-shunted" lamp holders on one end of each tube, connect the hot and neutral wires, and label this the "live end."
4. Leave the old lamp holders in place on the other end, but remove the wires to or between them.
5. Replace the reflector and install the new LED tubes.

Your lighting supplier can give you detailed instructions and help you calculate your return on investment.

## A Green Technology Tip

### How to get all the benefits of flat panels but use much larger screens

It's an understandable trend: technology managers are turning to flat panel displays to avoid buying, installing and properly disposing of replacement projection lamps.

There's just one problem. A 65" or even a 75" display is not big enough to be readable in the back of a classroom.

Even if all your students have 20/20 vision, the type is just too small.

There is a better way: laser/LED LampFree projectors from Casio.

Like flat panels, they last practically forever, with a rated life of 20,000 hours, or 16-18 years in a typical classroom.

And like flat panels, they require little to no maintenance: just dust them off once or twice each year.



But unlike flat panels, you can easily produce a 100" to 120" diagonal image (or larger) at an easily affordable cost.

Casio projectors are sustainable. Unlike older projectors (and some flat panels), they contain no mercury, and they use far less power than bulb based projectors.

They're extremely reliable as well. Less than 1% of Casio projectors need any kind of service within our five-year warranty period.

Low maintenance, low price, sustainable, reliable and a big-screen image that everyone can read...

It's a win-win-win-win-win!

# Did You Know

## Renewables are now cheaper than all other energy sources

It's true. Renewable energy sources including wind and solar are now less expensive for electrical generation than coal, oil, or natural gas.

This is great news for the planet, and it may affect decisions educators make about new facilities and the technology inside them.

The table below compares the average levelized cost of energy for electric generating plants in the United States in 2019, as calculated by the financial research firm Lazard. (These levelized numbers include all of the costs of building and operating each type of plant,

and they do not include any government subsidies.)

You can see from the graph that the cost of wind or solar generation for utilities now beats all fossil fuel energy sources, even natural gas. Note too, that the cost of renewables is fixed over the expected life of the plant (usually 25 years), whereas the price of natural gas, oil and coal may increase.

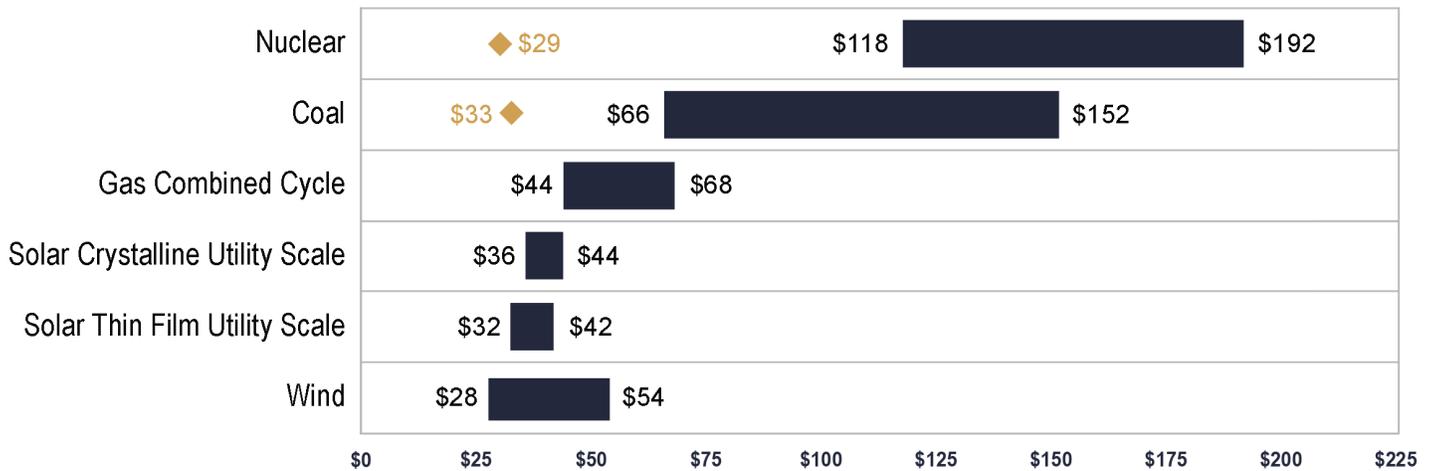
Other sources predict that the cost of building wind and solar plants will continue to drop. For example, "Swanson's Law" suggests that the cost of solar will drop at least 75% in the next 10 years.

**Takeaways.** There is reason for optimism about climate change: the technological barriers to eliminating new carbon emissions are dropping away.

Your capital planning may need to change as well. Electricity is becoming the cheapest energy source for HVAC, transportation and other key systems.



## Levelized Cost of Energy (Unsubsidized)



Estimates by Lazard, November 2019. Scale is dollars per megawatt hour. Gold indicates marginal cost of operating existing coal and nuclear facilities. Full report and expanded chart at [lazard.com/perspective/](http://lazard.com/perspective/)

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