

Lesson Plan

# Climate Change: Renewable Energy and Batteries

## Length

one 45-minute period

## Grade Level

High School

## Learning Objectives

Students will be able to identify the challenges presented by renewable energy sources and describe how energy storage can help to address these challenges.

[How to Lower Energy-Sector Emissions](#)



[Why Energy Storage is Essential for a Green Transition](#)



[handout](#)



[slideshow](#)



[California Grid Dashboard](#)



[U.S. Energy Information Administration Renewable Energy Map](#)



[New York Times Article: Here's What the Rise of Clean Energy Looks Like From Space](#)



## Homework

- Read the first half of "How to Lower Energy-Sector Emissions" up to the section "What's Holding Us Back?"
- Fill out the handout

## Class

- (5 min) Review student answers/thoughts from homework
- (10 minutes) Preview reading on Energy Storage using the attached slideshow. The speaker notes contain talking points.
- (15 minutes) Individually or in pairs, have students explore the California Grid Dashboard. Have them use the guiding questions that are on the last slide of the slideshow:
  - How much of California's electricity supply comes from fossil fuels? How much comes from renewables?
  - How does supply and the types of energy that make up the supply change over the course of the day?
  - Look back over the last week or two of supply graphs. Can you find a day that was cloudy just by

- looking at the graphs?
- Explore the other graphs. What do you notice? What challenges do you think the California grid operators might face?
- (15 minutes) Have students read all of "Why Energy Storage is Essential for a Green Transition" and complete the handout

## Homework

Have students explore the Renewable Energy Map and answer the following questions:

- What renewable energy sources are in or near your community? Are there any energy storage systems?
- In the context of today's class session, what do you imagine are the advantages and disadvantages of the mix of energy sources and energy storage systems in your area?

Optionally read the New York Times article "Here's What the Rise of Clean Energy Looks Like From Space" (note that this article is paywalled but many libraries and schools provide access)

## Vocabulary

fossil fuels

hydrocarbon energy sources such as oil, coal, or natural gas.

renewable energy

energy derived from sources such as sunlight, wind, and water, which have a steadily replenishing supply.

greenhouse gas

any gas that absorbs heat in the atmosphere and re-emits it back toward Earth, causing a warming effect.

emissions

refers to the amount of greenhouse gases an entity, such as a country or company, produces.

biofuel

liquid fuel derived from plants. A prominent example is ethanol, a product of sugarcane or corn.