

Green Buildings

How Weber State is **fighting climate change** with renewable energy and sustainable building design.

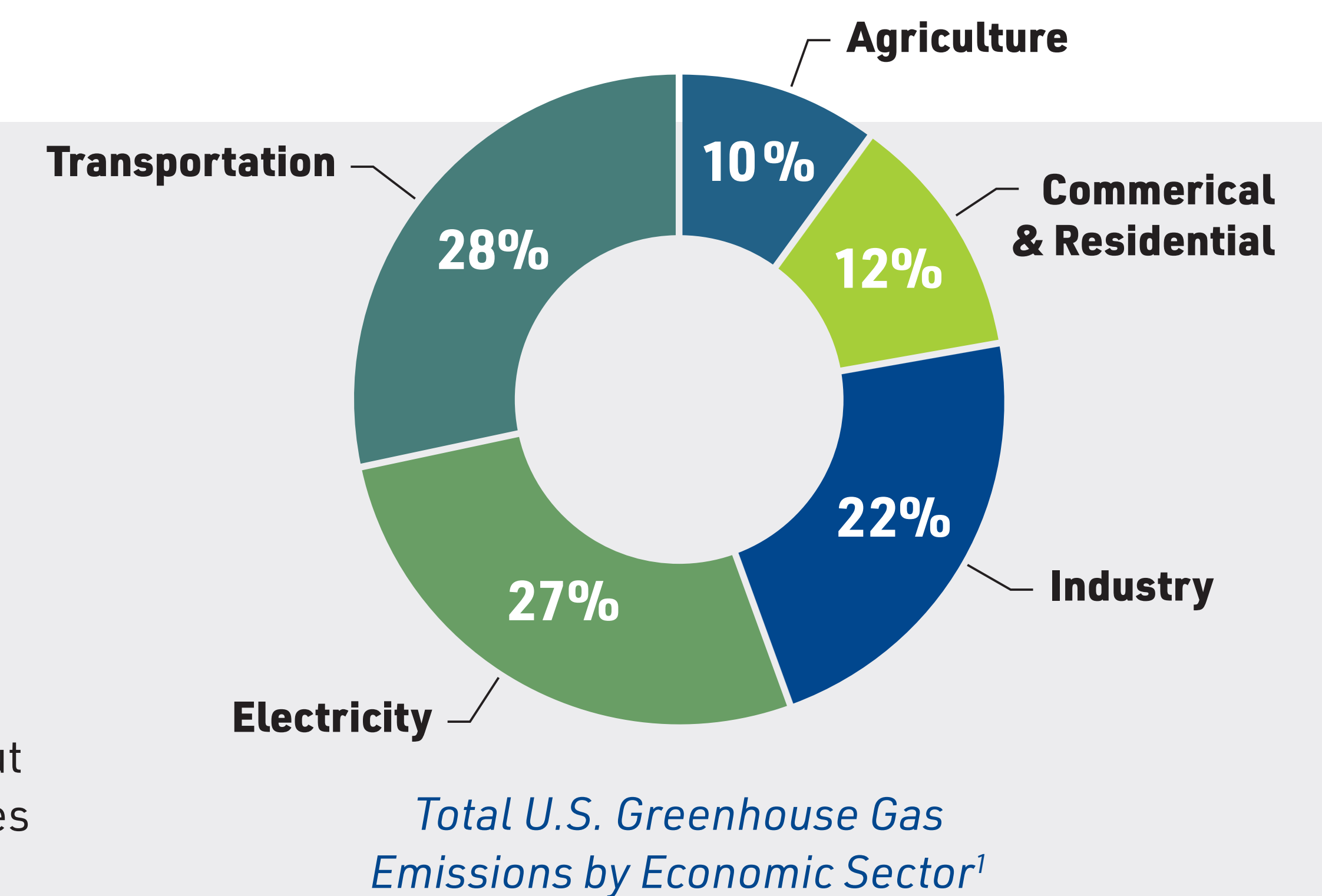
Greenhouse gases and climate change

Global climate change, which is driven by an increase of greenhouse gases in the atmosphere, is a serious threat to life on earth. In the last 150 years, most of the increase in greenhouse gases has come from human sources, especially the burning of fossil fuels. In order to slow global warming and climate change, it is crucial that we reduce our use of fossil fuels.¹

How buildings contribute to greenhouse gas emissions

Businesses and homes account for 12.3% of emissions in the United States. Burning fossil fuels for heat, along with products that contain greenhouse gases and waste disposal all contribute to greenhouse gas emissions from buildings.

Electricity production creates 26.9% of greenhouse emissions, making it the second biggest emitter after transportation. About 63% of electricity in the U.S. comes from burning fossil fuels.¹



Sustainable building technologies at Weber State University



Weber State University

▲ A covered parking lot in the northwest corner of campus is topped with a 550 kilowatt solar array.²

Solar Power

Photovoltaic systems convert sunlight directly into electricity. When photons from the sun strike silicon panels they knock electrons loose generating an electric current.³

Rooftop solar could reduce global carbon emissions by **24.6 GIGATONS**.⁴

Variable Refrigerant Flow

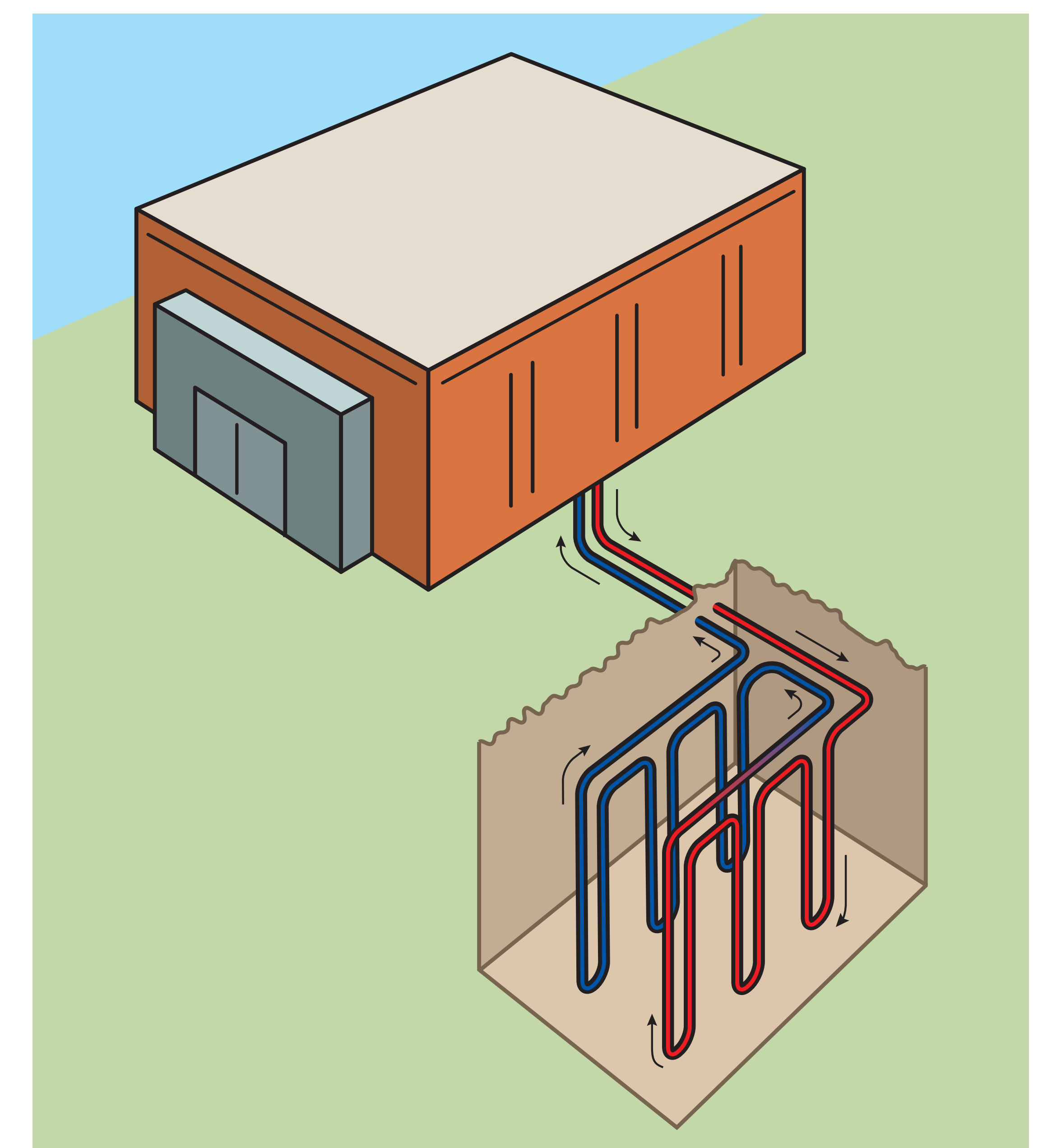
VRF is an efficient climate control system that uses thin pipes filled with refrigerant in place of traditional ductwork. It allows independent temperature control in each room.

34% ENERGY SAVINGS over typical heating and cooling systems.⁵

LED Lighting

Light emitting diodes are semiconductors that essentially perform the opposite function of photovoltaics by converting electricity into light.⁴ They consume 75% less energy and last 15–25 times longer than incandescent lighting.⁶

Widespread use of LEDs could prevent **2.8 GIGATONS** of carbon emissions globally.⁴



Curtis Soderborg

► The Lindquist Hall for social sciences is an LEED Gold rated building that is about 80% more efficient than required by building code. Lindquist Hall employs sustainable technologies like a geothermal heat exchange field that heats and cools the building, and a solar array that provides 80% of the building's electricity needs.²



Benjamin Zackl/Weber State University

Geothermal Heat Exchange

Geothermal heat pumps take advantage of the earth's near constant underground temperatures. In the winter, fluid filled pipes buried in the ground extract heat from the earth and carry it into the building. In the summer, the system reverses and takes heat from the building and deposits it into the cooler ground.

65% MORE EFFICIENT than conventional HVAC systems.⁷

SOURCES

1. Environmental Protection Agency. Sources of Greenhouse Gas Emissions. <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions> 2. Weber State University. Green Buildings. <https://www.weber.edu/sustainability/green-buildings.html> 3. Knier, Gil. How do Photovoltaics Work? <https://science.nasa.gov/science-news/science-at-nasa/2002/solarcells/> 4. Hawken, Paul. (Ed.) (2017). Drawdown: The most comprehensive plan ever proposed to reverse global warming. Penguin Books. 5. U.S. General Services Administration. Variable Refrigerant Flow. <https://www.gsa.gov/governmentwide-initiatives/sustainability/emerging-building-technologies/published-findings/hvac/variable-refrigerant-flow> 6. Department of Energy, Office of Efficiency and Renewable Energy. Lighting Choices to Save You Money. <https://www.energy.gov/energysaver/save-electricity-and-fuel/lighting-choices-save-you-money> 7. Mueller, Mike. (2017, August 1). 5 Things You Should Know about Geothermal Heat Pumps. Department of Energy, Office of Efficiency and Renewable Energy. <https://www.energy.gov/eere/articles/5-things-you-should-know-about-geothermal-heat-pumps>