A Guide To

Energy Efficiency & Sustainable Living

Sustainability

sustainability.wustl.edu

Welcome!

Sustainability at Home

This guide will help you learn how to use the features in your home to improve public health, address climate change, save energy, and save money.

Cover Art by Kristen Patino, *Arch 2018*

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Your Role in Climate Change

Individual actions are a crucial part of mitigating climate change effects

We are only beginning to feel the worsening impacts of climate change, including rising sea levels, flooding, drought, spread of vector-borne diseases, refugee crises, and famine. These impacts universally threaten public health, ecological systems, and economic stability. It is paramount that our generation takes immediate and multi-faceted steps to live in better balance with the intricate ecosystems that support us.

Climate change is a shared responsibility

In order to mitigate the impacts of climate change, all nations, all sectors, and all individuals need to work together. Our everyday actions as individuals contribute to the health or decline of our climate and global public health. Extensive scientific data and those already affected by climate change call upon each of us to actively engage in solving these shared issues by reducing our individual impact.

Locally, St. Louis faces a complex network of challenges related to health and the environment. For example, St. Louis has one of the highest child asthma rates in the country due to air pollution, and hundreds of households face high energy burdens (the percentage of income spent on utilities), especially in low income and black communities. Your actions to decrease energy usage can reduce greenhouse gas emissions, increase air quality, and combat respiratory disease.

Energy Efficiency

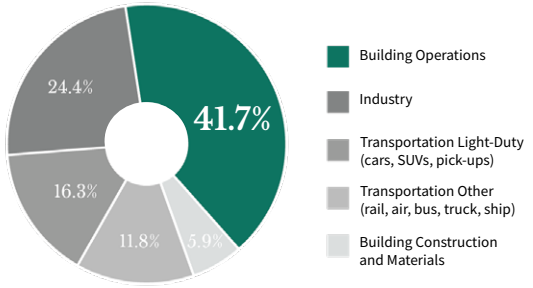
Why energy efficiency matters

In Missouri, **70-80%** of electricity comes from coal, an incredibly carbon intensive fuel source. According to EPA's eGRID, our region has the **3rd** most carbon intensive electricity in the nation. This means you are positioned to make an especially large impact on reducing CO_2 emissions relative to other parts of the country by mindfully utilizing energy efficient technology.

Impact of building operations

Building operations (lighting, heating, cooling, etc.) account for **41.7%** of all energy use in the United States, which makes it the largest sector.

Data Source: US Energy Information Administration (2012)

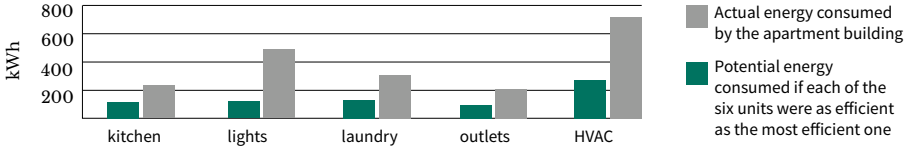


Your Energy Impact

Your daily actions have the potential to significantly decrease energy use and carbon emissions. If fact, behaviors that conserve energy can have an even greater impact than highly efficient technologies like LED lights and smart thermostats, particularly in residential buildings.

Case Study of Potential Savings

A recent study in Quadrangle Housing apartments found that energy conscious residents living in identical apartments can use 75% less energy than others simply due to lifestyle choices!



Don't underestimate the power you have as an individual to make meaningful change!

Thermostats

Master your thermostat to shrink your energy use from heating and cooling.

Using a programmable thermostat can save

10 - 20%

of your heating and cooling energy usage.

How to Work Your Thermostat

If your home is equipped with a programmable thermostat, you can set the temperature to change automatically according to your schedule and preferences. If you come home early, you can temporarily override your preset schedule. Later, the thermostat will return to its normal schedule.

If your home isn't equipped with a programmable thermostat but instead has a traditional thermostat, you can still easily adjust these temperatures manually when you go to sleep and when you leave.

The key to reducing your heating and cooling energy usage is active engagement with your thermostat. Even smart thermostats require smart engagement to conserve the most energy. This includes turning off your heating and cooling system altogether in the spring and fall and intermittently in the summer when the weather allows. Never turn it off in the winter to keep pipes from freezing.

Recommended Temperatures

Program your thermostat to the following recommended temperatures if you are able:

Winter

At home: 68 - 70° F or below
Away or sleeping: 60° F or below
Remember to adapt to the season. Warm socks, long sleeves, and warm bedding can go a long way.

Summer

At home: 76 - 78° F or above
Away: 85° F or above
Ceiling and plug-in fans increase your comfort at higher temperatures and save significant energy. See next page.

Spring & Fall

For warmer days: 78° F or above
For cooler days: 68° F or below
If open windows and ceiling fans are sufficient, turn off your heating/cooling system.

Fans

An energy efficient way to improve your thermal comfort.

The average AC unit uses
3,500 watts
but the average fan uses only
60 watts.

How Fans Work

Both portable and ceiling fans can be used to create air movement, which pulls heat away from your body to help cool you down. When you use fans correctly, less heating and cooling is needed to provide the same level of comfort. This can greatly reduce your CO_2 footprint.

- Once the fan is on the right setting, you can adjust your thermostat accordingly to reduce energy use.
- Turn off the fan when you aren't occupying the space. Fans cool people, not spaces.

Using Ceiling Fans

Summer — If you do not feel a cool breeze, reverse the direction of the fan by flipping the switch typically found on the base of the fan. The blades should rotate in the counterclockwise direction as you look up at them.

Winter — Remember that heat rises. Use the ceiling fan in the clockwise direction to bring the warm air down. Set the rotation speed on low.

Using Portable Fans

There are many fan options and sizes available that are relatively inexpensive and can help circulate air in your home. If your home does not have a ceiling fan, portable fans can be placed deliberately to provide maximum comfort.

- Make sure to position the fan close to where people are in a room to take full advantage of the cooling effect.

Windows

Proper ventilation is critical to your thermal comfort and indoor air quality.

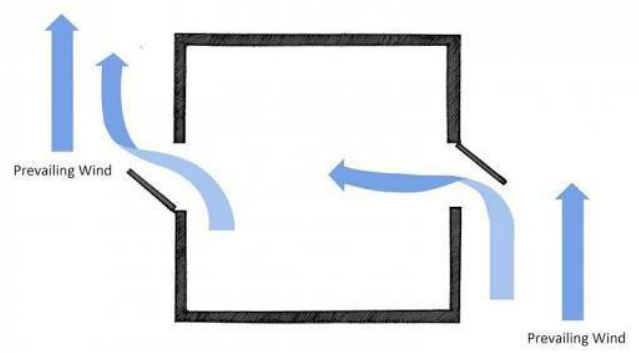
Ventilation is the most energy-efficient way to cool your apartment.

Indoor Air Quality

On average, we spend **90%** of our time indoors, and indoor spaces have pollutant levels **2 to 5** times higher than outdoor spaces. Poor air quality is due to building materials, air fresheners, furnaces, paints, cleaning products, care products, and more. Stay healthy and cut the risk of respiratory issues by eliminating indoor pollutants and ventilating the space by using your windows during temperate weather.

Cross Ventilation

You can create air movement on warm days by opening windows on opposite sides of your home. On still days, a box fan placed in an open window can help move air in and out. **When your windows are open, make sure to turn off your heating and cooling system.**



Ventilation through a room with opposite facing windows

Blinds

Warm Days — Close your blinds to keep your home cool and reduce the need to use your air conditioner.

Cold Days — Open your blinds when the sun is out to take advantage of natural light and heat. Close your blinds on cloudy days and at night to limit heat loss through windows.

Lighting

The installation of LED lights and conscious behavior can significantly reduce your energy use.

LIGHTING

On average, lighting accounts for **15%** of a household's energy consumption.

Use LED Light Bulbs

When replacing light bulbs, use LEDs. Only 10% of a conventional incandescent light bulb's energy consumption goes towards lighting, while the other 90% is wasted in heat generation. Similar to LEDs, Compact Fluorescent light bulbs (CFLs) are also quite efficient; however, they do not last as long, they use more energy than LEDs, and they contain mercury.

LED	CFL	Incandescent
Avg Life: 25,000 Hrs	Avg Life: 8,000 Hrs	Avg Life: 1,200 Hrs
No Mercury	Mercury	No Mercury
6-9 Watts	13-15 Watts	60 Watts
Uses 84% less energy	Uses 75% less energy	90% energy lost to heat

Turn Off Lights When Not In Use

On average, **15%** of a household's energy goes towards lighting alone. How much of that energy usage goes towards lighting unoccupied rooms in your home?

- Open the blinds to maximize natural lighting. See page 11 for additional details.
- Do a quick walk-through of your home to turn off lights before you leave or go to bed.
- Consider using dimmer switches to cut your energy use even more.
- Swap your incandescant light bulbs for LEDs. Visit this page on sustainability website to learn how.

Outlets & Phantom Loads

Understand the energy use and phantom draws of your devices to drive down your usage.

Even when electronics are turned off, they can account for up to

10%

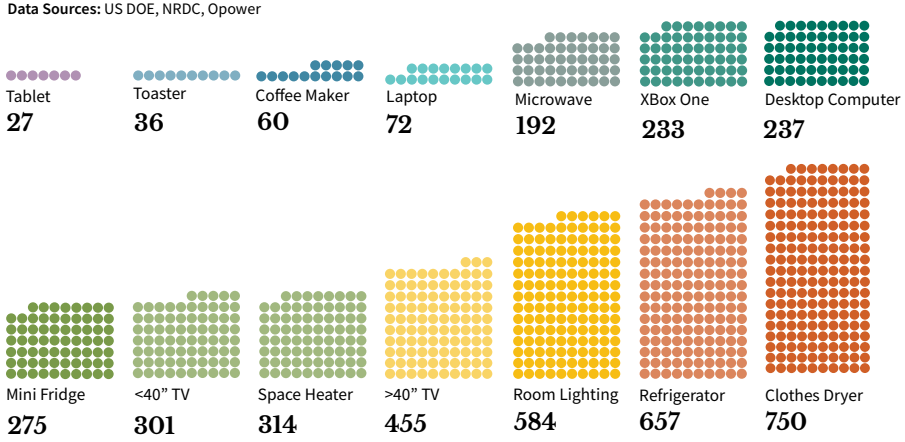
of a household's total electricity consumption.

Plug Loads

Plug loads are the energy consumed by devices that are plugged into outlets. They can account for up to 25% of a building's energy consumption. This graph shows the estimated annual energy consumption in kWh for 15 common devices:

The annual energy consumption of a common smart phone is 4 kWh = •

Data Sources: US DOE, NRDC, Opower



Phantom Loads

The term phantom load refers to energy use by plugged-in devices that are not in use or are powered off. One way to identify phantom loads is to look for lights, feel devices and plugs for heat, or listen for fan noises. Be sure to adjust your e-devices to power saving mode.

Get in the Habit of Unplugging

Unplug It — Going on break? Unplug all electronics that have a phantom load (especially DVRs, desktop computers, monitors, speakers, and printers) to save energy.

Duplicates — Identify and eliminate electronics that are duplicates or no longer needed/used.

Power Strips — Use a power strip for electronics that do not always need to be plugged in. Turn off the power strip when not in use.

ENERGY STAR — When possible buy ENERGY STAR labeled appliances.

Laundry

Washing clothes in cold water and air drying can significantly reduce your energy usage and prolong the life of your clothes.

Drying 1 load of laundry in a dryer is equivalent to running

330

LED light bulbs for 1 hour.

5 Tips to Save on Laundry

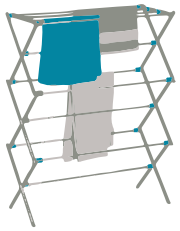
1. **Use a drying rack or clothesline instead of your dryer to save energy!**
   Using an indoor drying rack increases the life of your clothes compared to using a tumble dryer. If your clothes feel stiff after air drying, you can always throw it in the dryer for a few minutes.

2. **Wash clothes with cold water.**
   90% of the energy associated with washing clothes goes into heating water. In addition, cold water is gentler on your clothing, resulting in brighter colors and longer life.

3. **Avoid over-drying clothes.**
   Put clothes in for shorter cycles or take clothes out when they are nearly dry. Adding a dry towel to the dryer helps absorb water and dry clothes faster!

4. **Clean the dryer lint filter before each load.**
   A lint-free filter quickens drying, improves air circulation, and reduces fire risk.

5. **Do full loads of laundry.**
   It takes the same amount of water and energy to run one full load versus one half load, so avoid doing partial loads.



If all Americans air dried their clothes for just half a year, it would save 3.3% of the country's total residential output of CO_2.

Kitchen & Bathroom

Conserve water and energy by limiting hot water use and using more efficient appliances.

More than
20%
of a household's water usage comes from showers.

Heating hot water for domestic uses like showers, laundry, and sink is often the largest or second largest residential energy usage.

Kitchen

Dish Washing
Load your dishwasher fully before running it. A dishwasher is often more efficient than hand-washing dishes. If hand-washing, fill a bowl of soapy water to use instead of leaving the faucet running.

Use Electric Kettles
Electric kettles are the most efficient for heating water, followed closely by microwaves. Stove-top kettles are significantly less efficient.

Use a Toaster Oven
Toaster ovens take less time and energy to heat food compared to a normal-sized oven. Limit oven usage when running air conditioning.

Conserve Cold
Limit the amount of time that your refrigerator and freezer are open. Avoid putting hot food into the freezer or refrigerator.

Bathroom

Short Showers
Showers are typically the third largest water use after toilets and clothes washers. Take shorter and cooler showers to save both water and energy. Aim for 3 - 5 minute showers.

Decrease the Flow Rate
This saves water and energy and you don't need to sacrifice the length of your shower. Visit this page on sustainability website to learn how to swap your shower head for a low-flow showerhead.

Turn off the Tap
Avoid letting the tap run when brushing teeth, cooking, or doing dishes. When showering, turn off the water while applying soap and shampoo.

Report Leaks
Submit a housing maintenance request (on-campus residents) or contact your landlord to report leaking faucets and showers or toilets that run.

Food

Choose healthy food that is locally and responsibly sourced and has a small "foodprint."

FOOD

The global food system accounts for more than

1/3

of total global greenhouse gas emissions.

Understanding Your Foodprint

Your diet is one of the most significant ways to manage your environmental impact. According to the Intergovernmental Panel on Climate Change, about 14% of global emissions is attributed to agricultural production including: soil management, livestock digestion, and biomass burning. The entire food production system, with transportation and packaging included, accounts for as much as 37% of total greenhouse gas emissions, according to an IPCC report released in August 2019.

Tips for Choosing Food

Download the Food Guide

This comprehensive and interactive guide will help you make informed food choices, from grocery shopping to cooking and to waste disposal. View the guide here!

Source Locally

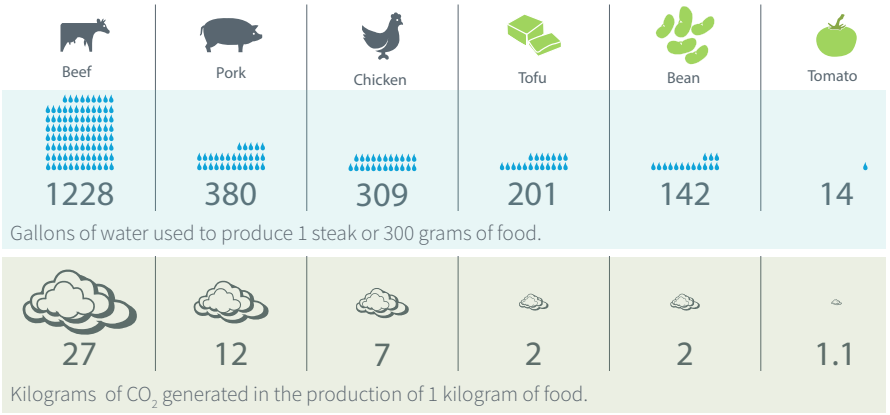
Sign up for the WashU Community Supported Agriculture program to support local farmers and get a bi-weekly crop box with fresh produce. Visit the WUSM farmers' market on Thursdays, 10a - 2p.

Reduce Food Waste

Use appropriate portions so you don't waste food. Store leftover food in the fridge or freezer and be conscious of expiration dates.

Eat Less Meat

Limiting the amount of meat you eat per week or substituting chicken for beef greatly reduces your impact - refer to the chart below to see by how much!



Sustainable Products

Choose products that are environmentally and socially just, toxin-free, and inspire well-being.

SUSTAINABLE PRODUCTS

Major companies produce over

60,000

chemicals that are unregulated by the EPA and found in everyday products.

Healthy Product Choices

Many household products and cleaning solutions contain chemicals that can have a detrimental impact on your health and ecosystem health.

Avoid Toxins

Avoid products that contain chemicals that are known to damage your physical and neurological health.

Look for **Safer Choice** labels and for products that use natural or non-toxic compounds.

GoodGuide is an app that lists the health ratings of products based on the ingredients.

The **Environmental Working Group** produces consumer guides that list toxins, water and energy use, and farming practices used to create consumer products.

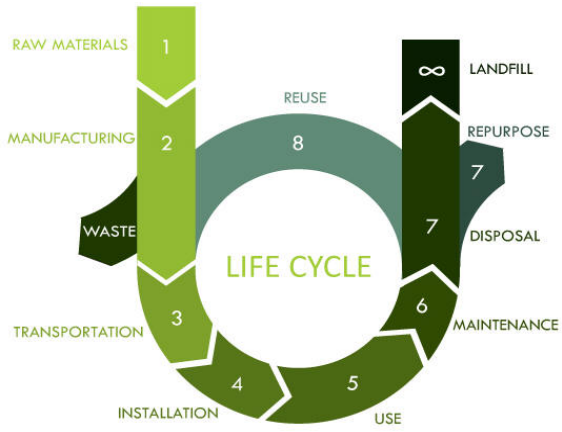
DIY Cleaning

Cleaning solutions can be made from simple household ingredients and are better for your health and ecosystem health. Regular cleaning improves air quality and increases the lifespan of the materials in your home.

Try a mixture of 1/2 c white vinegar, 2 Tbsp baking soda, 10 drops tea tree, lavender, or lemon essential oil (for their disinfectant properties) for an DIY all-purpose cleaner.

Life Cycle

When purchasing household objects or clothes, take into consideration the environmental and ethical impacts at each stage of a product's life. Avoid petroleum-based products.



Waste

Know when to reduce and reuse and how to manage your waste.

The average American produces **4.4 lbs** of waste per day. The global average is 2.2 lbs per day.

Less is More

The biggest way to reduce your waste is to consume less.

- **Refuse** by seeking out and using durable, reusable items wherever possible to avoid CO2 emissions, natural resource consumption and disposal challenges whenever possible. Start with: water bottles, cups/ mugs, utensils, dishes, straws, paper towels, napkins, and bags.
- Order efficiently, and choose items with minimal packaging. Support products and retailers that reduce packaging and use recyclable or biodegradable packaging.
- Make use of reuse at WashU. If you are looking for new items for your home or passing along old items, visit the **Trading Post** free thrift store on the South 40 section of campus, check out **WashU Free and For Sale** on Facebook, and donate to the **Share Our Stuff** move-out drive at the end of the semester.

Diverting Waste

In the US, recycling and composting diverted **87.2 million tons** of waste from the landfill in 2013, up from 15 million tons in 1980. Diverting this material prevented the release of nearly **186 million metric tons** of CO_2 into the air in 2013 — equivalent to taking over **39 million cars** off the road for a year.

How to Sort Your Waste

Sorting your materials properly is important to reduce contamination, which could cause loads of recyclables and compostables to go the landfill.

Recycling

Paper, cartons, cardboard, metal, glass, and #1-5 plastic containers (clean, empty, dry). Compostable plastics are not recyclable. Other items may be recyclable through special collection (not via single stream recycling). Visit this page to recycle materials like electronics, plastic bags, textiles, etc.

Compost

Food scraps, certified compostable serviceware, uncoated brown paper, napkins, and paper towels. Compost collection is available at select dining halls, and S40 residents can request compost bins for their rooms. Those living off campus have options for composting, including vermiculture, outdoor compost piles, or subscribing to a compost collection service.

Landfill

Everything else (food-soiled containers, paper cups, Styrofoam, #6 plastics, etc.) For proper disposal of hazardous materials, visit this page.

Alternative Transportation

Reduce greenhouse gas emissions and stay in shape by leaving your car behind.

In the United States

76.4%

of people commute in single occupancy vehicles

Why Drive Less?

Vehicle transportation is the largest part of an average American's carbon footprint. Luckily, there are many options for alternative transportation in St. Louis that are better both for the environment and for your personal health.

Navigating the Options

Walking

It is recommended that the average person walks 5 miles per day or 10,000 steps. Walking to your destination improves your health, reduces your impact on climate change, and allows you to get to know your neighbors and community.

Biking

WashU's campus features separated bike lanes, covered bike parking, an Active Commuter Hub, and bike repair stations to make riding a comfortable and safe experience. You can view these resources on this page. Visit this page for bike routes in the St. Louis region.

Metro

Most people on WashU's campus live within a mile from 2 Metro train stations and multiple bus stops. Check out a map of St. Louis Metro stops at metrostlouis.org. WashU offers free U-Passes to all full-time students and employees!

Carshare & Carpool

If you need to drive, avoid driving alone! WashU car share and carpool programs allow car-free people to access a car when needed. Visit rides.wustl.edu or the Parking & Transportation website for more info.

Travels

A single airplane flight produces three tons of CO_2 per passenger. Consider carpooling, taking the bus, or taking the train for longer travel. The Greyhound Bus, Megabus, and Amtrak stations downtown are easily accessible by the Metro.

Download the Transit App to track and plan trips using the Metro in St. Louis and navigate transit in other major cities around the world.

Questions?

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QUADRANGLE
WASHU OFF-CAMPUS LIVING

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