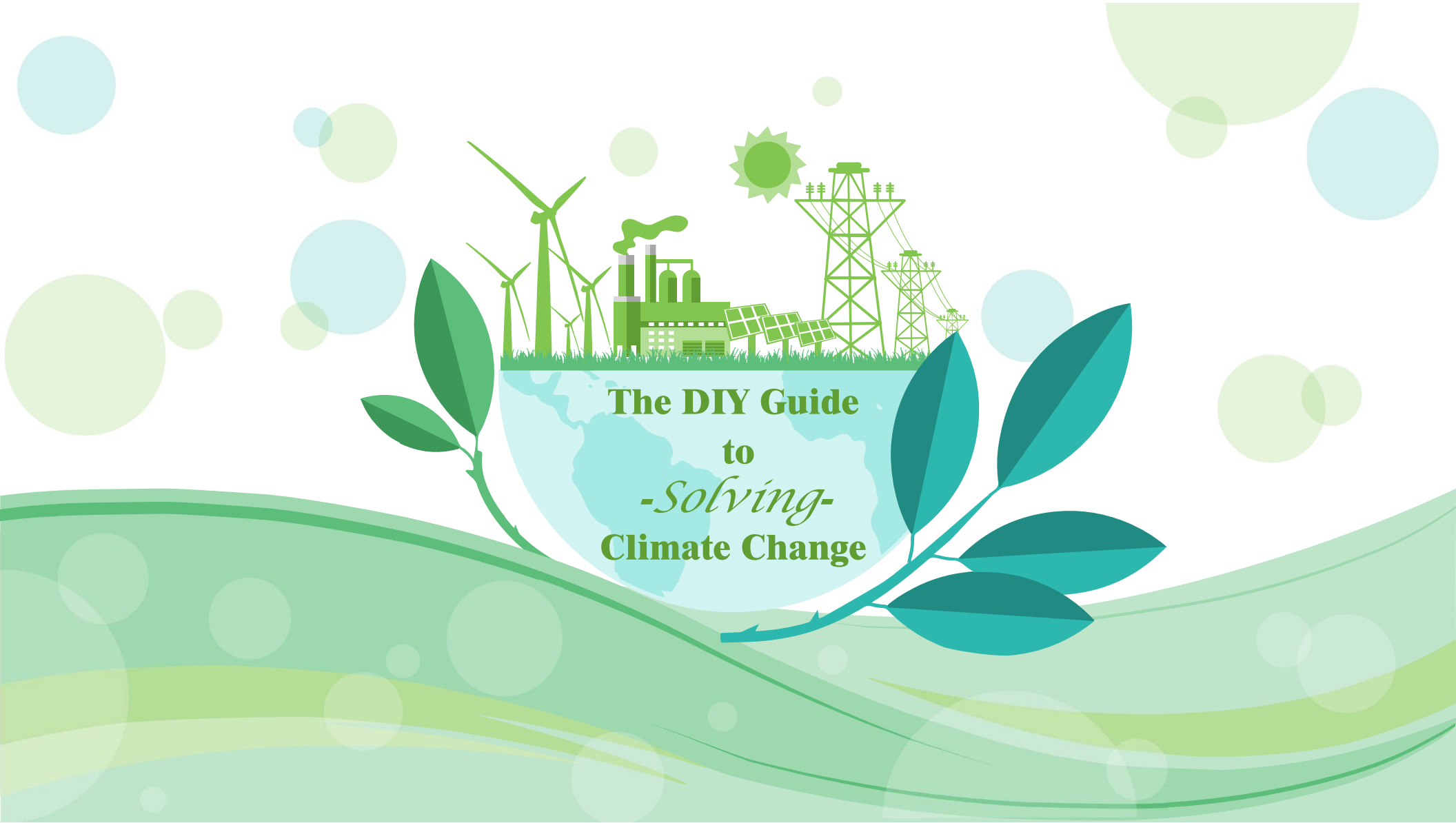
The DIY Guide
to
-Solving-
Climate Change

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Outline:

1. What is clean energy?
2. The power grid
3. What are we doing to solve climate change?
4. Energy consumption and conservation
5. Performing an energy audit
6. What can I do?

What is clean energy?

Hint: There isn't one "right" answer!

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Clean energy sources

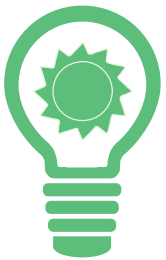
Clean energy sources

Wind

Wind blows and turns the blades on a windmill. This rotates magnets around a coil of copper wire, generating an electric current.

Solar

Photons, a particle of light energy, are absorbed by electrons in a solar panel. This gives the electrons enough energy to move in an electrical current.



Biomass

Flammable natural material is burned. This energy can be used directly as heat, or to boil water which turns a turbine similar to a windmill.

Hydro

A river is dammed, and water is allowed to pass at a controlled rate to spin a turbine, generating electricity.

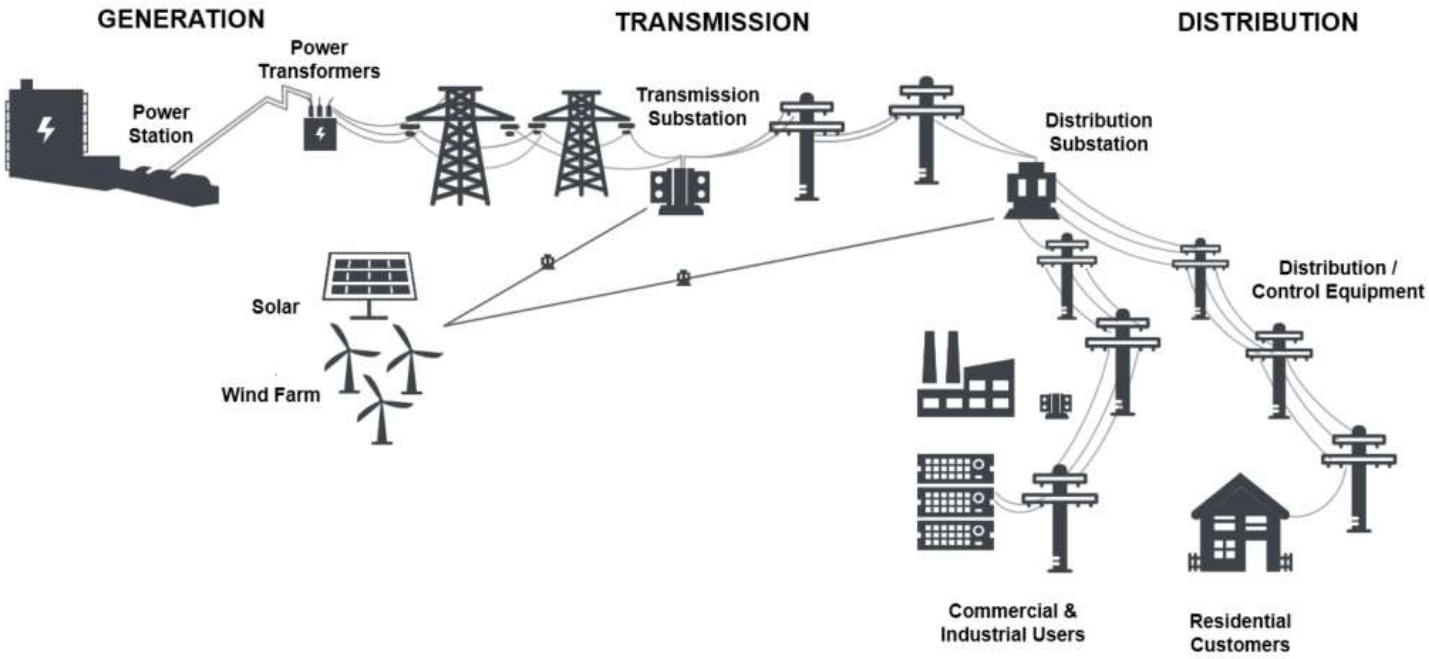
Geothermal

Underground hot water or steam heated by the earth is used for direct heating or to turn a turbine.

How does power get from the source to your device

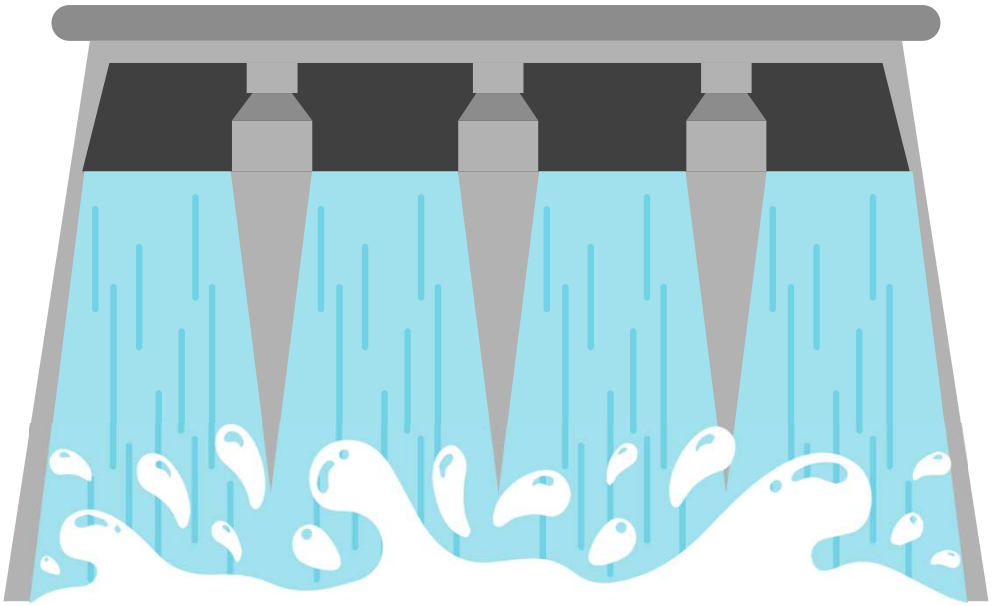
Draw a diagram showing the path from your (plugged in) device to the source of your electricity. Do you know how it's generated?

The Power Grid



How is your power generated?

Washington is powered by hydro!



Most of the power in Washington state is supplied by the Bonneville Power Administration

This public entity is responsible for operating all of Washington's federally owned dams, included the Grand Coulee and Chief Joseph projects.

To find how your power is generated, you can check your local utility's website.

This website:
https://www.inmyarea.com/utilities
can help you find your local utility providers. In areas that have multiple providers, you can check your utility bill, which is either paid directly or through your housing management company.

For a complete map of power plants in Washington state, you can visit https://www.eia.gov/state/?sid=WA

Now, how do we solve climate change?

A huge, multidisciplinary effort in the global community is underway to combat climate change. Some examples are:

- Clean power generation
- Energy storage
- Green materials
- Carbon capture
- Responsible farming practices
- Habitat restoration
- Environmental justice and public policy

Visit https://www.cei.washington.edu/ to learn more about what we're working on.

But we need you!

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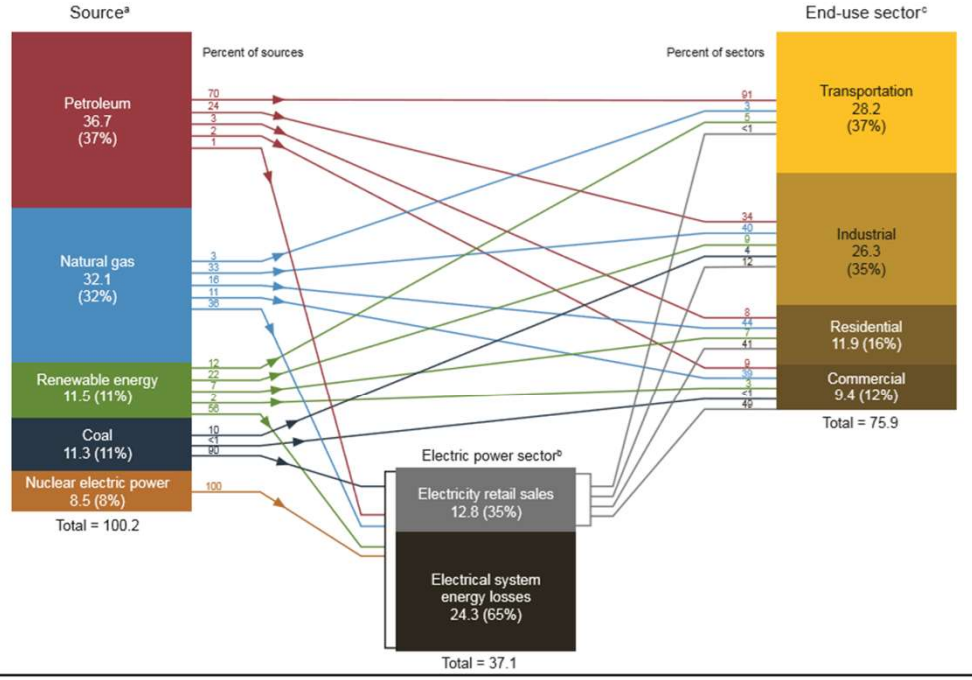
So, what can you do? Start with conservation!

The US consumes a tremendous amount of power each year. By reducing our consumption, we can cut down on power production, making it easier to implement clean energy solutions without the need of supplemental production from petroleum fuels.

You can be a leader in your community!

U.S. energy consumption by source and sector, 2019

(Quadrillion Btu)



[a] Primary energy consumption. Each energy source is measured in different physical units and converted to common British thermal units (Btu). See U.S. Energy Information Administration (EIA), *Monthly Energy Review*, Appendix A. Noncombustible renewable energy sources are converted to Btu using the "Fossil Fuel Equivalency Approach", see EIA's *Monthly Energy Review*, Appendix E.

[b] The electric power sector includes electricity-only and combined-heat-and-power (CHP) plants whose primary business is to sell electricity, or electricity and heat, to the public. Energy consumed by these plants reflects the approximate heat rates for electricity in EIA's *Monthly Energy Review*, Appendix A. The total includes the heat content of electricity net imports, not shown separately. Electrical system energy losses are calculated as the primary energy consumed by the electric power sector minus the heat content of electricity retail sales. See Note 1, "Electrical System Energy Losses," at the end of EIA's *Monthly Energy Review*, Section 2.

[c] End-use sector consumption of primary energy and electricity retail sales, excluding electrical system energy losses from electricity retail sales. Industrial and commercial sectors consumption includes primary energy consumption by combined-heat-and-power (CHP) and electricity-only plants contained within the sector.

Note: Sum of components may not equal total due to independent rounding. All source and end-use sector consumption data include other energy losses from energy use, transformation, and distribution not separately identified. See "Extended Chart Notes" on next page.

Sources: EIA, *Monthly Energy Review* (April 2020), Tables 1.3 and 2.1-2.6.

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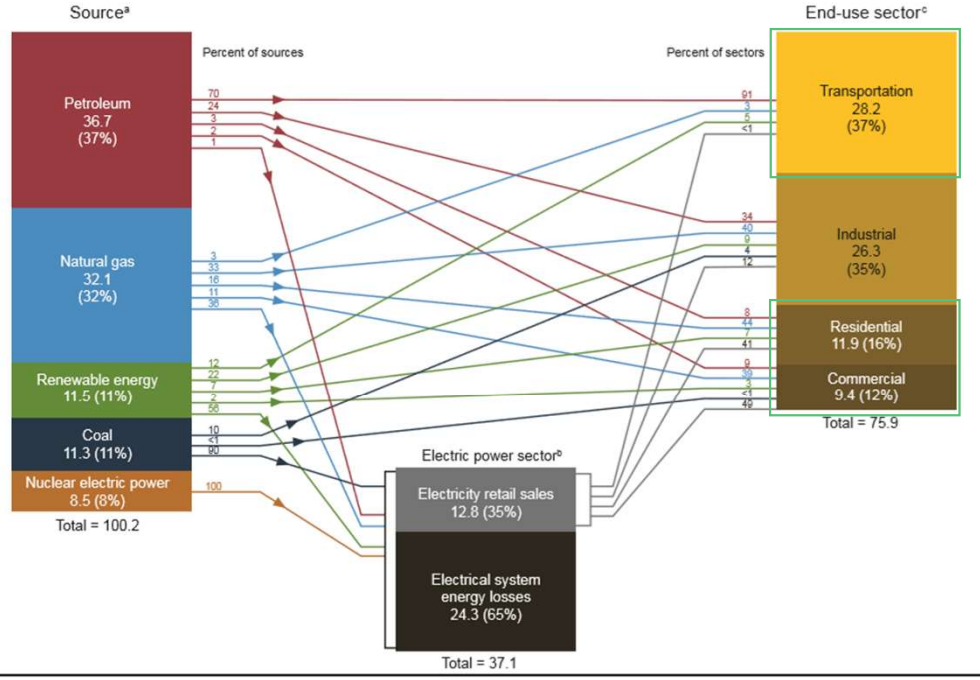

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Give your life an EFFICIENCY BOOST with an energy audit!

To understand the most effective changes you can make, it is important to understand your energy consumption.

For a general calculation of your carbon footprint, you can use this resource: https://www.carbonfootprint.com/calculator.aspx

Let's start with your activities and your home. Consider:

Transportation

Appliances

Purchases

Home

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Let's start with your activities and your home. Consider:

Transportation

Do you drive yourself? Carpool? Take the bus? Ride your bike?

Appliances

Are your appliances Energy Star rated? Do you use them efficiently? Could you limit your usage?

Purchases

Do you buy local? Reuse or repair old items? Buy from companies that use clean power or buy carbon offsets?

Home

Do you have high efficiency lights? Do you turn them off? How much do you use AC? Are your windows insulated?

Use the energy audit worksheet to go analyze your energy consumption.

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Energy Audit

What wouldn’t you have thought about?

Where did you lose the most points?

What’s one thing you could do this week to improve?

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How to read a utility bill

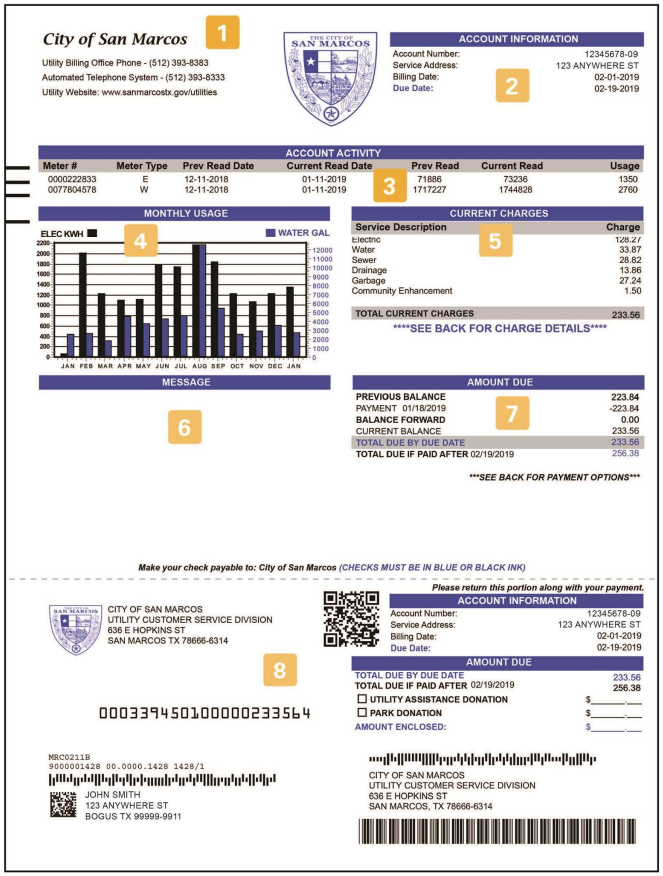
Utility bills

Utility bills are sent once a month by your PUD either directly to you or your property manager. They contain information on your monthly utility usage, and often statistics on your historical usage.

Utility bills can show charges for water, power, natural gas, sewer, and waste.

City of SAN MARCOS
How To Read Your New Utility Bill

1. Office Information
2. Account Number and Summary Details
3. Meter and Service Period Information
4. Consumption History for Previous 12 months
5. Summary of Current Charges (See #4 Detail on Back of Bill)
6. Messages
7. Account Balance Information
8. Payment Stub- Detach and Return with Your Payment. Also restates Your Account Summary Detail



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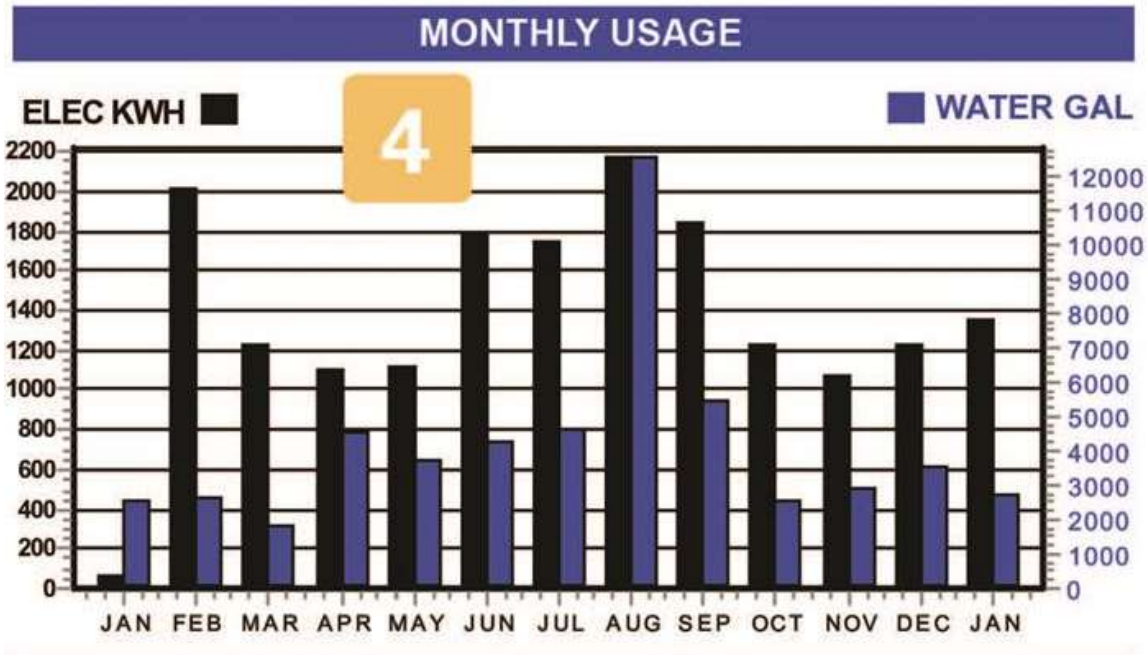
How to read a utility bill

Analyzing the bill

What month has the highest usage of water and electricity? Why do you think this is?
What could they do to lower their usage?



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Some project ideas:

Give your water heater a blanket!

Insulating your hot water heater can reduce its energy consumption by up to 16%!

Keep the heat out / in.

Apply a film on your windows or make curtains!

Save on laundry.

Build some simple drying racks for your clothes to save 6% of your yearly power usage!

Stop those energy vampires!

Use power strips (and turn them off) to prevent appliances from using energy while in their standby mode. This can save up to $100 a year!

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What about outside of your home?

You can perform energy audits for your school, community centers, or religious buildings!

Schools and large buildings are huge consumers of power. You can join or start environmental clubs in your organizations to make big changes!

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Write your local legislator!

Writing letters (or emails) to legislators is a great way to let them know what issues are important to their constituents.

You can use this website to find your federal level lawmakers and bills that affect you: https://www.govtrack.us/
For local issues, you can look here:
https://www.commoncause.org/find-your-representative/addr/

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How to get involved with the broader community

Lots of programs exist for getting involved in environmental work, including:

Summer internships in industry:
https://www.sparksip.org/

Leadership, activism, and environmental justice:
https://www.sustainabilityambassadors.org/youth

Internships with a national lab:
https://www.pnnl.gov/stem-internships

For incoming UW engineering freshmen:
https://www.cei.washington.edu/education/undergraduate-students/alva/

Key points

Clean energy sources are replenishable on a human timescale and have a net zero carbon emission.

The clean energy sources are wind, hydro, solar, geothermal, and biomass.

You can fight climate change by improving your personal and community energy efficiency! This can be done in many ways.

The power grid connects you and other users to the power plant. How our power is generated matters!

You can make wider-scale changes by writing your policy makers and getting involved in research!

Thank You!

To keep the conversation going, please email us at CEI-outreach@uw.edu