
ENERGY EFFICIENCY

— What it means, and what you can do! —



Holland

MICHIGAN



“Holland is committed to being a highly-competitive world-class community, supported by innovative energy solutions that benefit the citizens, the business community, and the environment.”

(Holland Community Energy Efficiency and Conservation Strategy Project Work Team Report)

What is energy?

The ability to do work

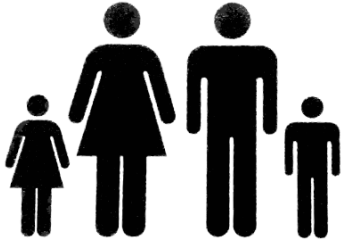
Often measured in Kilowatt
hours (kWh)



**What are the ways we
use energy?**

What can **we** do to be responsible energy users?

Sustainability is the idea of only using resources that we **need**, so we don't **deplete** our natural resources and **harm** the environment, or **run out** of resources that can't be replaced quickly.



Three pillars of sustainability or “Triple Bottom Line”

An accounting framework with 3 parts:
social, environmental and financial impact

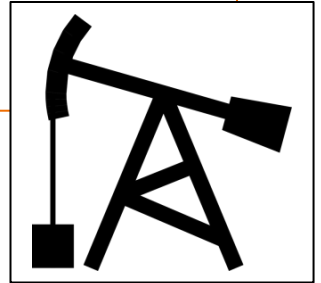
“People, Planet, Profit”

Renewable vs. Nonrenewable Energy

Renewable: energy from resources that are naturally replaced



Nonrenewable: energy that will not be replenished for thousands or millions of years, often they are fossil fuels



What are some forms of renewable energy?

Solar Energy



Heat Energy from the sun can be converted into electrical energy that we can use

Wind Power



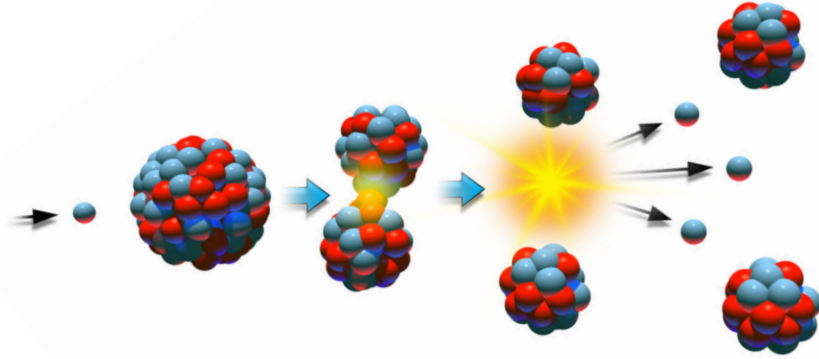
Windmill Island, Holland, MI



Helder Park, Zeeland, MI

Changes in temperature
create wind; we can
harness wind with turbines
to create electrical energy

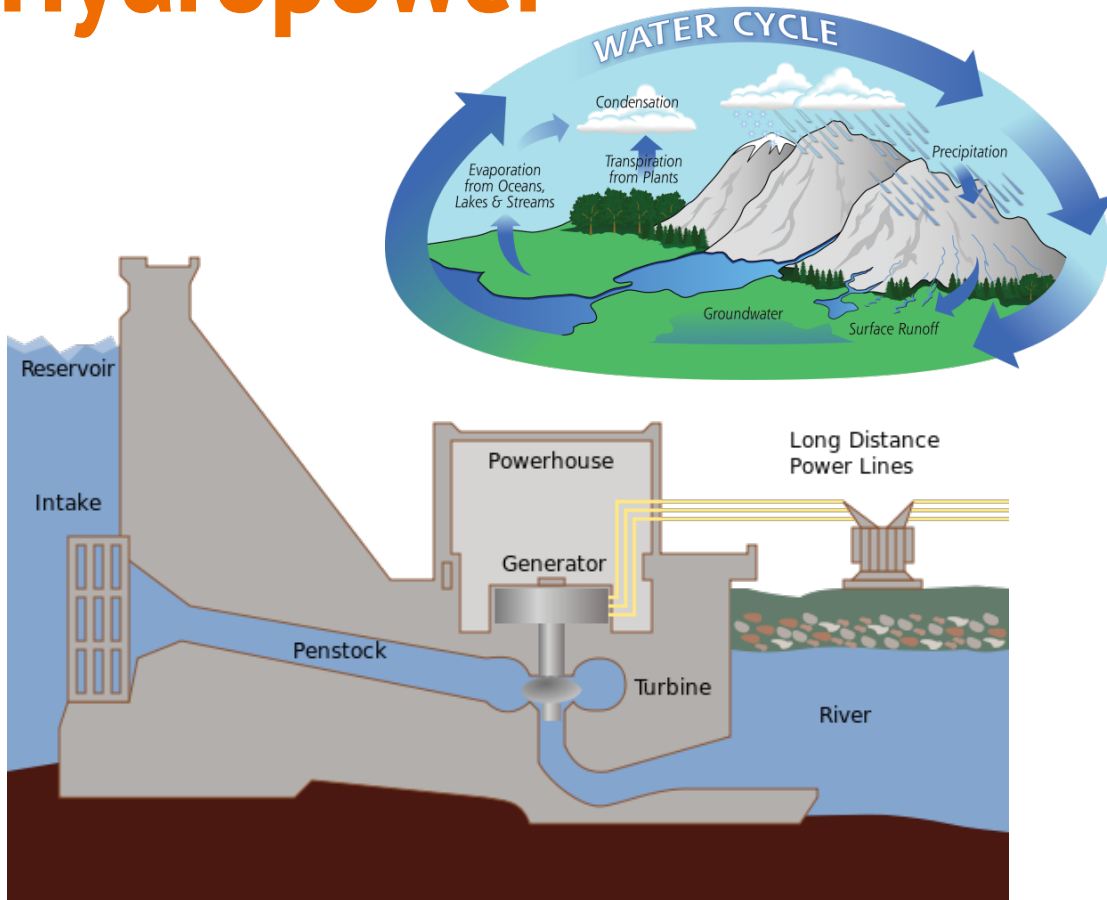
Nuclear Energy



A **nuclear reaction** releases energy that generates heat, which is then used in steam turbines to produce electricity

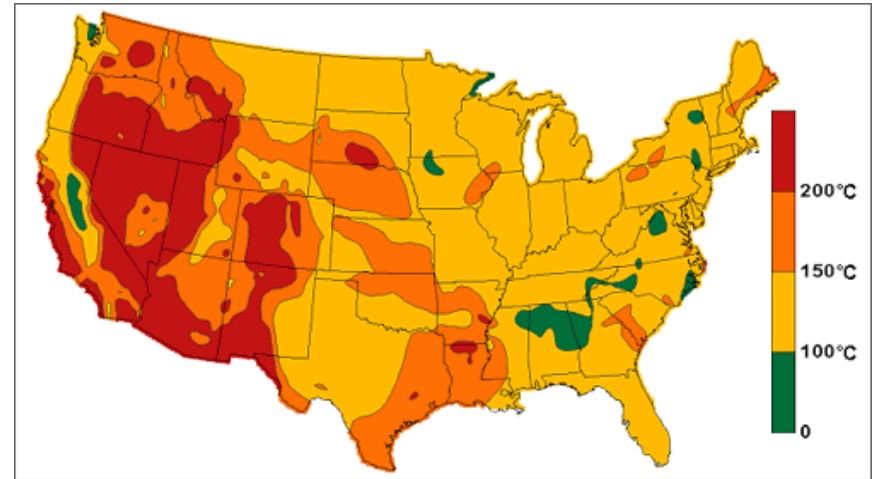
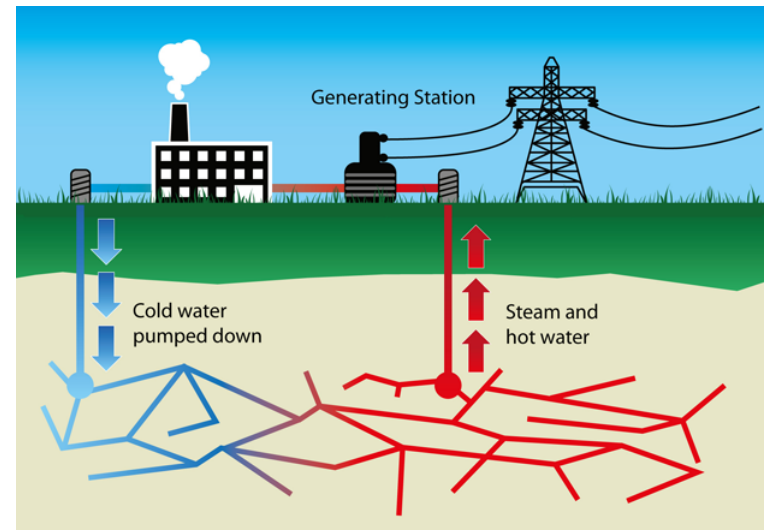
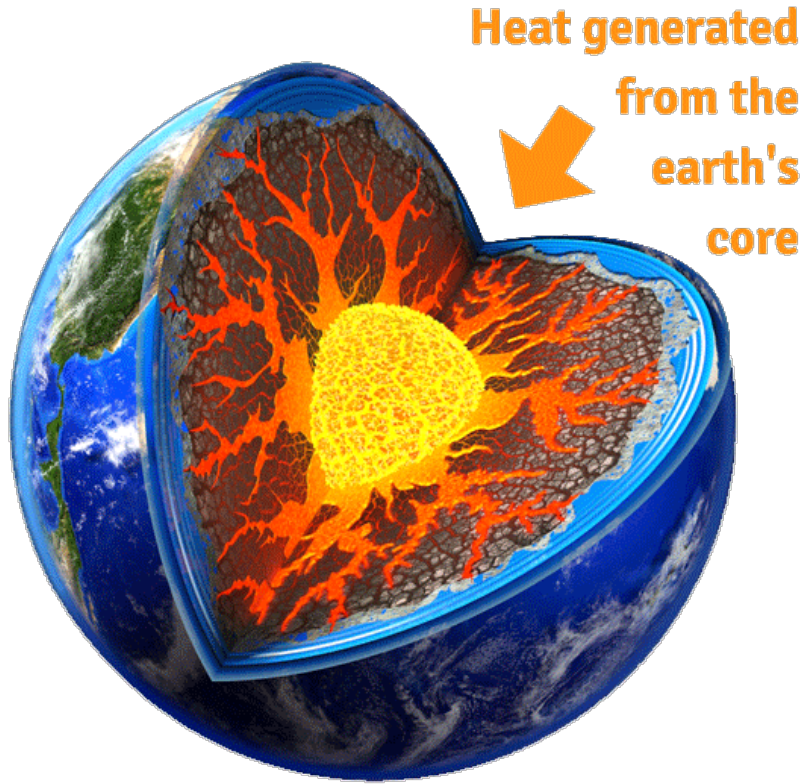


Hydropower

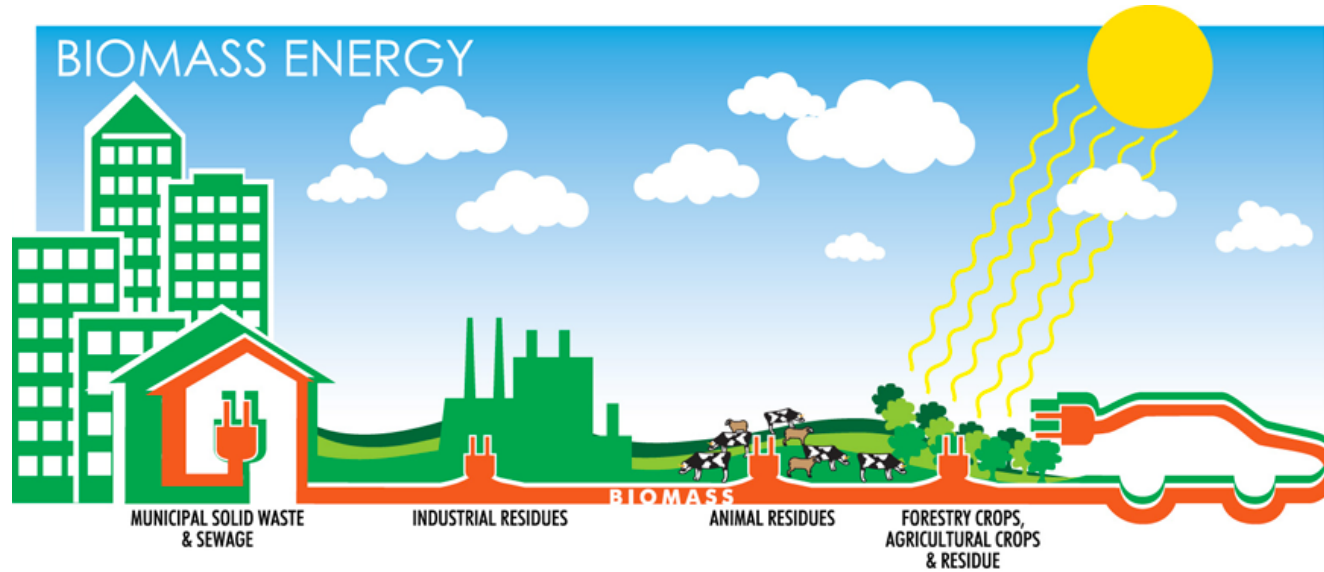


When water flows over **turbines**, they spin; this turns a generator and produces electricity

Geothermal Energy



Biomass Energy



When we **burn materials** they create steam, which turns a turbine to create electricity

Types of Biomass



Wood fuel



Rubbish



Alcohol fuels



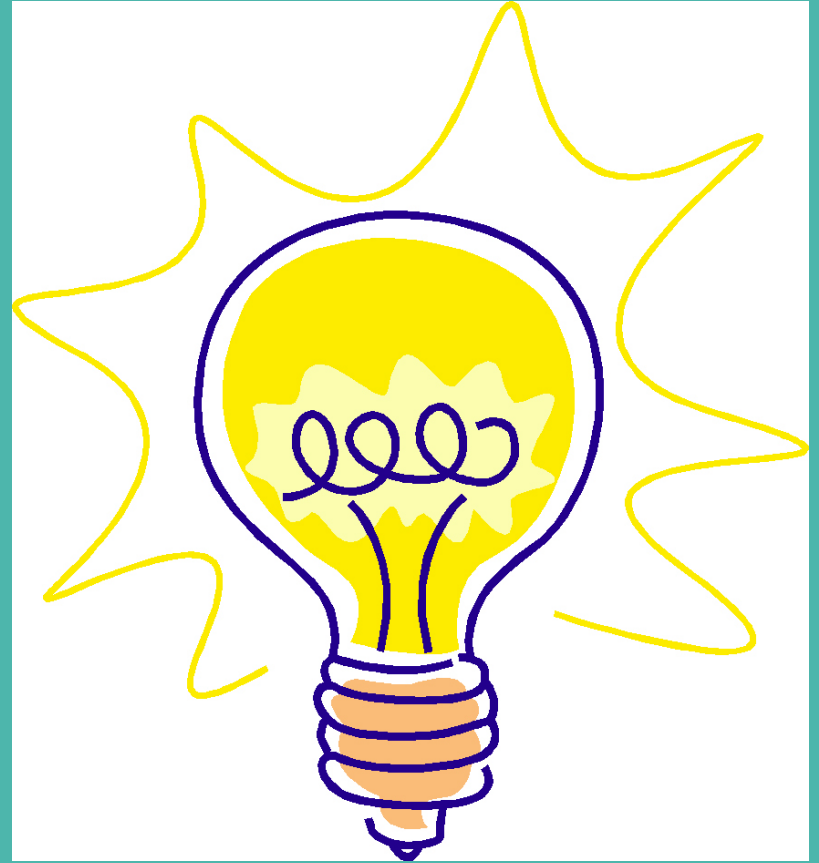
Crops



Landfill gas

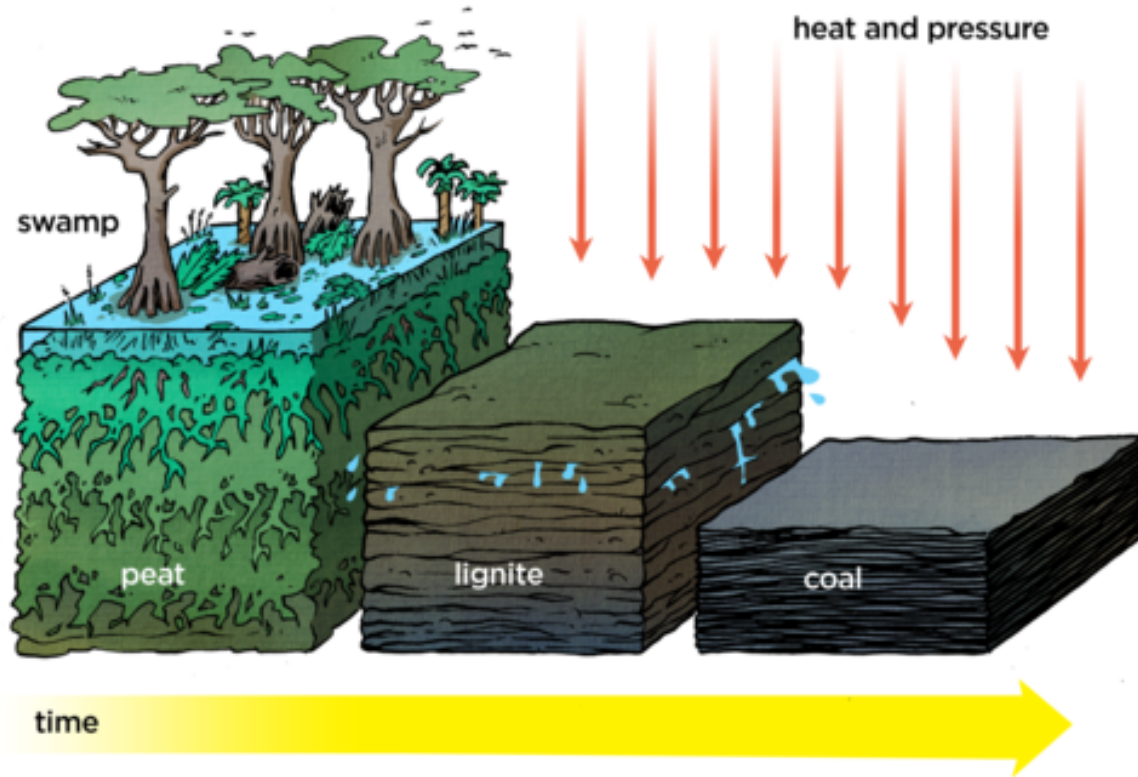


Where does our
energy come
from?





Coal: formed 300 million years ago



In 2012, Holland burned

550 Tons

of coal everyday!

How do we make our energy cleaner?

Natural Gas



Renewable Energy



Wind Farms

Landfill Gas



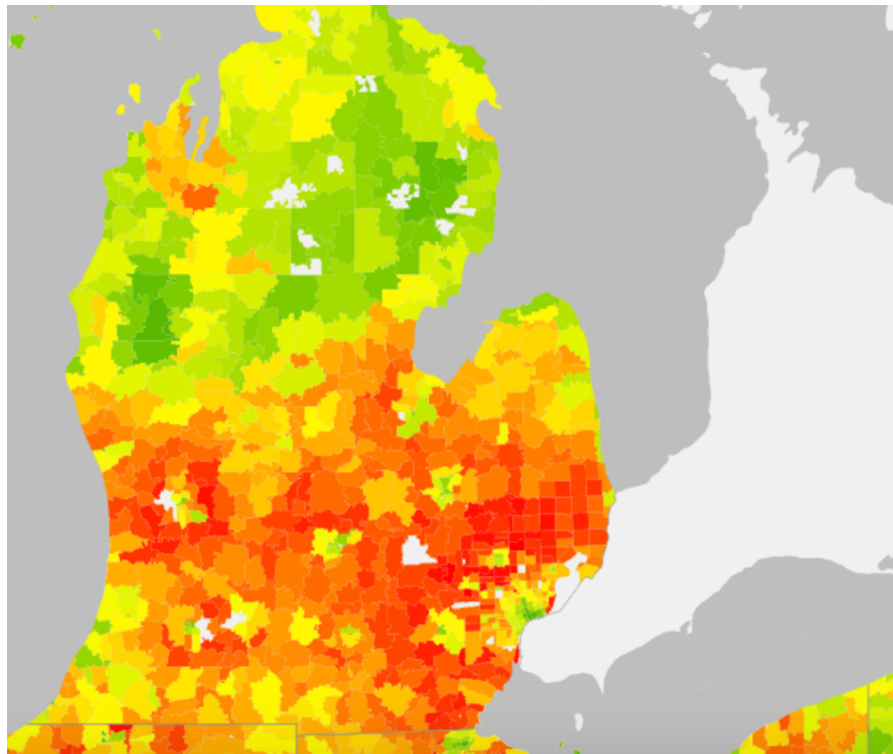
Wood
Biomass

New Holland Energy Park:



Know your CARBON FOOTPRINT

Average
Annual
Household
Carbon
Footprint



Zipcode: 49424

Holland, Ottawa County, MI

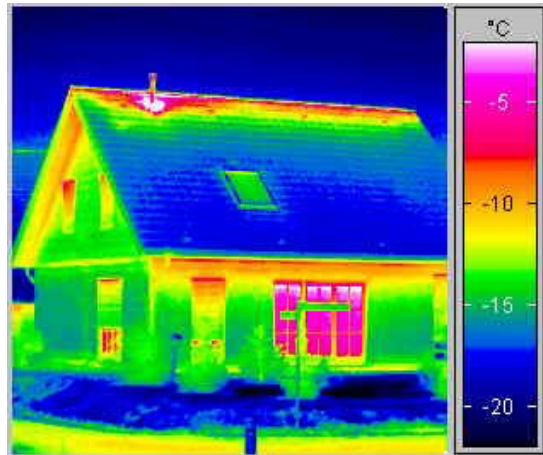
59.6

metric tons CO₂ equivalent



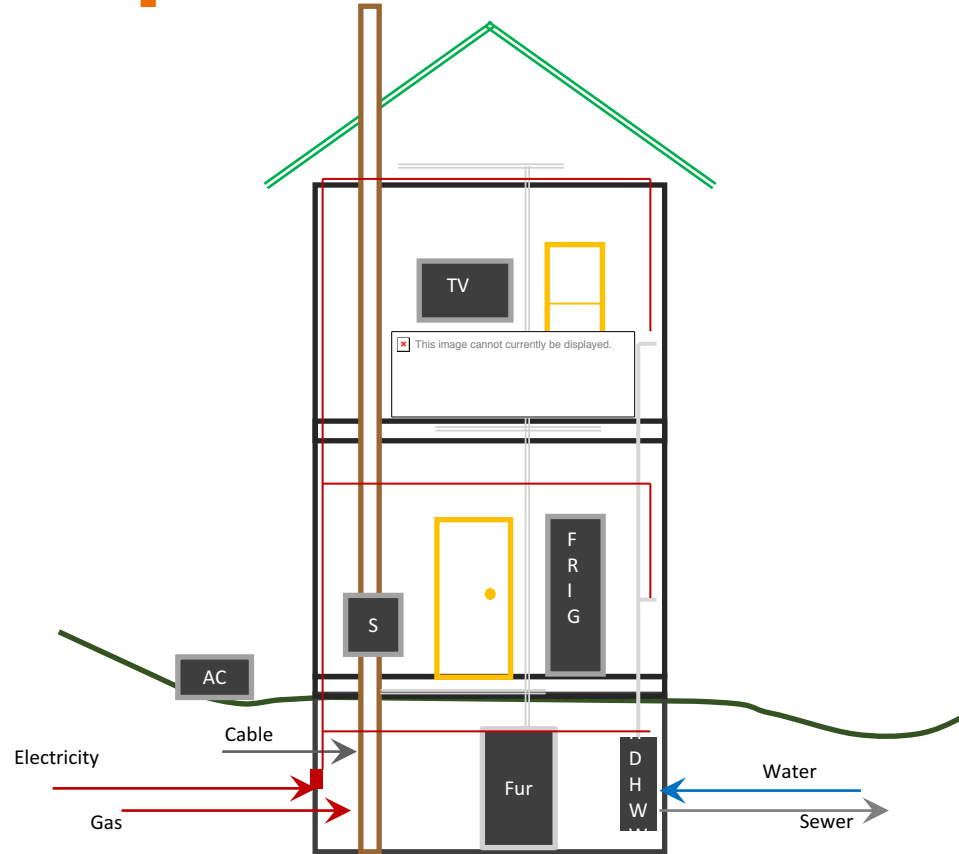
Holland Home Energy Retrofit Program

- *Energy Ambassador* works with the [Home Energy Retrofit Task Force](#) and uses building science to reduce gas and electric use in people's homes
- **Building Science:** studying the physical behavior of a building as a system and how it impacts energy efficiency, costs, comfort, and indoor air quality
- In Holland, people can take out loans to have money to make their house more efficient...in the long run, this saves money!



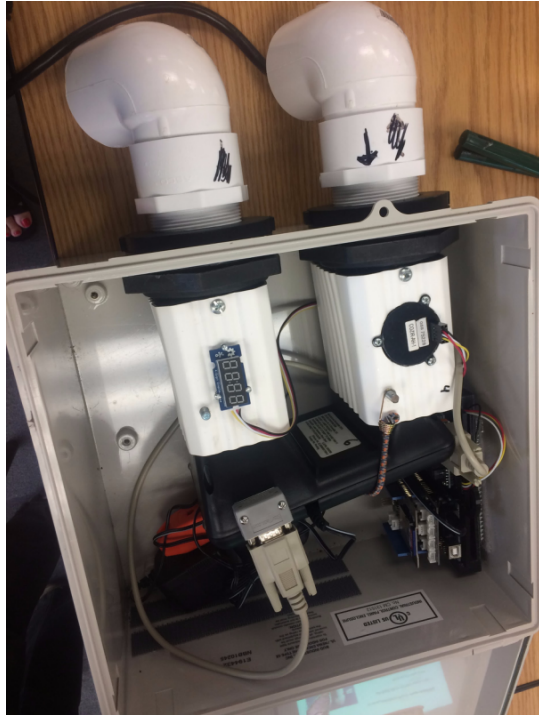
Building Science Principles

- **Utility Dollars**
- **Building Shell**
- **Indoor Air Quality (IAQ)**
- **HVAC**
- **Appliances**
- **Lifestyle**
- **Community Values**

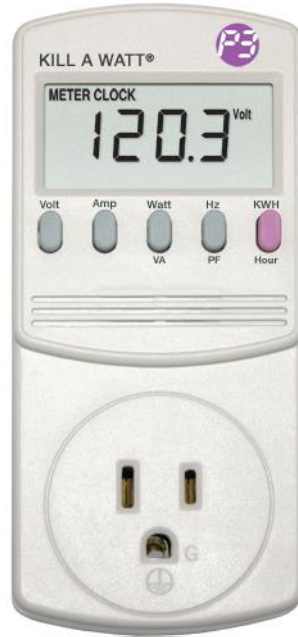


Building Science Tools

Air Quality Monitor



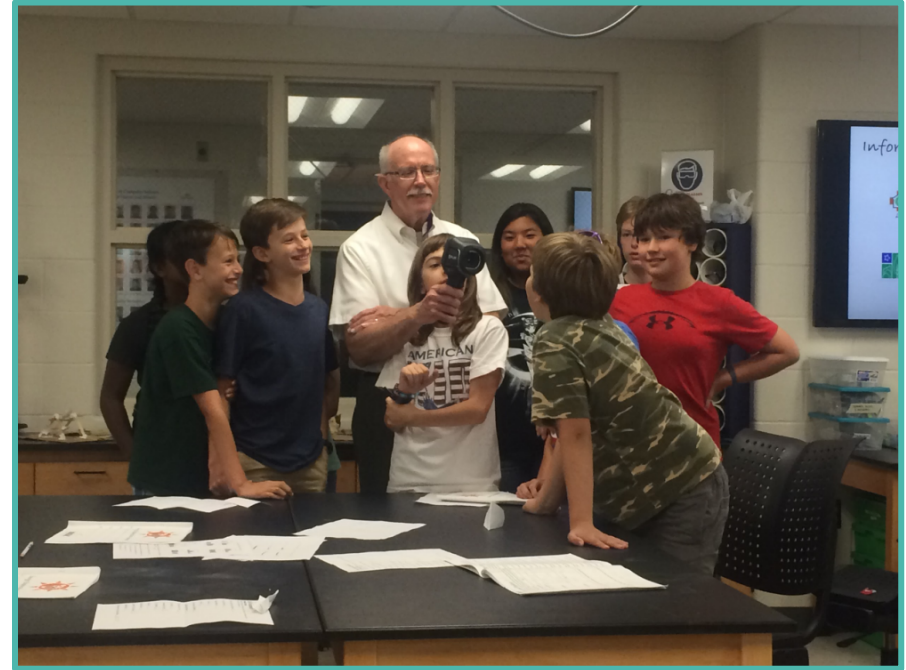
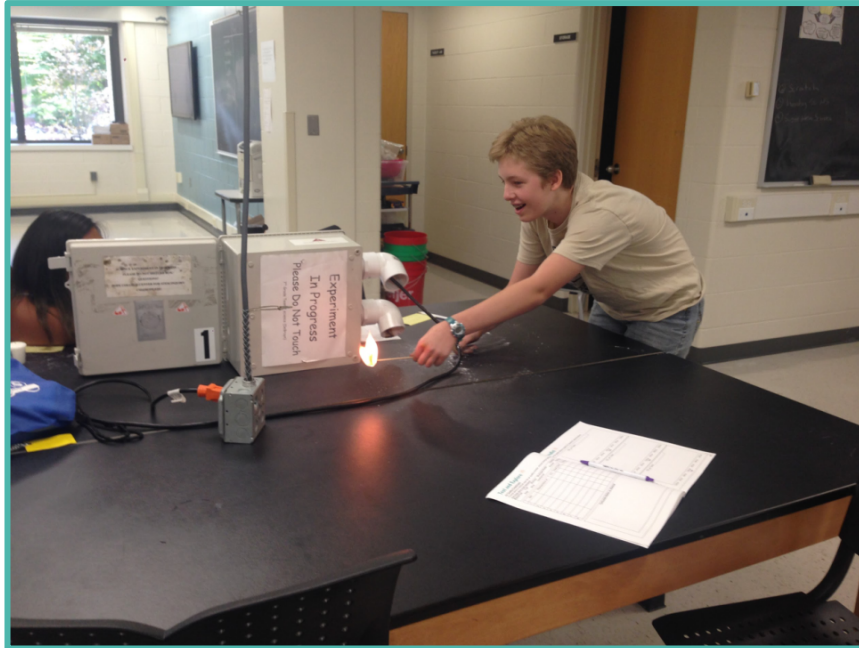
Electricity Usage Monitor



Infrared Thermography

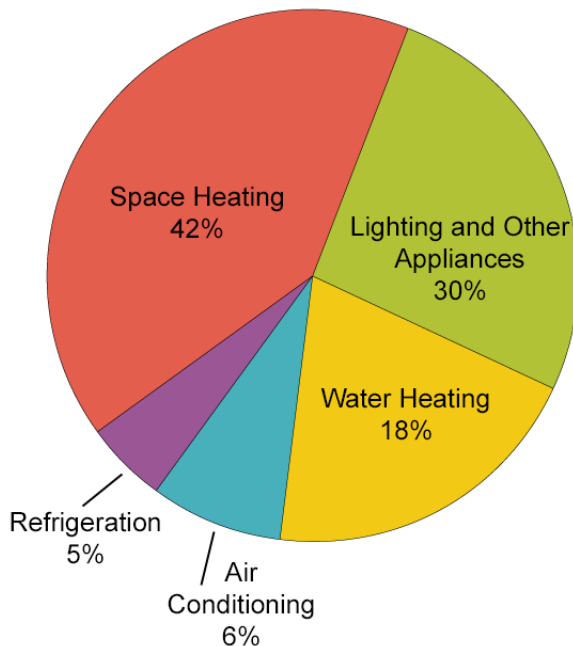


Building Science Tools



Energy Use in Homes

How Energy Is Used in Homes (2009)*

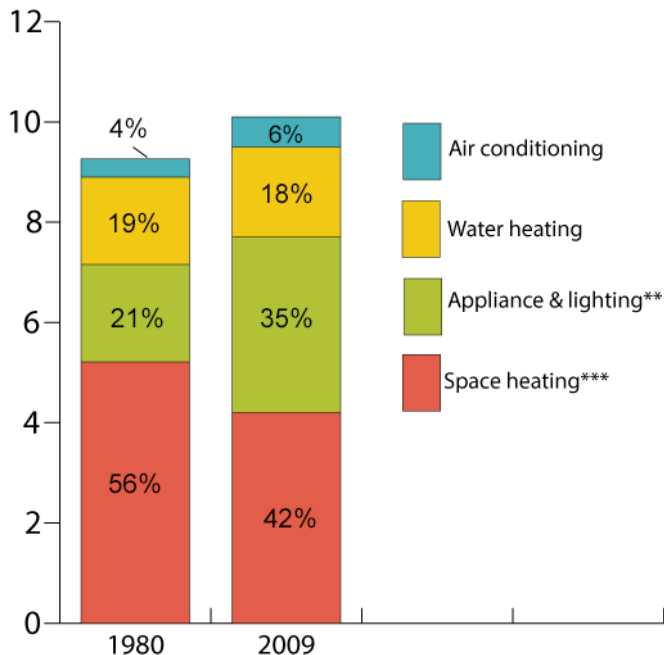


* 2009 is the most recent year for which data are available.

Source: U.S. Energy Information Administration, *Residential Energy Consumption Survey (RECS) 2009*.

Home Energy End-Uses: Share of Total Consumption, 1980 and 2009*

Quadrillion Btu



*The most recent year for which data are available.

**Includes refrigeration.

***Does not include wood.

Source: U.S. Energy Information Administration, *Residential Energy Consumption Surveys 1980 and 2009*.

What can you do at home?

- When leaving a room, turn **off** the lights
- Wash clothes in **cold** water and dry them on a **clothes line** rather than
- Eat a sandwich with raw fruits and vegetables for dinner instead of
- **Don't** stand in front of the refrigerator with the door open—**think** about what you want before you open it!
- Open the **curtains** during the day to let the sun in, so that you don't have to use lights!
- Plant **trees** around your home to provide shade
- Switch incandescent light bulbs to **LED lights** to save energy & money
- Adjust the **thermostat** to a comfortable but reasonable setting
- Use a **Smart Strip** or surge protector to turn off devices when not in use

**What other ideas do you
have for saving energy?**



community foundation
Holland/Zeeeland Area



Hope COLLEGE



TEACH FOR OUR
ENERGY FUTURE



Holland
MICHIGAN



Perrigo[®]



HOLLAND-HOPE COLLEGE
**SUSTAINABILITY
INSTITUTE**