

# Energy Systems

Texas is the leading  
producer of wind energy in  
the US

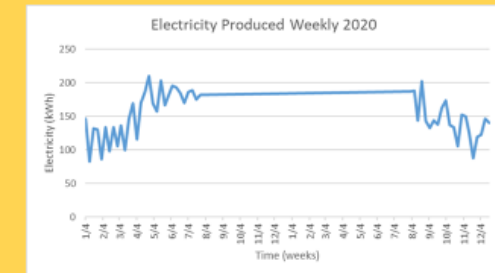
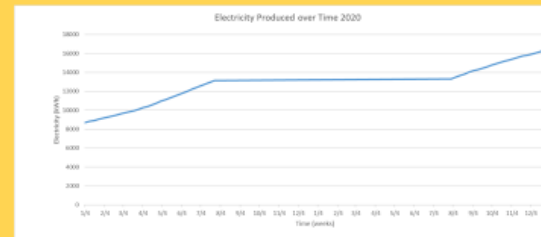
# Emmy's Earth: Energy Systems

Goal: **Energy Efficiency:** Reduce carbon footprint by decreasing energy use and increasing use of clean energy. At my home I use:

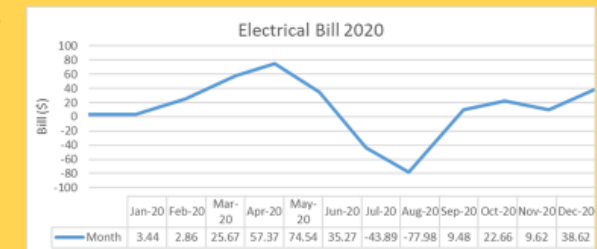
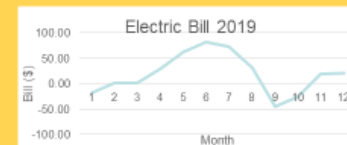
1. added insulation,
2. PV grid tied solar panels,
3. solar box cooking and dehydrating,
4. solar lighting inside and out,
5. solar and electric attic fans,
6. a solar clothes dryer (clothesline!),
7. energy efficient windows to minimize energy loss, and
8. a bike to run errands.



## Energy Use 2020



Note: Positive value means a credit



# And why does this matter?

- Energy in the US is relatively inexpensive.
- As such we take for granted what is behind flipping on a switch or stepping on an accelerator pedal.
- Our energy production has **socioeconomic, human health, and environmental costs above the price we pay for electricity.**
- We are only beginning to be aware of the issues concerning energy production in the US.
- Anything we can do to **reduce** operational energy demand or use a **cleaner energy source** is a sustainable action.
- A cleaner energy source also cuts greenhouse emissions.

Check out [The Full Cost of Electricity](#)

**And although we might think that cities have higher energy use per capita that is not so.**

- Approximately 83% of US population live in urban areas.
- One study found that doubling population-weighted urban density reduces CO<sub>2</sub> emissions from household travel by 48% and residential energy use by 35% respectively.

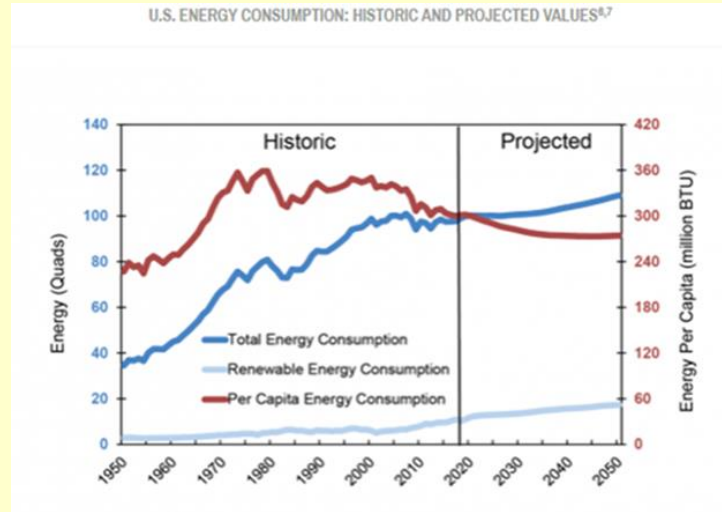
[U.S. Cities Factsheet | Center for Sustainable Systems \(umich.edu\)](#)



[More on built environments...](#)

Overtime our energy demand has grown and will continue to grow. So, what can we do?

## Use Renewables



[U.S. Energy System Factsheet | Center for Sustainable Systems \(umich.edu\)](#)

## Conserve More

- Integral part of sustainability
- A better rate of return
- Two ways to save are to change our energy behaviors or become more efficient

# Design Better

## Living Building Challenge



I-20 WILDLIFE PRESERVE  
JENNA WELCH NATURE STUDY CENTER

INTEGRATED DESIGN WORKSHOP REPORT AND TRACKING DOCUMENT  
Revised: 04.02.2016

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	Goal 02: Create opportunities to advance education related around water resources.
	Goal 03: Provide a platform for business to attendees and stable water conservation.
	Goal 04: Link the building to the place.
	Goal 05: Communicate the needs of various ecosystems.
	Goal 06: Create/increase options for habitat variety.
	Goal 07: Educate how the Preserve fits in larger landscape/ecological/environmental systems.
	Goal 08: Clarify as little as possible in construction techniques.
	Goal 09: Make the building enhance habitat but not create negative habitat (such as bird strikes and nests). Minimize conflicts with wildlife.
	Goal 10: Allow for wildlife (including spiders) to call this place home and tell the story of the circle of life.
22	Energy / Air Quality / Light Goal Tracking
	Goal 01: Create a living building using the Living Building Challenge.
	Goal 02: Make building systems for energy, air, and light visible to create teachable, educational moments for visitors of all ages.
	Goal 03: Move elements of the exhibit, interpretive, and classroom program areas outside into spaces that are shaded, protected from the wind, and provided with air movement for thermal comfort.
	Goal 04: Partner with at least one local energy company in developing the building systems.
	Goal 05: Provide 80% daylight autonomy to achieve 100% in each occupied space at noon.
	Goal 06: Design interior and exterior lighting to Dark Sky Standards.
29	Materials / Construction Goal Tracking
	Goal 01: Create a green list for the project favoring materials that are historical, local/regional, repurposed, durable and protect the water cycle and habitat.
	Goal 02: Create a red list that bans environmentally negative materials from the project.
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	Goal 05: Partner with local industry.
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## Lake Flato

# Solar Box Cooker Meal



Ready to cook!



Placing in oven



Cooking away!



Done!



Serving up!



Dinner from the garden served!

Solar Food Dehydrator



I  
decrease  
my  
energy  
use  
with...



Solar Attic Fans



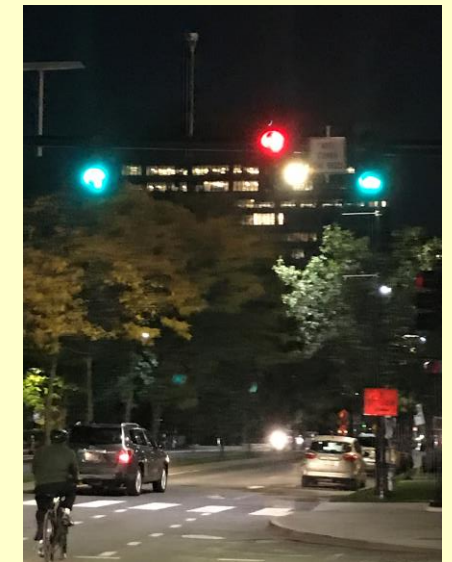
Solar Clothes Dryer!



Passive Solar Lighting

# Personal Transportation

- On short errands, I bike!
- In an average week, I bike anywhere from 8 to 30 miles on errands to stores, the post office, the library, and farmer's market.
- My commuter bike has paniers to bring home anything I purchase.
- I bike on residential streets during the day but in many big cities there are designated bike lanes and commuters at all hours of the day and night.





A monarch butterfly with vibrant orange and black wings is perched on a cluster of purple flowers with yellow centers. The scene is brightly lit, suggesting sunlight. The background is filled with more of the same flowers, creating a lush, natural setting.

**Solar energy is not new.**

**Our Earth already runs on sun energy!**