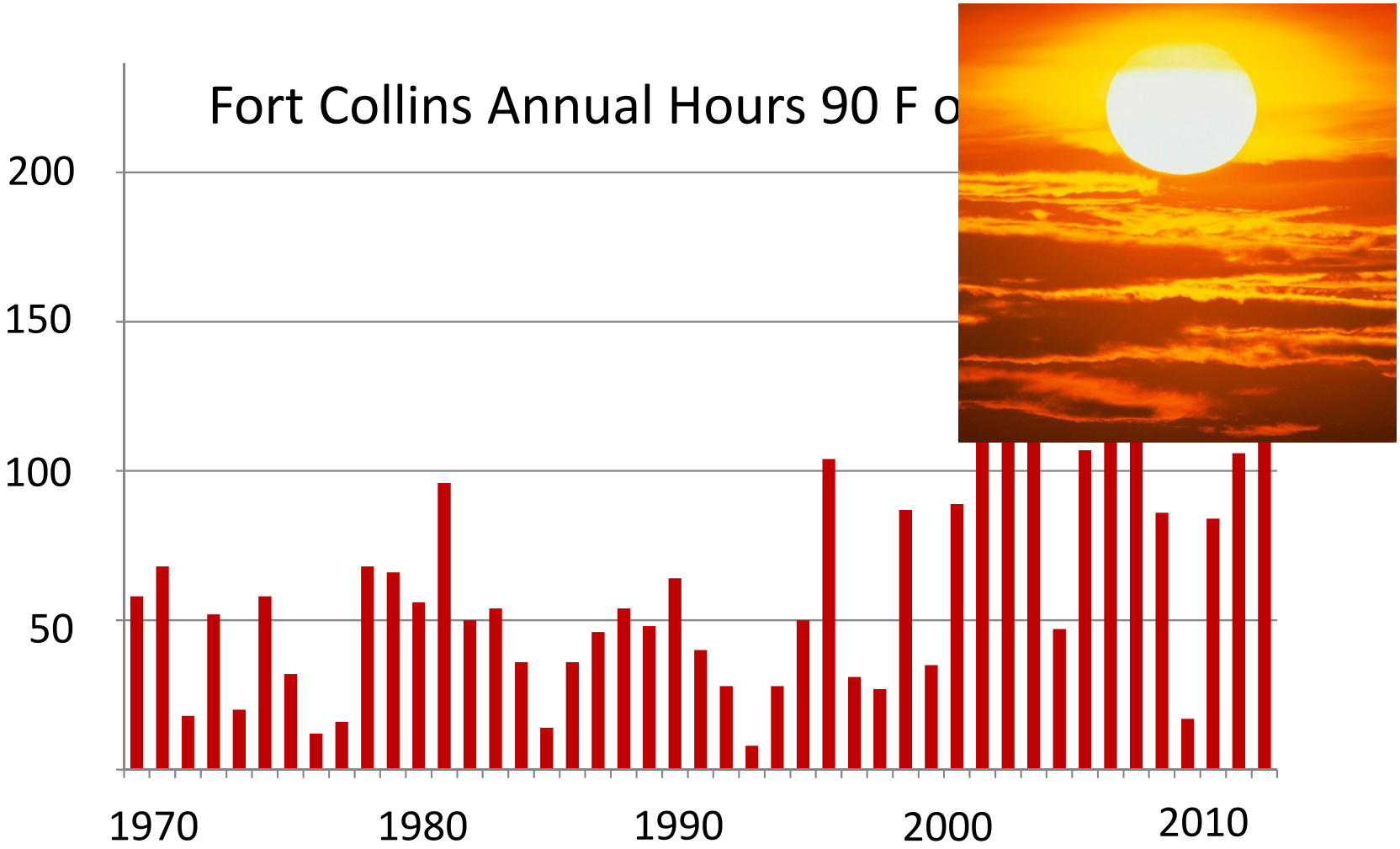
COOL Strategies for Summer Utility Savings

Residential Environmental Program Series

May 15, 2013

City of Fort Collins

Are FC Summers Getting Hotter?



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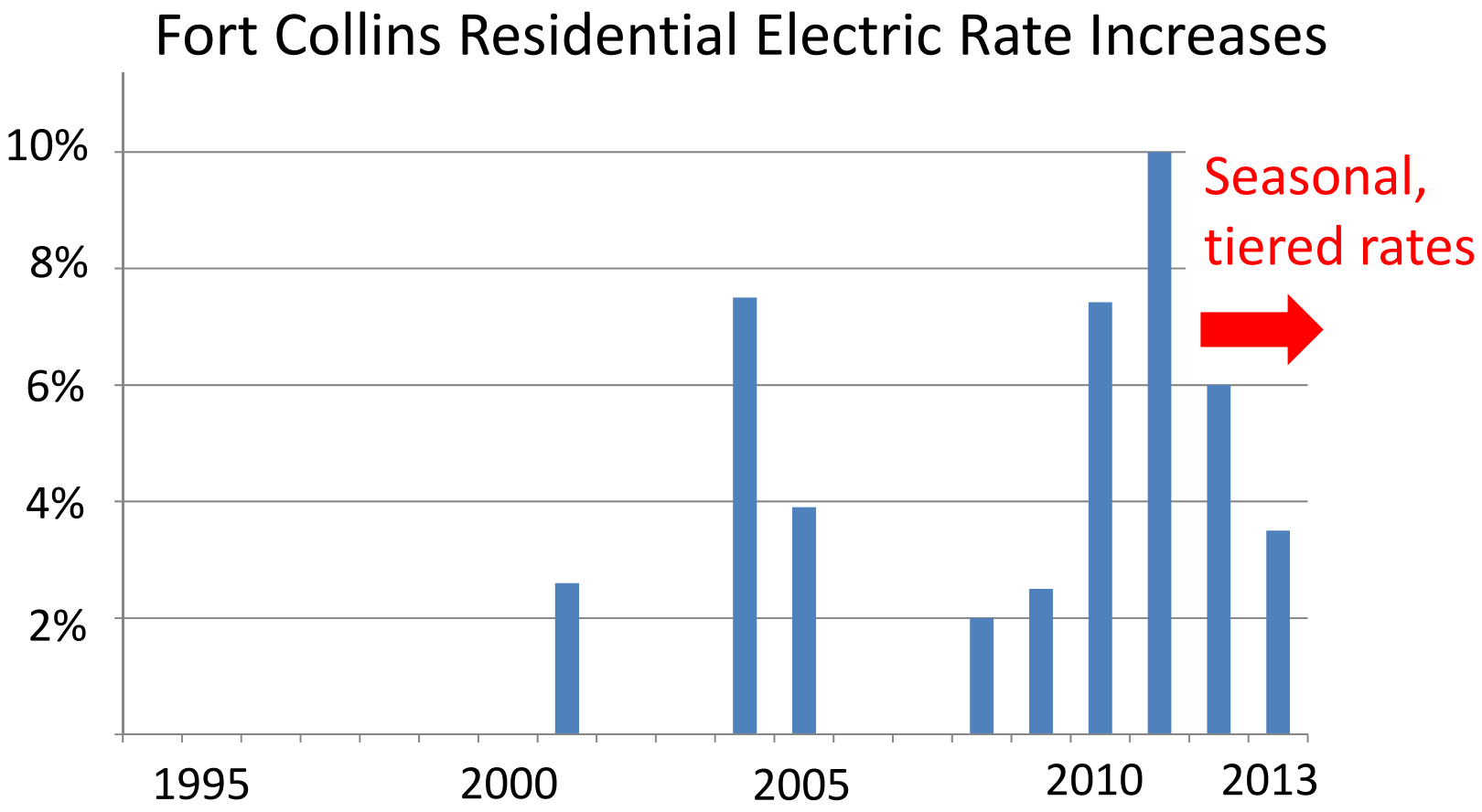
Is Electricity Getting More Expensive?



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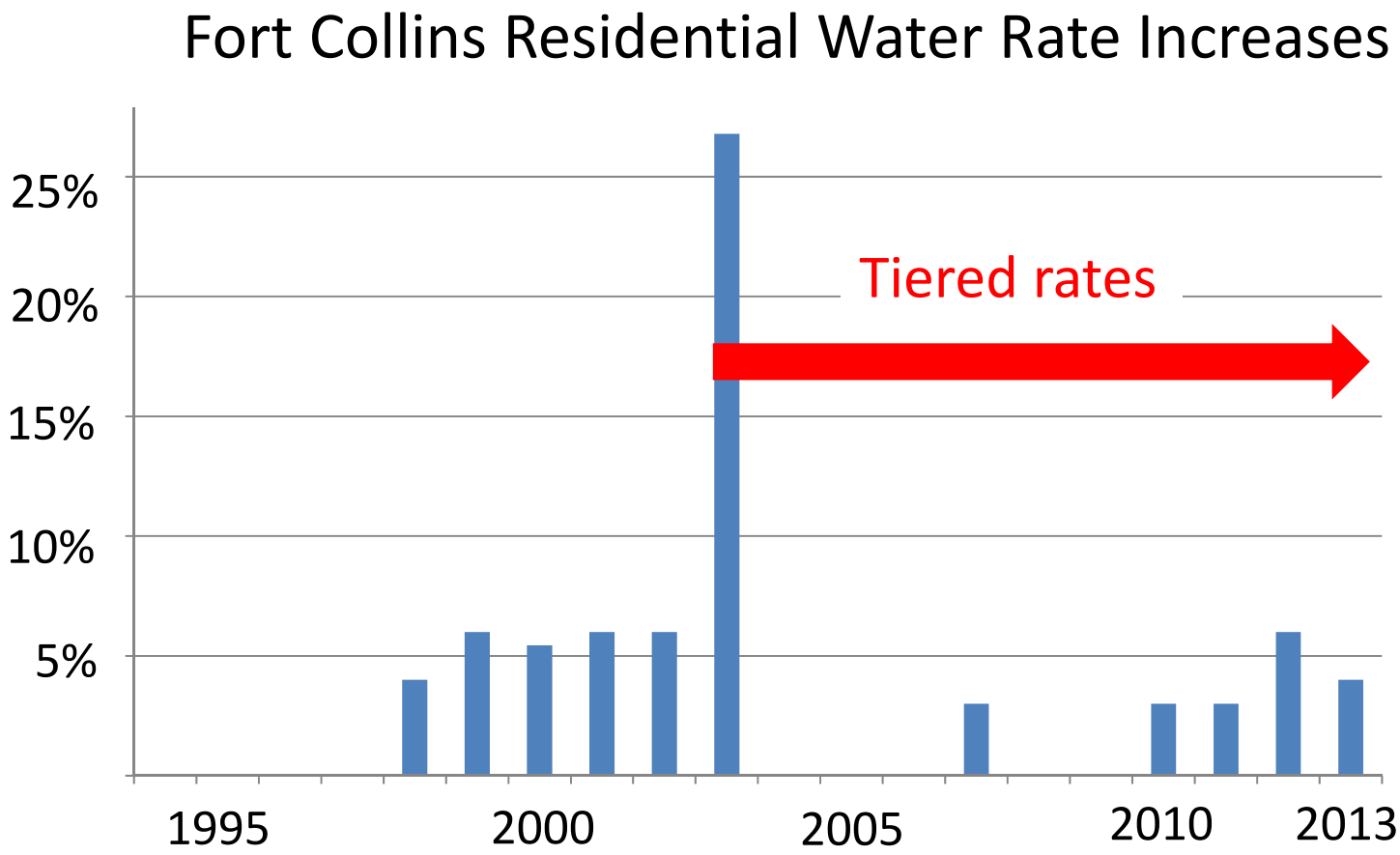
Is Water Getting More Expensive?



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Program

Cooling Energy Use + Cost

Staying Cool . . . Affordably

Water-saving Strategies

Cool Resources

PLUS

- Your questions
- Resource tables
- Door prizes!

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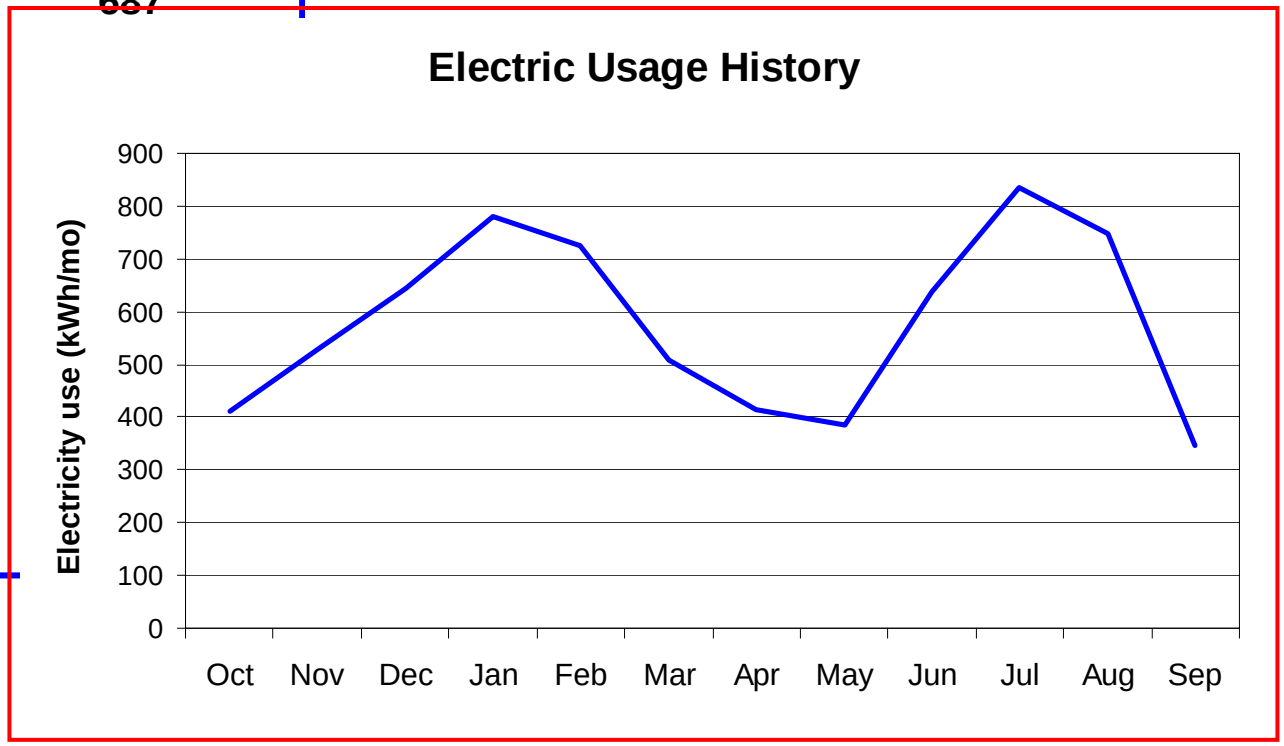
Cooling
Energy Use + Cost

Electricity: Where and How Much?

Electric Billing History

Read Date	Days	Use in kWh
10/05/11	33	377
09/02/11	28	687
08/05/11	30	
07/06/11	33	
06/03/11	35	
04/29/11	28	
04/01/11	28	
03/04/11	30	
02/02/11	28	
01/05/11	30	
12/06/10	33	
11/03/10	29	
10/05/10	28	



Time of year →

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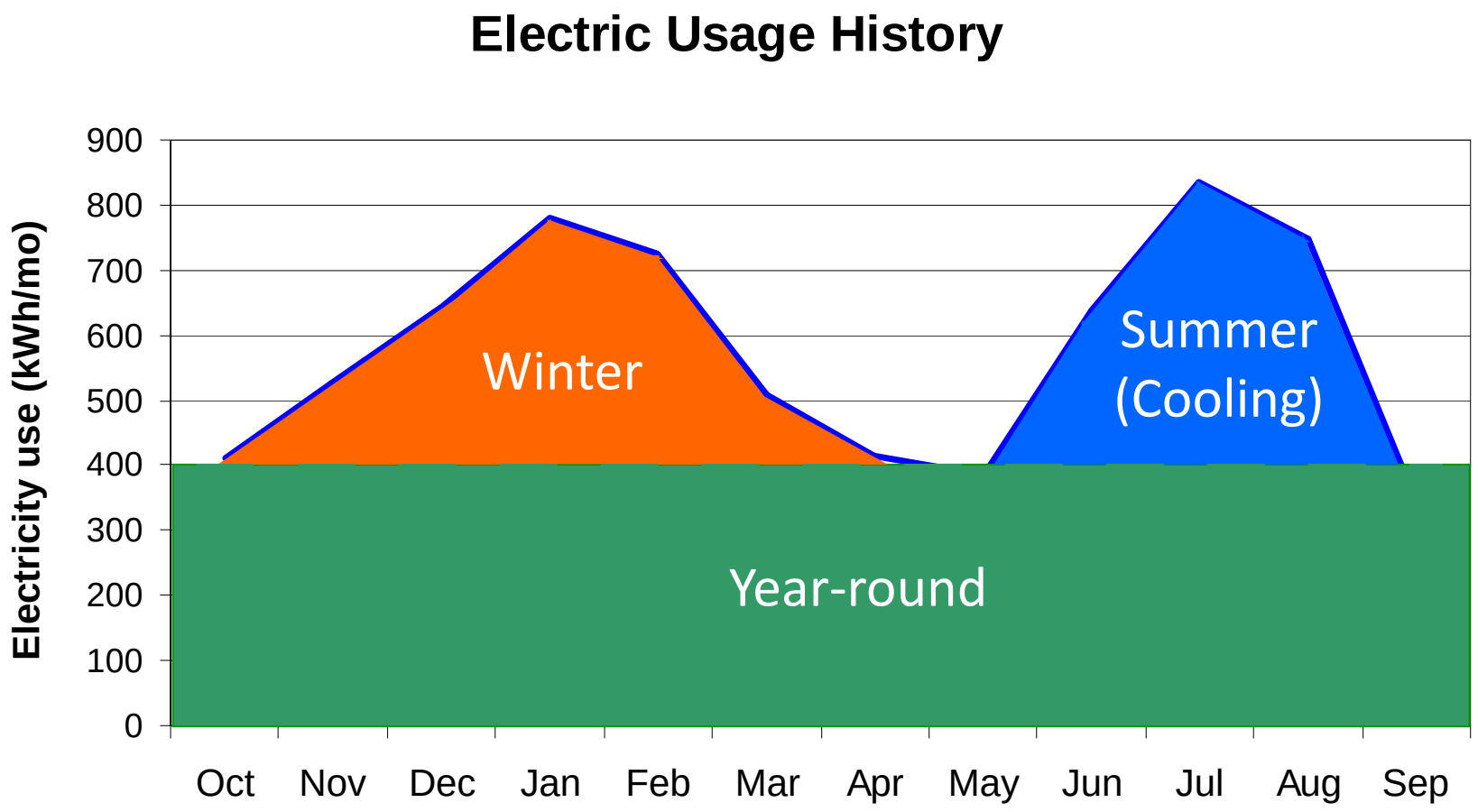
Year-Round + Seasonal Pieces



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Year-Round + Seasonal Pieces

Annual Usage

Cooling electricity usage

- DEPENDS!
- AC: 0 to ~4,500 kWh/year
- Other approaches: lower

Cooling electricity cost

- DEPENDS!
- Tiered rates

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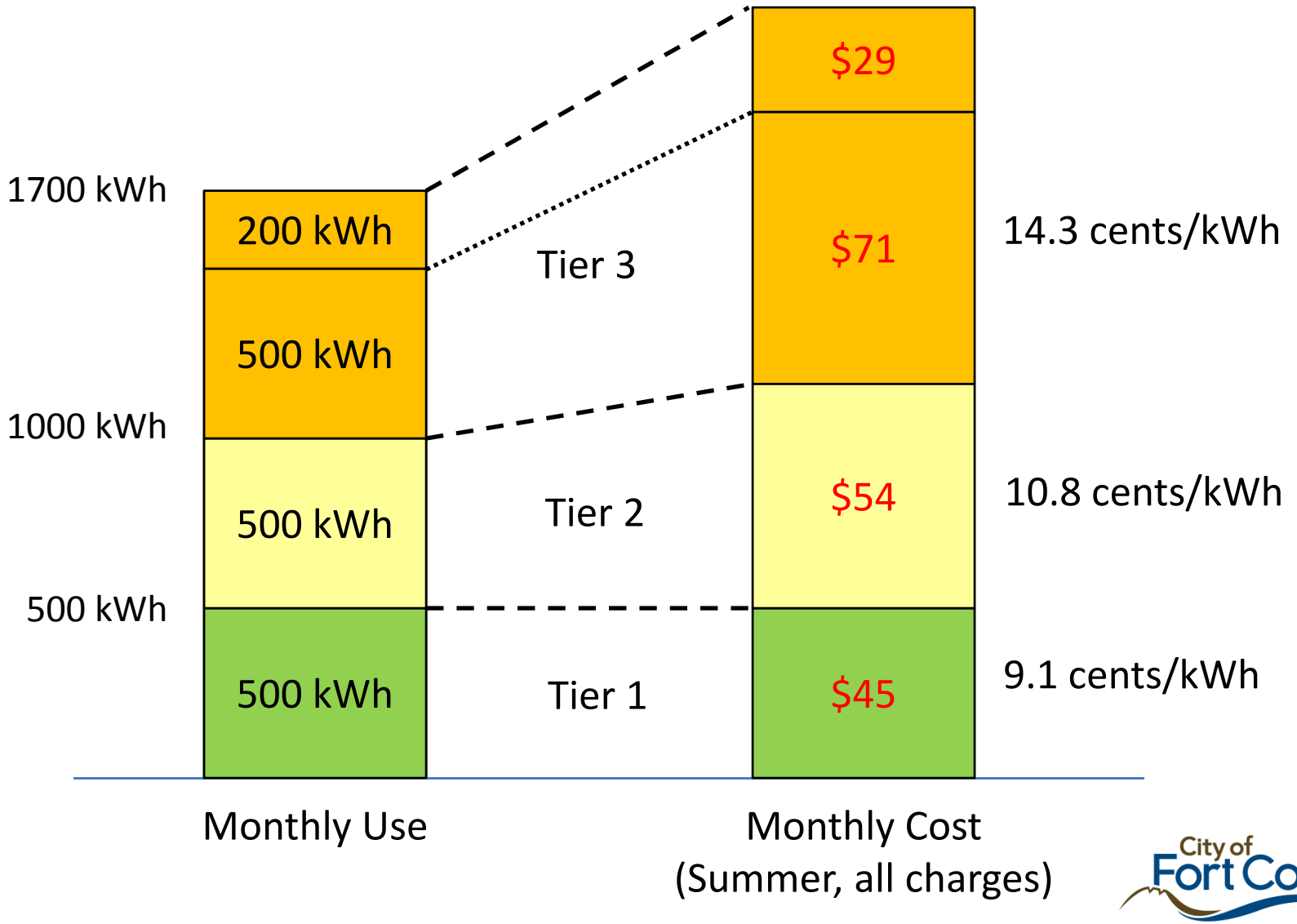
Tiered Electrical Rate



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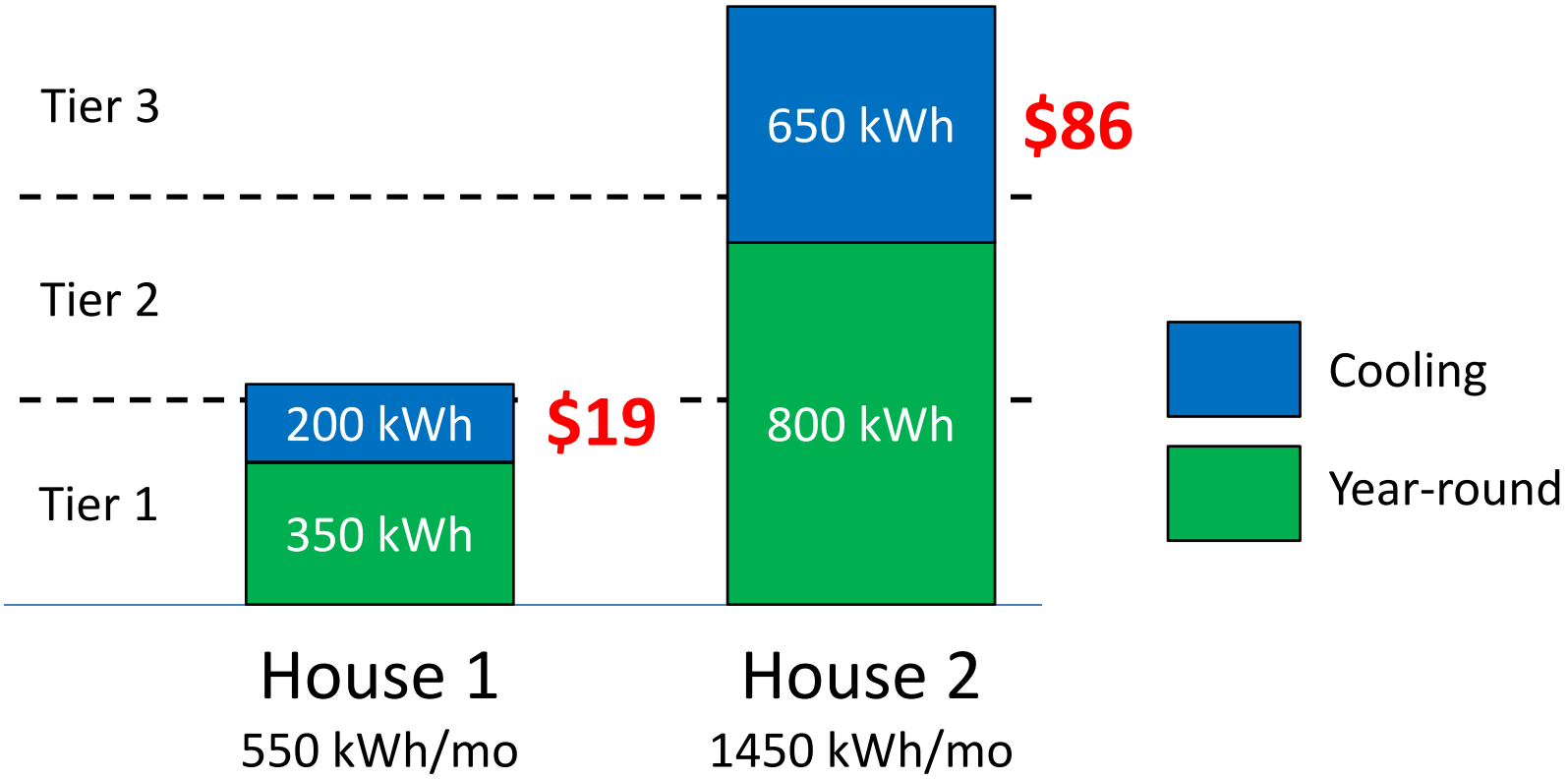
Cost to Stay Cool – DEPENDS



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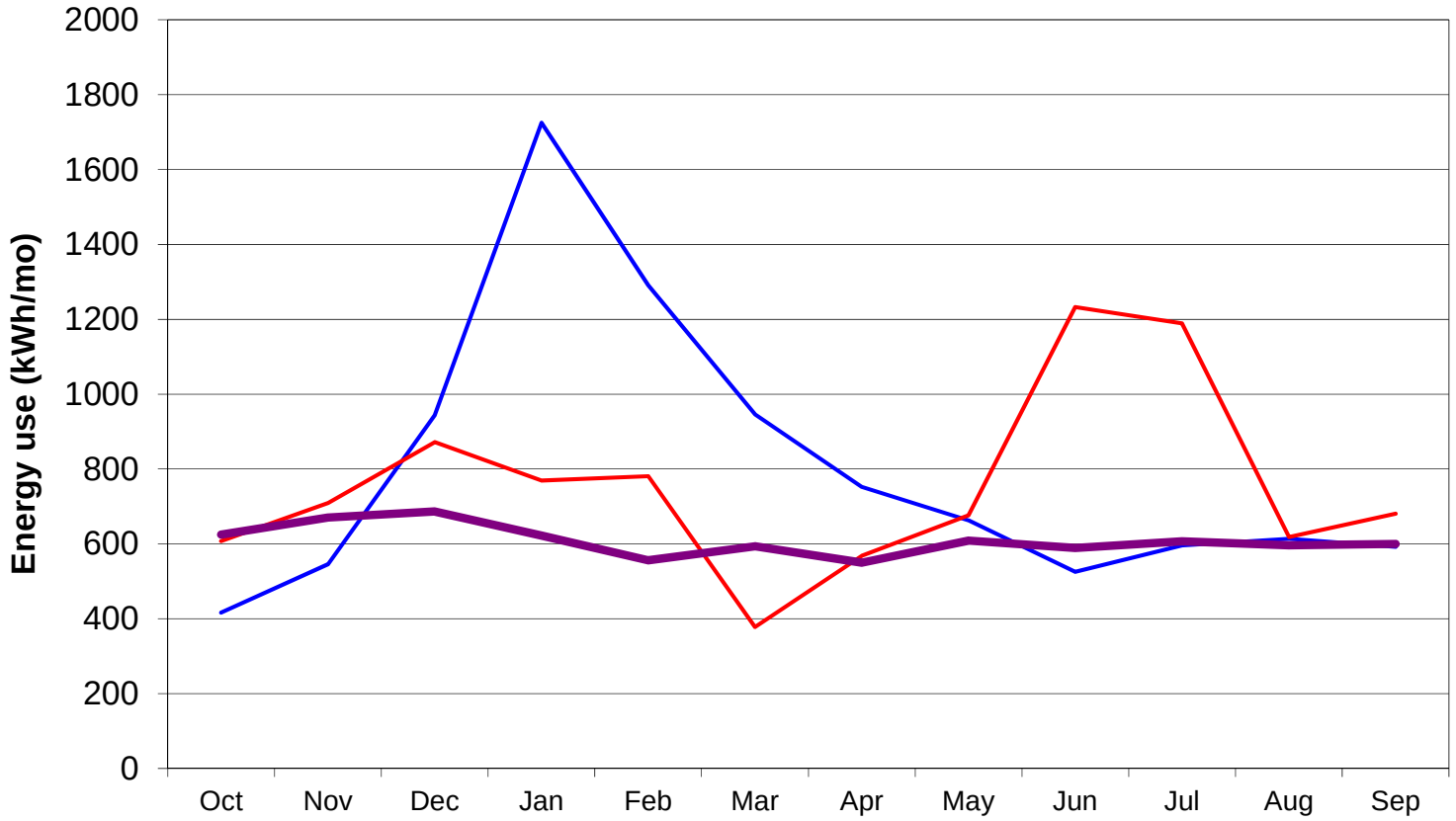
How Much Do You Use For Cooling?



Everyone uses electricity differently

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Staying Cool. . . Affordably

Three Basic Strategies

Use common sense!

1. Keep the heat out ← **Most effective**
2. Remove the heat
3. Spot cooling ← **Most fun!**

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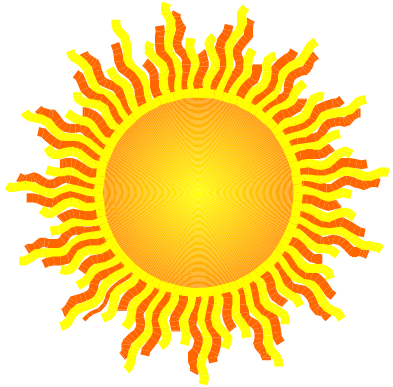
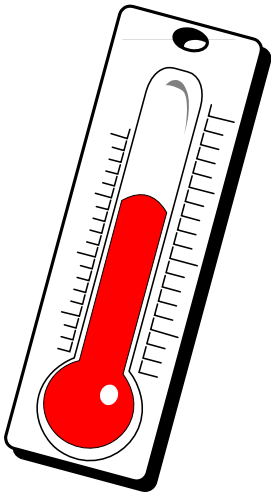
1. Keep the Heat Out





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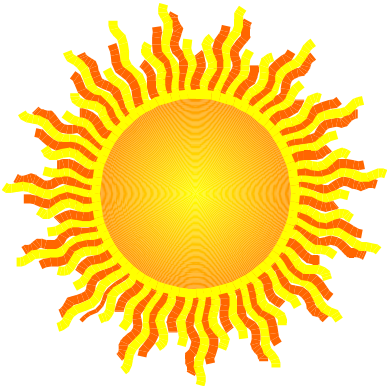
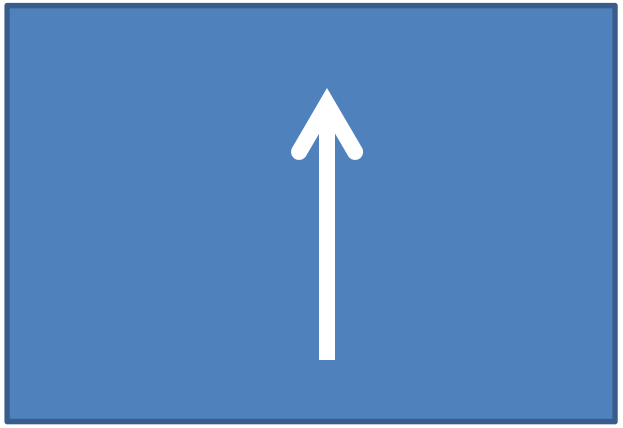
Shading



North: No problem!



East + West: bigger challenges

- Low sun angles
- LONG overhangs
- Porches, trellises
- Vertical structures

South: Pretty easy

- High sun angles
- Short overhangs
- Summer vs. winter balance

Sun path very well known

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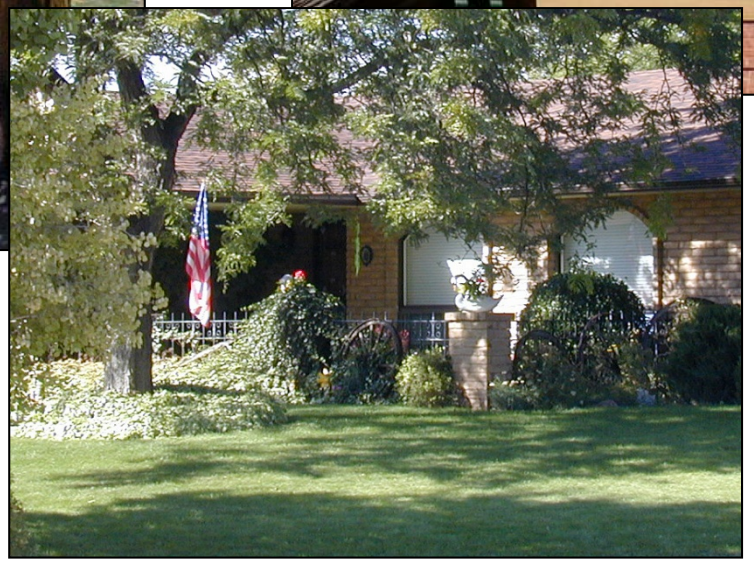
Shading



Many options

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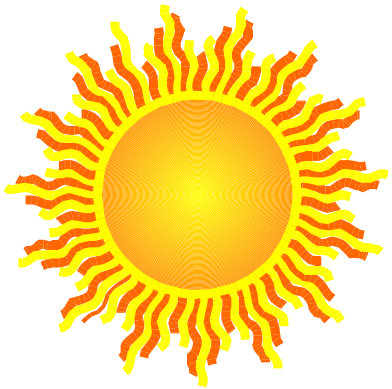
Shading



Many options

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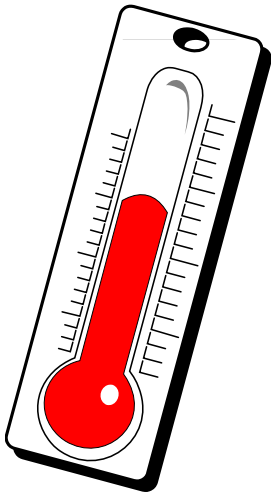
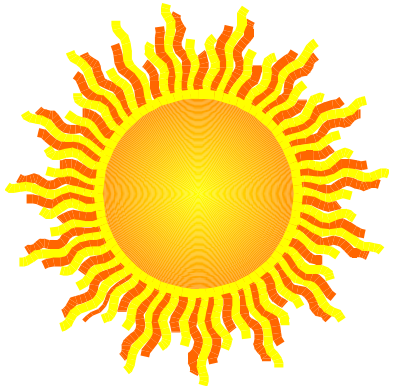
Windows





U-Factor
Lower always better

SHGC
Low = less solar heating

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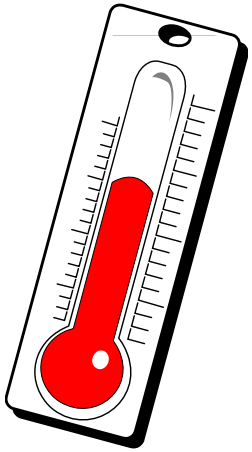
Insulation + Air Sealing



- Low-tech, low cost, works!
- Year-round benefits:
  better comfort, less noise,
  lower energy use

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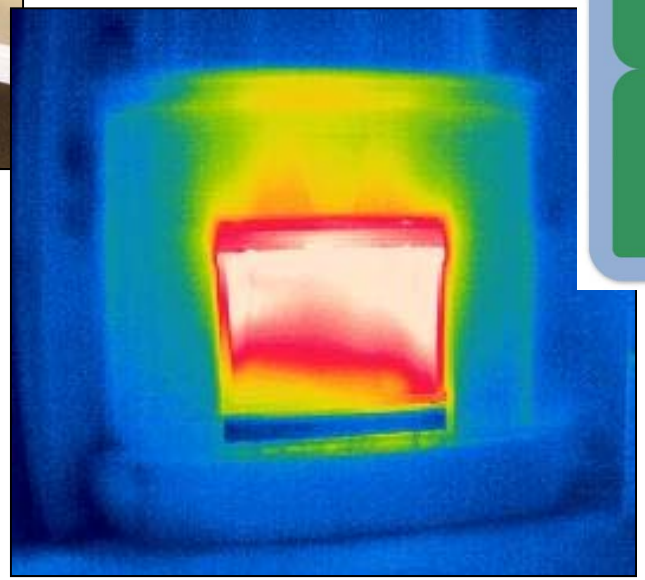
Less Internal Heat Gains



Turn off heat sources when not in use

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Less Internal Heat Gains

Move heat source outside

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Less Internal Heat Gains

Efficient appliances
(Save twice!)

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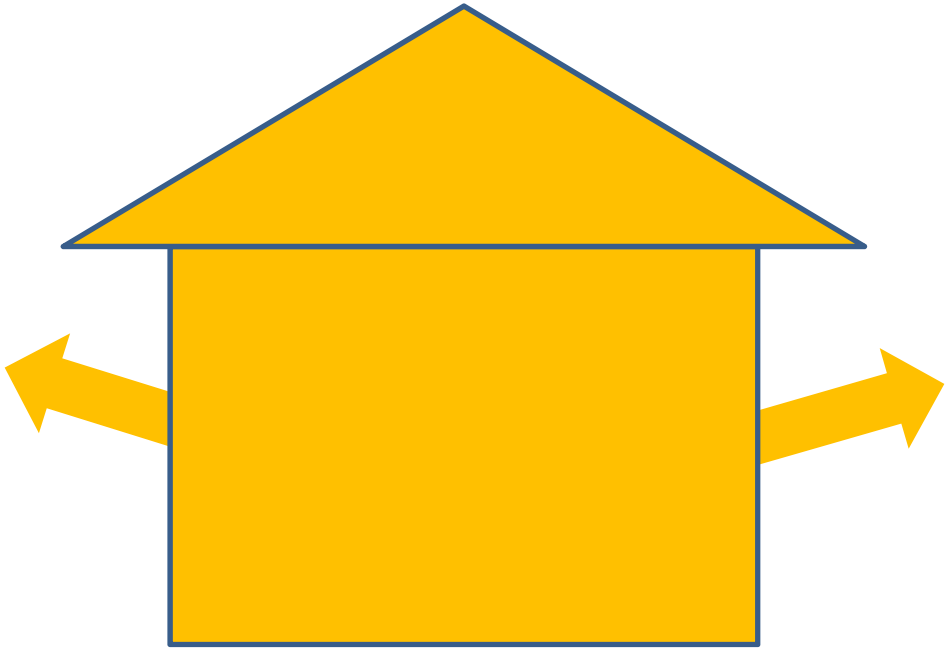
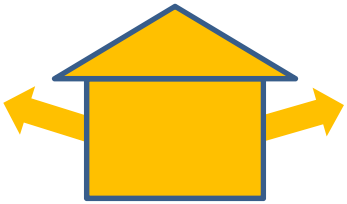
2. Remove the Heat



No energy

Ventilation



- Zero cost
- Only when cooler outside
- Manual operation
- No filtration
- Security

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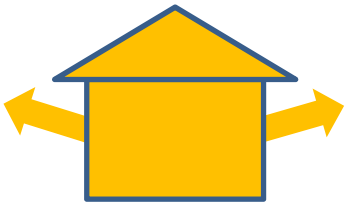
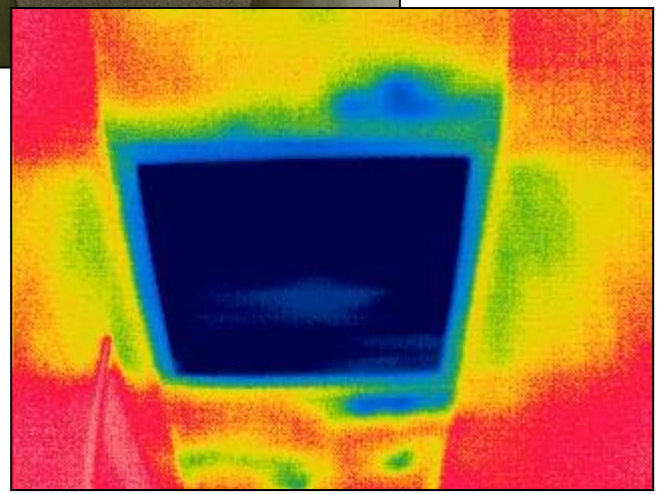
350 W

Ventilation





- Only when cooler outside
- Windows open
- Adequate attic ventilation
- Multi-speed
- No filtration
- Winter hole

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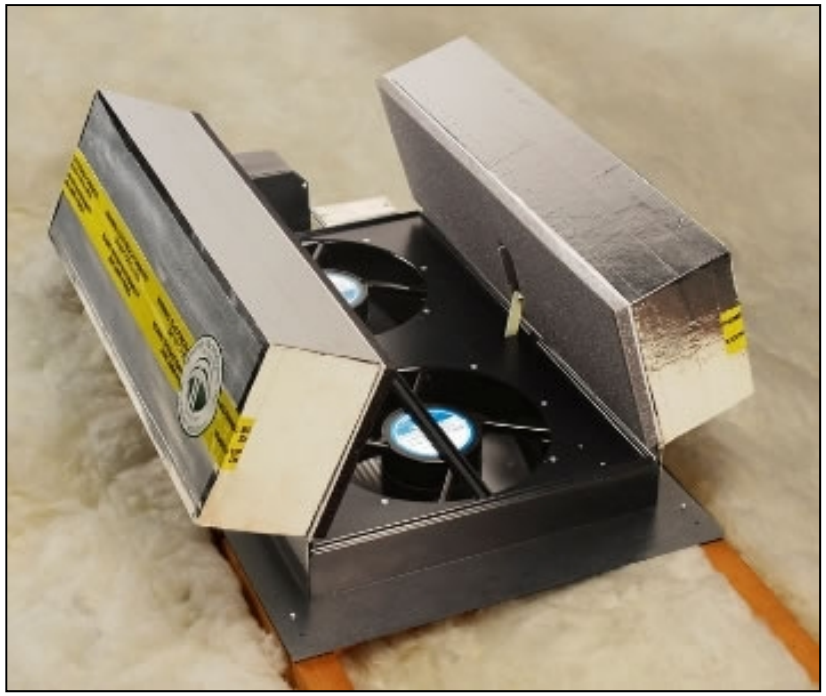
70 W

Ventilation



Efficient alternative

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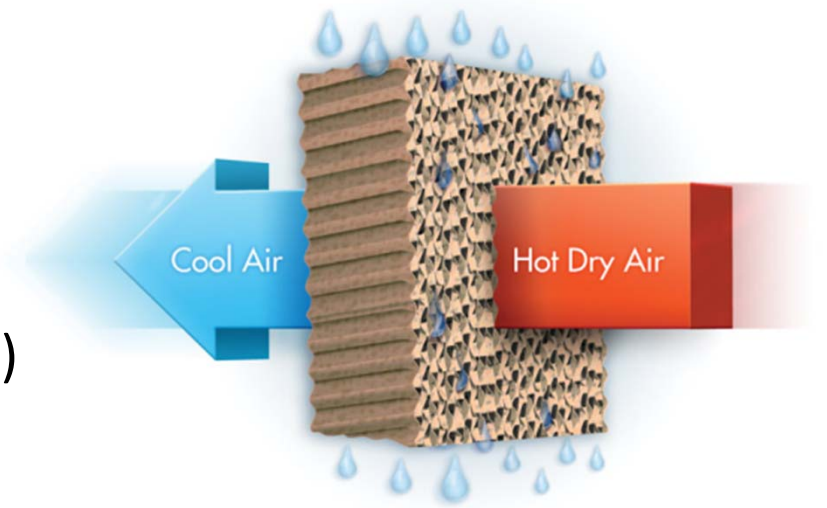
400 W

Evaporative Cooling

- Simple
- Clean, fresh air
- Fan + small pump
- Window-mount or ducted
- Windows open or relief ducts
- Low-tech maintenance (winter)
- Water use



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Air Conditioning

900 W
3,500 W

- Highest tech, most automatic
- House closed
- Recirculated, filtered air
- Many design + installation problems
- Most expensive operation
- Peak electrical demand

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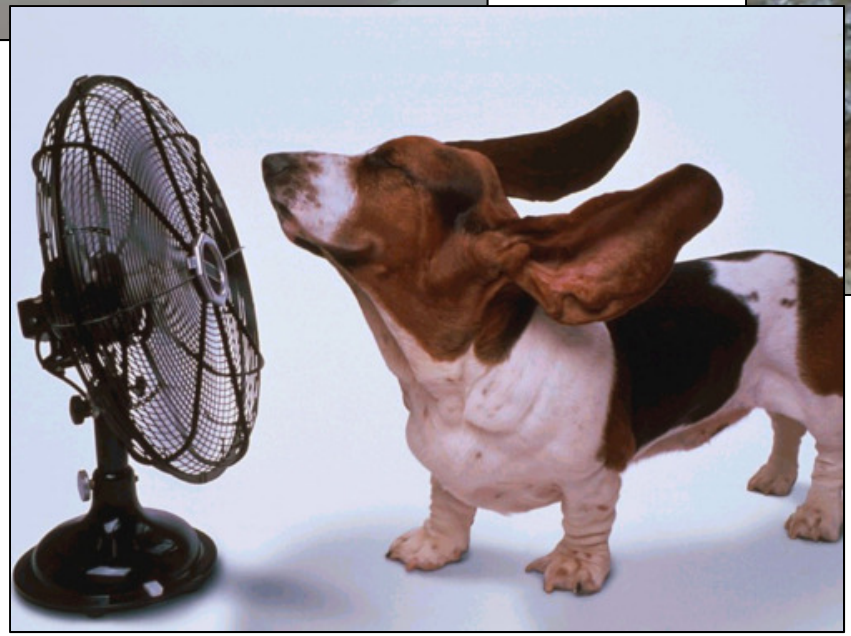
3. Spot Cooling



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Spot Cooling – Most Fun!

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Staying Cool . . . Affordably

Use common sense!

1. Keep the heat out ← **Most effective**
2. Remove the heat
3. Spot cooling ← **Most fun!**

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Water-saving Strategies

Summer Water

- Outdoor use = 50% of year's water use
- Where is it used?
  - Lawns
  - Veggie gardens
  - Flowers, perennials, shrubs, trees
  - Water features
- Indoor, summer use (not covering)
  - Evaporative cooling

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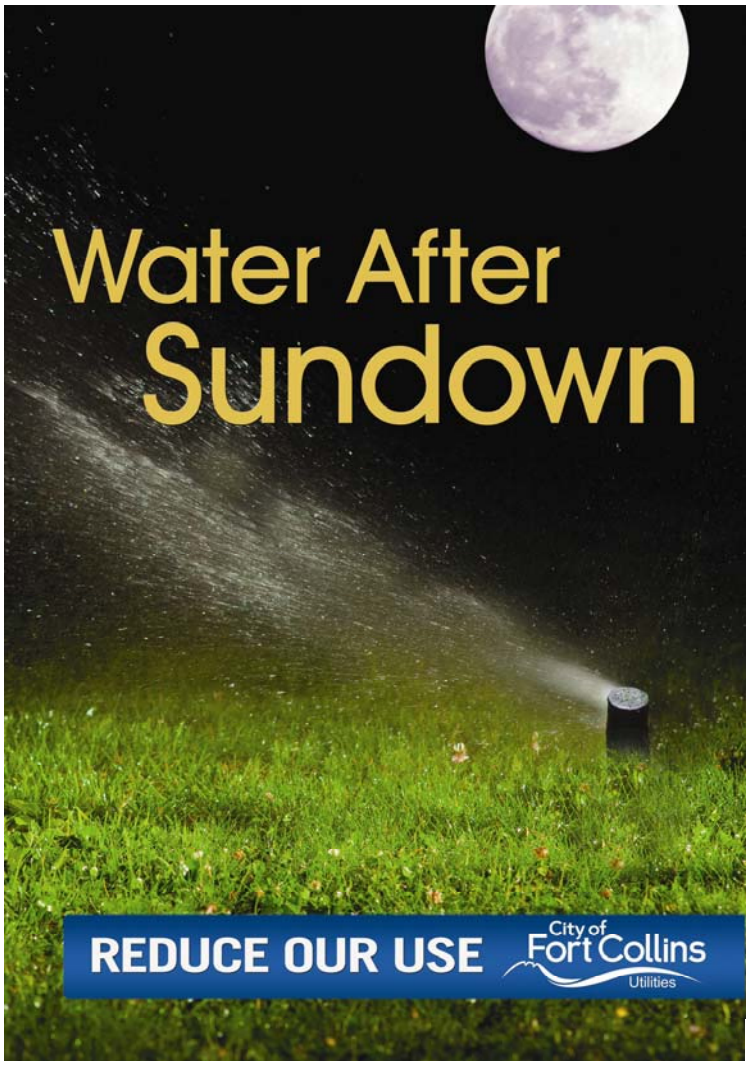
Lawn water use

- How much water?
  - Typically May – October, peaking in July
  - 2012 = March through November, two peaks
  - May, October = 4,000 gallons ($11)
  - June, September = 6,000 – 8,000 ($17-$22)
  - July, August = 10,000+ ($27+)



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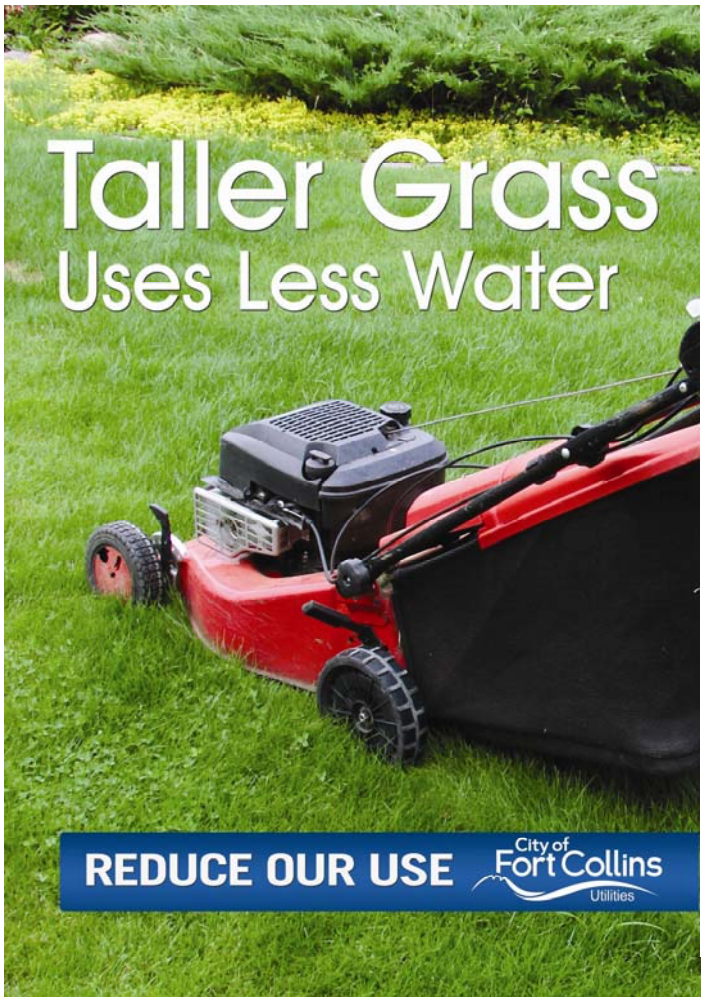

Lawn water use

Biggest consumer of water at a home!

- Healthy lawns and roots survive droughts best
  - Aerate every 1-3 years
  - Apply compost and topseed after aerating
  - Mow to 3”, leave clipping on lawn

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Lawn water use

- Sprinkler system startup
  - Walk each zone, head by head
  - Check for soft spots, watering rising next to heads
  - Fix spray patterns and tilted heads
  - Unclog nozzles with irregular pattern
  - Replace suspect nozzles

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Lawn water use

- Watering to save water
  - Use a manual setting
  - Nighttime cycles
  - Cycle and soak
  - Water deeply and infrequently

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Changing the Landscape

Differences in plants

- Grass varieties
  - Cool season, green in April, dormant in heat
  - Warm season, green in June, dormant in cool
- Hydrozones
  - Gallons per square foot per year
  - Very Low to High zones

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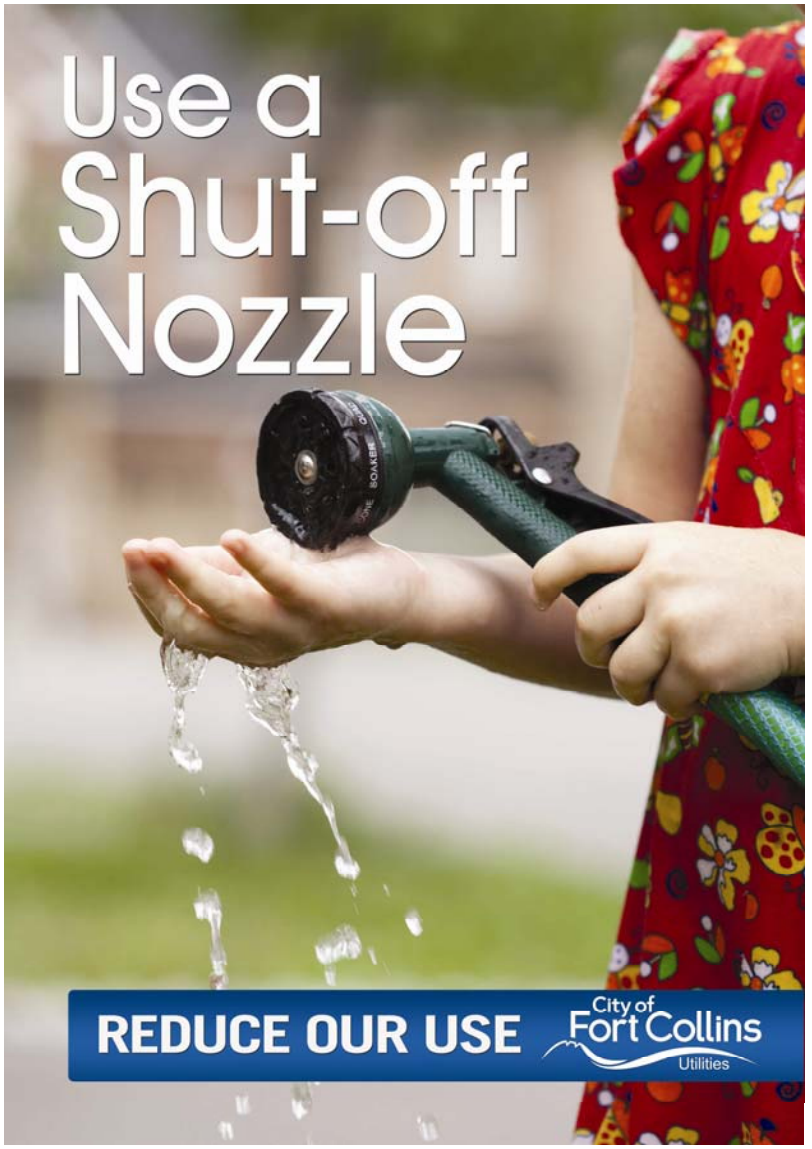
Landscapes

- Very low and low hydrozones
  - Buffalo grass and blue grama
  - 3 leaf sumac, sages, coneflowers
- Moderate hydrozones
  - Columbines, lilacs, some veggies
- High hydrozones
  - Bluegrass, willows, tomatoes



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Water saving from projects

- To Xeriscape
  - 30-50% savings
- To Veggie gardens
  - No savings, maybe more water use
- To Water Feature
  - No savings likely
- To Native Grasses
  - No savings for 2 years, then up to 50% savings

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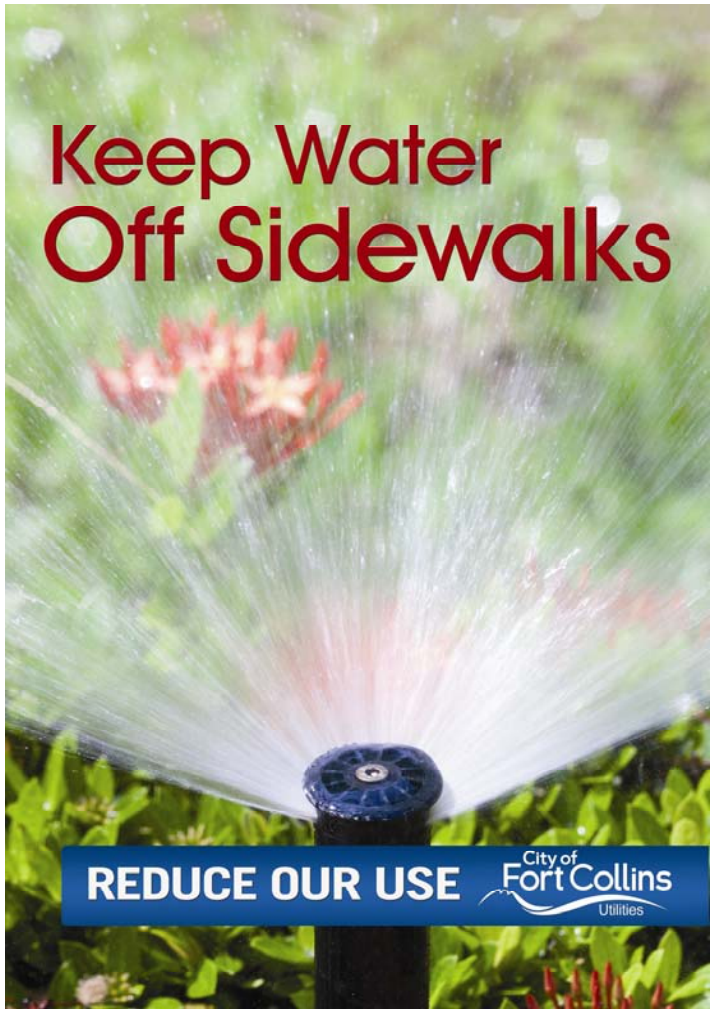
Sprinkler systems

- Audits
  - 1.5 hours of testing
  - Suggested schedule
- Upgrades (rebates!)
  - Nozzles and heads
  - Sensors, rain and soil moisture
  - Controller/timer upgrade



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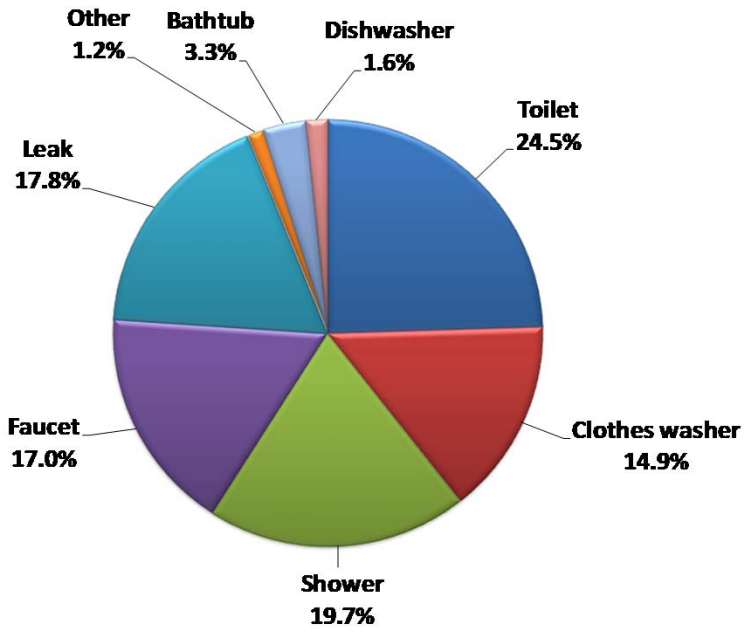
Other ways to save

- Heavy water users
  - Toilets
  - Clothes washers
  - Showers
- Rebates
  - Toilets
  - Clothes washers
  - Showerheads



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Cool Resources

Cool Resources

Home Energy Reports

Home Efficiency

Sprinkler Audits

Home Utility Use Estimator

Measurements

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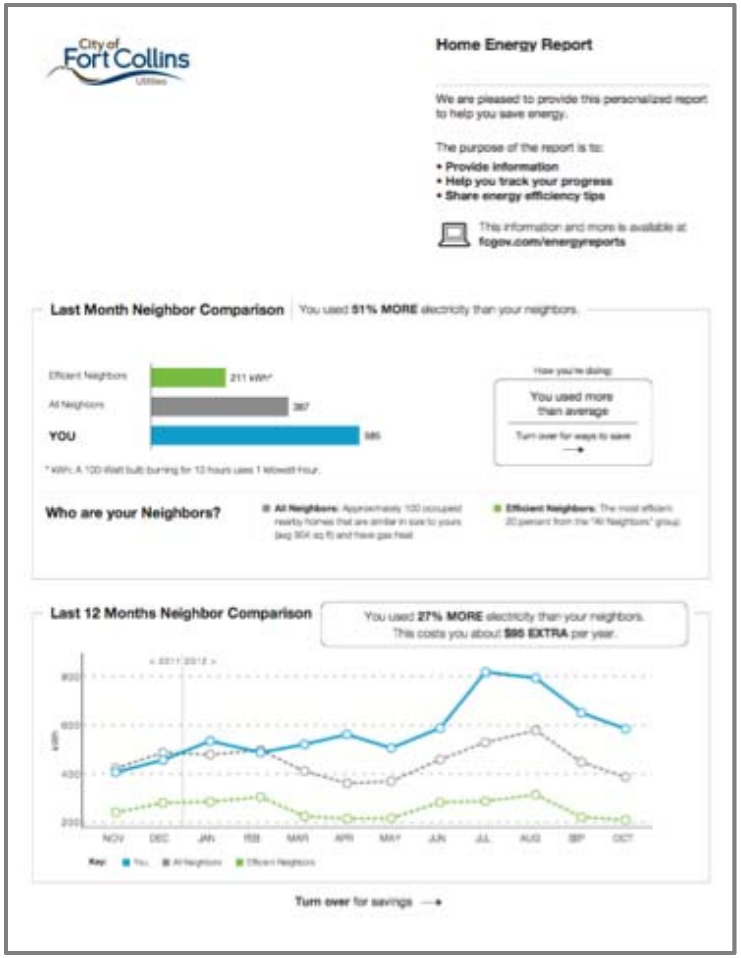
Home Energy Reports

Bi-monthly Summary

- Gauge your electric use
- Compare to 100 “neighbors”
  - -Home type
  - -Heating Fuel type
  - -Size
  - -Proximity
- Includes tips to save



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Home Efficiency Audit

- $60 cost, $350 value
- 3-4 hours
- Comprehensive:
  - Utility use analysis
  - Blower door test
  - Infrared scan
  - Combustion safety testing

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Home Efficiency Audit

Report Sample

Install air barrier on attic knee walls [High Priority]:

Your attic knee walls are insulated but not encased on all sides with an air barrier. Fiberglass insulation loses most of its effectiveness if it is not encased by an air barrier. We recommend installing an air barrier on your attic knee walls. Insulation dams were not installed in the area above your attic knee walls allowing insulation to fall over the edge and leaving ceiling areas exposed or un-insulated. We recommend adding insulation dams and blowing in more attic insulation after installing an air barrier on your attic knee walls.

Knee walls in your attic are shown in the photos above. The photo on the left was taken in the main attic above the house and the other two were taken in the attic over your garage. This insulation is not performing well because no air barrier is applied to the attic side. Applying spray foam over the fiberglass insulation is one method for improving exposed attic knee walls. An example is shown in the

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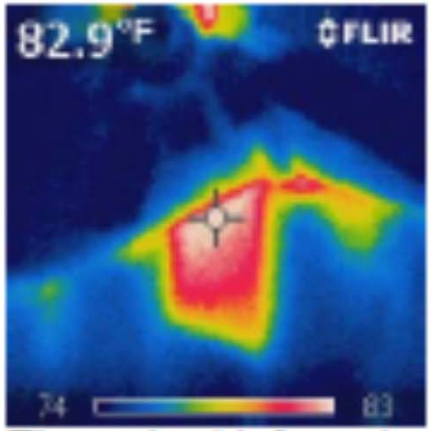
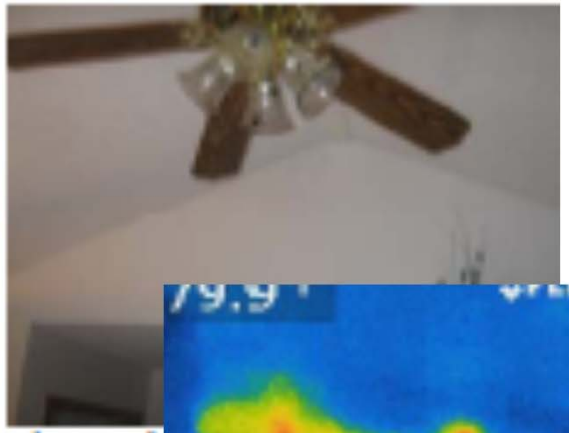
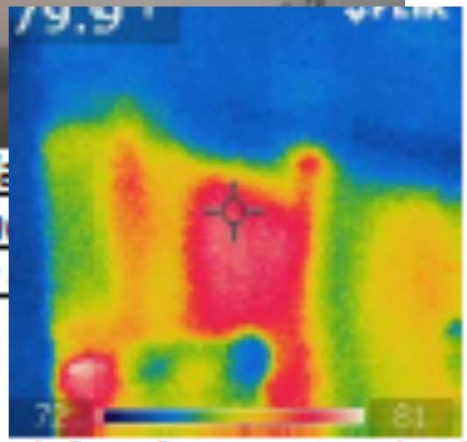
Home Efficiency Audit

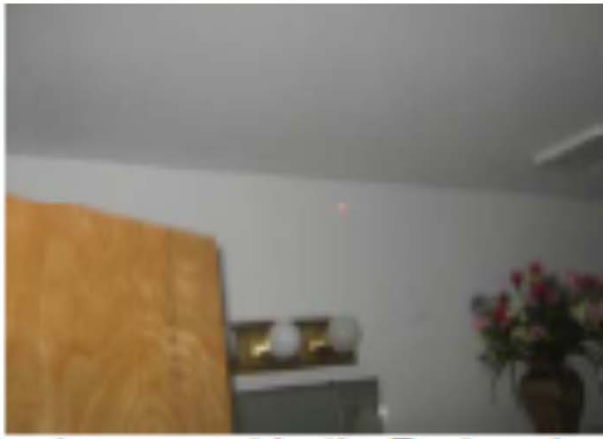
Report Sample





The paired infrared and regula
white in the infrared photos in
inaccessible part of your attic
them.





taken in your master bedroom and bath. Red and
ation in these knee walls. These knee walls are in an
ary to create an attic access in order to improve

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Home Efficiency Audit

What Now?

- Free advisement
- **Rebates** for improvements
- Approved contractors – install standards
- Independent quality assurance
- On-bill financing

Air sealing
Insulation
Whole-house fan
Evaporative cooler
Air conditioners

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Sprinkler Audit

June - August

- No cost
- ~1.5 hours
- Inspect and test each zone
- **Rebates** for improvements

Nozzles & heads
Rain/soil sensors
Timers/controllers

fcgov.com/sprinkler-audit

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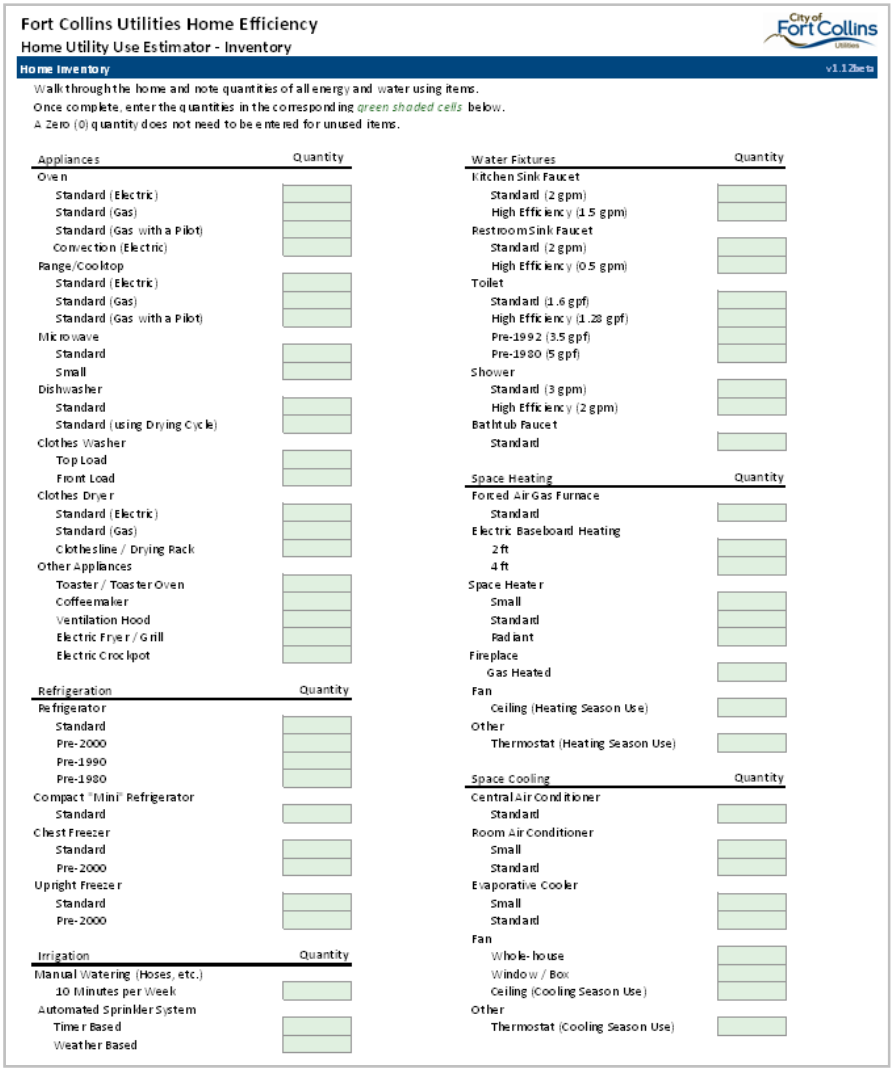
Home Utility Use Estimator

Overview

- Inventory
- Electric, water & gas
- Compare to national average data



Fort Collins Utilities Home Efficiency

Home Utility Use Estimator - Inventory

Home Inventory v1.12beta

Walk through the home and note quantities of all energy and water using items.
Once complete, enter the quantities in the corresponding *green shaded cells* below.
A Zero (0) quantity does not need to be entered for unused items.

Appliances	Quantity
Oven	
Standard (Electric)	
Standard (Gas)	
Standard (Gas with a Pilot)	
Convection (Electric)	
Range/Cooktop	
Standard (Electric)	
Standard (Gas)	
Standard (Gas with a Pilot)	
Microwave	
Standard	
Small	
Dishwasher	
Standard	
Standard (using Drying Cycle)	
Clothes Washer	
Top Load	
Front Load	
Clothes Dryer	
Standard (Electric)	
Standard (Gas)	
Clothesline / Drying Rack	
Other Appliances	
Toaster / Toaster Oven	
Coffeemaker	
Ventilation Hood	
Electric Fryer / Grill	
Electric Crockpot	

Refrigeration	Quantity
Refrigerator	
Standard	
Pre-2000	
Pre-1990	
Pre-1980	
Compact "Mini" Refrigerator	
Standard	
Chest Freezer	
Standard	
Pre-2000	
Upright Freezer	
Standard	
Pre-2000	

Irrigation	Quantity
Manual Watering (Hoses, etc.)	
10 Minutes per Week	
Automated Sprinkler System	
Timer Based	
Weather Based	

Water Fixtures	Quantity
Kitchen Sink Faucet	
Standard (2 gpm)	
High Efficiency (1.5 gpm)	
Restroom Sink Faucet	
Standard (2 gpm)	
High Efficiency (0.5 gpm)	
Toilet	
Standard (1.6 gpf)	
High Efficiency (1.28 gpf)	
Pre-1992 (3.5 gpf)	
Pre-1980 (5 gpf)	
Shower	
Standard (3 gpm)	
High Efficiency (2 gpm)	
Bathtub Faucet	
Standard	

Space Heating	Quantity
Forced Air Gas Furnace	
Standard	
Electric Baseboard Heating	
2 ft	
4 ft	
Space Heater	
Small	
Standard	
Radiant	
Fireplace	
Gas Heated	
Fan	
Ceiling (Heating Season Use)	
Other	
Thermostat (Heating Season Use)	

Space Cooling	Quantity
Central Air Conditioner	
Standard	
Room Air Conditioner	
Small	
Standard	
Evaporative Cooler	
Small	
Standard	
Fan	
Whole-house	
Window / Box	
Ceiling (Cooling Season Use)	
Other	
Thermostat (Cooling Season Use)	

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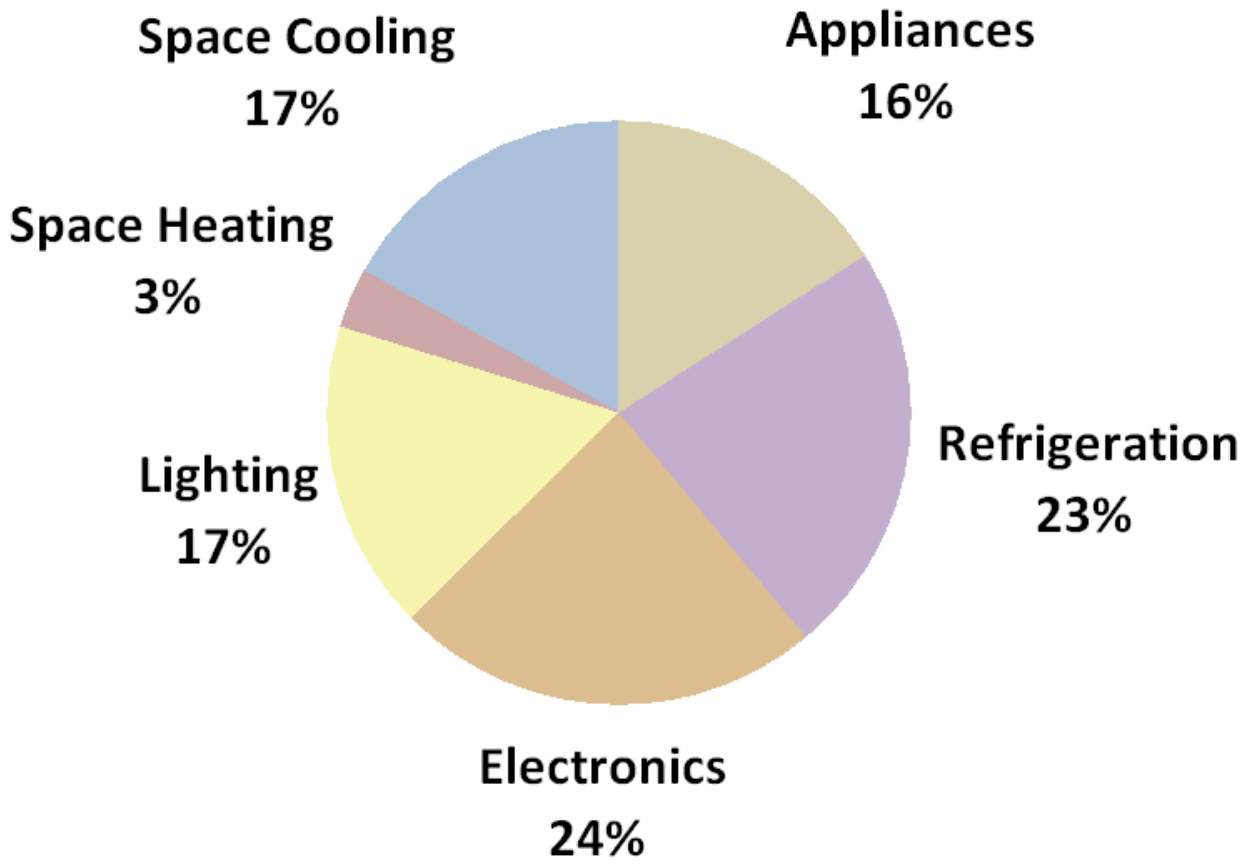
Home Utility Use Estimator

Results



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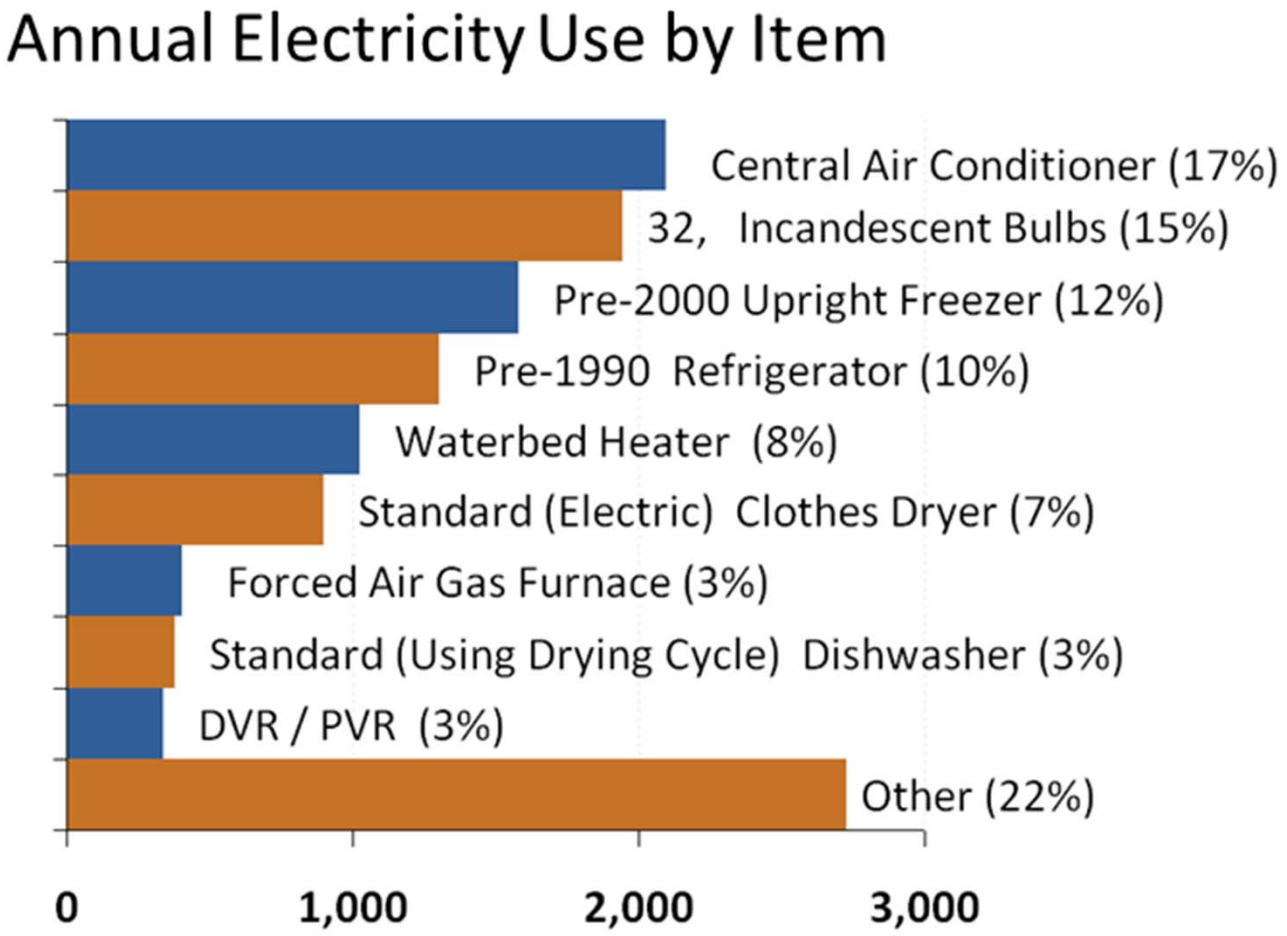
Home Utility Use Estimator

Results

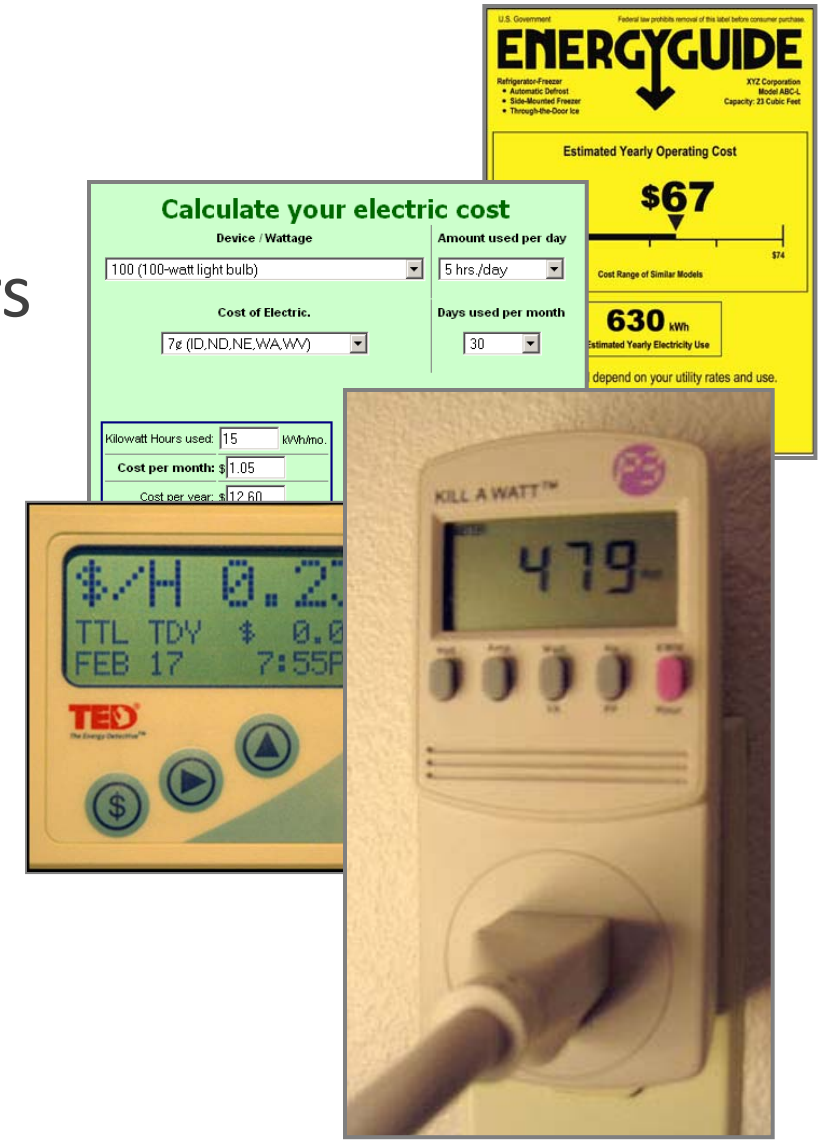


fcgov.com/home-efficiency

City of Fort Collins

Measurements

- Labels, tables & calculators
- Appliance meters
  - $25 to $100+
- Whole-house meters
  - $100 to $200+
  - Incremental & trends
- Upcoming website

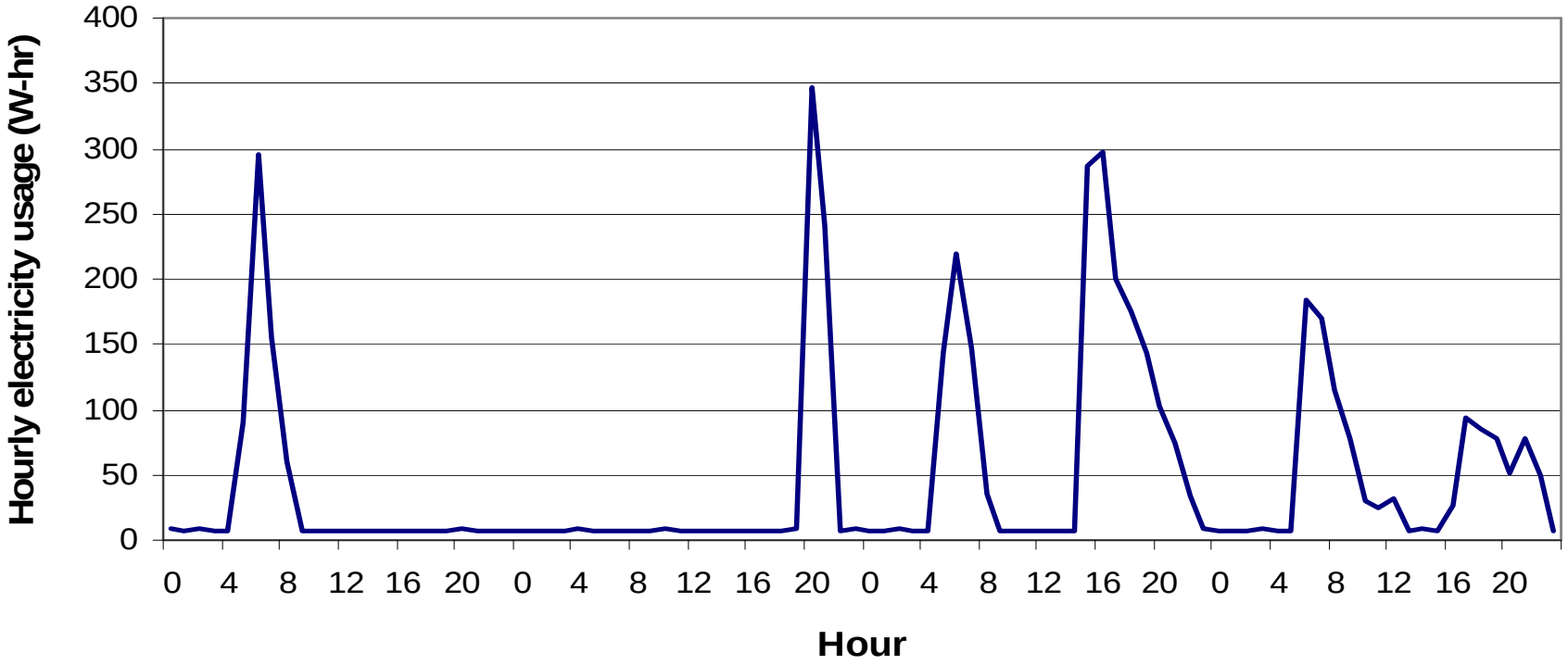


Check out appliance meters at Poudre Libraries

City of Fort Collins

Measurements

Why Intervals & Trends



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City of Fort Collins

Fort Collins Utilities Staff

Always here to help

Customer Service Reps

+ staff dedicated to energy and water efficiency

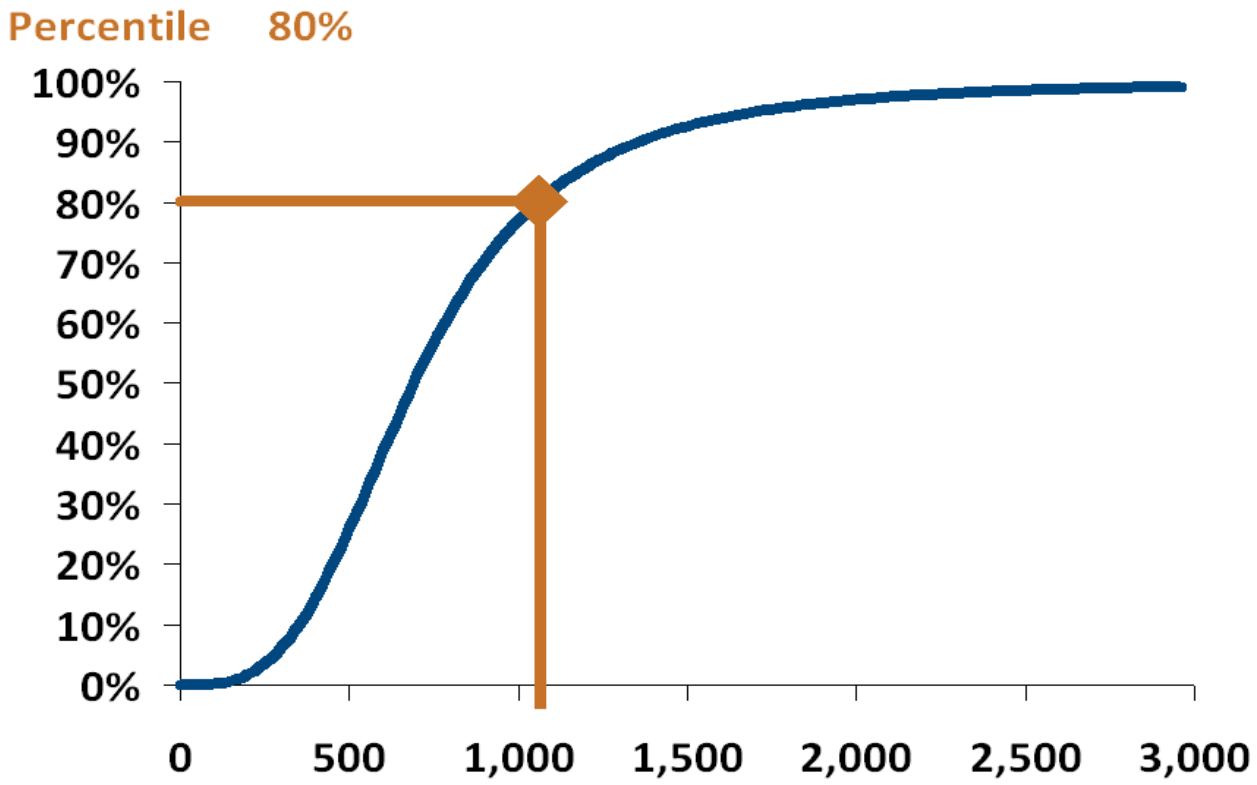
fcgov.com/conserve

City of Fort Collins

Home Utility Use Estimator

Results

Electric Use Comparison



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