

# SOUTHEASTERN COLORADO (SECRES)

A photograph showing a solar farm with several solar panels in the foreground, set against a backdrop of rolling green hills and a cloudy sky. The panels are tilted towards the sun.

- Non-profit organization staffed by volunteers
- Mission: To educate the public and promote the use of clean, healthy and low cost renewable energy, and energy efficiency.
- More information at [cres-energy.org](http://cres-energy.org)  
(select Chapters/SECRES)



# Building Efficiency Basics: Selecting Appliances

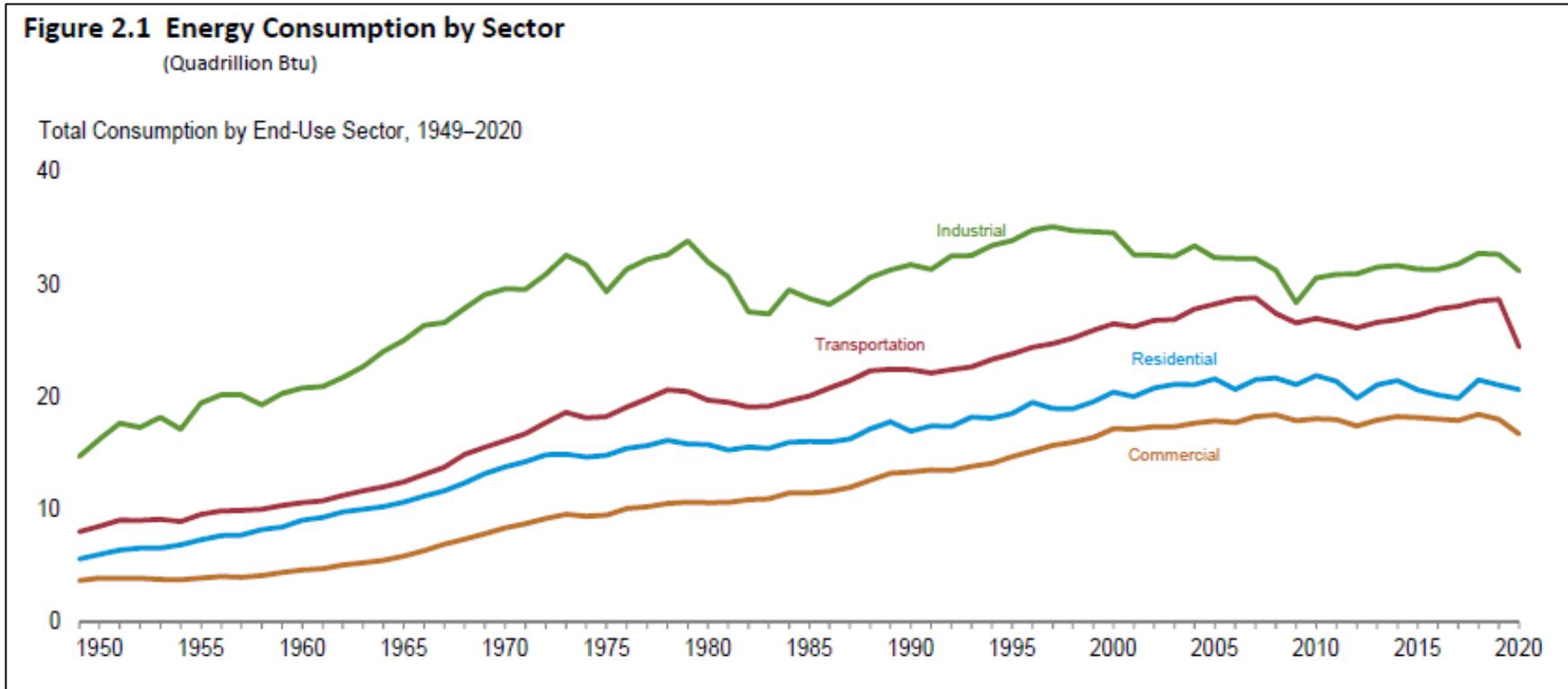
LEADING SOUTHEASTERN COLORADO AND ITS PEOPLE TO AN ENERGY-EFFICIENT (EE) AND RENEWABLE-ENERGY (RE)  
ECONOMY THROUGH EDUCATION, POLICY, AND ECONOMIC DEVELOPMENT.



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April 19, 2022

# U.S. Energy Consumption by Sector

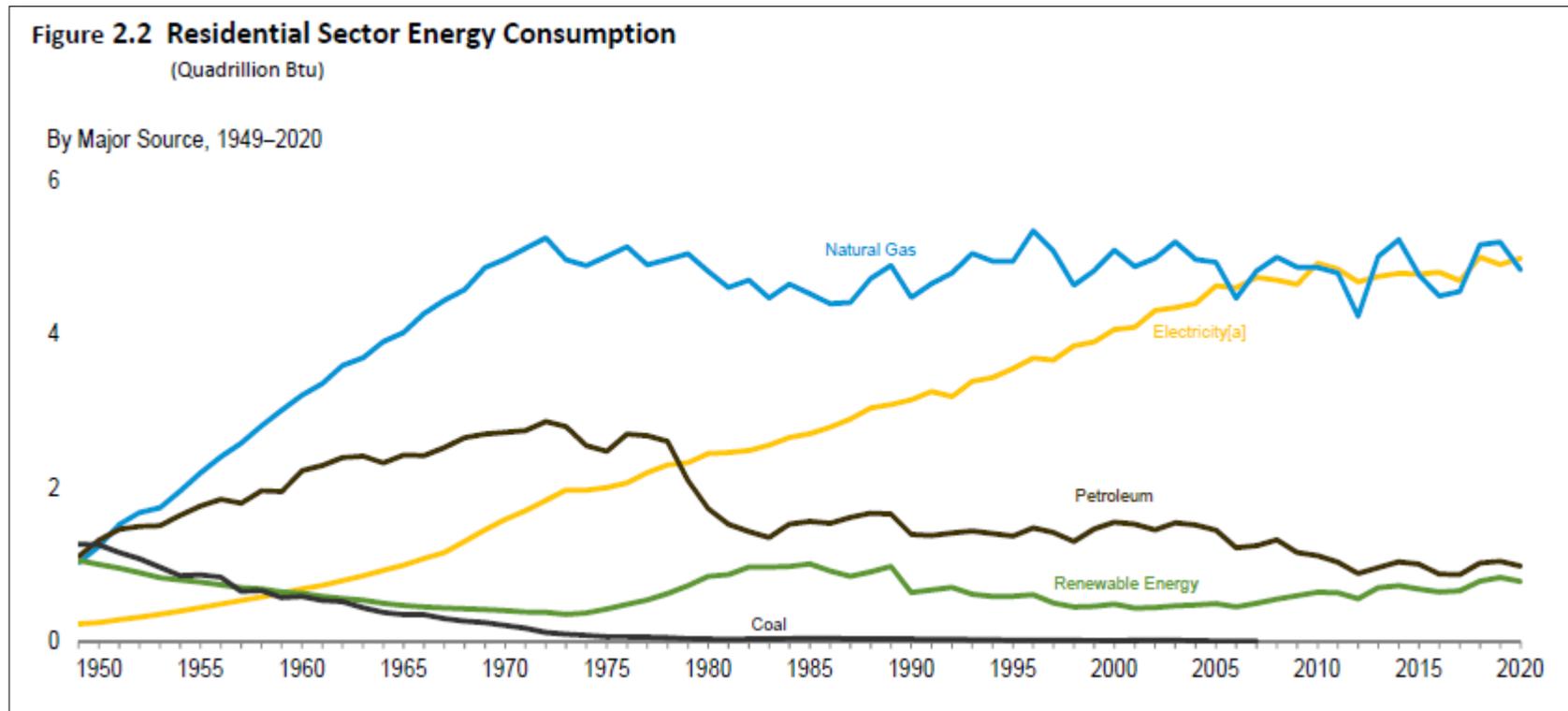


U. S. Energy Information Administration / Monthly Energy Review January 2022

## U.S. Residential Energy Consumption

- Represents 22% of total U.S. consumption
- 20 Quadrillion BTU consumed annually

# U.S. Residential Sector Energy Consumption by Source



\*Does not illustrate 9 Quadrillion BTU in Electrical System Energy Losses

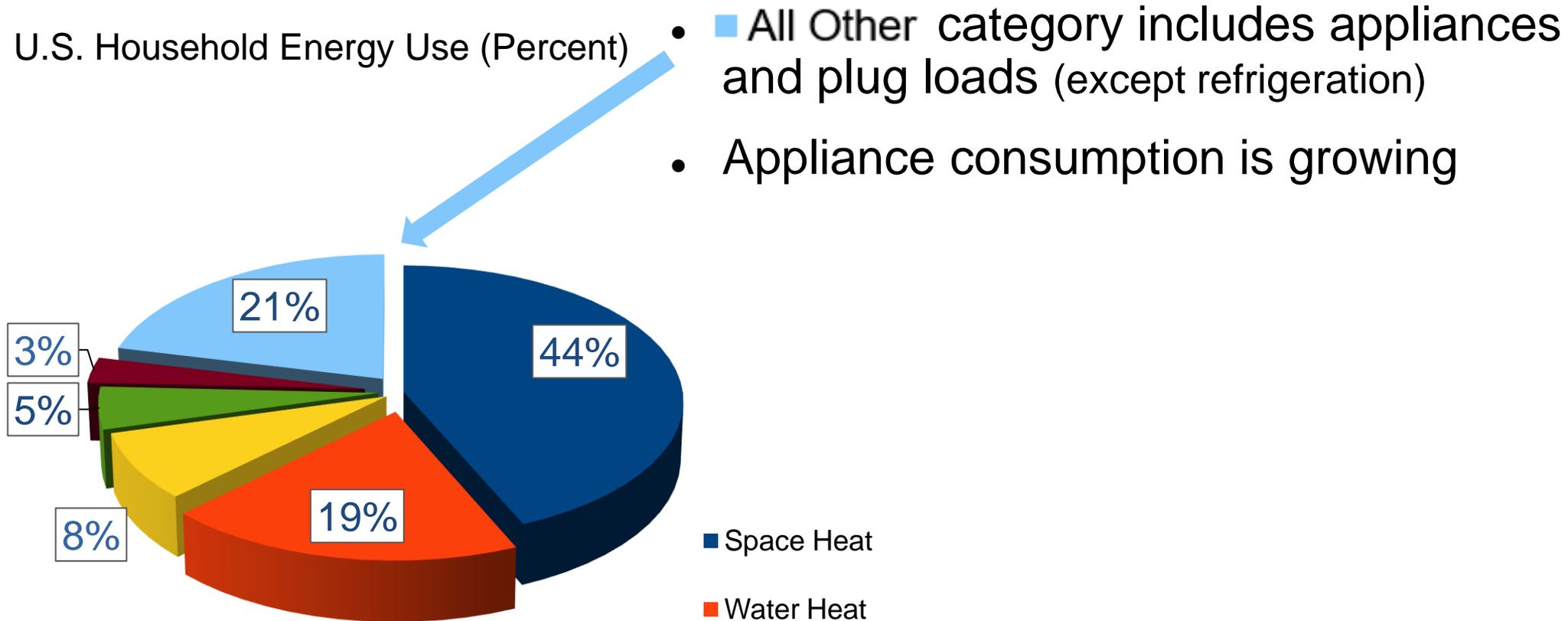
U. S. Energy Information Administration / Monthly Energy Review January 2022

## Electricity is the Fastest Growing Residential Source of Energy

- 5 Quadrillion BTU consumed annually
- EnergyStar program aids in curbing accelerated growth
  - 500 billion kilowatt-hours of electricity saved annually
  - 390M tons of greenhouse gases ~5% of total U.S. greenhouse gas emissions

# Home Energy Consumption by Category

U.S. Household Energy Use (Percent)

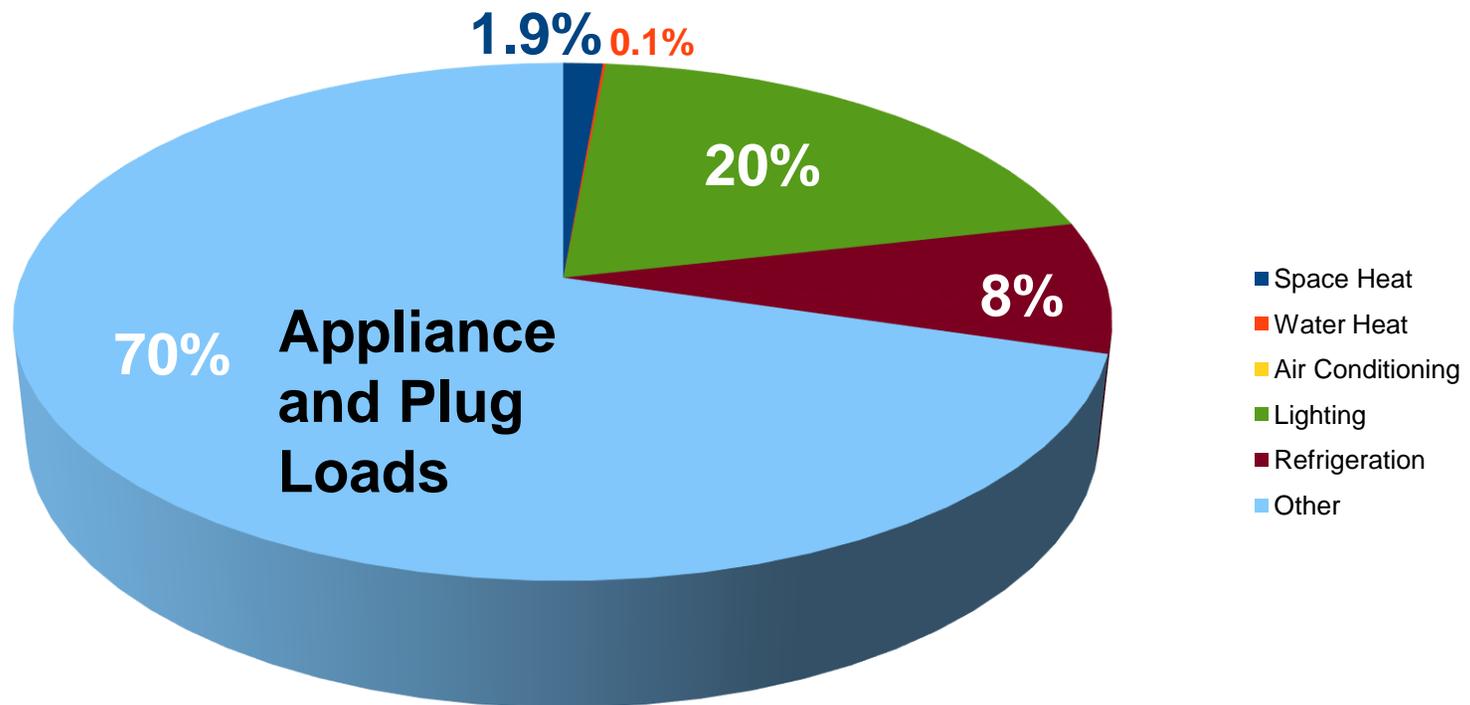


- All Other category includes appliances and plug loads (except refrigeration)
- Appliance consumption is growing

• Source: U.S. EIA 2020

- Space Heat
- Water Heat
- Air Condition
- Lighting
- Refrigeration
- All Other

# Efficient Shell and Passive Solar Shifts the Focus to Appliances & Plug Loads

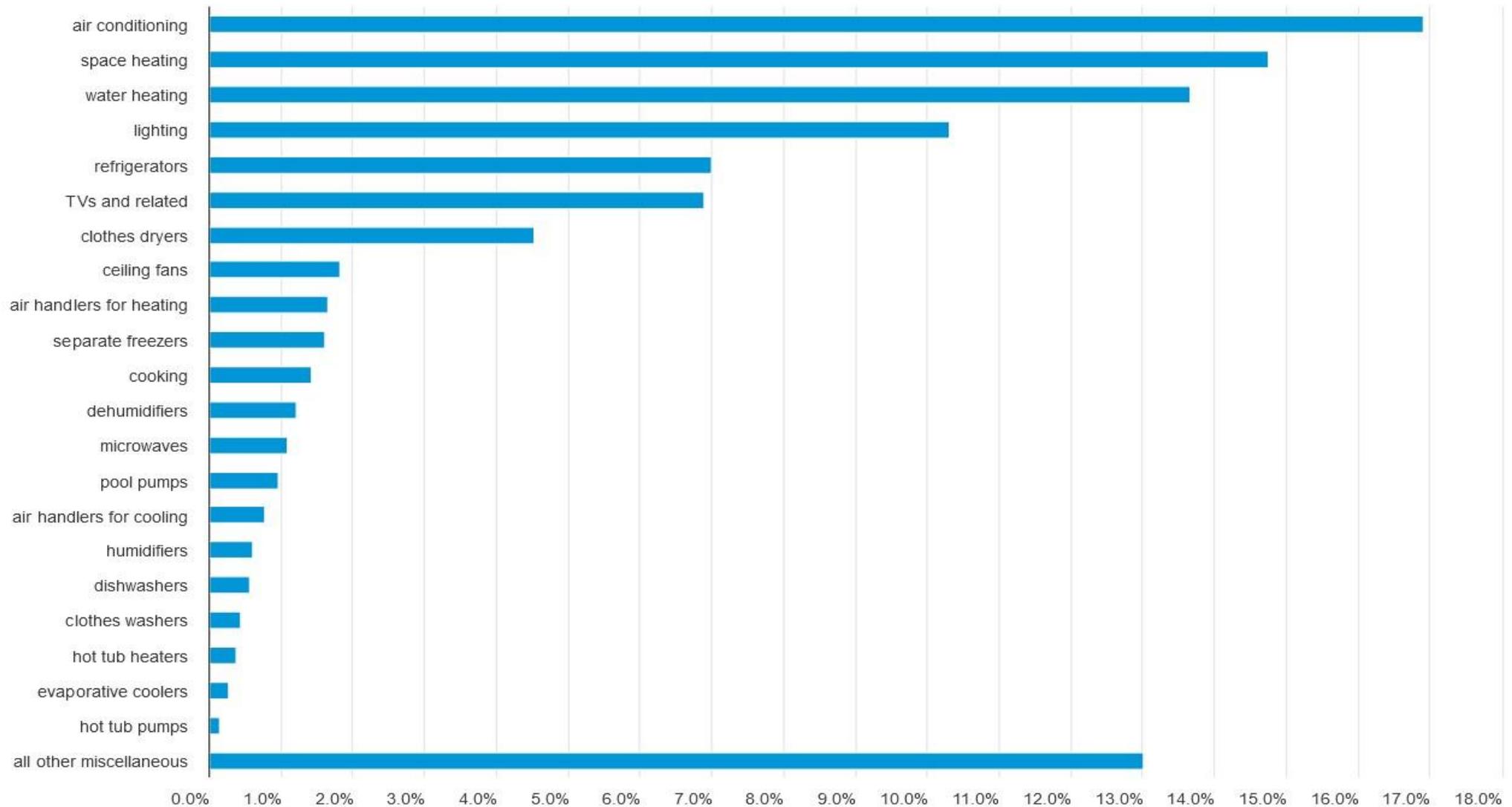


Modeled Loads of Net-Zero Energy House in Colorado

# Electrical Consumption by Appliance

Residential site electricity consumption by end use, 2015

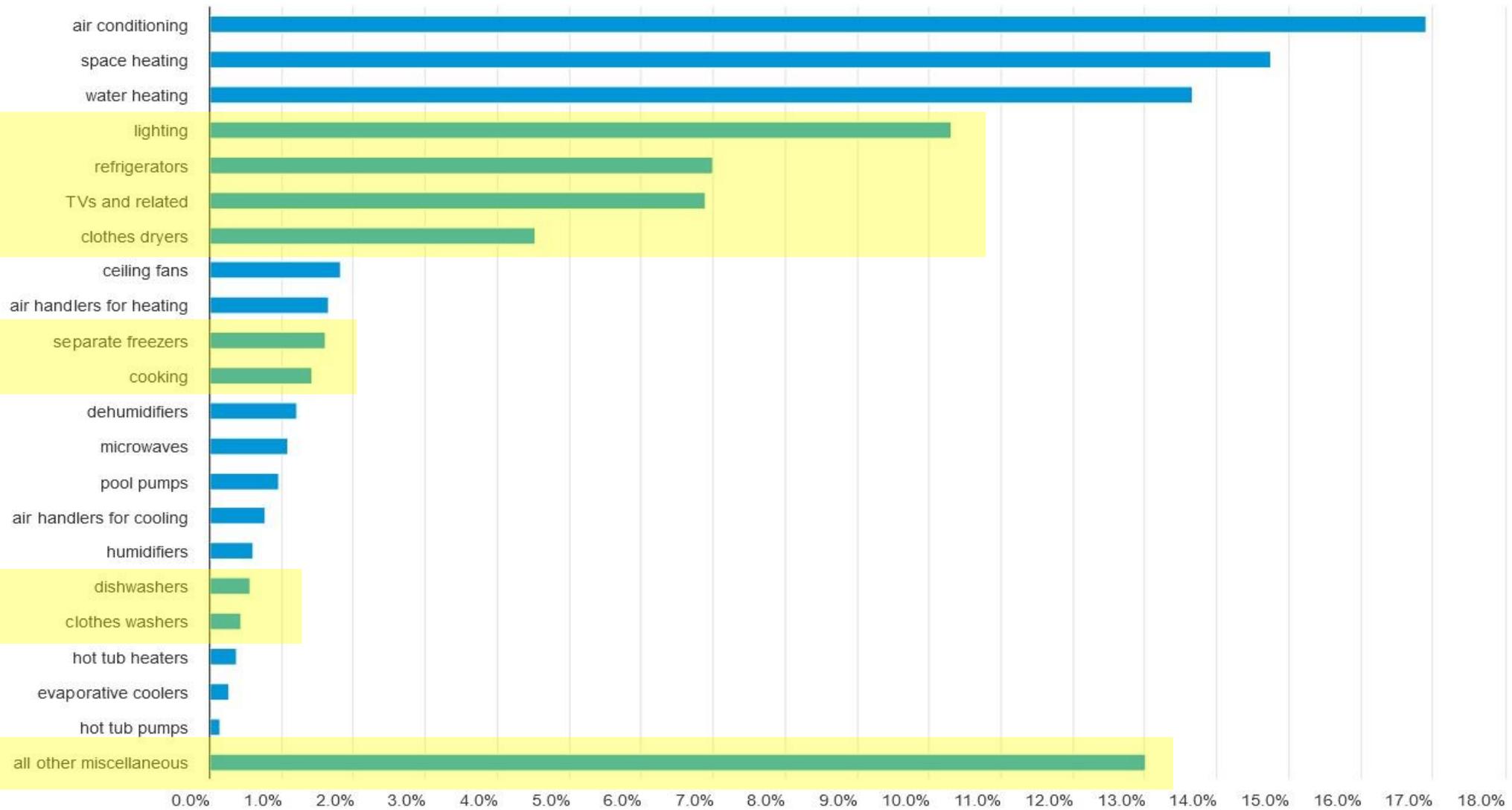
percent of total



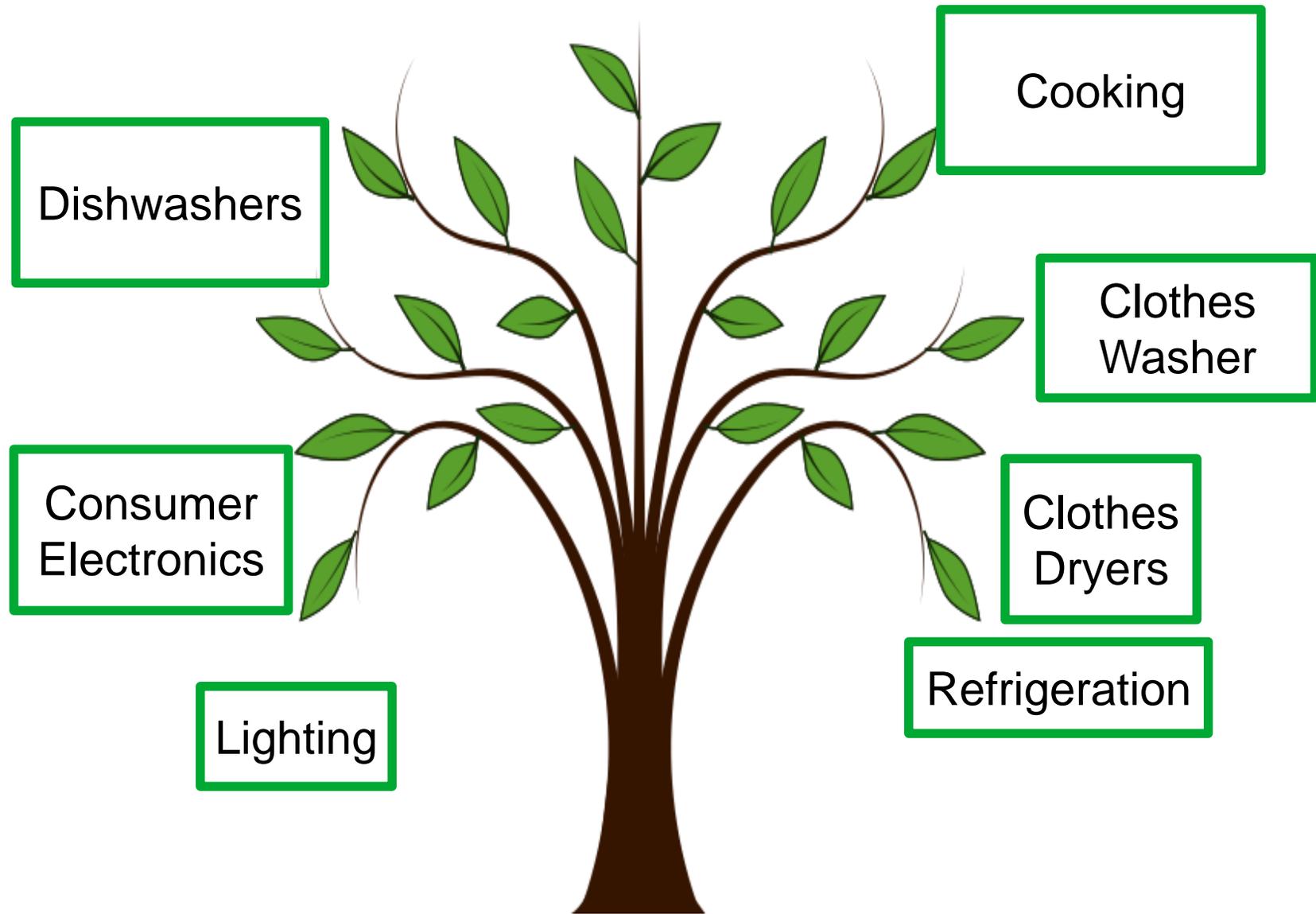
# Electrical Consumption by Appliance

Residential site electricity consumption by end use, 2015

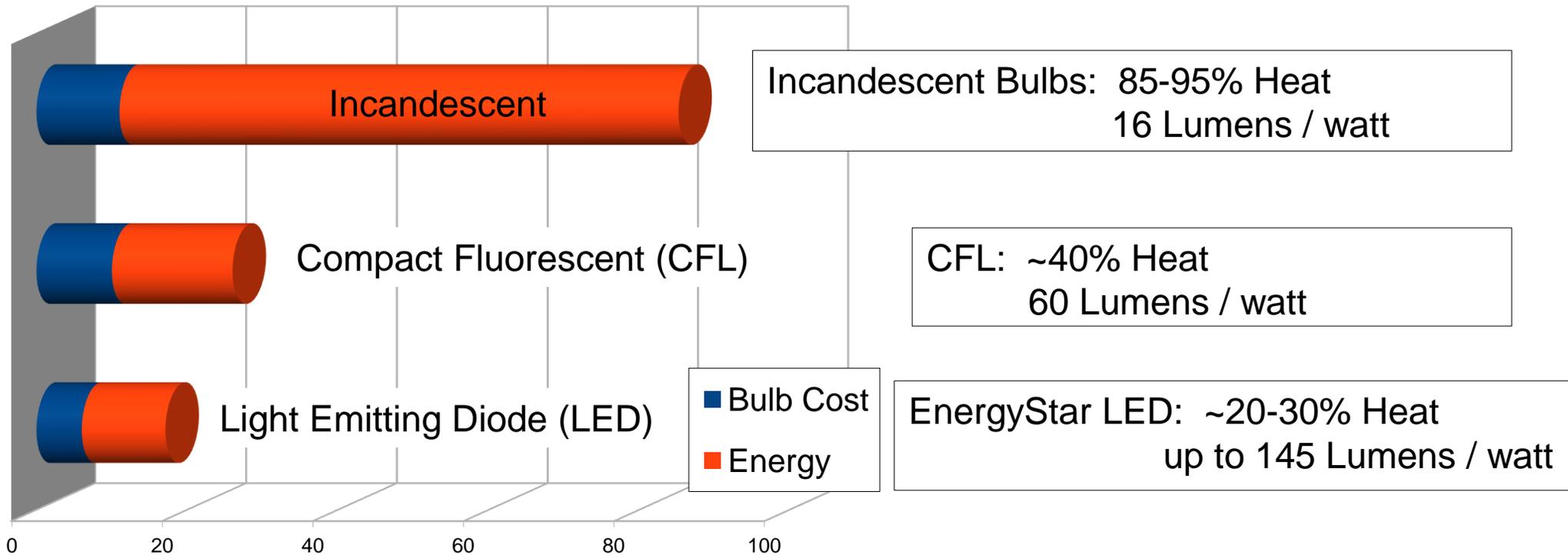
percent of total



# The Low Hanging Fruit



# Lighting: 10-Year Cost



## Savings from LED Bulbs

- Up to 50,000 hours of life (10x more than conventional)
- 9 watt consumption for 60 watt light output equivalency
- Less cooling energy needed in summer

# Refrigeration

Start Here:  
<https://www.energystar.gov>

## Filters:

- Price
- Type
- Brand
- Volume
- Dimensions
- Features

Typical annual energy use dropped

1200 kWh in 1980  
to  
550 kWh today

252 Records Found

### Filter Your Results

filter by keyword

Price

low to high

- Under \$500 (22)
- \$500-\$749 (34)
- \$750-\$999 (45)
- \$1000-\$1499 (42)
- \$1500-\$1999 (58)
- \$2000-\$2999 (95)
- \$3000 and up (137)
- Price not available (2564)

Type

- Top Freezer (498)
- Bottom Freezer (1053)
- Side-by-Side (98)
- Freezerless and Single Door (121)
- Compact Refrigerator (1332)
- Cooler (9)
- Compact Cooler (4)

Sort by: Annual Energy Use (kWh/yr)

[Share Your Results](#) [Disclaimer](#)

[No rebates for Residential Refrigerators found in \(80908\) - click here to search other areas >>](#)

**Frigidaire - FPRU19F8W\***  Compare

Freezerless and Single Door Capacity (Total Volume) (ft3): 18.9  
Annual Energy Use (kWh/yr): 301 Lower GWP Refrigerant: R-600a (3)

[CLICK FOR PRODUCT DETAILS](#)

**Frigidaire - FFHT1824UW**  Compare

Top Freezer Capacity (Total Volume) (ft3): 18.0  
Annual Energy Use (kWh/yr): 362 Lower GWP Refrigerant: R-600a (3)

[CLICK FOR PRODUCT DETAILS](#)

**Frigidaire - FFHT1824U\***  Compare

Top Freezer Capacity (Total Volume) (ft3): 18.0  
Annual Energy Use (kWh/yr): 362

[CLICK FOR PRODUCT DETAILS](#) **\$686.10 - \$776.10**

**Frigidaire - FFHT1824US**  Compare

Top Freezer Capacity (Total Volume) (ft3): 18.0

**ENERGY STAR Most Efficient**

Note: Fridge in unheated garage loses 15% efficiency

# Clothes Washers

Start Here:

<https://www.energystar.gov>

$$IMEF = \frac{C}{M + E + D + L}$$

Higher IMEF = more energy efficient washer

- **Integrated Modified Energy Factor (IMEF):** measure of energy efficiency that factors:
  - Capacity (C)
  - Energy used by the washer during the cycle and standby (M)
  - Hot water energy consumption (E)
  - Energy needed to dry remaining water (wringing efficiency) (D)
  - Combined low power mode energy consumption (L)

$$IWF = \frac{Q_A}{C}$$

Lower IWF = more water efficient washer

**Integrated Water Factor (IWF):** measure of water efficiency that factors:

- Gallons of water consumed for all wash cycles (Q<sub>a</sub>)
- Cubic foot of capacity (C)

# Clothes Washer Notes

283 Records Found

## Filter Your Results

filter by keyword

### Price

low to high

- Under \$600 (5)
- \$600-\$799 (14)
- \$800-\$999 (32)
- \$1000-\$1249 (30)
- \$1249-\$1499 (3)
- \$1500 and up (4)
- Price not available (211)

### Load Configuration

- Front Load (165)
- Top Load (134)
- Do not filter

### ENERGY STAR Most Efficient

- Most Efficient (57)

Sort by:

Integrated Modified Energy Factor



Share Your Results Disclaimer

No rebates for Residential Clothes Washers found in ( 80908 ) - click here to search other areas >>

### LG - WM8900H\*A

Compare

Front Load

Volume (cu. ft.) 5.2

Annual Energy Use (kWh/yr) 105

Annual Water Use (gallons/yr) 4423

Integrated Modified Energy Factor (IMEF) 3.1

Integrated Water Factor (IWF) 2.9

CLICK FOR PRODUCT DETAILS



### LG - WSEX200H\*A

Compare

Front Load

Volume (cu. ft.) 5.0

Annual Energy Use (kWh/yr) 105

Annual Water Use (gallons/yr) 4278

Integrated Modified Energy Factor (IMEF) 3.1

Integrated Water Factor (IWF) 2.9

Laundry Center

CLICK FOR PRODUCT DETAILS



### Samsung - WF45B63\*\*A\*

Compare

Front Load

Volume (cu. ft.) 4.5

- In general, Front Load washers are more efficient
  - Typical EnergyStar Front Load: 100 kWh/yr; 4200 gal/yr
  - Typical EnergyStar Top Load: 130 kWh/yr; 5100 gal/yr

# Clothes Dryers

- Clothes dryers consume more energy than any other home appliance
- Relatively new EnergyStar category (est. 19 May 2014)

$$CEF = \frac{C \text{ (lbs)}}{E_{on} + E_{standby}}$$

Higher CEF = more energy efficient dryer

- **Combined Energy Factor (CEF):** measure of energy efficiency that factors:
  - Load size (C)
  - Energy use during operational and standby cycles (E)
- Select capacity that meets your needs
  - Drying too large or too small both waste energy
- Types: traditional vented; ventless (condensing); heat pump
  - Most efficient is the ventless heat pump
- Example of the difference between EnergyStar-rated models:
  - Most efficient 299 kWh/yr vs least efficient: 640 kWh/yr (\$33 vs \$70 per yr)
- Non-EnergyStar vented dryers: approx 900 kWh/yr (\$99/yr)

# Sample Dryer Search by Efficiency (> 7 cuft capacity)

## Fuel Type

- Electric Clothes Dryer (351)
- Gas Clothes Dryer (154)
- Do not filter

## ENERGY STAR Most Efficient

- Most Efficient (27)

## Other Features and Characteristics

- Connected (11)
- Paired with ENERGY STAR Clothes Washer (285)
- Vented (441)
- Ventless (64)
- Heat Pump Technology (36)

[Show more](#)

## Refrigerant Type

- Lower impact on global warming (1)

## Brand Name

- Almison (2)
- Amana (3)
- Asko (2)

### Whirlpool - WHD560CH\*\*

Compare

Electric Standard Ventless

Combined Energy Factor (CEF): 5.2

Drum Capacity (cu-ft): 7.4

Estimated Annual Energy Use (kWh/yr): 460

Paired with ENERGY STAR Clothes Washer, Heat Pump

[CLICK FOR PRODUCT DETAILS](#)



### Whirlpool - WHD862CH\*\*

Compare

Electric Standard Ventless

Combined Energy Factor (CEF): 5.2

Drum Capacity (cu-ft): 7.4

Estimated Annual Energy Use (kWh/yr): 460

Heat Pump

[CLICK FOR PRODUCT DETAILS](#)



### Whirlpool - WED9290FW\*

Compare

Electric Standard Ventless

Combined Energy Factor (CEF): 4.5

Drum Capacity (cu-ft): 7.4

Estimated Annual Energy Use (kWh/yr): 531

Paired with ENERGY STAR Clothes Washer, Heat Pump

[CLICK FOR PRODUCT DETAILS](#)



### Whirlpool - WED7990FW\*

Compare

Electric Standard Ventless

Combined Energy Factor (CEF): 4.5

Drum Capacity (cu-ft): 7.4

Estimated Annual Energy Use (kWh/yr): 531

# Dishwashers

- Using an EnergyStar certified dishwasher compared to handwashing will save you:
  - \$130 per year or \$1,500 in total lifetime operating costs
  - 8,000 gallons of water per year
- Most EnergyStar models employ soil-sensing to control amount of water needed
- Boost water temperatures to 140 degrees which improves disinfection compared to handwashing
- Scrape don't rinse, for caked on food, use the rinse feature

# Sample of Full Size Dishwashers- EnergyStar Rated

Sort by: Annual Energy Use (kWh/yr)  [Share Your Results](#) 

<b>Miele - G 6875 SCVi</b> <input type="checkbox"/> Compare
Standard Annual Energy Use (kWh/yr): 199 Water Use (gallons/cycle): 3.2
<a href="#">CLICK FOR PRODUCT DETAILS</a> 
<b>Miele - G 6880 SCVi</b> <input type="checkbox"/> Compare
Standard Annual Energy Use (kWh/yr): 199 Water Use (gallons/cycle): 3.2
<a href="#">CLICK FOR PRODUCT DETAILS</a> 
<b>Miele - G 6835 SCi</b> <input type="checkbox"/> Compare
Standard Annual Energy Use (kWh/yr): 199 Water Use (gallons/cycle): 3.2
<a href="#">CLICK FOR PRODUCT DETAILS</a> 
<b>Miele - G 6987 SCVi</b> <input type="checkbox"/> Compare
Standard Annual Energy Use (kWh/yr): 199 Water Use (gallons/cycle): 3.2
<a href="#">CLICK FOR PRODUCT DETAILS</a> 

Sort by energy use

Sort by: Water Use (Gallons/Cycle)  [Share Your Results](#) 

<b>Beko - DDT38530***</b> <input type="checkbox"/> Compare
Standard Annual Energy Use (kWh/yr): 225 Water Use (gallons/cycle): 2.36
<a href="#">CLICK FOR PRODUCT DETAILS</a> 
<b>Blomberg - DWT 52800 ****</b> <input type="checkbox"/> Compare
Standard Annual Energy Use (kWh/yr): 225 Water Use (gallons/cycle): 2.36
<a href="#">CLICK FOR PRODUCT DETAILS</a> 
<b>Blomberg - DWT 81800 ****</b> <input type="checkbox"/> Compare
Standard Annual Energy Use (kWh/yr): 225 Water Use (gallons/cycle): 2.36
<a href="#">CLICK FOR PRODUCT DETAILS</a> 
<b>FULGOR MILANO - F6DWT24SS2</b> <input type="checkbox"/> Compare
Standard Annual Energy Use (kWh/yr): 225 Water Use (gallons/cycle): 2.36
<a href="#">CLICK FOR PRODUCT DETAILS</a> 

Sort by water consumption

Ensure it has an auto-sensing cycle with soil-sensor

# Consumer Electronics / Phantom Loads



- Look for the EnergyStar label
- Set up power-saving modes for computers, monitors, printers, modems, and routers
- When able, turn off electronics rather than use standby
- **Phantom Loads:** Energy consumption when an appliance or device is not in use (“off” or “standby”)
  - AC to DC transformers
  - Cable and satellite TV boxes are notorious offenders
- Check out a Kill-A-Watt power and energy meter from Pikes Peak Library District
- Connect devices to a power strip that is turned off nightly
- Use automatic timers – do not exceed the timer’s rated value

# Phantom Loads

## Real World Examples

### Real world examples:

- Entertainment Center w/ DirectTV box (Off): 70 watts, \$61 per yr
- TV + Wii Console (Off): 17 W, \$16 per yr
- Empty Garage Fridge: \$73 per yr
- Comcast TV box (Off): 29 W, \$23 per yr
- Elliptical Trainer (Off): 5 W, \$4.70 per yr
- Well Pump Controller (Standby): 60 W, \$53/yr

These examples add to \$230 per year or \$19.23 per month

# Miscellaneous Considerations

- Cooking: induction stovetop most efficient (with no CO emissions), but requires ferrous (stainless, iron) cookware
- Electric Vehicle Supply Equipment (EVSE)
  - Home charging stations are now in the EnergyStar program
- Great tips for efficient use of appliances:  
[www.energy.gov/energysaver/appliances-and-electronics](http://www.energy.gov/energysaver/appliances-and-electronics)
- Understand your electricity consumption
  - Utility smart meters allow hour-by-hour consumption
  - Consider buying a circuit panel energy monitor (\$50 to \$350)
  - Look for monitors that can ID devices using machine learning

# Rebates

## Residential Rebates & Incentives

Double down on savings with our rebates and incentives by first earning immediate credit on your purchase of efficiency products. Then, reap long-term gains from their year-over-year performance.

### Rebates



Watch electric use tumble and receive a \$50 rebate with an ENERGY STAR dryer.

CLOTHES DRYER >



If you recently put your old icebox on ice, recycle it or your refrigerator for a chill \$50.

FRIDGE/FREEZER >



Heat up the savings with a \$250 rebate on a furnace and \$1,000 on a heat pump.

FURNACE/HEAT PUMP >



Wrap up savings when you upgrade the insulation and seal air leaks in your home.

INSULATION >



Install savings with smart controllers, spray nozzles, rain sensors and other equipment.

IRRIGATION >



Thinking about solar? Plug in to rebates when you install your photovoltaic system.

RENEWABLE ENERGY >



Dial up energy savings along with a \$50 rebate on a smart thermostat.

SMART THERMOSTAT >



Ultra-high efficiency toilets provide water savings and up to a \$100 rebate.

TOILETS >



Fire up the savings, and we'll help with a \$50 or \$200 rebate.

WATER HEATER >

### Incentives

Showerheads

Our free showerhead exchange produces savings that make a splash.

LEARN MORE >

<https://www.csu.org/Pages/ResidentialRebates.aspx>

### Residential Efficiency Rebate Application

Before you begin, please review the Terms and Conditions and have your receipt and ID.

Account Number \*  Customer Name \*   
(Ten-digit number) (As shown on utility bill)

Service Address  
Address \*  City \*  State \*  Zip Code \*

Email \*  Home Phone \*  Cell Phone \*   
(Either Home Phone or Cell Phone is required.)

How did you hear about the rebate? \*

+ Appliances & Fixtures Rebates

+ Insulation Rebates

+ Water Rebates

Grand Total of Expected Rebates: \$ 0.00

Please consider a tax-deductible donation to Project COPE. All donations are matched dollar for dollar, up to \$500,000, thanks to a matching fund grant from Colorado Springs Utilities. 100% of your contribution assists neighbors with their utility bills.

Donation Amount: \$

I swear/affirm under penalty of perjury under the laws of the State of Colorado that I am:

- a United States citizen, or
- a Permanent Resident of the United States, or
- am lawfully present in the United States pursuant to Federal Law.

Signature Required \*  Date \*

I understand that this sworn statement is required by law because I have applied for a public benefit. I understand that state law requires me to provide proof that I am lawfully present in the United States prior to receipt of this public benefit or prior to entering a contract with the state. I further acknowledge that making a false, fictitious, or fraudulent statement or representation in this affidavit is punishable under the criminal laws of Colorado as perjury in the second degree under Colorado Revised Statute 18-8-503 and it shall constitute a separate criminal offense each time a public benefit is fraudulently received.

\*\*\* Attachments \*\*\*

Please do not use any special characters when adding attachments

(Characters other than alpha, numeric, spaces and underscores are not allowed.)

1. Include a copy of your approved photo ID.
2. Include copies of receipts related to the requested rebate items.

## My rebates since July 2020:

- \$50 Energy Star Dryer
- \$50 Smart Thermostat
- \$50 Rain sensor for Sprinkler
- \$50 WiFi Sprinkler Controller
- \$200 Insulation
- \$580 Solar Panels (\$.10/Watt)

\$980 in total rebates to-date

## Black Hills Energy

<https://tinyurl.com/BHERebate>

## Mountain View Electric Association

<https://tinyurl.com/MVEAREbate>

Other Charges: **\$-50.00**

• Residential Electric Dryer Rebate

\$-50.00

# <https://www.energysmartcolorado.com/wp-content/uploads/2022/03/2022-Rebates-by-Utility.pdf>

		Utility Rebates														
	EFFICIENCY MEASURE	CITY OF ASPEN ELECTRIC	ATMOS ENERGY	BLACK HILLS ENERGY (gas)	EMPIRE ELECTRIC	CITY OF GUNNISON ELECTRIC	GUNNISON COUNTY ELECTRIC	HOLY CROSS ENERGY	LA PLATA ELECTRIC	MOUNTAIN PARKS ELECTRIC	SAN ISABEL ELECTRIC	SAN MIGUEL POWER	SDCEA	XCEL ENERGY	YAMPA VALLEY ELECTRIC	
ENVELOPE	Air Sealing	25% up to \$500 (electric only)	30% up to \$300					25% up to \$500						30% up to \$200		
	Insulation	25% up to \$500 (electric only)	30% up to \$300	\$0.25/sq.ft up to \$890		\$0.15/sq ft up to \$300 (attic)		25% up to \$500			60% up to \$450			30% up to \$400		
HEATING & COOLING	Programmable Thermostat	25% up to \$500	\$20 - \$75 (Energy Star)	\$25 - \$100	\$25 - \$50	up to \$100		25% up to \$300	\$25 - \$75	\$25 - \$50	\$25	\$25		visit Xcel Energy store	up to \$50 (limit 2)	
	Gas Furnace		\$400 (95% AFUE) \$350 (97% AFUE)	\$300 (95% AFUE) \$350 (97% AFUE)										\$300 (95% AFUE)		
	Boiler		\$300 (95% AFUE)	\$35 (84% AFUE)										\$250 - \$350 (95% AFUE)		
	HVAC Equipment Maintenance & Tune Up		\$50													
	Evaporative Cooler (Swamp Cooler)	25% up to \$500						25% up to \$200							\$300 - \$1,200	
	Balanced Ventilation (HRV/ERV)	25% up to \$500														
	Cold Climate Air Source Heat Pump	25% up to \$500 -->\$2,500		\$1500 (gas fired absorption)	50% up to \$2,400	\$400 to \$1,000	\$675 - \$4,800	25% up to \$4,000	\$1,000 - \$3,500	\$675 - \$1,000	\$875 - \$2,900	\$900 - \$2,000	\$675 - \$2,400	\$1,000 - \$2,000		
	Indirect Hot Water Heater			\$85												
HOT WATER	Standard Tank Hot Water Heater			\$50 (min 0.64 EF)	\$60		\$50 - \$70 (electric)			\$180 (fuel switch from gas)	\$50 - \$250	\$150	\$30 - \$50	\$50 (min 0.64 UEF)	up to \$200 fuel switch from gas	
	Tankless Hot Water Heater		\$200 (min 0.86 EF)	\$80 (min 0.92 EF)										\$100 (min .87 UEF)		
	Heat Pump (Hybrid) Hot Water Heater	25% up to \$500			\$350		\$740	25% up to \$1,000 (Energy Star)	\$550 - \$700	\$350	\$350	\$700		\$600 - \$800		
RENEWABLES	Solar Photovoltaic (PV)	\$0.75/watt up to 3kW up to \$2,250						\$100 to \$250 per kW for up to 25kW installed		\$1,000 (2kW+)		\$0.10/watt up to 3kW or \$300		Solar Rewards Program		
	Storage System	25% up to \$2,250 -->\$2,500						\$500 per kW for up to 25kW installed or Tesla Powerwall-2s								
ELECTRIC	EV Charger (Level II)	25% up to \$500			50% up to \$1,000		50% up to \$1,250	Free level 2 ChargePoint Charger	Free level 2 ChargePoint Charger	Match up to \$500	50% up to \$1,000	50% up to \$500		\$50 annual bill credit	\$250	
	Electric Bike				25% up to \$150			25% up to \$50 (up to 2 per household)	25% up to \$150		25% up to \$150	\$150			25% up to \$150	
	Lighting (LEDs)	25% up to \$500			50% up to \$8 per LED	commercial program only	50% up to \$8 per LED	25% up to \$100	50% up to \$8 per LED	50% up to \$8 per LED	50% up to \$8 per LED	50% up to \$8 per LED	50% up to \$8 per LED	visit Xcel Energy store	up to \$10/bulb max 10 LEDs/yr	
	Induction Cooktop/Range						\$100 - \$350	25% up to \$100 (replace gas stove)	\$100 - \$350	\$100 - \$350		\$150 - \$450	\$100 - \$350			
	Heat Tape Controls/Timers	25% up to \$200 -->\$500						25% up to \$200 (must be hard-wired)							\$100 (hard-wired) \$15 (plug-in)	
APPLIANCES	Heat Pump Clothes Dryer				\$60 (Energy Star) \$120 (electric hybrid heat pump)		\$30 (Energy Star) \$90 (electric hybrid heat pump)	25% up to \$100	\$30 (Energy Star) \$90 (electric hybrid heat pump)	\$30 (Energy Star) \$90 (electric hybrid heat pump)	\$80 (Energy Star) \$180 (electric hybrid heat pump)	\$60 (Energy Star) \$180 (electric hybrid heat pump)	\$30 (Energy Star) \$90 (electric hybrid heat pump)	\$30	\$100 (fuel switch from gas)	
	Clothes Washer (Energy Star)			\$25 (top loading)	\$60 - \$80		\$50 - \$60		\$30 - \$40	\$30 - \$40	\$70 - \$80	\$60 - \$80	\$30 - \$40	\$30		
	Dishwasher (Energy Star)				\$40						\$30					
	Refrigerator or Freezer (Energy Star)				\$60		\$50 \$60 for recycling		\$30 \$60 for recycling	\$30 \$60 for recycling	\$80 \$60 for recycling	\$80 \$100 for recycling	\$30 \$60 for recycling	\$50 for recycling		
OTHER	Window Replacement			up to \$700 (storm windows)												
	Cellular Shades													variable		

apply for rebates: <https://www.energysmartcolorado.com/for-my-home/home-rebates/>

Questions?