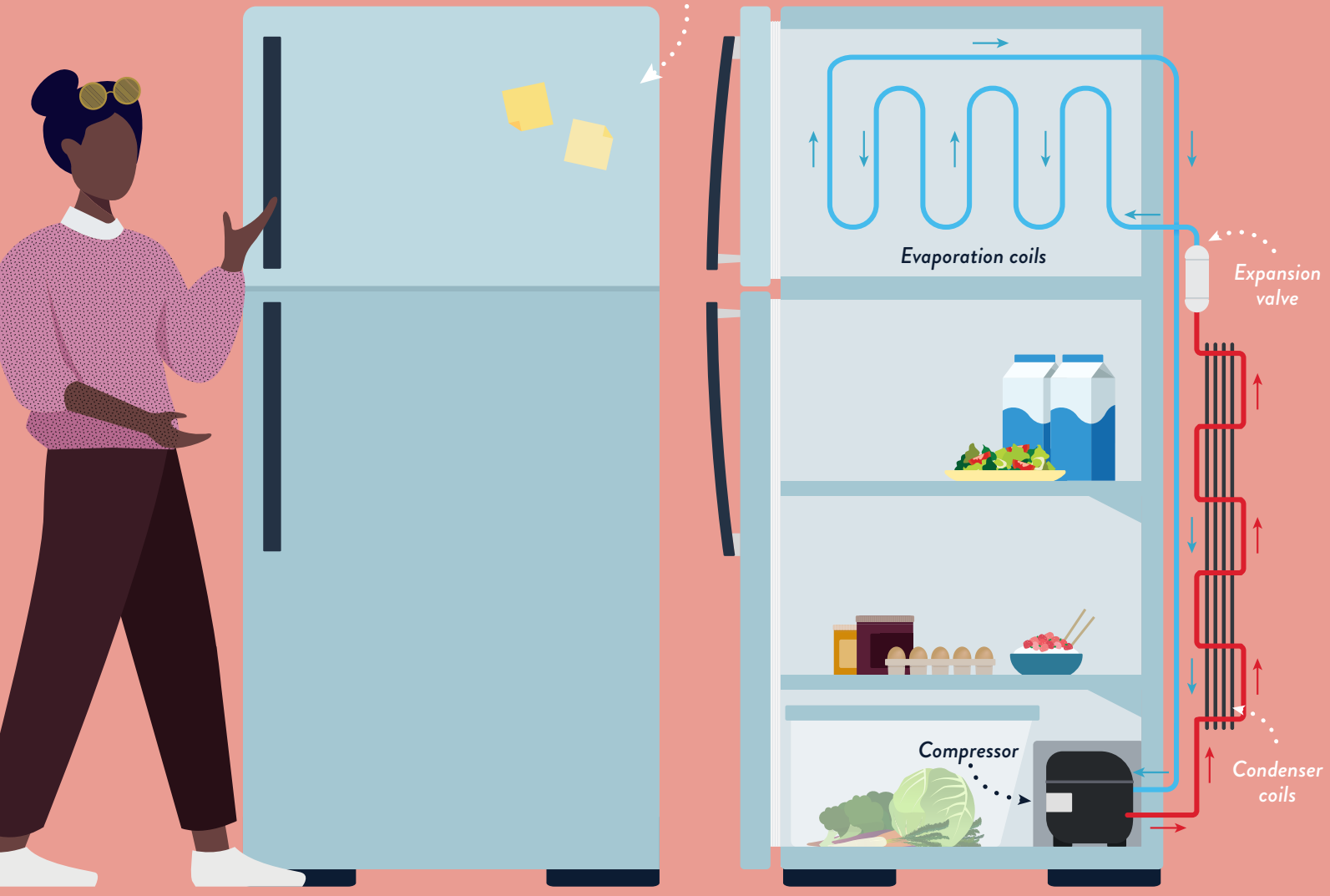
ecoblock™

APPLIANCES 101:

KNOW YOUR *EFFICIENT REFRIGERATORS*

Did you know? ENERGY STAR®-certified top-mount freezer refrigerators generally use less energy than a 60-watt light bulb!



01 *WHAT ARE EFFICIENT REFRIGERATORS?*

Efficient refrigerators **maximize energy savings and minimize consumption**. According to the U.S. Department of Energy (DOE), ENERGY STAR-certified **top-mount freezer refrigerators** are **10 to 25 percent** more efficient than other models—this is because the placement of the **freezer** in relation to the **compressor** greatly affects performance.

Refrigerators are **heat pumps**: they transfer heat by circulating **refrigerant** via a compressor. A freezer that is **further away** from the compressor uses less energy to refrigerate food. Sending the coldest air to the top of the system naturally cools the rest of the appliance as well.

02 *PARTS OF A REFRIGERATOR*

+ ***Refrigerant:*** The substance that is circulated to cool refrigerator space; it fluctuates between a liquid and gas state.

+ ***Compressor:*** Raises the pressure and temperature of the refrigerant gas and sends it to the condensor.

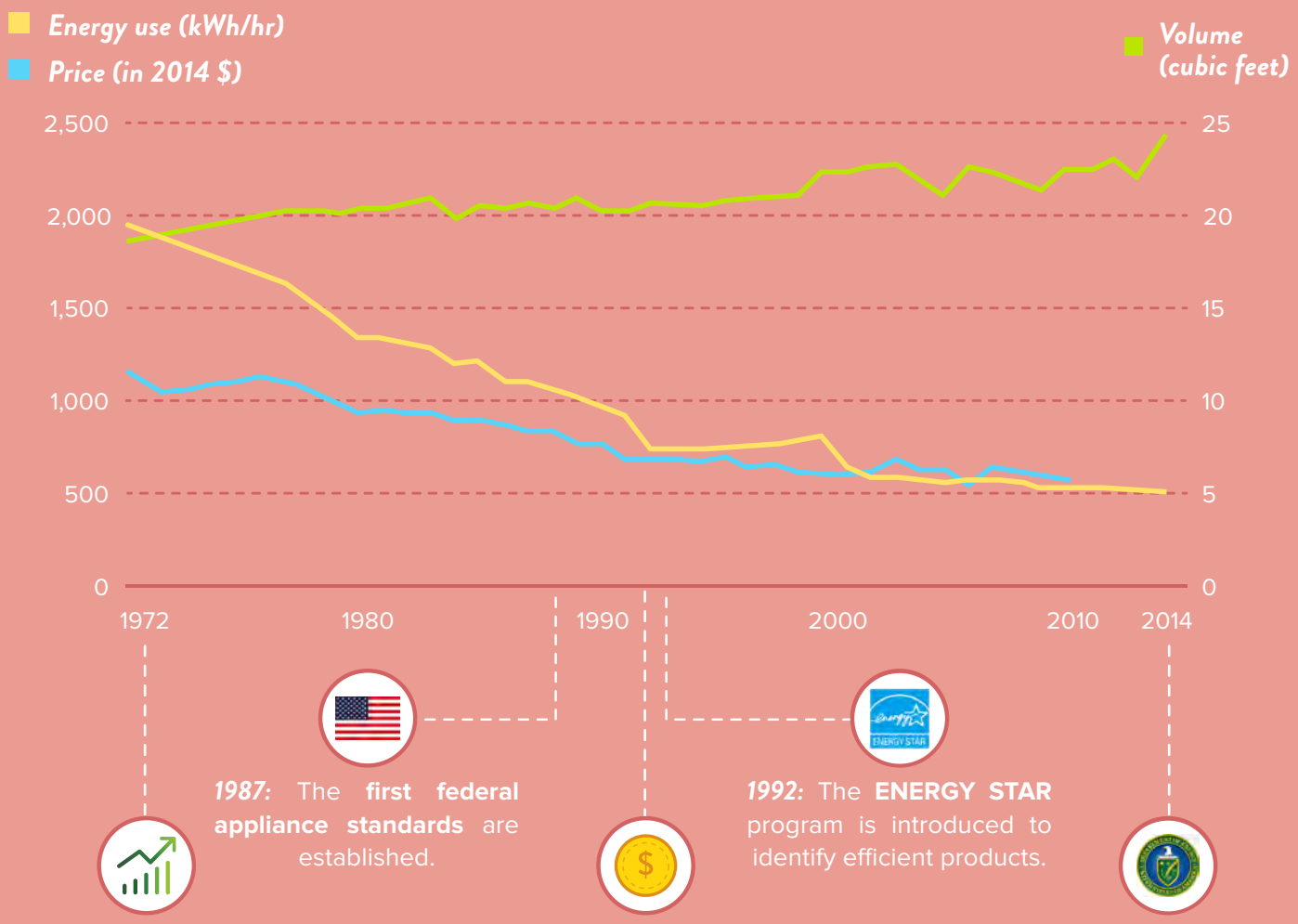
+ ***Condenser:*** Removes heat from the refrigerant gas, condensing it into liquid form.

+ ***Expansion valve:*** Lowers the temperature and pressure of the liquid, sending it to the evaporator.

+ ***Evaporator:*** Allows the refrigerant to absorb heat in the refrigerator and sends it to the compressor, starting the cycle all over again.

03 REFRIGERATOR STANDARDS OVER TIME

For the past several decades, the U.S. Department of Energy has established standards that have signficantly improved the energy efficiency of residential refrigerators and freezers while meeting consumer needs and preferences.



1970s: Refrigerator efficiency rises rapidly in response to the **U.S. energy crisis**. The **first efficiency standards** are established in California.

1987: The **first federal appliance standards** are established.

1991: The **Super Efficient Refrigerator Program (SERP)** is launched to commercialize refrigerator efficiency.

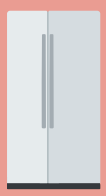
1992: The **ENERGY STAR** program is introduced to identify efficient products.

2014: The **current DOE refrigerator standards**—which were finalized in 2011—take effect.

04 EFFICIENCIES OF ENERGY STAR REFRIGERATORS*

Top-mount
365 kWh or $45/year

Bottom-mount
560 kWh or $70/year



Side-by-side
630 kWh or $75/year

**Energy consumption may vary based on refrigerator/freezer size, defrost type, and whether or not an ice dispenser is included.*

05 WHY TOP-MOUNT FREEZER REFRIGERATORS?

Pros

+ Significantly **reduce electric bills**
+ Eligible for **rebates**
+ Generally **cheaper**
+ **More usable space** for perishable items
+ Can **preserve & keep food fresh** for longer

Cons

+ **Fewer storage & organization alternatives**

Design by Eunice Chung

Sources: Amy Dryden, EcoBlock • Appliance Standards Awareness Project • Constellation • Energy Innovation • ENERGY STAR • Fantastic Fridges • National Renewable Energy Laboratory • U.S. Department of Energy • Vox