

Reducing Your Building's Carbon Emissions

Presented by Juanita Garcia and Evan Caprile
of Pepper Construction

2021 REBUILD CONFERENCE

Pepper Construction
Tomorrow Transformed

The logo for Pepper Construction features the company name in a bold, sans-serif font. The word "Pepper" is in a dark green color, while "Construction" is in a lighter green. Below the name, the tagline "Tomorrow Transformed" is written in a smaller, dark green font. A stylized green swoosh or arc curves around the bottom right of the text.



Juanita Garcia

Senior Project Manager, High Performance
Pepper Construction Company



Evan Caprile

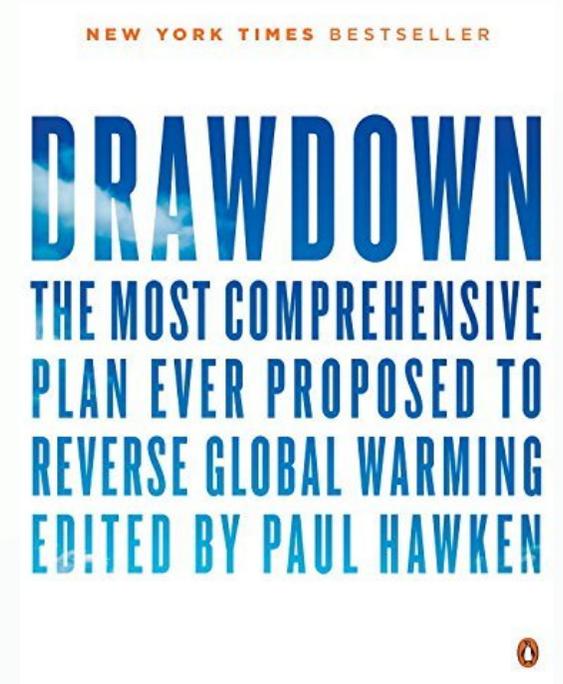
Project Manager, High Performance
Pepper Construction Company

What is Drawdown?

draw·down

Noun

Removing more Greenhouse gasses than we release into the atmosphere.

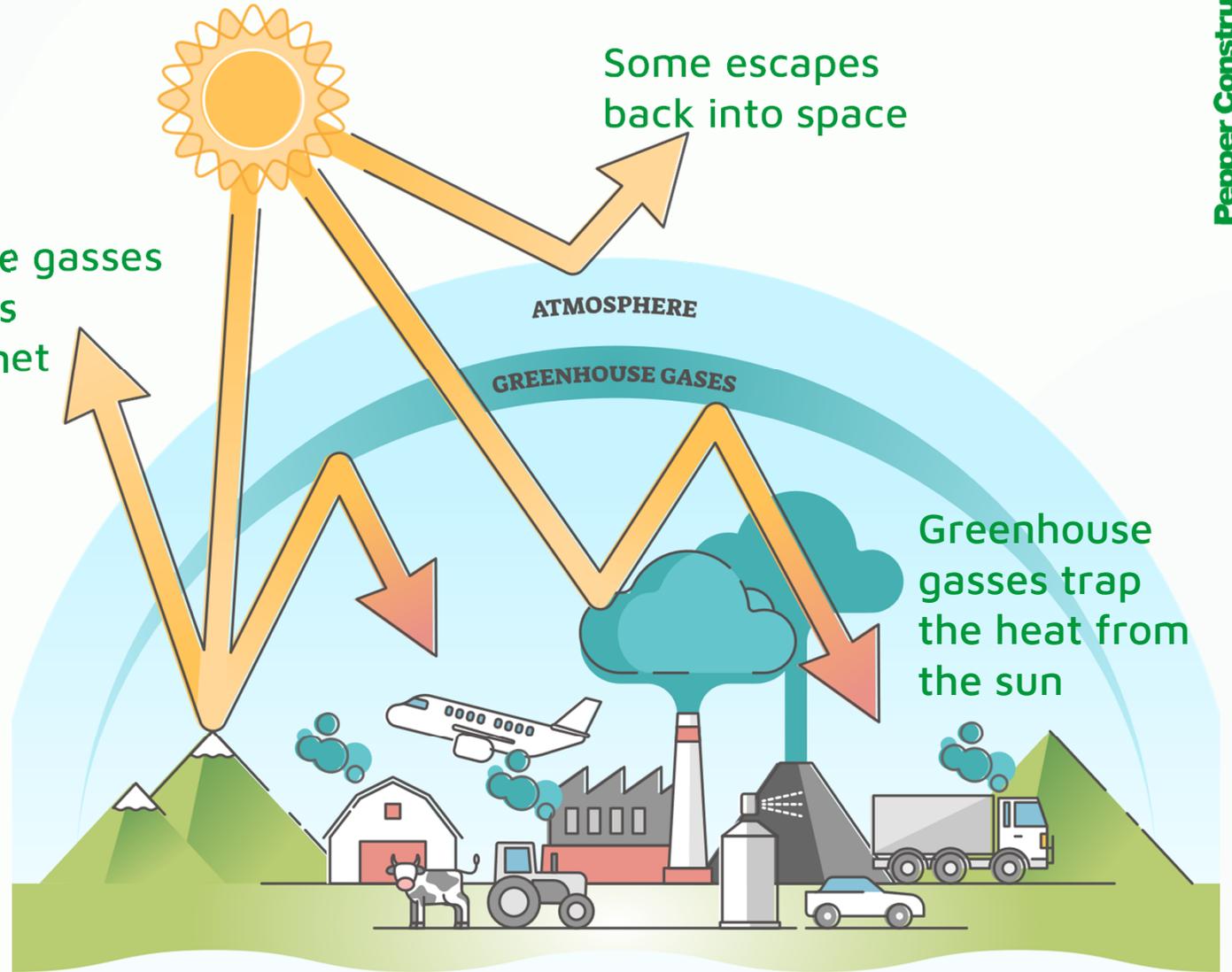


The Greenhouse Effect

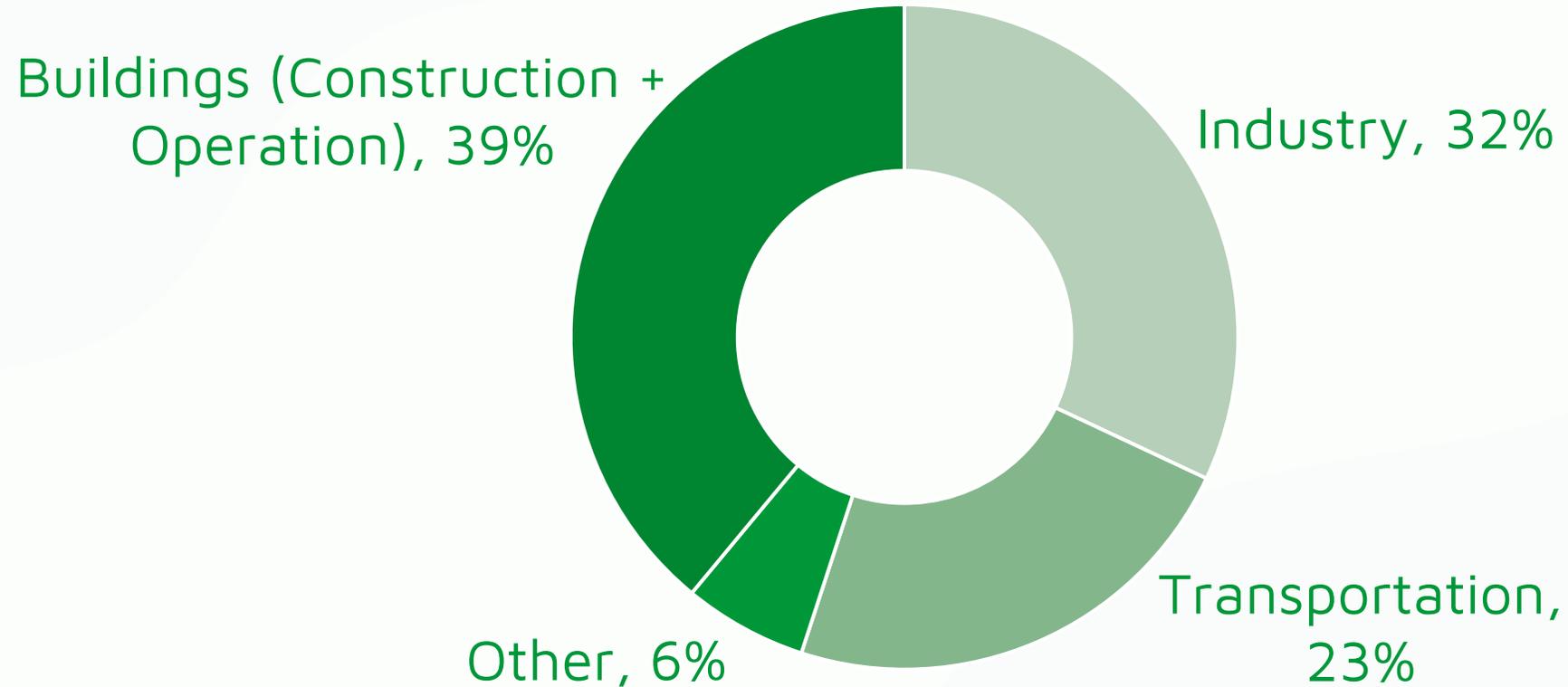
Energy from the sun warms the Earth

Some escapes back into space

Some is held by greenhouse gasses in the atmosphere, bounces around and warms the planet



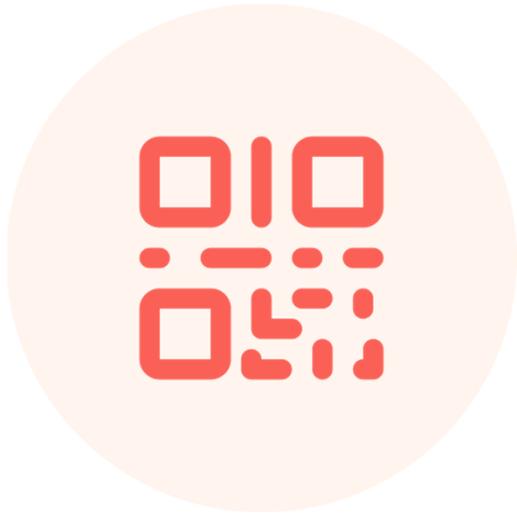
Global CO2 Emissions by Sector



Let's play 'The Environment's in JEOPARDY



slido



**Join at slido.com
#243959**

ⓘ Start presenting to display the joining instructions on this slide.

WASTE

RENEWABLES

HEATING + COOLING

PLANTS + WATER

BUILDING COMPONENTS

2
GIGATONS CO₂e

6.19
GIGATONS CO₂e

4.16
GIGATONS CO₂e

0.6
GIGATONS CO₂e

0.29
GIGATONS CO₂e

6.18
GIGATONS CO₂e

15.94
GIGATONS CO₂e

6.28
GIGATONS CO₂e

0.91
GIGATONS CO₂e

6.4
GIGATONS CO₂e

6.29
GIGATONS CO₂e

27.98
GIGATONS CO₂e

57.75
GIGATONS CO₂e

3.59
GIGATONS CO₂e

16.97
GIGATONS CO₂e

The Environment's in **JEOPARDY**

slido



The amount of C&D debris compared to municipal solid waste.

ⓘ Start presenting to display the poll results on this slide.

Construction Waste

[Source](#)



Back to the board
JEOPARDY

slido



The process of using microbes to control the decomposition of organic materials to produce renewable biogas and nutrient- rich compost.

① Start presenting to display the poll results on this slide.

Anaerobic Digester

[Source](#)



Back to the board

JEOPARDY

slido



U.S. EPA estimates this many tons of carpet and rugs were generated in the U.S. waste stream in 2018.

ⓘ Start presenting to display the poll results on this slide.

Extended Producer Responsibility



 **Tarkett**

ShawContract®

Interface

 MOHAWK | Mohawk Group

RECOVER
CARPET RECYCLING PROGRAM

Back to the board
JEOPARDY

slido

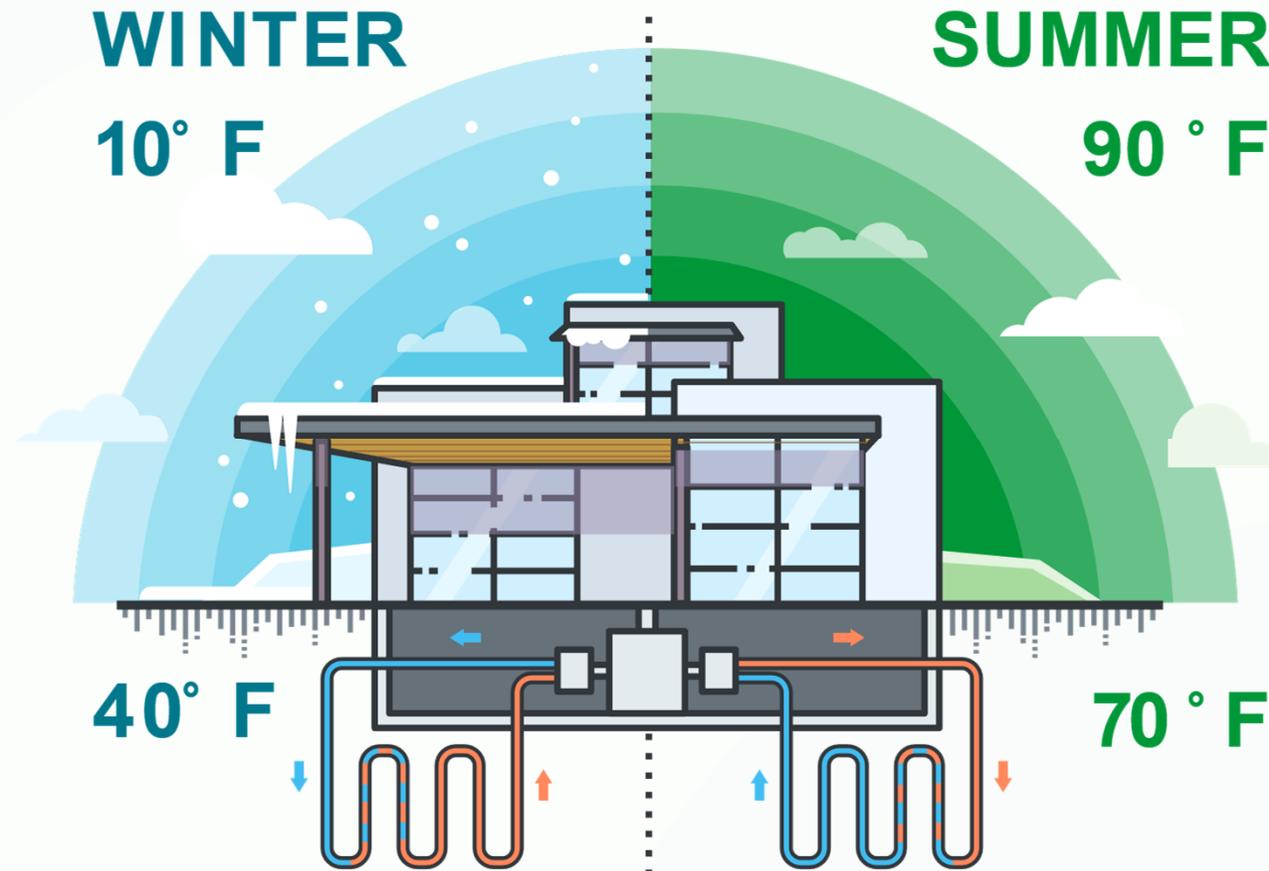


An emission-free renewable source of energy produced inside the earth. The name comes from the Greek words for Earth and Heat.

ⓘ Start presenting to display the poll results on this slide.

Geothermal

[Source](#)



Back to the board
JEOPARDY

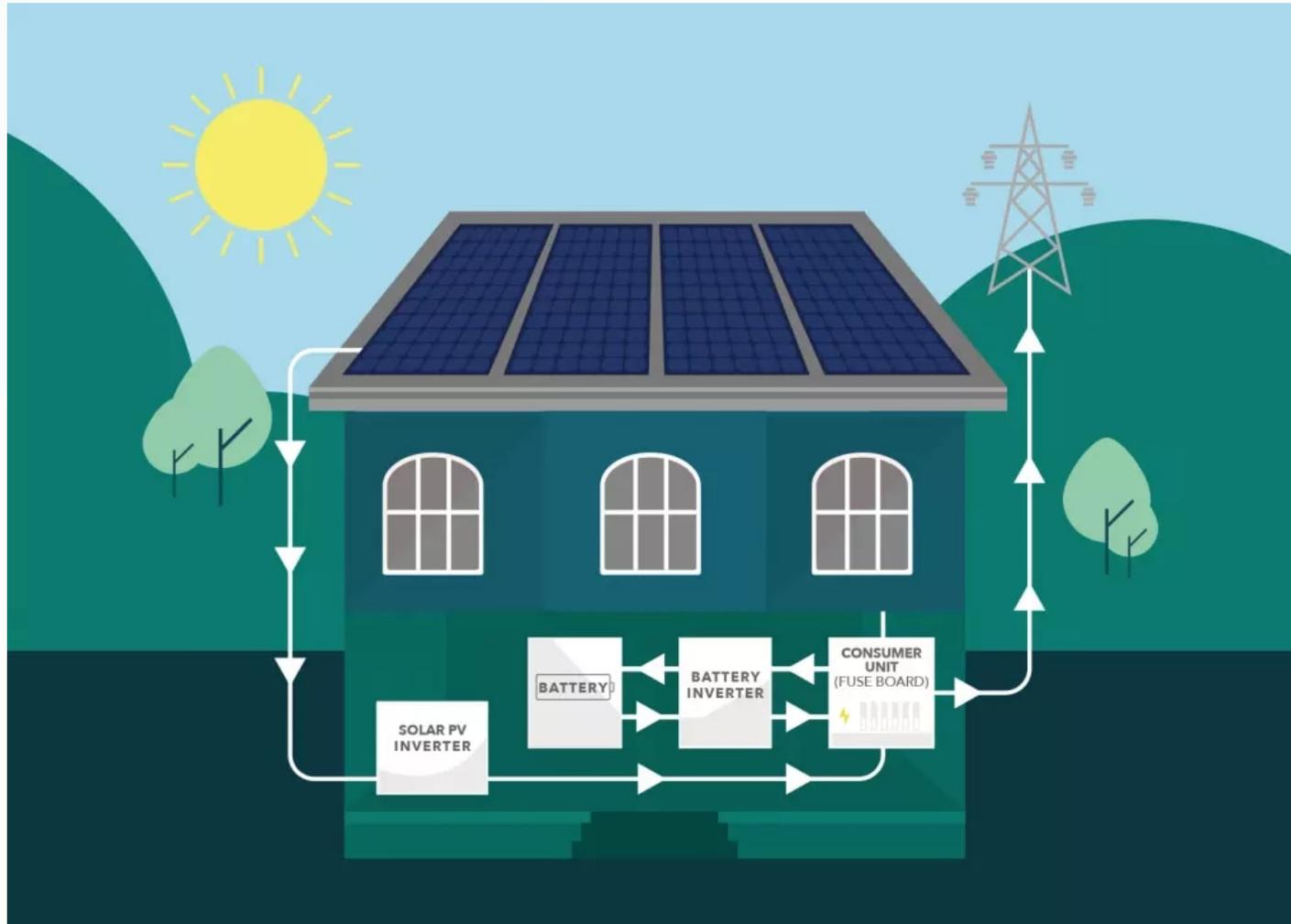
slido



This solution allows flexibility for energy use when the sun isn't shining or the wind isn't blowing.

ⓘ Start presenting to display the poll results on this slide.

Batteries - Energy Storage



Back to the board
JEOPARDY

slido

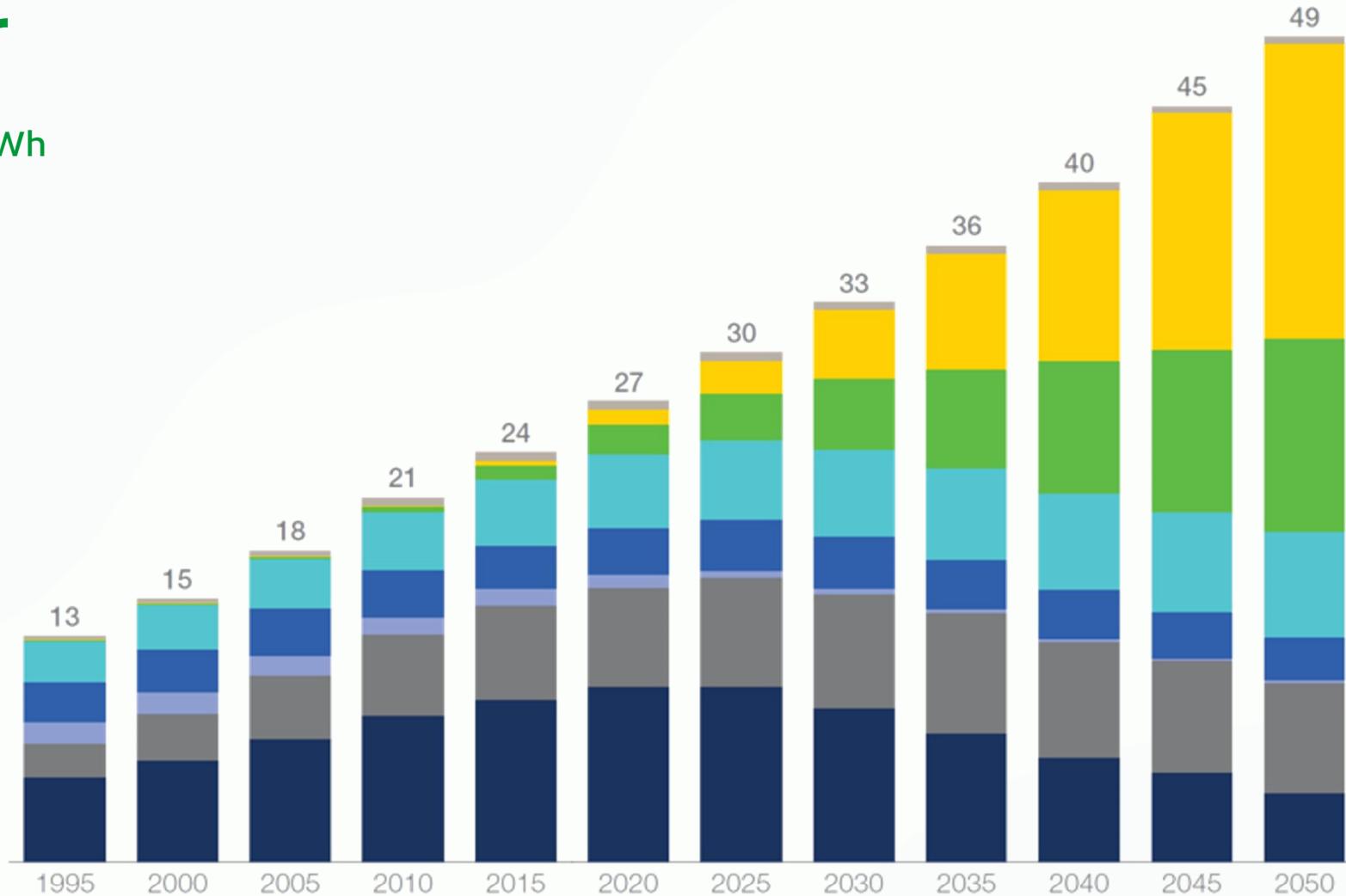


This renewable energy solution will reduce 27-69 gigatons of GHG emissions at the current rate of growth.

ⓘ Start presenting to display the poll results on this slide.

Solar

Thousandth TWh



Share of renewables

18%

27%

51%

73%

Other¹ Solar Wind Hydro Nuclear Oil Gas Coal

Global Power Generation
Thousandth TWh

Back to the board
JEOPARDY

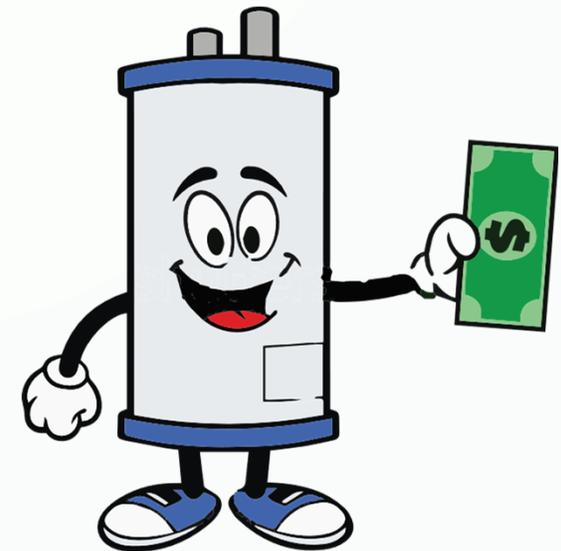
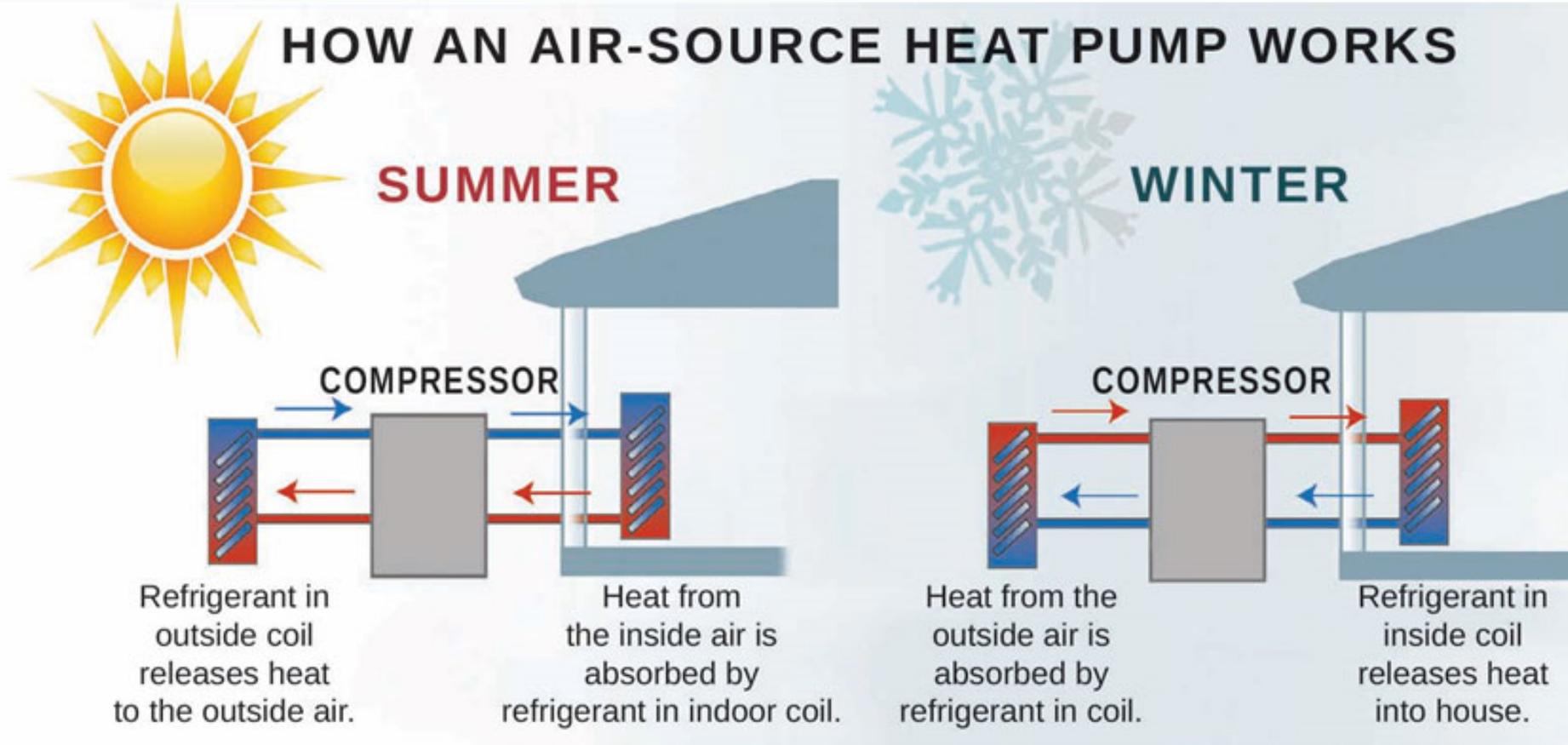
slido



Using this instead of central air conditioning can save between \$50-\$200 annually

ⓘ Start presenting to display the poll results on this slide.

Heat Pump



Back to the board
JEOPARDY

slido

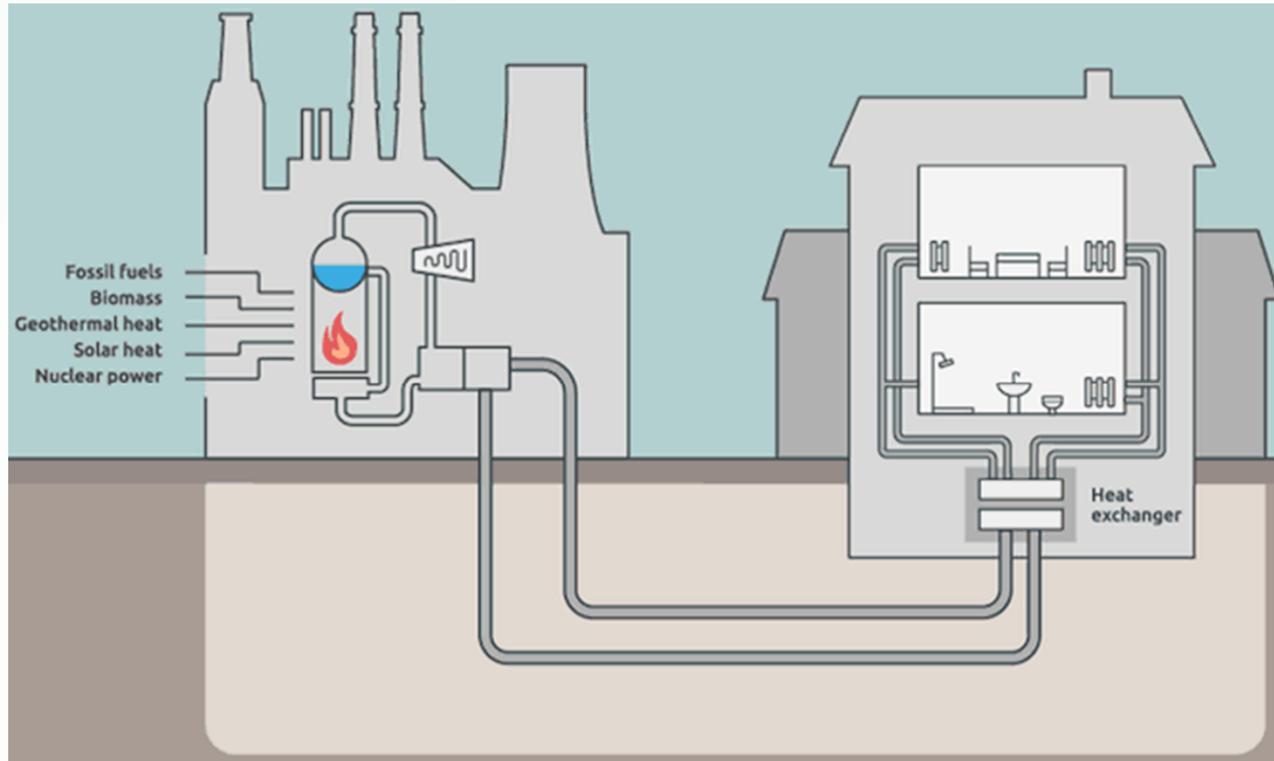


A central plant that channels hot and/or cool water through a network to several buildings.

ⓘ Start presenting to display the poll results on this slide.

District Heating/Cooling

[Source](#)



Back to the board
JEOPARDY

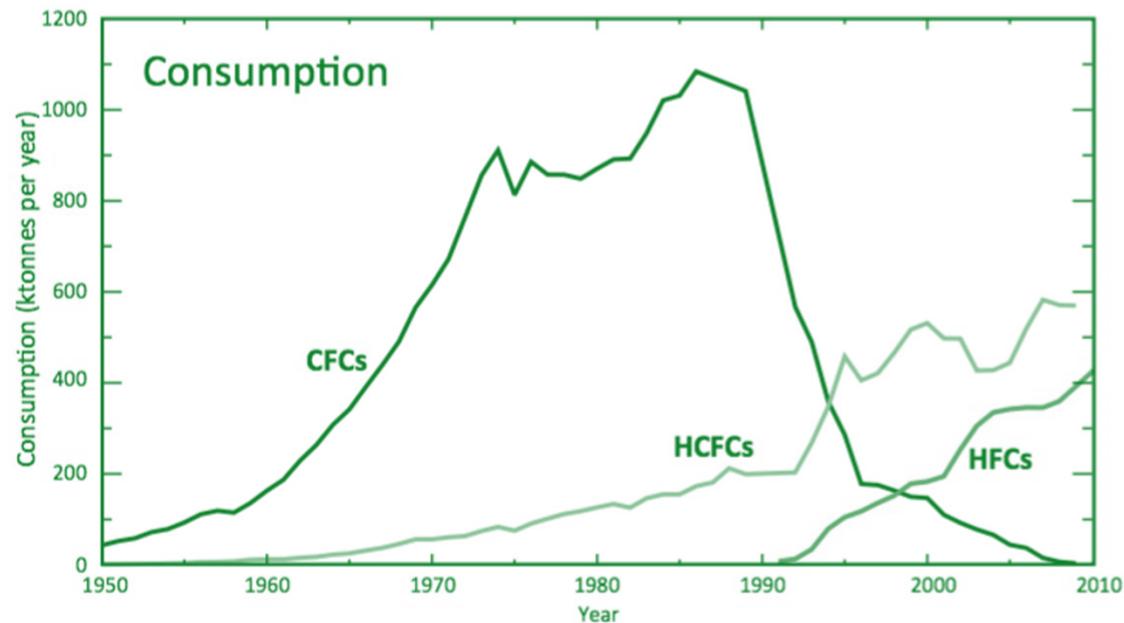
slido



Earlier this year, the EPA announced an accelerated timeline to phase out these compounds with high Global- Warming potential.

ⓘ Start presenting to display the poll results on this slide.

Refrigerants



Global Warming Potential (GWP) for Various Refrigerants

TYPE	GWP (100YR)
CFC	10,600
HFC (1)	3,800
HFC (2)	2,000
HCFC	1,700
NATURAL (1)	~20
HFO	4
NATURAL (2)	<1
NATURAL (3)	1

Source: Clam & Hourahan, 2001

Back to the board
JEOPARDY

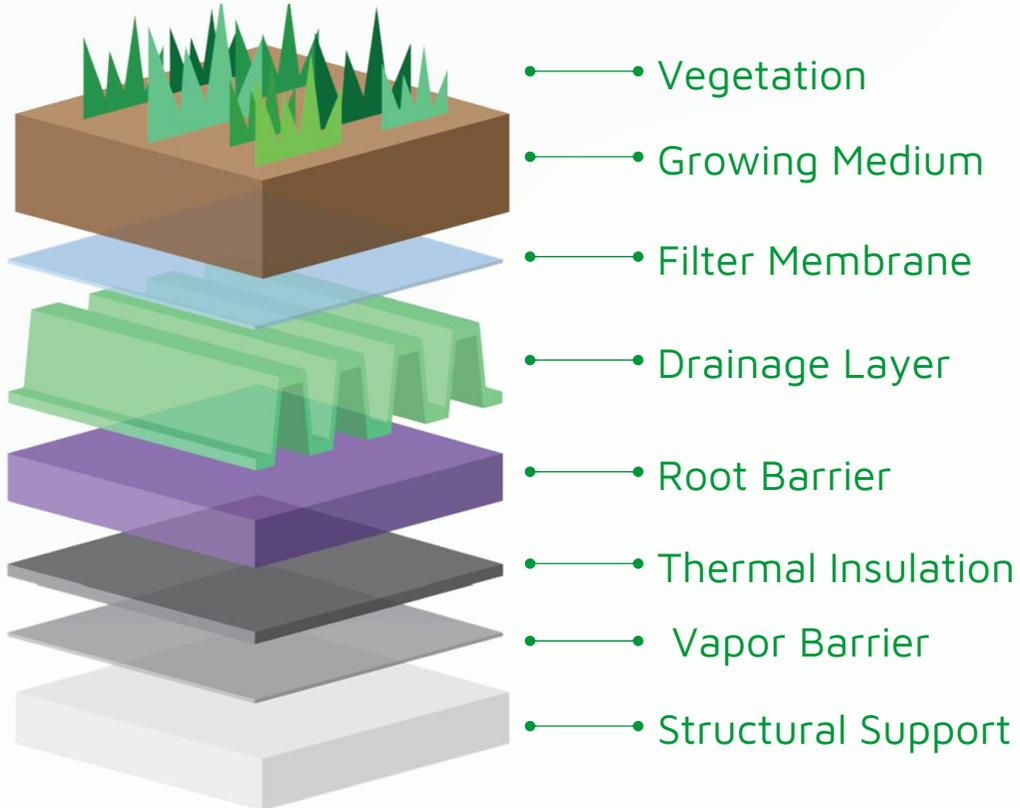
slido



This acts as an insulator for buildings and improves the quality of life through human interaction with nature

ⓘ Start presenting to display the poll results on this slide.

Green Roof



	Green Roofs	Trees + Vegetation	Cool Pavement	Cool Roofs
Air quality	Dark Blue	Green	Purple	Teal
Energy use	Dark Blue	Green	Purple	Teal
Greenhouse gas emissions	Dark Blue	Green	Purple	Teal
Human health and comfort	Dark Blue	Green	Purple	Teal
Nighttime visibility	Light Grey	Light Green	Purple	Light Blue
Quality of life	Dark Blue	Green	Purple	Teal
Safety	Light Grey	Light Green	Purple	Light Blue
Stormwater management	Dark Blue	Green	Light Purple	Light Blue
Water quality	Dark Blue	Green	Light Purple	Light Blue

Pepper Construction

Back to the board
JEOPARDY

slido



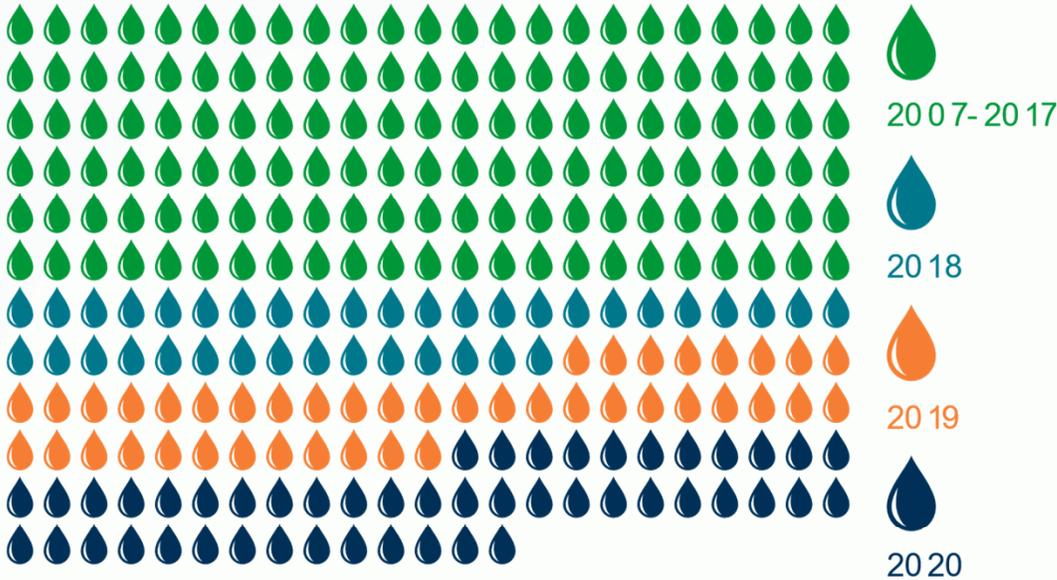
Since 2006, this EPA label indicates water fixtures that help reduce 20% of water use.

ⓘ Start presenting to display the poll results on this slide.

Low Flow Fixtures

Source

5.3 trillion gallons of water saved since 2006!



968 billion gallons of water saved in 2020!

That's the water used in **200 days** by all U.S. households!



Back to the board
JEOPARDY

slido

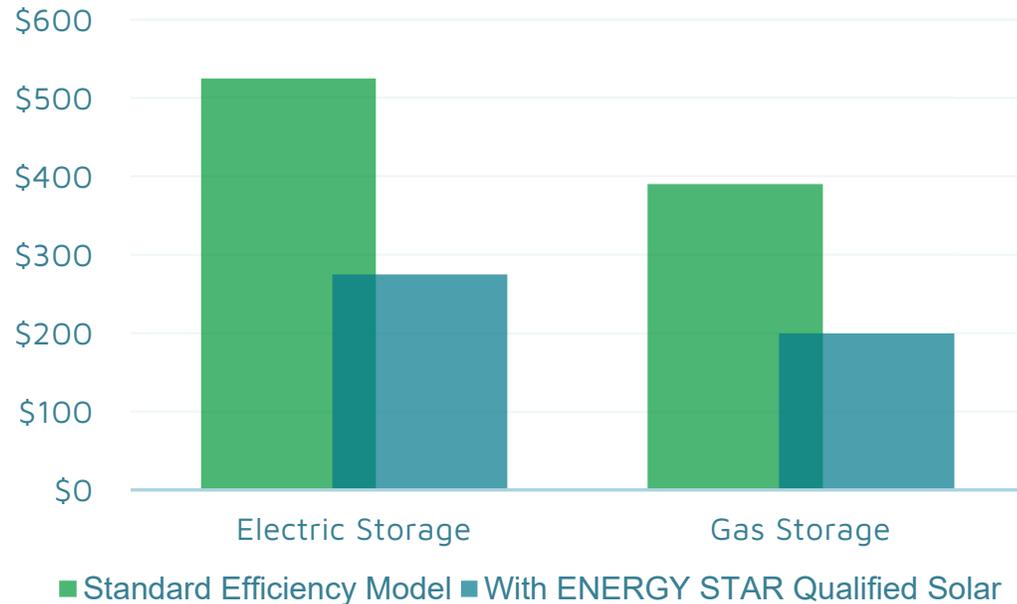


This highly efficient strategy allows you to avoid the use of a water heater and lowers your building's operating cost.

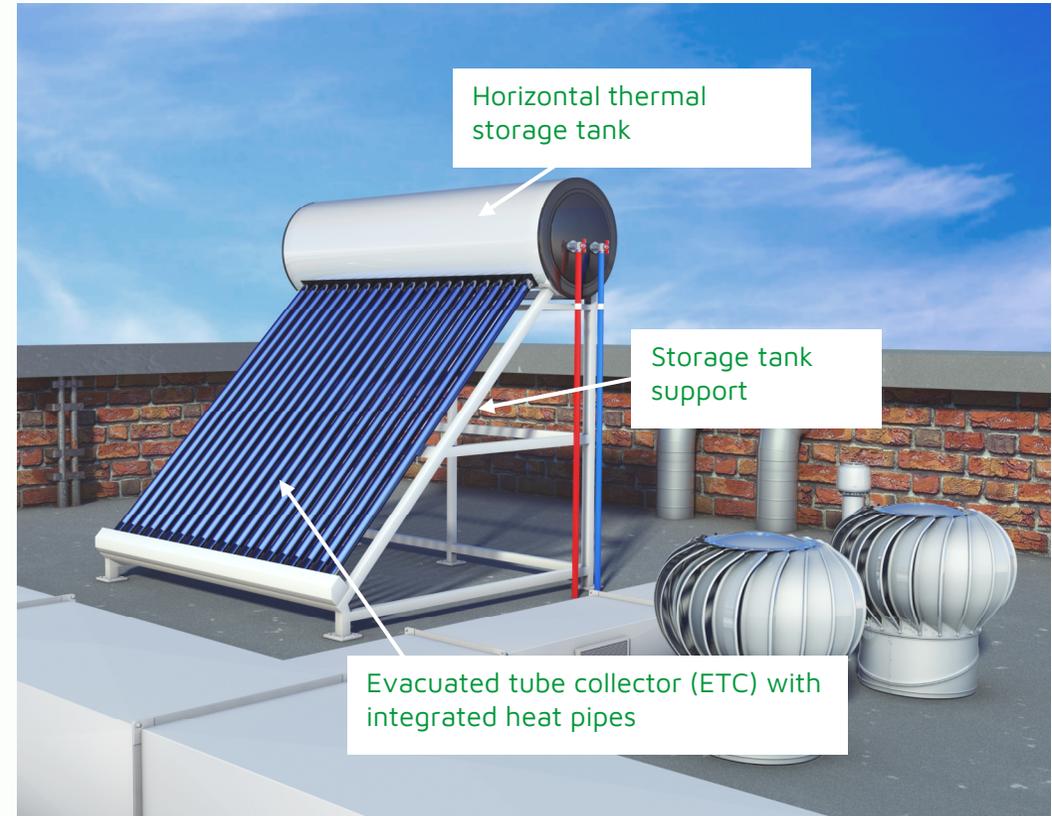
ⓘ Start presenting to display the poll results on this slide.

Solar Water

Add Solar and Cut Your Water Heater Energy Costs by 50%



*Based on average household of 2.6 occupants, US Census 2006.



Back to the board
JEOPARDY

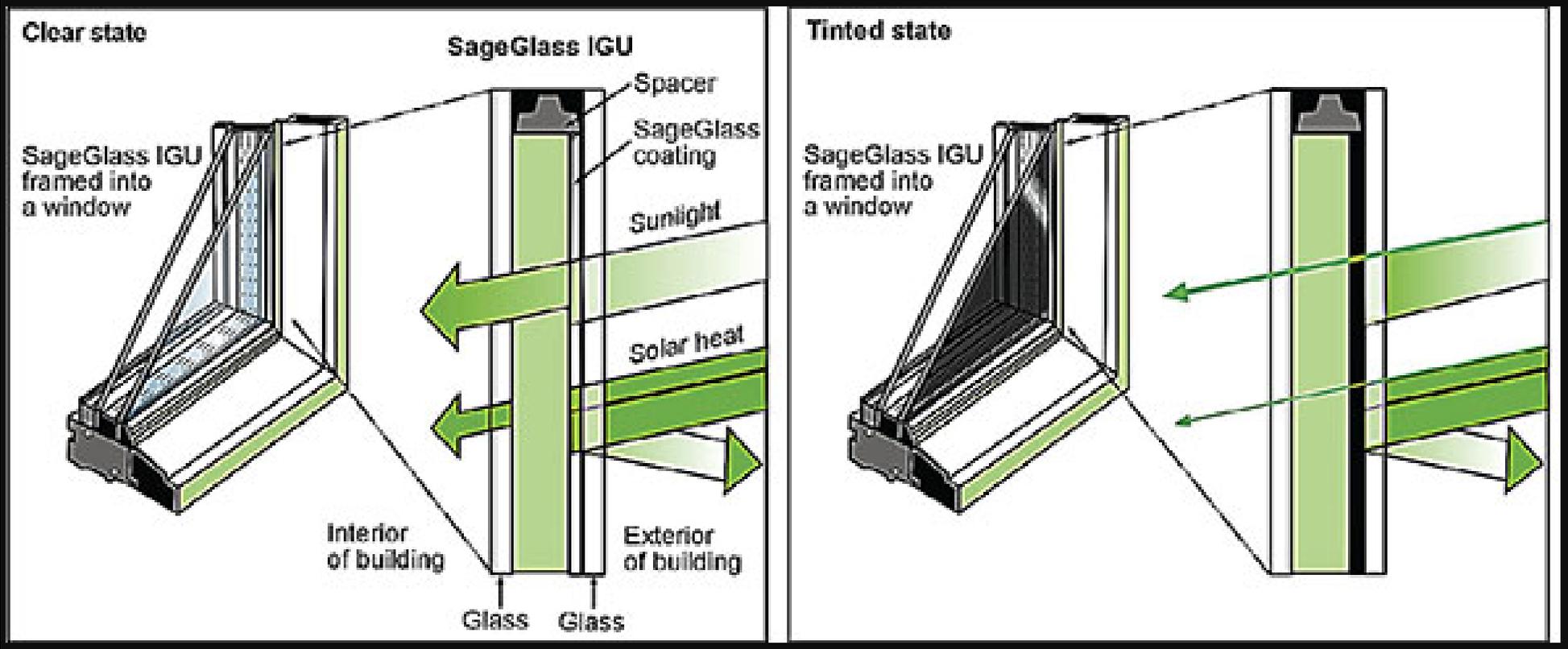
slido



This envelope improvement helps with heat loss in the winter and solar gain in warm months and can help reduce energy by up to 35%

ⓘ Start presenting to display the poll results on this slide.

Smart Glass



Back to the board
JEOPARDY

DAILY

DOUBLE

slido



This uses sensors to lower operating and maintenance costs.

ⓘ Start presenting to display the poll results on this slide.

Building Automation

- Buildings with Building Automation are more energy efficient
- Have lower operating and maintenance costs



Back to the board
JEOPARDY

slido



This solution improves indoor air quality and comfort and its performance is measured in R-values.

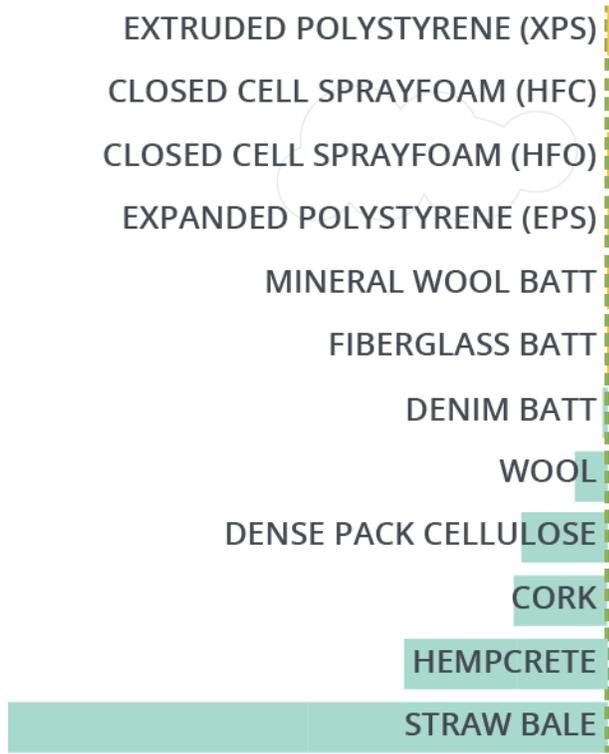
ⓘ Start presenting to display the poll results on this slide.

Insulation

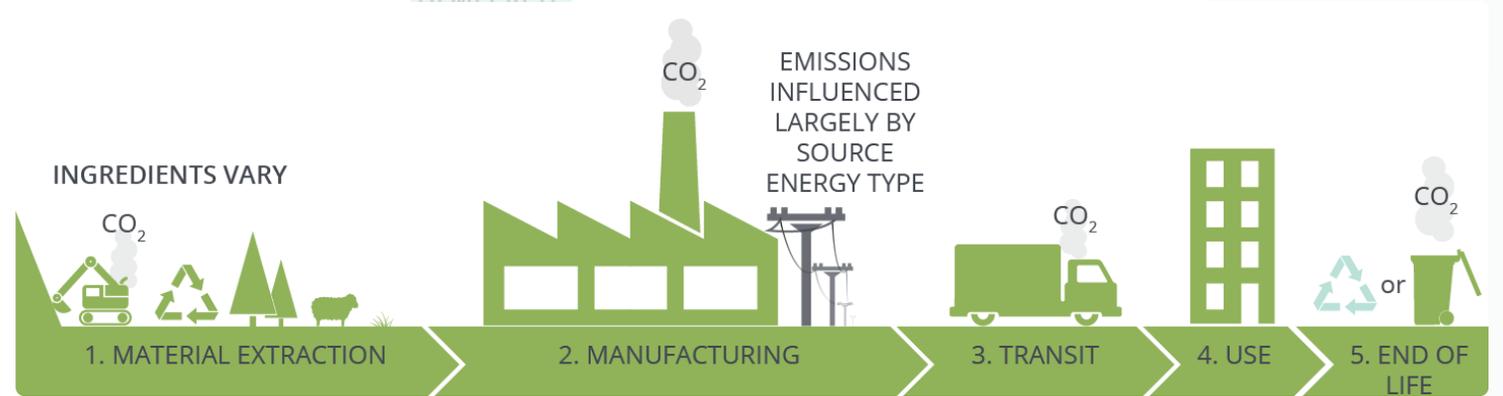
CARBON IMPACTS OF INSULATION

kgCO₂ represents R-20 at 234 m²

6,735 kgCO₂ emitted



-7,437 kgCO₂ embodied



Back to the board
JEOPARDY

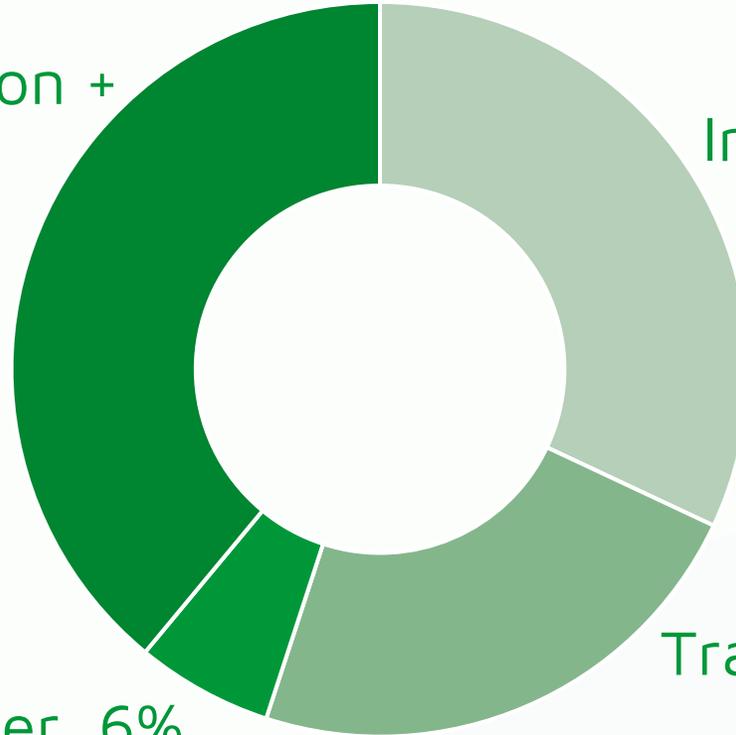
Final Jeopardy

Buildings (Construction +
Operation), 39%

Industry, 32%

Transportation,
23%

Other, 6%





Juanita Garcia

jgarcia@pepperconstruction.com



Evan Caprile

ecaprile@pepperconstruction.com