Messaging Comprehensive Retrofits

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ACEEE
Smart Energy. Clean Planet. Better Lives.

Going beyond one-off energy upgrades

How can we encourage more homeowners to invest in "comprehensive*" energy upgrades / whole-home retrofits?

** Reducing home energy use by 20 % or more (modeled savings)*

Going beyond one-off energy upgrades

IRA offers rebates for energy efficiency upgrades that improve the overall energy performance for single-family homes.

Energy Savings*	Household Type	Rebate Cap
20%-35%	LMI	80% of cost, up to $4,000
	Non-LMI	50% of cost, up to $2,000
35% or more	LMI	80% of cost, up to $8,000
	Non-LMI	50% of cost, up to $4,000

Source | §50121(c) of Inflation Reduction Act of 2022 (P.L. 117-169)

**based on modeled energy savings*

Going beyond one-off energy upgrades

How can we encourage more homeowners to invest in "comprehensive*" energy upgrades / whole-home retrofits?

Going beyond one-off energy upgrades

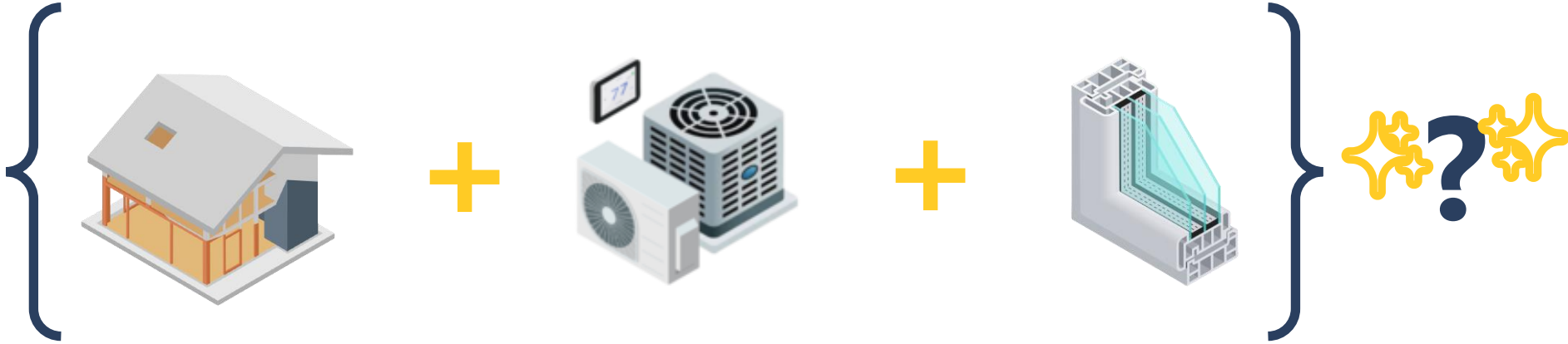
How can we encourage more homeowners to invest in "comprehensive*" energy upgrades / whole-home retrofits?

What would be the most attractive way to combine home energy upgrades as a "comprehensive" retrofit package reducing energy consumption by 20% (or more)?

Research Questions

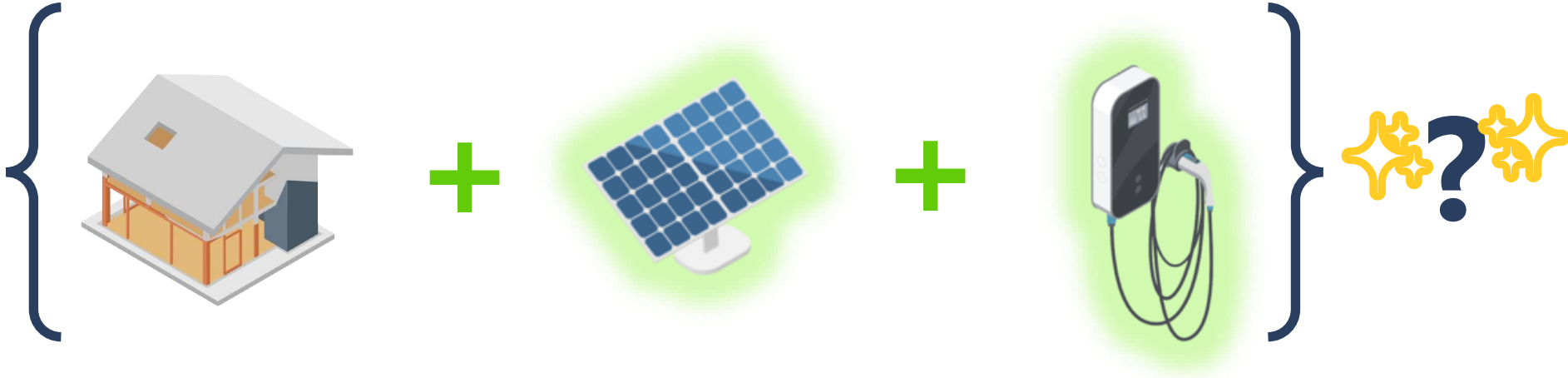
Q1

In the context of energy retrofit bundling, **which energy upgrades or packages of upgrades, are most attractive to homeowners?**



Research Questions

Q2 Would adding non-EE measures like (Level 2) **EV chargers*** **or solar panels make comprehensive energy efficiency packages more attractive** to homeowners?



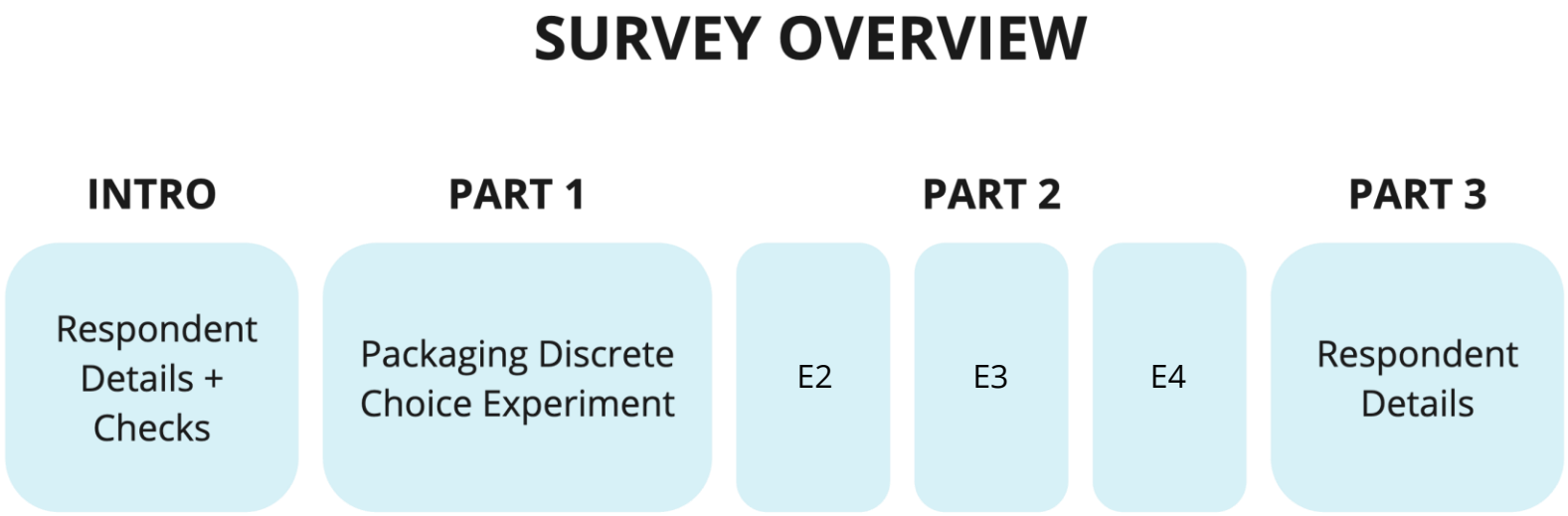
Research Questions

Q3

In the context of energy retrofit bundling, **are there any identifiable groups or types of people who would be more receptive** to comprehensive-level investments?

Methods

We conducted an online survey of 1500 US homeowners.



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Discrete Choice Experiment

- Homeowners

  single-family detached home, duplex, rowhouse, townhouse, manufactured/mobile home, or condominium/apartment structure with no more than six units
- Live in continental US
- Proficient in English
- 18 or older
- NOT employed in marketing, advertising, PR, environmental orgs, or utilities

Which of the following energy upgrade packages would you prefer?

	Package A	Package B
Insulation and Air Sealing 	-	Insulate and air seal attic
Window and Door Upgrades 	Upgrade windows	Upgrade windows
Heating and Cooling System 	Upgrade heating AND cooling systems to a heat pump	Upgrade either heating OR cooling system to a higher efficiency model
Water Heater 	Upgrade to heat pump water heater	Upgrade to heat pump water heater
Major Appliances 	Upgrade 1 appliance	-
Solar Panels 	-	Install solar panel system
Electric Vehicle (EV) Charger 	-	Install EV charger
Cost to Homeowner *(financed at 0% interest over 5 years)*	$384 per month for 5 yrs. Total cost: $23,020	$827 per month for 5 yrs. Total cost: $49,640
Savings on Energy Bill *(Bill = $250 / mo. before upgrades)*	$92 per month Save 37% on your energy bill	$210 per month Save 84% on your energy bill
	I would select **Package A**	I would select **Package B**

Which of the following energy upgrade packages would you prefer?

Upgrade Types *(Attributes)*	Package A	Package B
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Additional Cost information	I would select Package A	I would select Package B

The Obvious

Cost = Prohibitive

35%

of respondents NOT willing to spend $1000 or more

Preferred the cheapest options/no upgrades

65%

of respondents willing to spend $1000 or more

More holistic decision-making, varying preferences

Key Finding 1

Most Appealing Upgrades in Packages

Across nearly all demographic groups, **packages were selected more frequently when they included the following** elements:

Heat Pump Hot Water Heaters (22% increased preference)

Heating and Cooling Systems (7% increased preference)

Appliances (5% increased preference)

Key Finding 1

Most Unappealing Upgrades in Packages

And packages were avoided more frequently when they included the following elements:

Level 2 EV Charger (22% reduced preference)

Solar (20% reduced preference)

Energy Star windows (19% reduced preference)

Key Finding 2

No one package to rule them all…

Our research resulted in 5 classes of preferences:

Appliance Enthusiasts (28% of interested homeowners)	Prefer only appliance upgrades and firmly reject solar
Mechanical System Enthusiasts (26% of interested homeowners)	Interested in upgrading mechanical systems and open to additional improvements
Mechanical System Purists (12% of interested homeowners)	Interested only in upgrading mechanical systems, excluding solar, EV charging, or windows
Traditional Max Energy Savers (17% of interested homeowners)	Focus on reducing energy consumption to the maximum with traditional comprehensive energy efficiency
Energy Independence Seekers (17% of interested homeowners)	Desire solar, EV charger, and energy efficiency for energy independence

Key Finding 3

Packaged vs. à la carte?

Later in the survey we asked participants to write in their answer to the following question:

"Which home energy upgrade would you be most interested in purchasing for your home?"

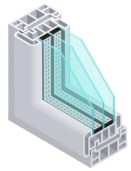
Key Finding 3

Evidence of contextual preferences

Top 3 Desired Upgrades

1. Solar

2. Insulation and air sealing



3. Windows

These were NOT preferred in the experiment!

Summary

- Cost can't be ignored
- No clear winner when it comes to comprehensive retrofit packages
- Evidence for diverse classes of preferences for retrofit packages
- Evidence for contextual preferences when bundling upgrades
- Solar and EV chargers seem less attractive when packaged with EE upgrades (and/or when cost is highly salient)
- Most attractive in general: HVAC upgrades, heat pump water heaters, and appliances

Presenter

Grace Lewallen, Research Analyst, ACEEE

As part of the Behavior, Health, and Human Dimensions team, Grace conducts research focused on understanding human behavior aspects related to energy efficiency. Her work aims to promote pro-environmental behaviors and contribute to a more sustainable future.

She holds a master of behavioral and decision sciences from the University of Pennsylvania.

You can reach her at ***glewallen@aceee.org***

About ACEEE:

The American Council for an Energy-Efficient Economy (ACEEE), is a nonprofit research organization that develops policies to reduce energy waste and combat climate change. Its independent analysis advances investments, programs, and behaviors that use energy more effectively and help build an equitable clean energy future.

Learn more at aceee.org

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