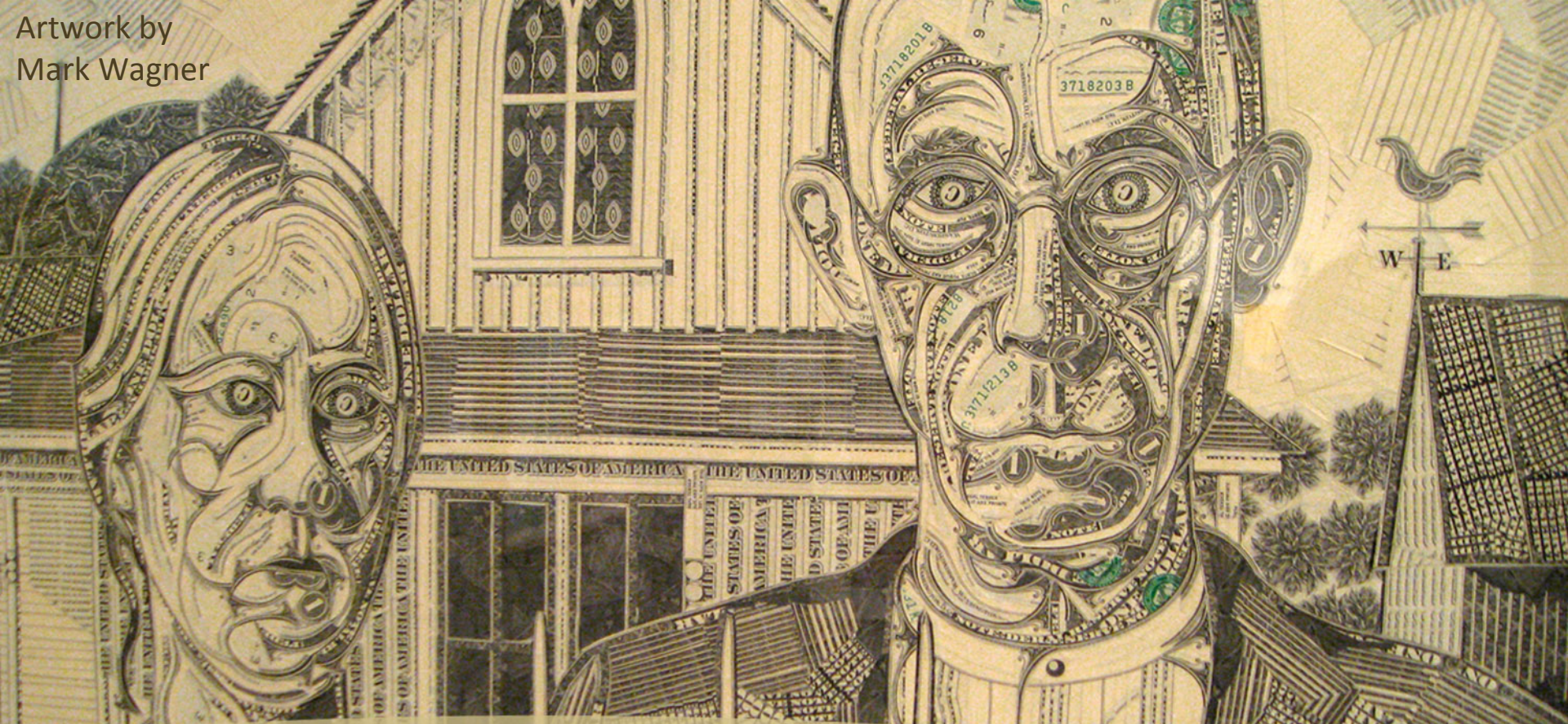


Artwork by  
Mark Wagner



**Kat Donnelly, MIT PhD in Engineering Systems, EPower Devices**

**Kristen Bremer: Duke University MS in Environmental Management**

**Advisor: Dan Ariely, PhD.**

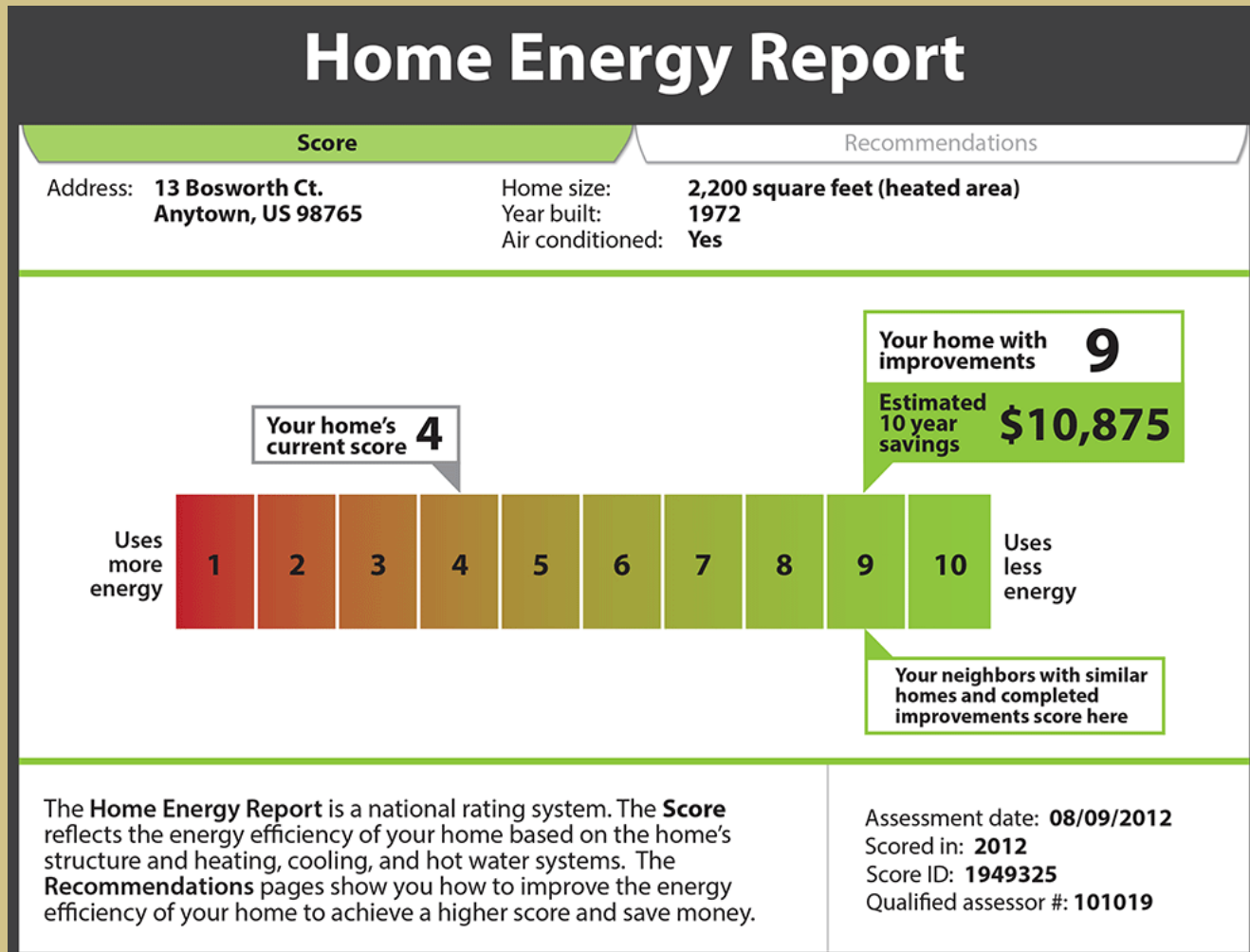
## **Using Home Energy Scoring to Motivate Energy Improvements**

Analysis of factors influencing consumers' willingness to pay for energy-efficient home improvements

November 19, 2013, Behavior Energy and Climate Change Conference

# Project Background

## DOE Home Energy Score (researcher-modified version)



# Experimental Design

Manipulated two factors

- Report type (decision environment)
- Housing condition (situational factor)

		Housing Situational Factor		
		Selling	Buying	Staying
Report Type				
Decision Environment	Control (No report)			
	Home Energy Score only			
	Basic Report (Score + High-level recommendations)			
	Detailed Report (Score + Detailed recommendations)			

# Research Questions

How is WTP for home energy improvements impacted by a consumer's:

- Decision environment (score & report detail)
- Housing situation (buy, sell, stay)
- Do-it-yourself (DIY) home repair preference
- Political affiliation
- Preference for tax incentives
- Preference for public availability of the Home Energy Score

# Survey Design

## WTP for 5 energy-efficient improvements

Question	WTP Action	Avg. Cost	Savings /Year
1.	25 CFLs	\$100	\$220
2.	Two Smart Outlets & Two Power Strips	\$40	\$80
3.	Attic Insulation	\$1,100	\$450
4.	Duct Sealing	\$950	\$380
5.	Air Sealing	\$1,400	\$250



# Survey Design

WTP questions in three formats:

- Yes/no



If you need to refresh your memory, click on the thumbnails to refer back to the report.

**4. It will cost you about \$950 to hire a professional contractor to seal and insulate the ducts in your home. If you have your ducts sealed and insulated, you will save about \$380 each year on your utility bill.**

**Would you hire a contractor to seal and insulate your ducts for \$950?**

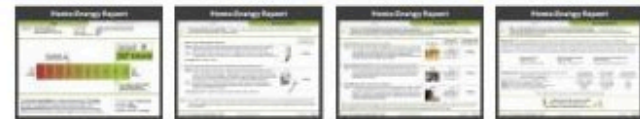
Yes

No

# Survey Design

WTP questions in three formats:

- Matrix



If you need to refresh your memory, click on the thumbnails to refer back to the report.

**4. It will cost you about \$950 to hire a professional contractor to seal and insulate the ducts in your home. If you have your ducts sealed and insulated, you will save about \$380 each year on your utility bill.**

Would you hire a contractor to seal and insulate your ducts if the price was \$ \_\_\_\_\_?

	\$500	\$650	\$750	\$850	\$950	\$1,050	\$1,150	\$1,250	\$1,350	\$1,450	\$1,550	\$1,650
Yes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

# Survey Design

WTP questions in three formats:

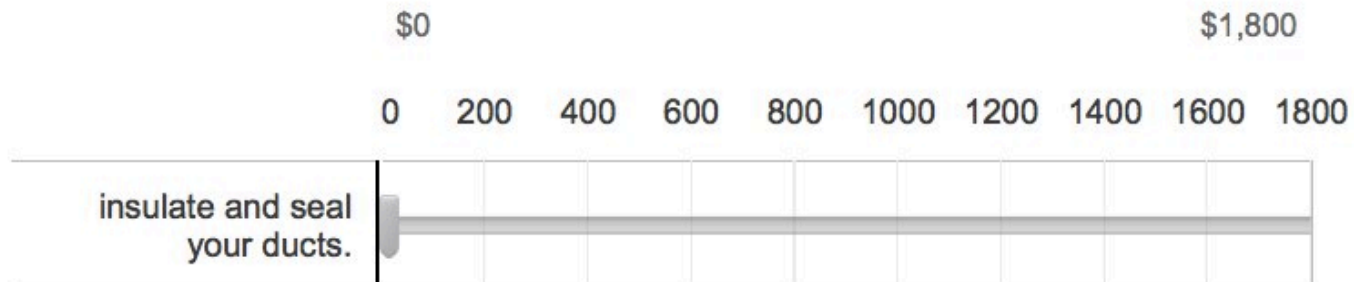
- Slider



If you need to refresh your memory, click on the thumbnails to refer back to the report.

4. It will cost you about \$950 to hire a professional contractor to seal and insulate the ducts in your home. If you have your ducts sealed, you will save about \$380 each year on your utility bill.

Please move the slider to the **MAXIMUM** you would be willing to spend to have a professional come into your home and seal your ducts.

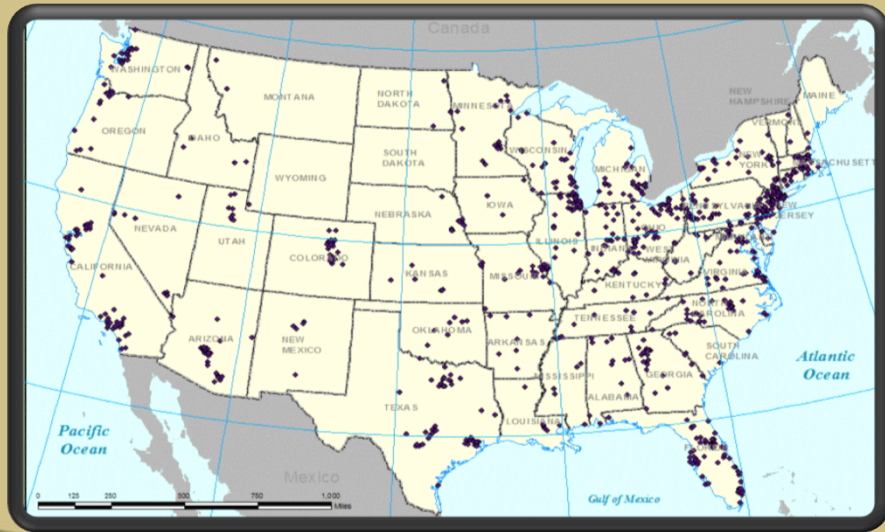




# Survey Distributions

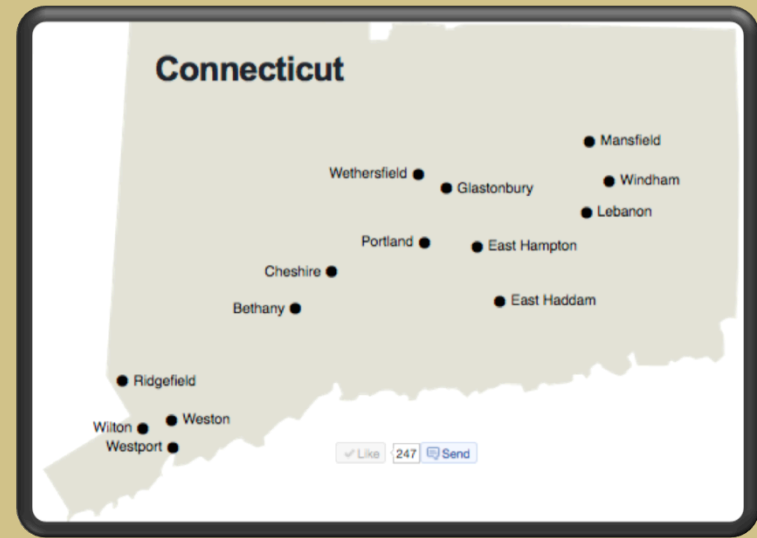
## U.S. Panel (Qualtrics)

- Dispersed across U.S.
- 897 Valid Responses

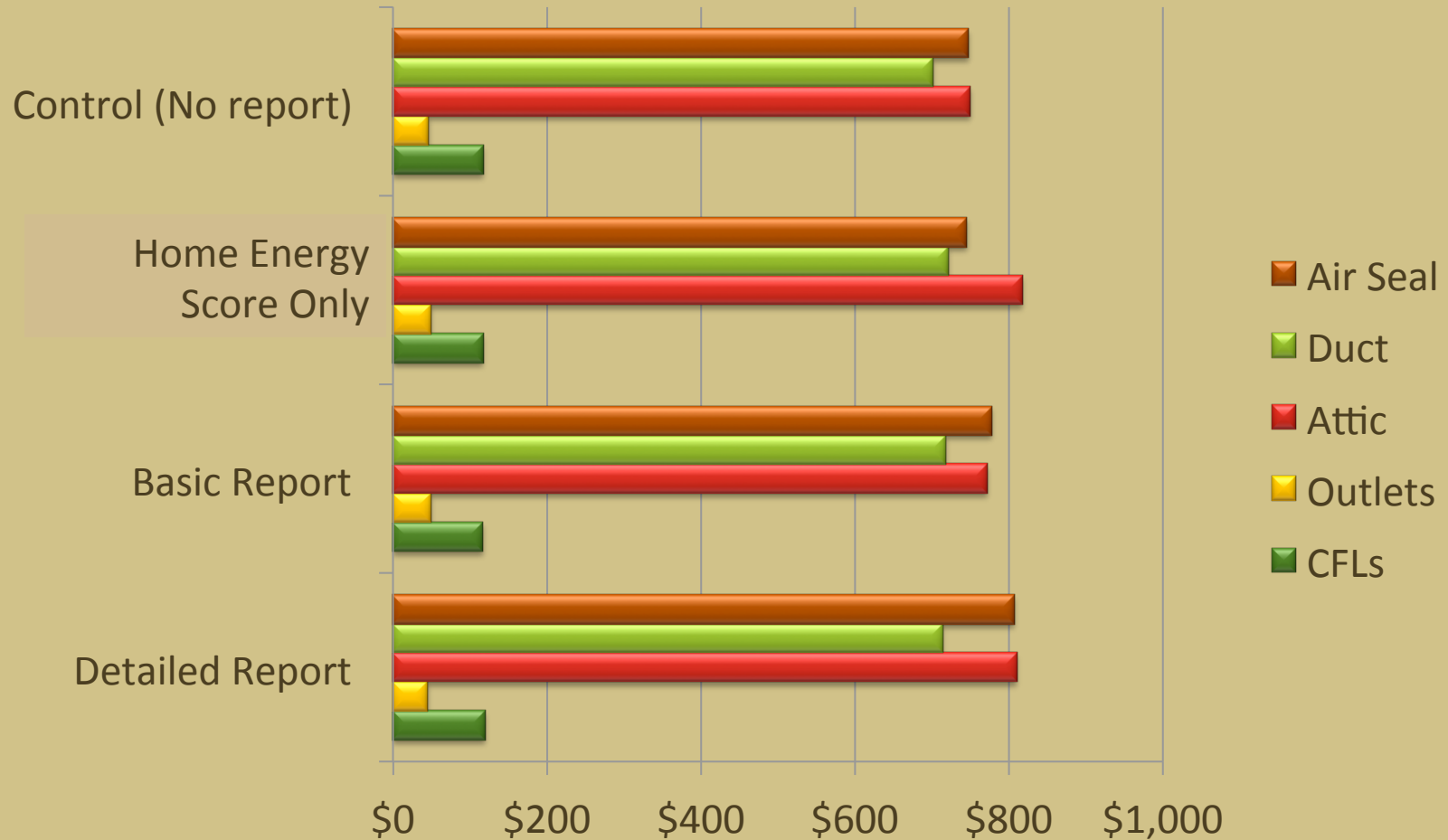


## CT Population (Self-selected)

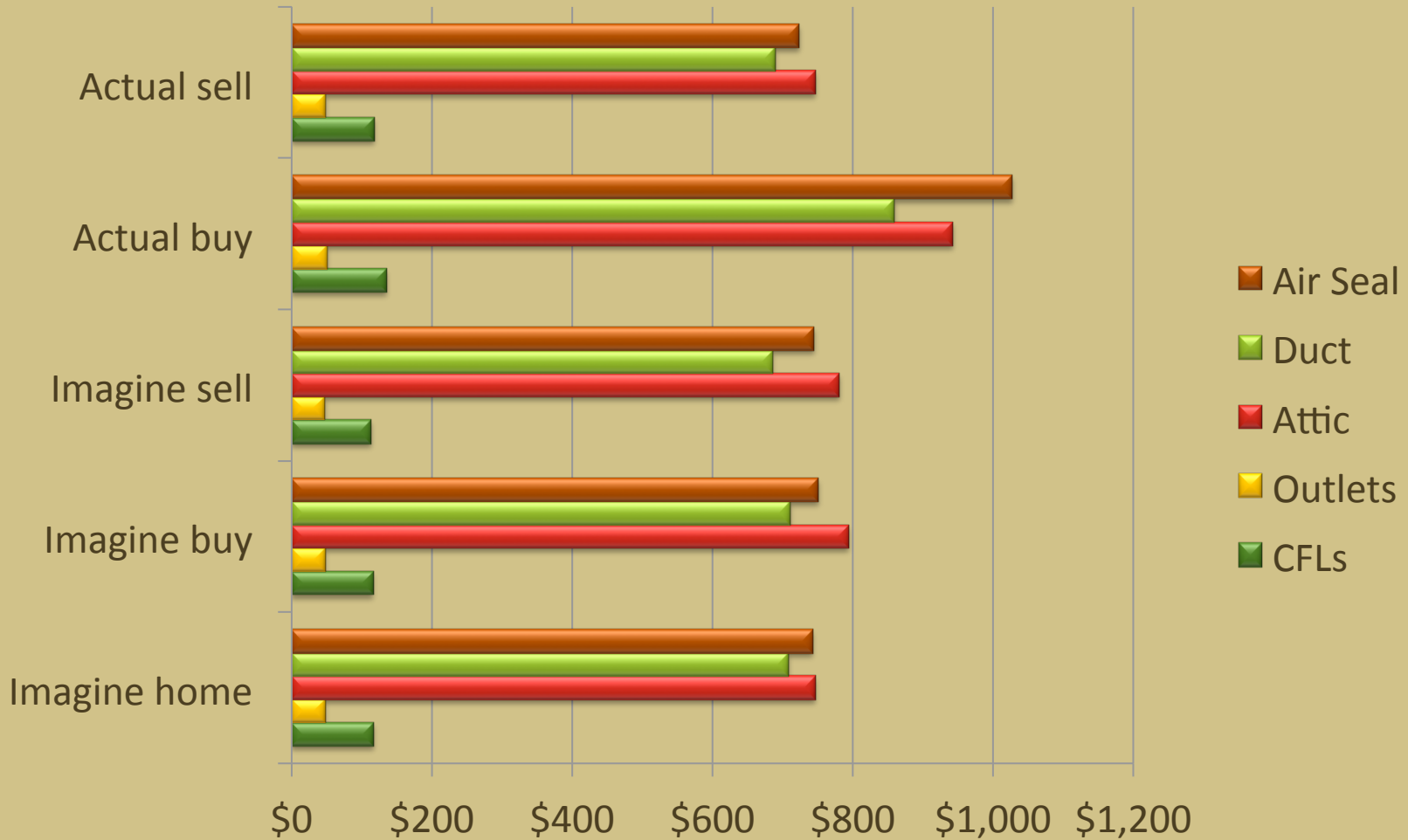
- Early Adopters from DOE CT Neighbor to Neighbor grant
- 586 Valid Responses
- Same overarching results, but slightly higher WTP than U.S.



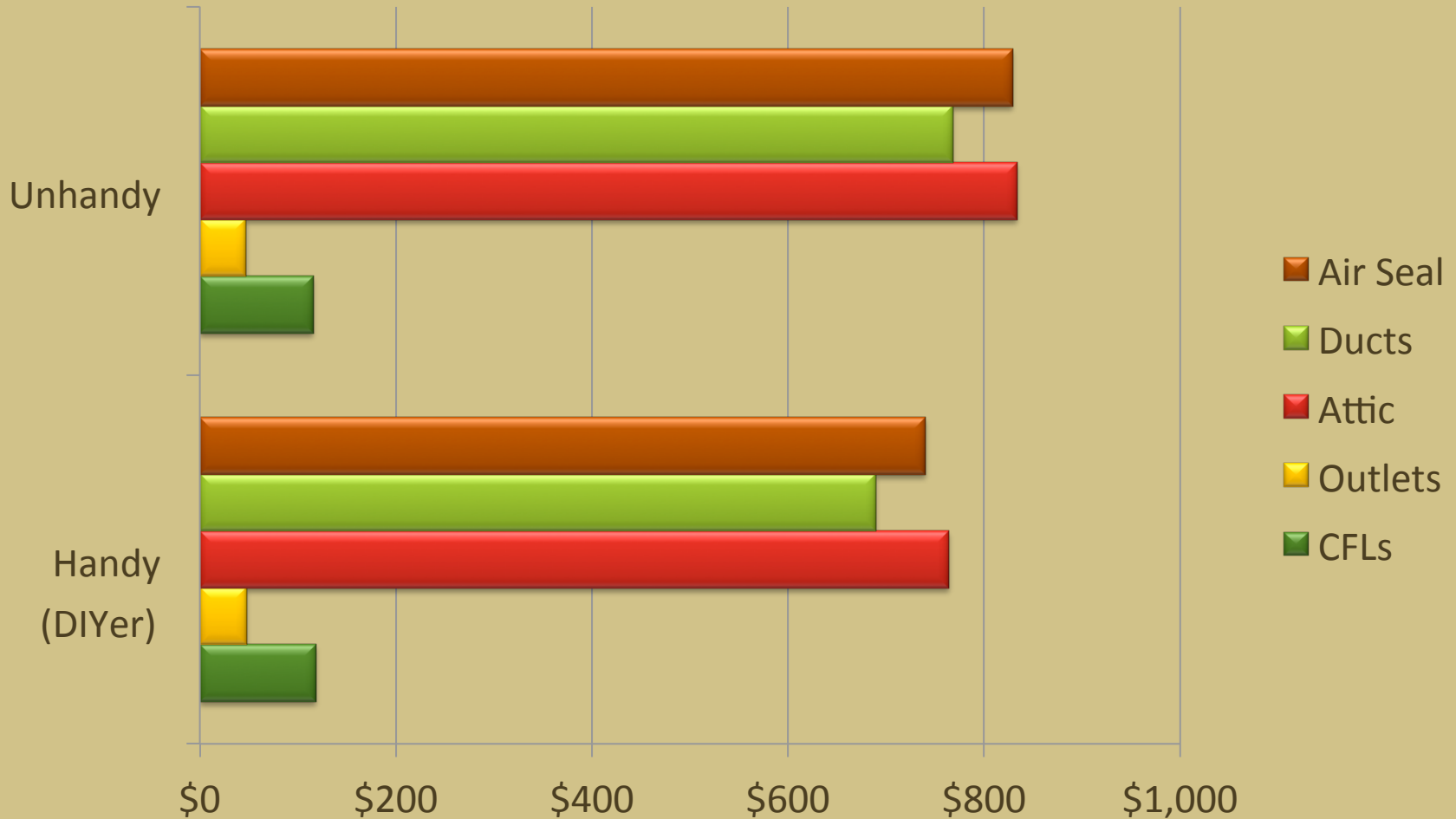
# Decision Environment



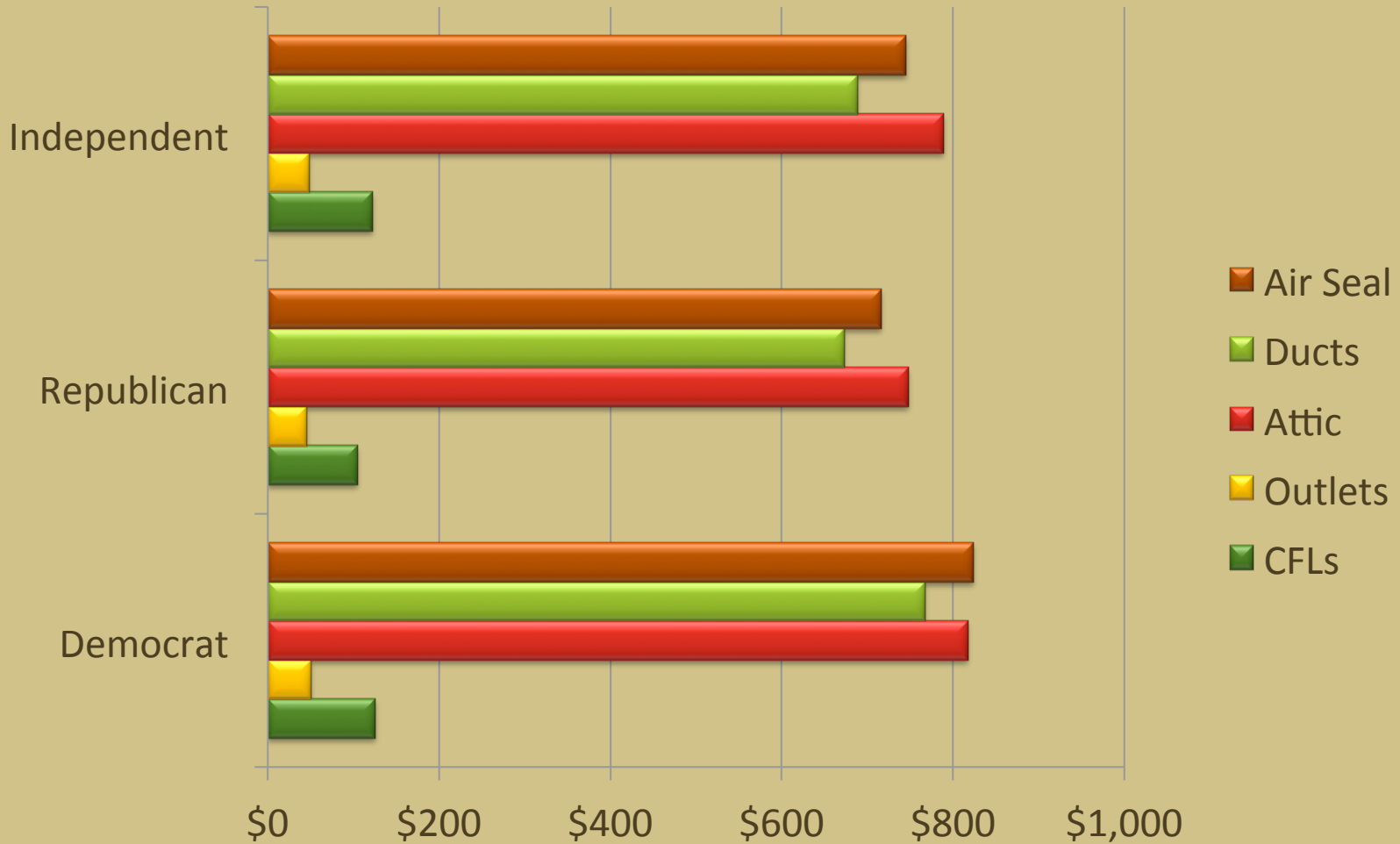
# Housing Situation



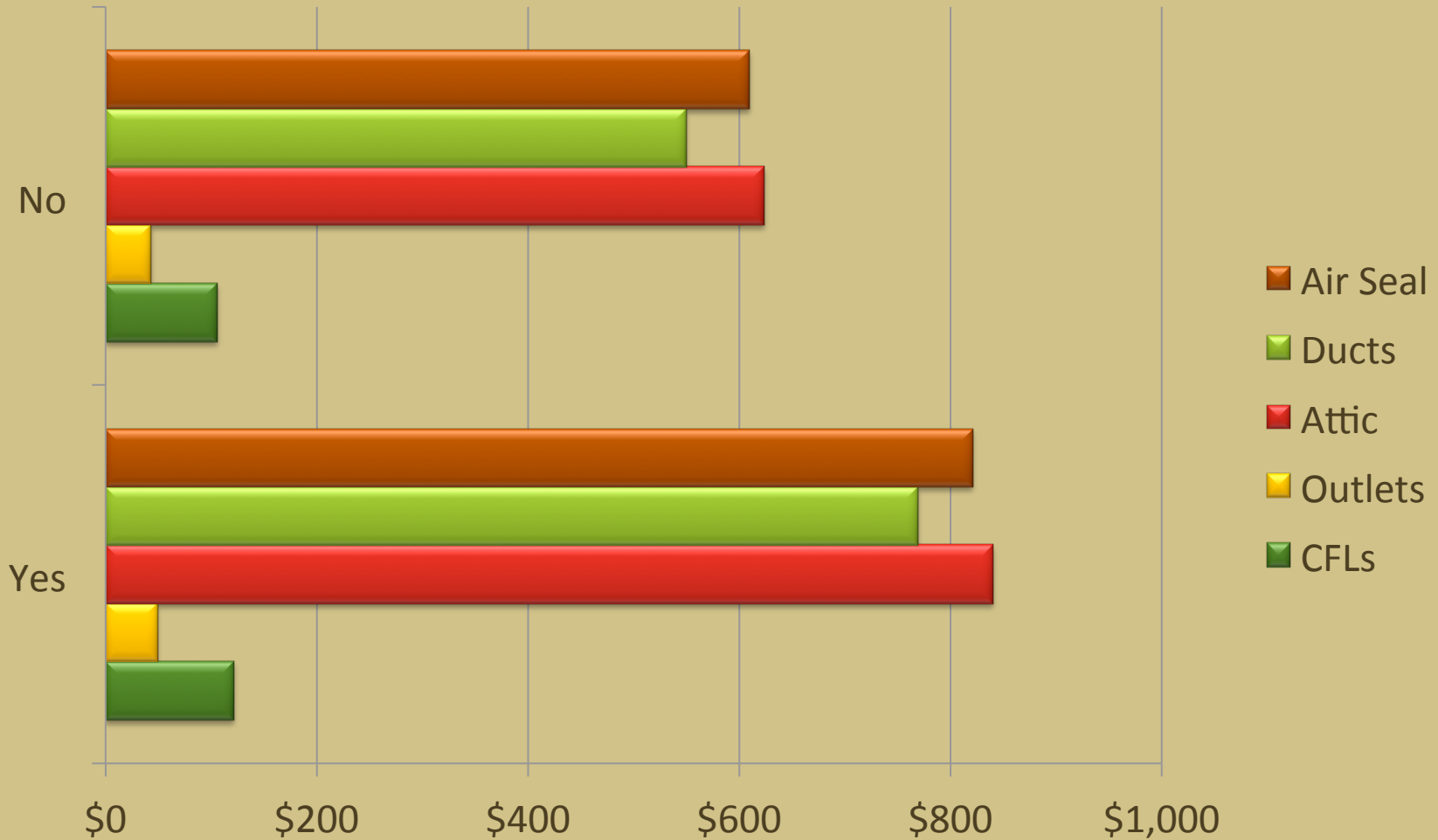
# Repair Preferences



# Political Affiliation



# Public Availability



# Findings Discussion

## No single factor affects consumers' WTP

The decision process is influenced by many factors, such as:

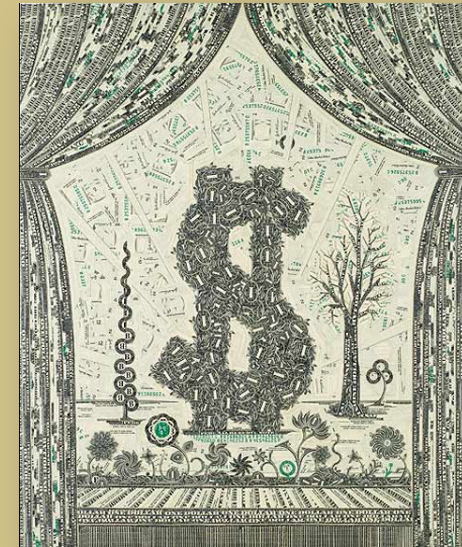
- Heuristics/Associative Memory
- Anchoring Effects/Framing
- Evaluability
- Social Norms/Peer pressure
- Housing, Personal, and Market Characteristics



Artwork: Mark Wagner

# Program Recommendations

- Test different framing options (words matter!)
- Increase understanding among all homeowners
- Consider the do-it-yourselfer
- Target home buyers and provide incentives
- Target Democrats and Independents as early adopters to gain traction
- Bundle incentives and rebates at the outset
- Make it public and develop social norms



Artwork: Mark Wagner



# Concluding Thoughts

- Choice decisions are fraught with emotion
- Labeling programs are helpful, but need a basis for understanding
- Audience considerations are critical
- Nudging factors - like tax incentives and public availability of the Home Energy Score - should be part of the policy discussion



Artwork: Mark Wagner

# Any Questions?



Artwork: Mark Wagner

## **BIG Thanks to:**

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Alon Evron, RTI International  
(formerly Duke University)

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