Using iButtons to Study Energy Efficiency in Mexico

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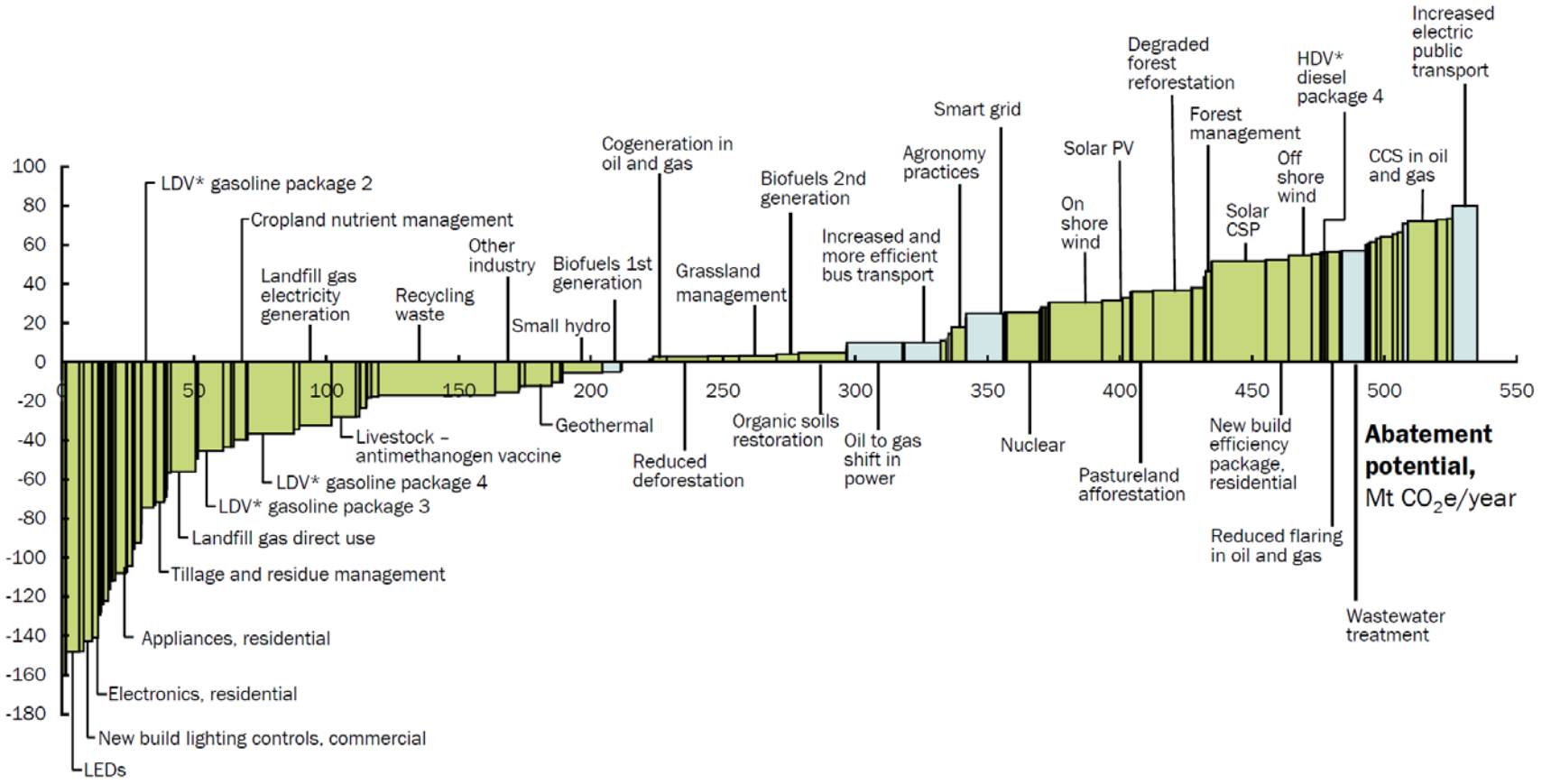
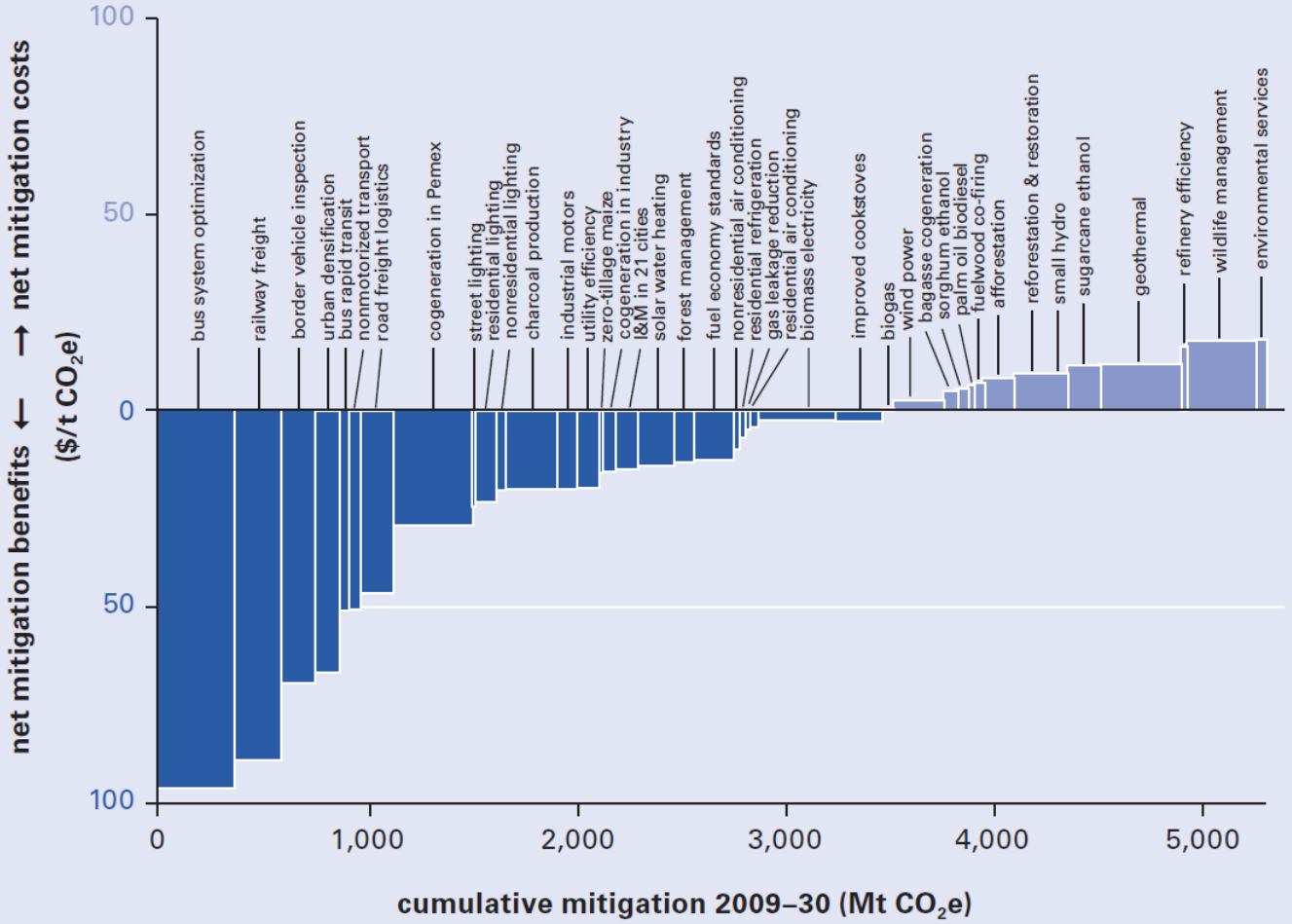
Exhibit 4. National carbon abatement cost curve for Mexico



Source: Low-Carbon Growth: A Potential Path for Mexico, McKinsey and Co. (2009).

Figure 2 Marginal Abatement Cost Curve



Source: Low-Carbon Development for Mexico, World Bank 2009.

Cash for Coolers

Between 2009 and 2012 almost 2 million refrigerators and air-conditioners were replaced through Mexico's "Cash for Coolers" Program.

Fig. 3. Smoothness of running variable across subsidy thresholds.

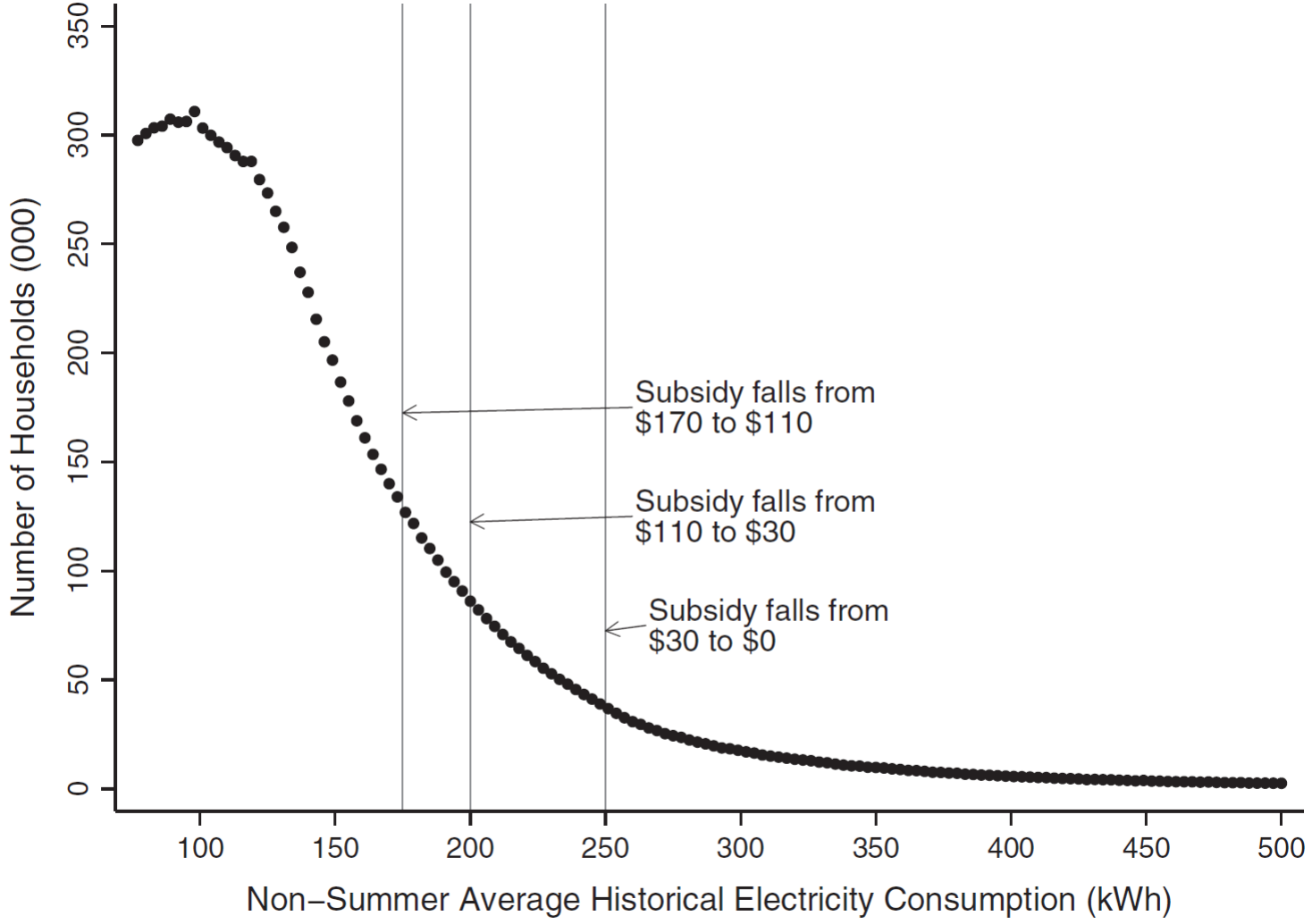


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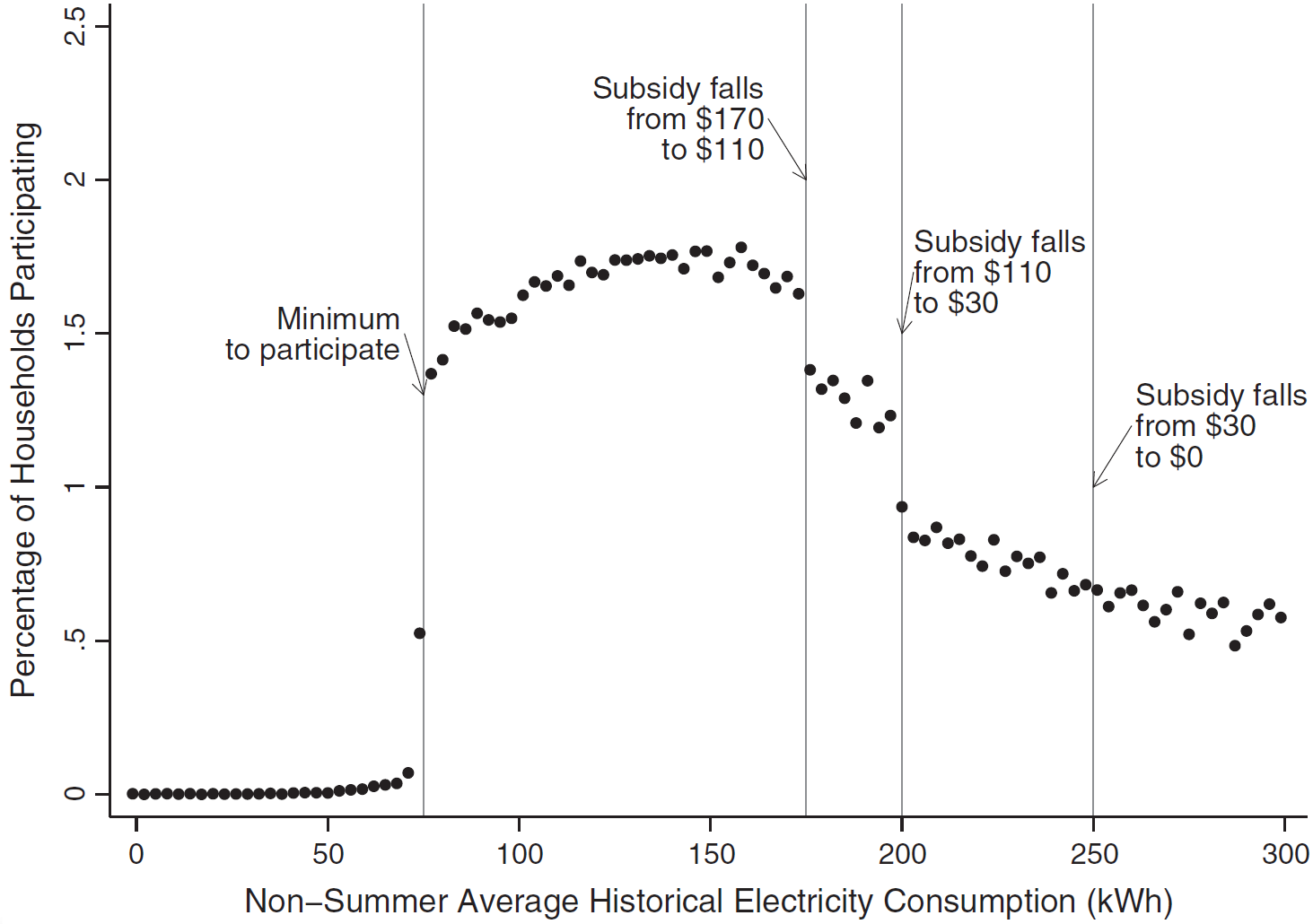
Fig. 5. Program participation.



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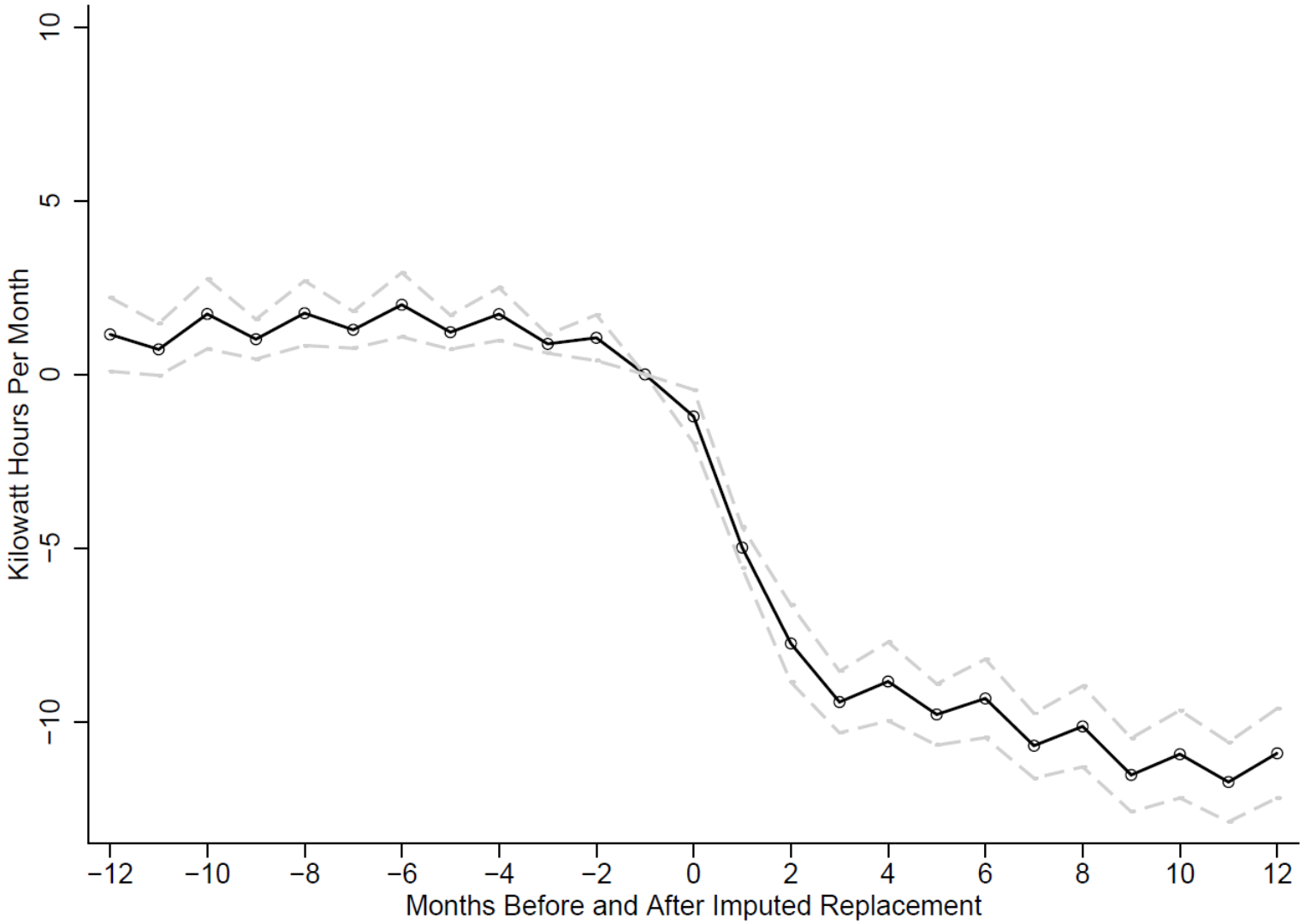
The Effect of Refrigerator Replacement on Household Electricity Consumption



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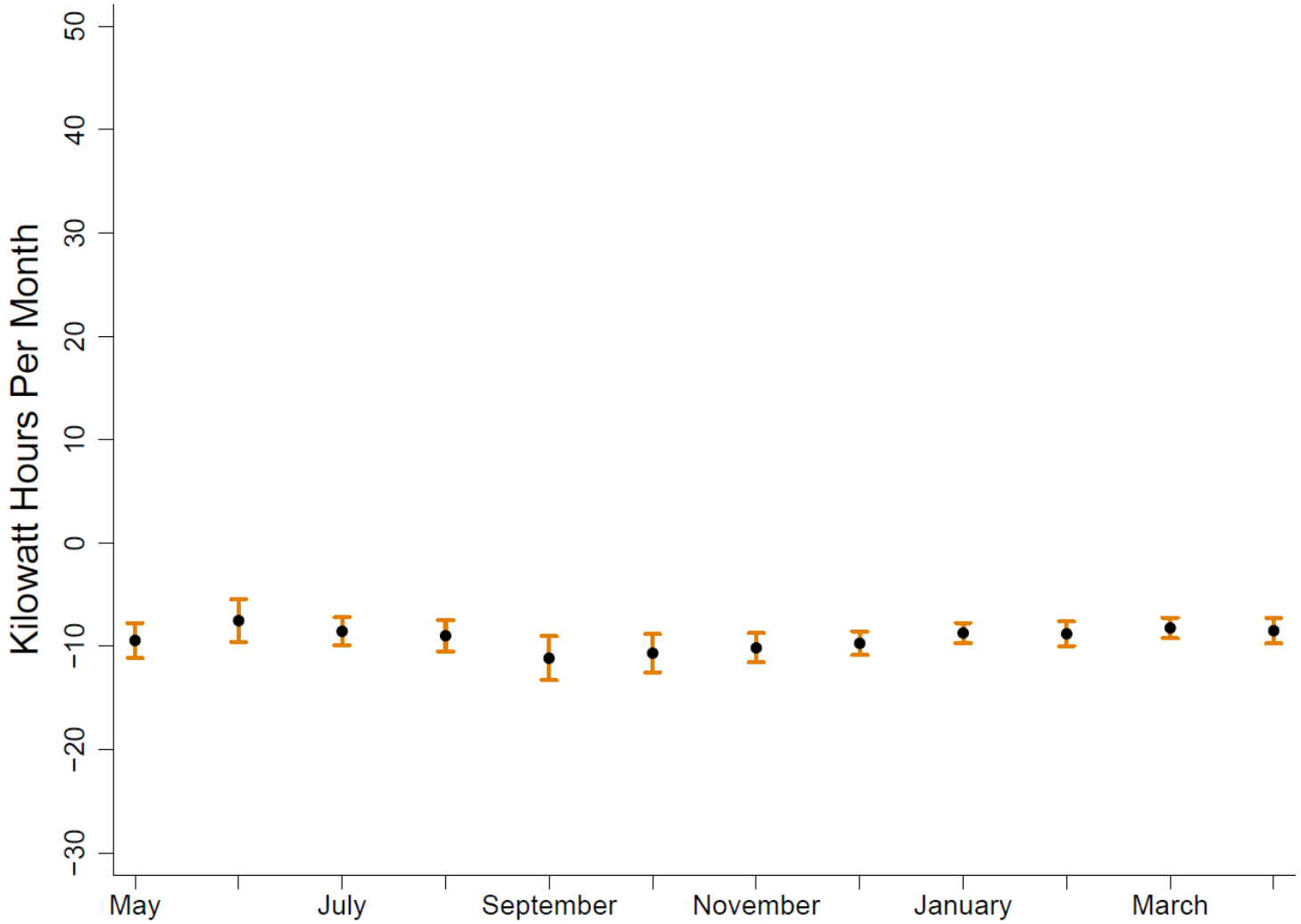
The Effect of Refrigerator Replacement by Month of Year



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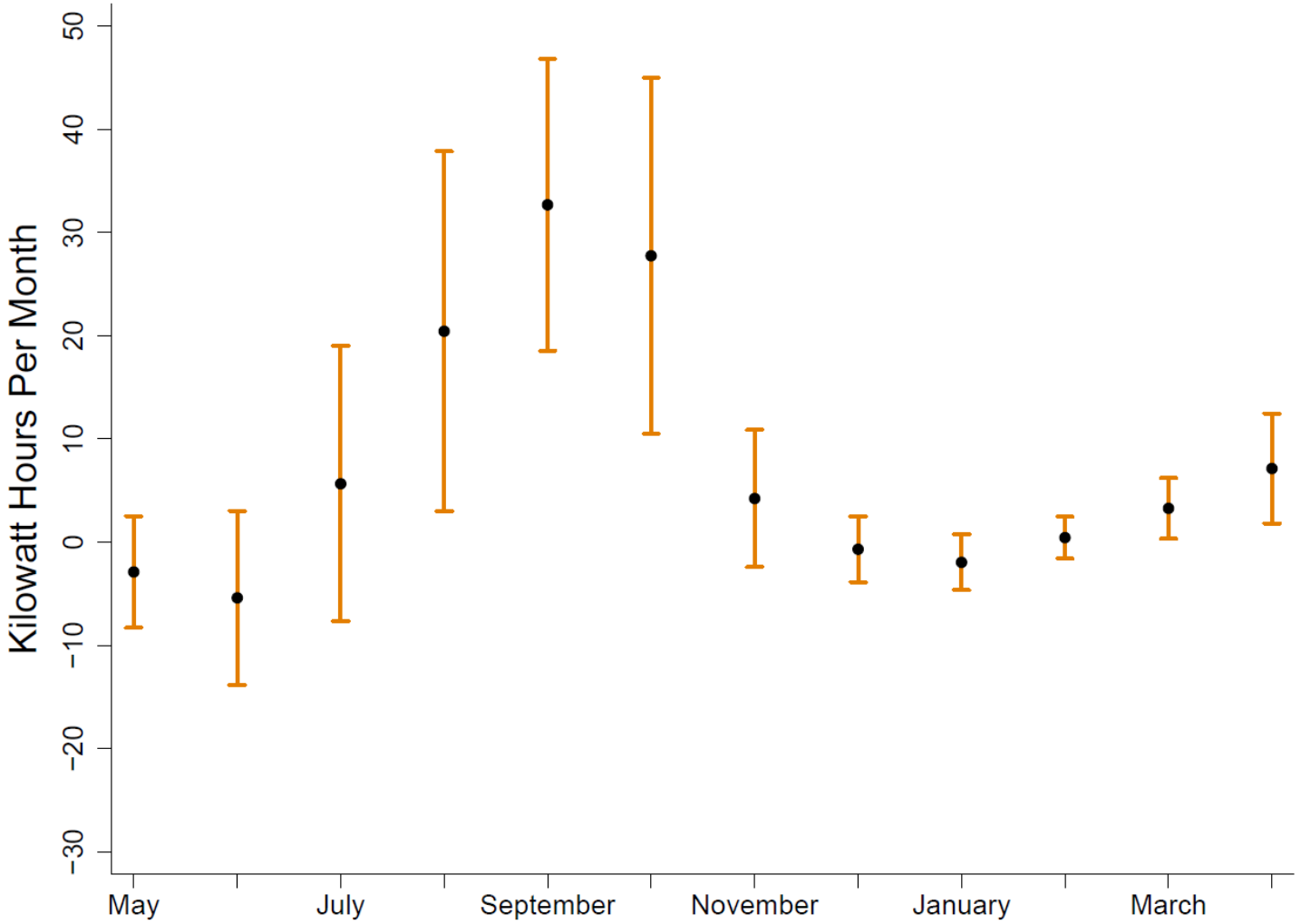
The Effect of Air Conditioner Replacement by Month of Year



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Summary of Results and Next Steps

- The analysis of billing data allowed us to trace out the "demand curve".
  - Most households would have participated even for much lower subsidy amounts.
  - About 50% would have participated even without any cash subsidy whatsoever.

- The billing data also allowed us to measure electricity savings.
  - Refrigerator replacement reduces household electricity consumption by 8%.
  - But air conditioner replacement actually *increases* electricity consumption.

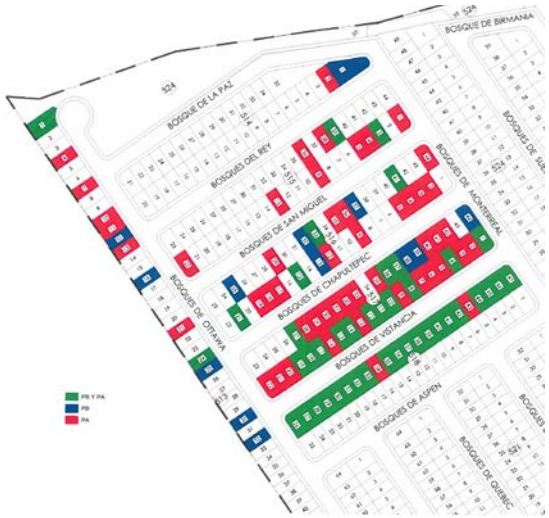
- What explains this increase in consumption?
  - Are households keeping their homes cooler than before?
  - Or is there some other explanation?

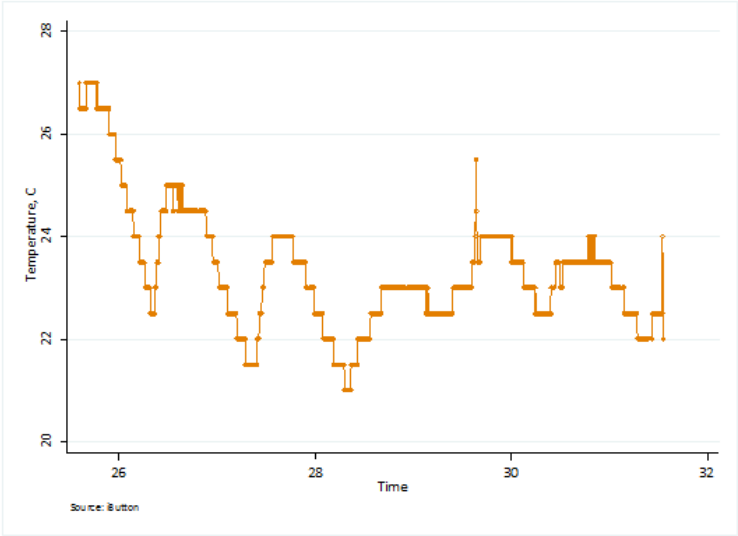
The iButton

The iButton is a tiny, durable, inexpensive digital thermometer.

Many different models are available. The most basic model costs about $20, and can record temperatures for as long as 1-year.

Ecocasa Project





- We are planning to use iButtons in a new project aimed at evaluating residential energy-efficiency investments in Monterrey, Mexico.
- The idea is to combine billing data with high-frequency temperature measures to come up with a more comprehensive measure of impacts.