

# The relative merit of regulatory mechanisms in climate policy

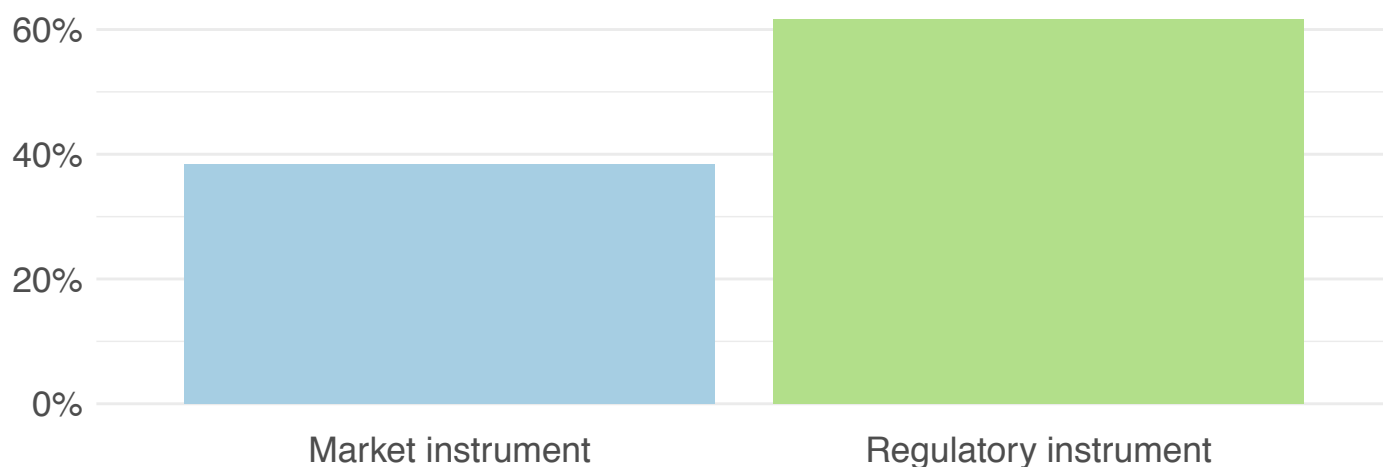
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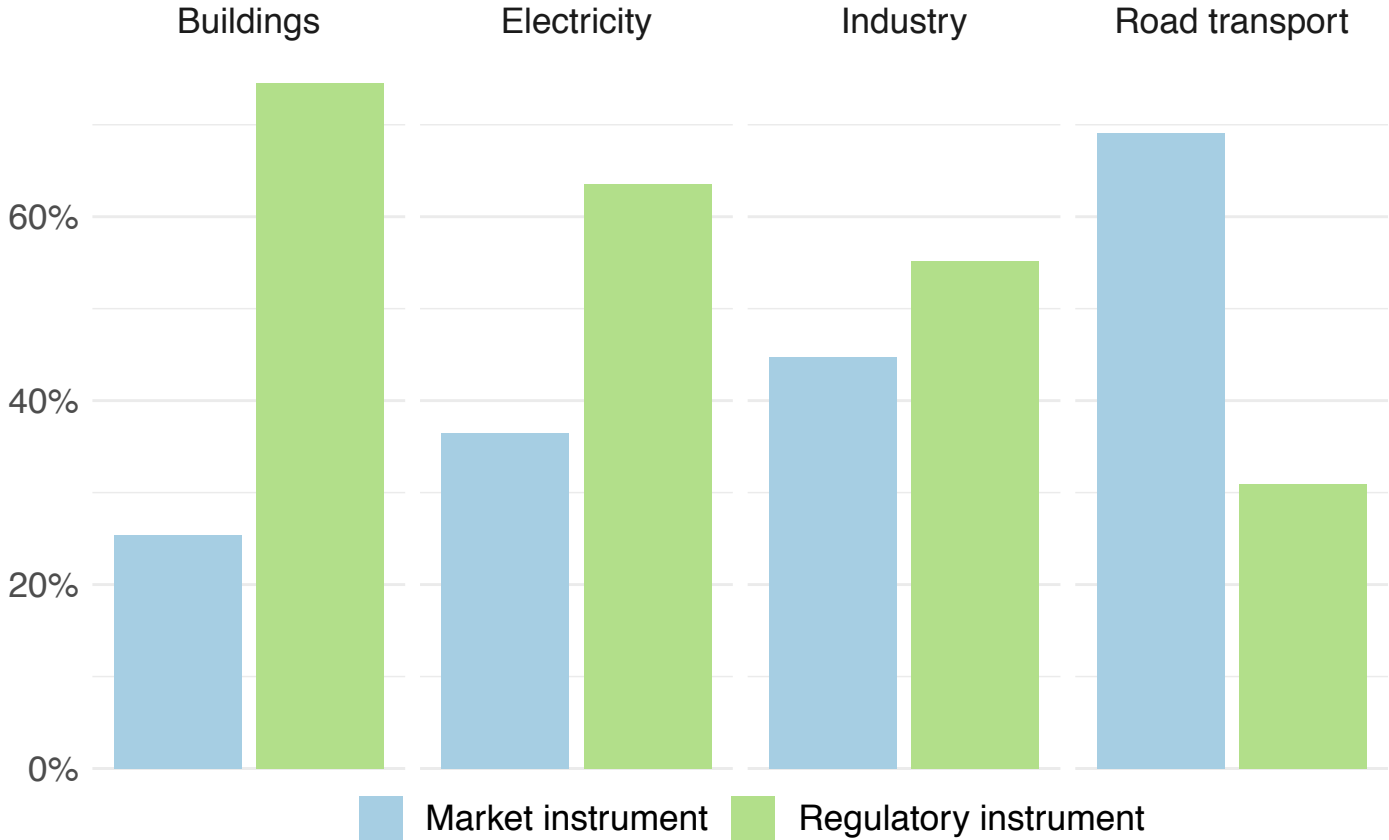
## Regulation is the dominant form of climate policy

- **Market instruments** (e.g. **carbon pricing**) are widely considered by economists as the **most effective** policies to reduce GHG emissions
- Yet **regulatory instruments** are still very **popular** with **policymakers**



National-level climate policies in force worldwide as of 2021 by type, *IEA Policy Database (2021)*

# The prevalence of regulatory approaches varies by sector



National-level climate policies in force as of 2021 by sector and type, *IEA Policy Database (2021)*

## Why are non-market instruments so popular?

- **Top-down techno-economic approaches**

- ▶ Modelling methodologies used to build **decarbonization scenarios** tend to allocate reduction **targets by sector**

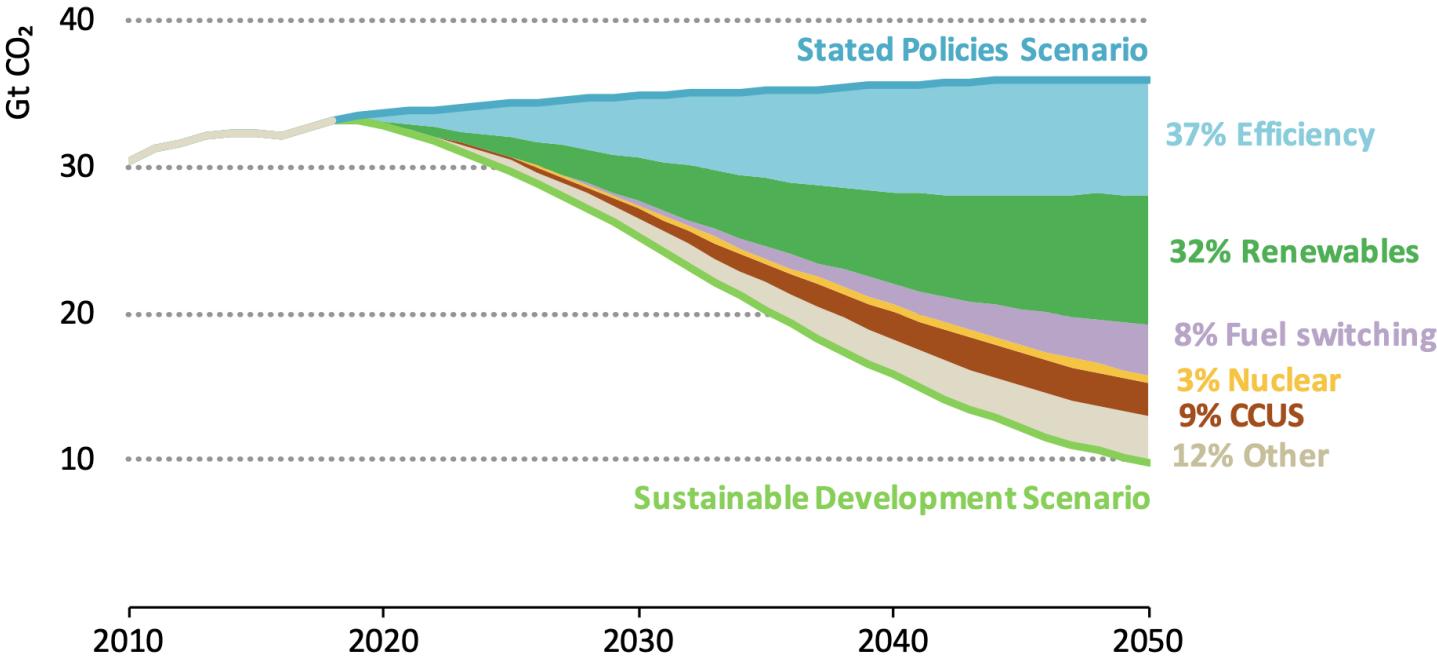
- **Salience of energy expenditures**

- ▶ Pricing mechanisms are only **effective** insofar that energy expenditures are **salient** enough to economic agents

- **Distributional impacts**

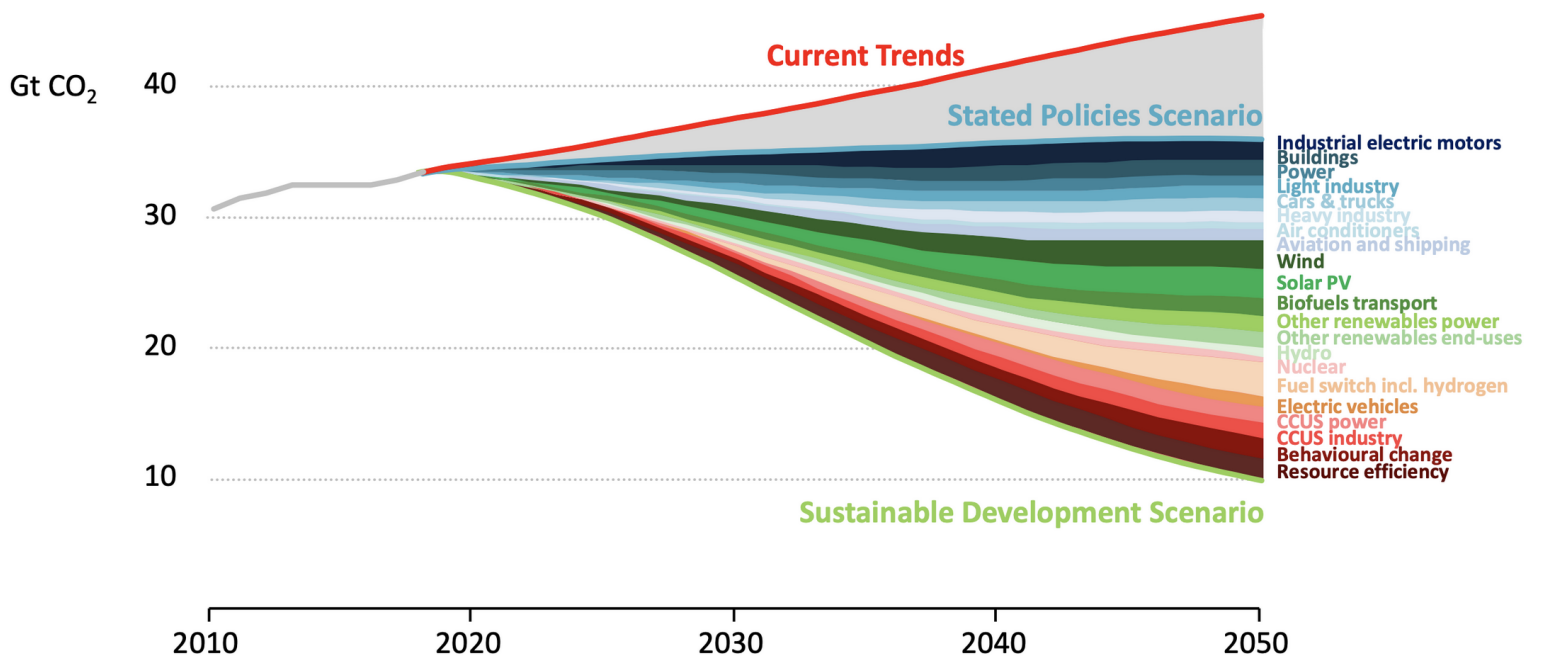
- ▶ Standards and other non-market mechanisms are often **perceived** by policymakers to be **less regressive** than carbon pricing

# An example of top-down scenario: IEA's WEO



CO<sub>2</sub> emissions reductions in the Sustainable Development Scenario, *IEA WEO (2019)*

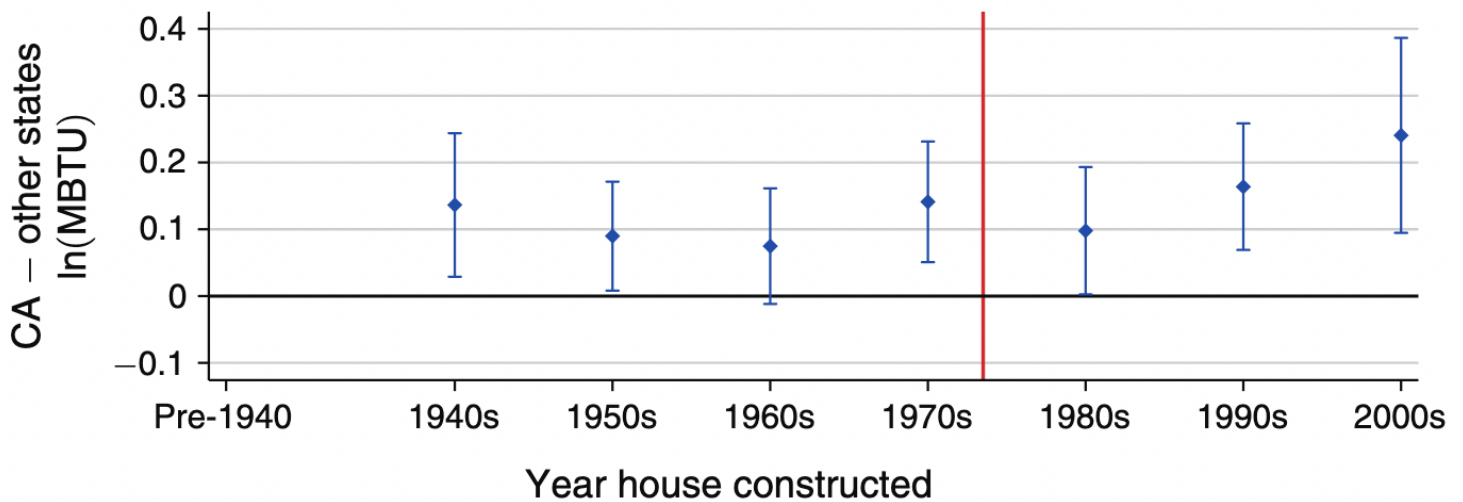
Each sector's abatement potential is emphasized separately



CO<sub>2</sub> emissions reductions by source in the Sustainable Development Scenario, *IEA WEO (2019)*

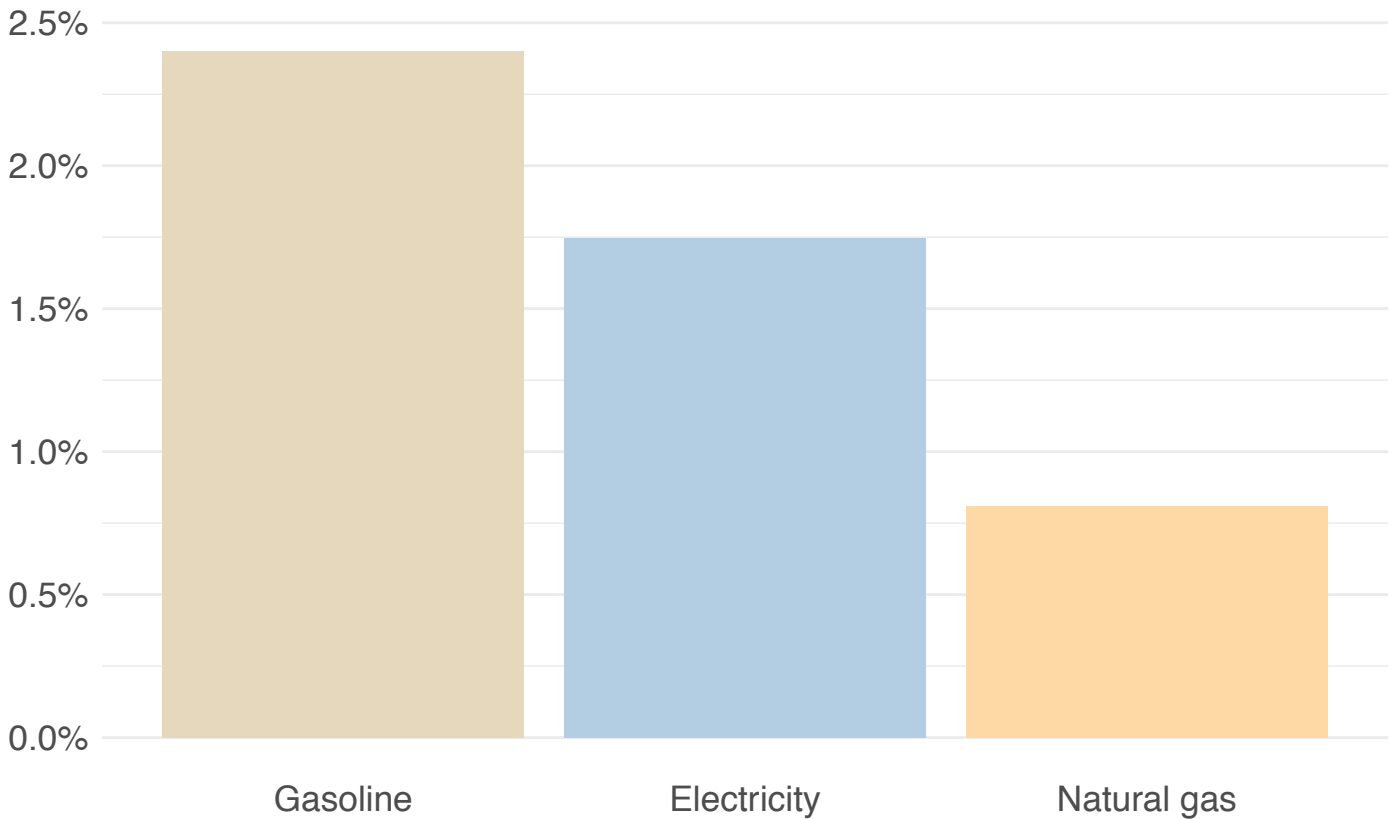
## Sectoral regulatory approaches may not be effective

- This type of approach favors the design of **targeted standards** aimed at capturing the **abatement potential** in **each sector**
- For example, **building energy codes** are a mainstay of energy efficiency policies since the 1970s
- However their **effectiveness** is **uncertain** despite their popularity



Residential energy use in California compared with other states  
*How much energy do building energy codes save?* (Levison, 2015)

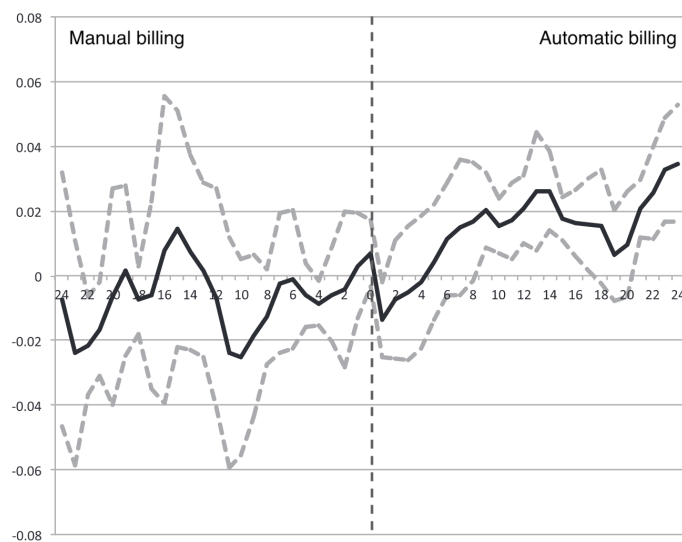
# Energy forms a small share of household expenditures



Household energy expenditure as a share of income (EIA, 2018)

## Low salience of residential energy expenditure

- Potential **effectiveness** of carbon pricing on residential energy expenditure is **hampered** by:
  - ▶ A **small total amount**, both absolute and relative
  - ▶ **Infrequent** and possibly **automatic billing**



Effect of automatic billing enrollment on residential electricity consumption  
*Automatic bill payment and salience effects: evidence from electricity consumption*  
(Sexton, 2015)

# Information policies can improve price salience

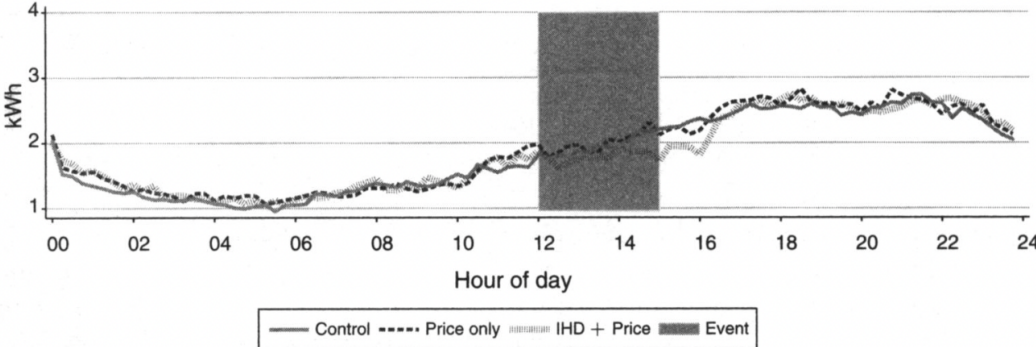


FIGURE 1. JULY 21, 2011: 4HR \$0.50 INCREASE, DAY-AHEAD NOTICE

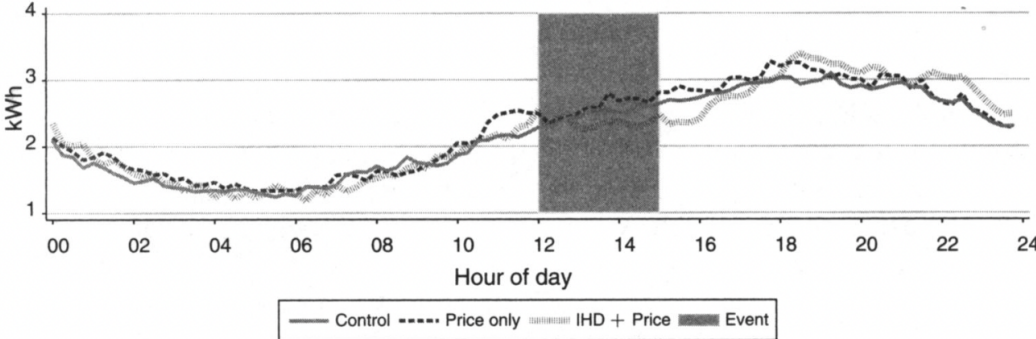
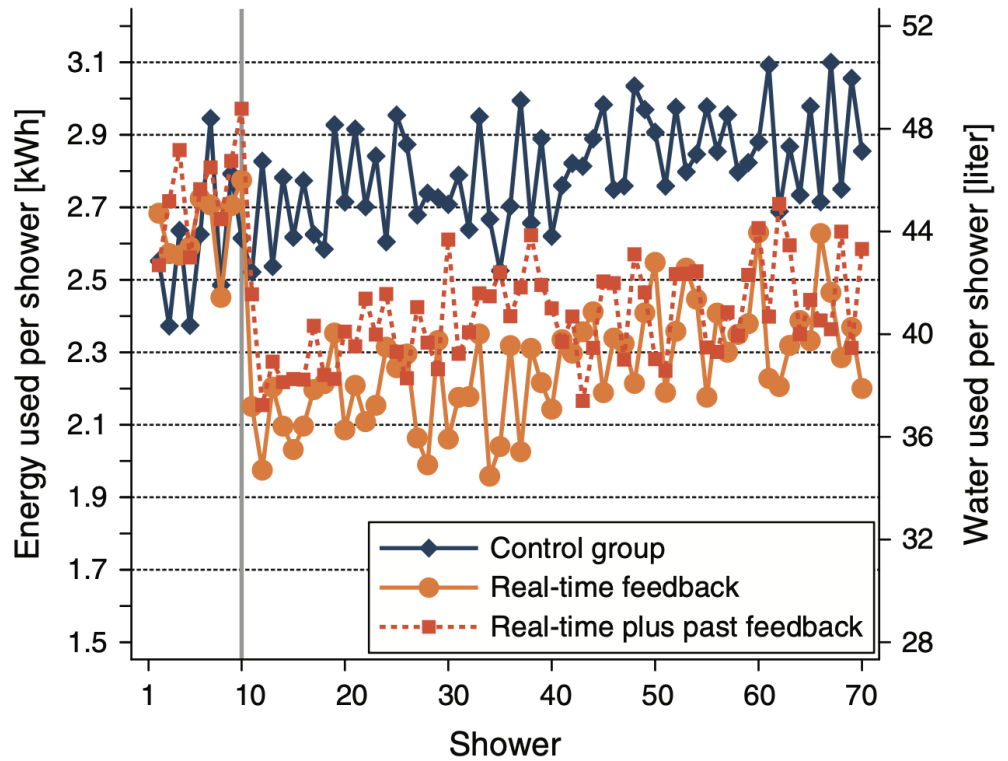


FIGURE 2. JULY 22, 2011: 4HR \$1.25 INCREASE, 30-MIN NOTICE

Effect of in-home display providing pricing information on electricity consumption  
*Knowledge is (less) power* (Jesoe & Rapson, 2014)

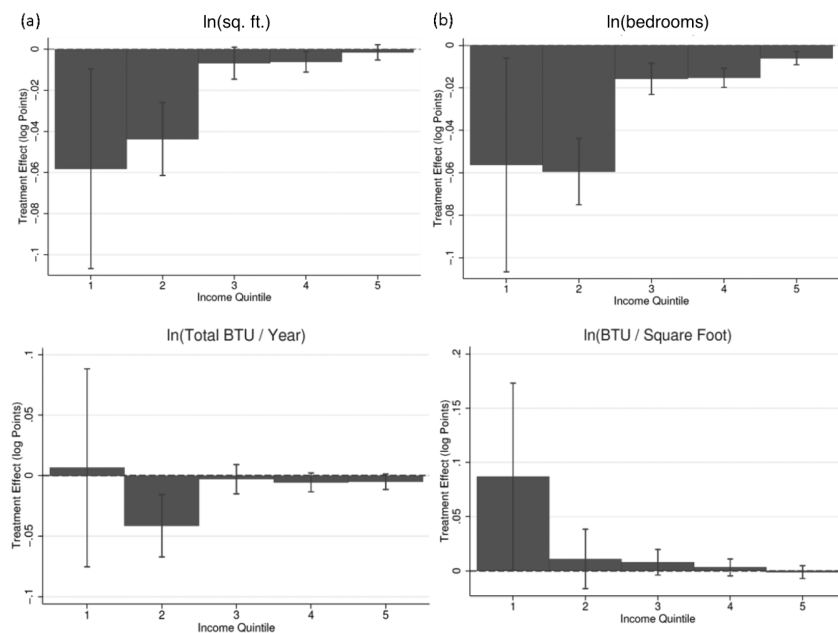
...and energy consumption salience



The impact of real-time feedback on energy consumption  
*Overcoming salience bias* (Tiefenbeck et al., 2018)

## Standards are not necessarily less regressive

- Carbon pricing is **regressive without redistribution**
- Fear of reinforcing **energy poverty**, particularly with residential energy consumption
- Yet **building energy codes are regressive too**



Effect of building energy codes on home characteristics and energy consumption  
*The Distributional Effects of Building Energy Codes* (Bruegge et al., 2019)

## Many perceived advantages of standards are not verified

- **Targeted energy standards** such as **building energy codes do not necessarily deliver** the expected energy savings
- **Regulatory approaches** to climate change mitigation can raise the **same distributional issues** as carbon pricing
  - ▶ But are harder to correct
- **Information policies** offer a way to enhance the effectiveness of carbon pricing by **improving** the **salience** of:
  - ▶ energy **prices**
  - ▶ energy **expenditures**