Do energy efficient appliances cost more?

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Why is it important?

- **30% of electricity use, 21% of CO_2**
- **25% increase by 2020**
- **the cost/efficiency relationship important because:**
  - **Used to set performance specs for Standards & Labels, procurement, etc**
  - **Used to calculate cost of CO_2 abatement, national/global**
  - ***Cost assumptions influence policy decisions***

Study Aims

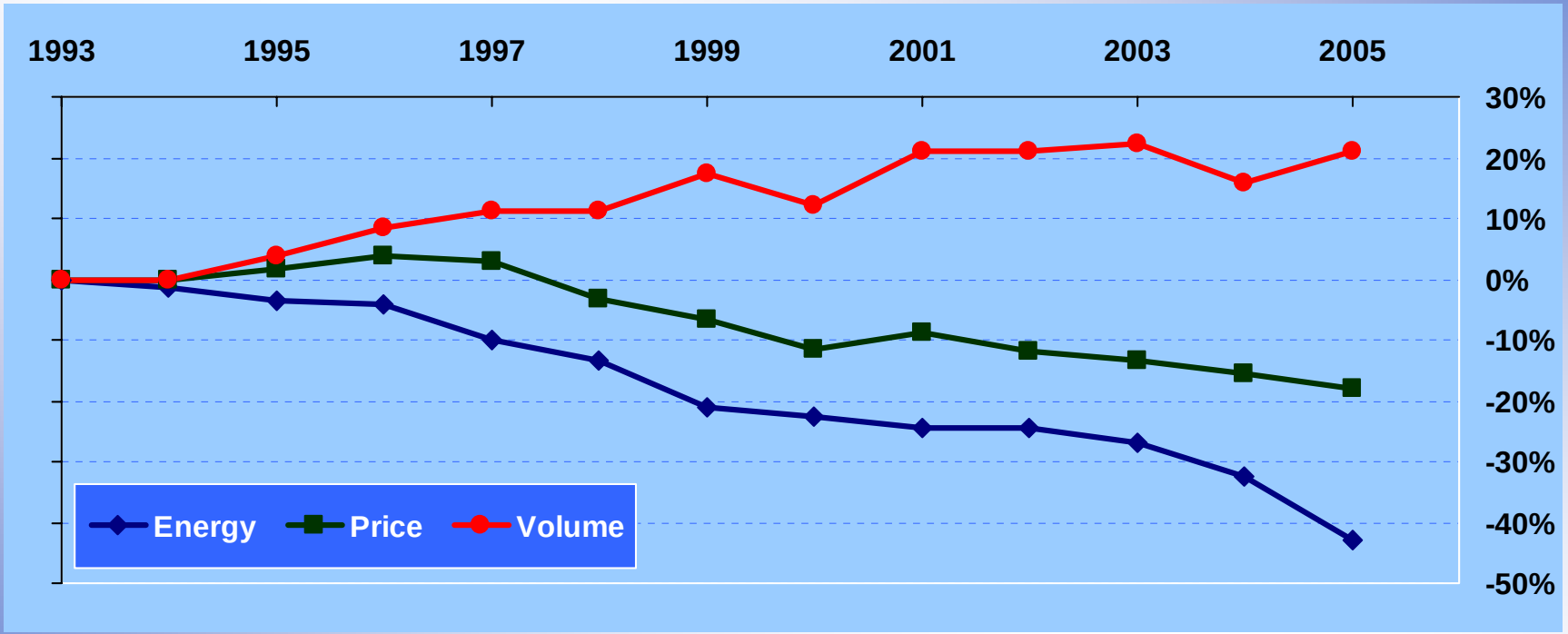
- To examine:
  - How much the efficiency and price of appliance have changed over time
  - Whether estimates of the future cost of efficient appliances were accurate
- To make recommendations about forecasting future costs

Methodology

- Comparison of national data since 1980s from
  - United States
  - Japan
  - European Union and the United Kingdom
  - Australia
- Data from tracking of regulatory programmes
  - Minimum energy performance standards
  - Mandatory labels
- Appliances
  - Refrigerators/Freezers
  - Clothes Washers & Dryers
  - Air conditioners

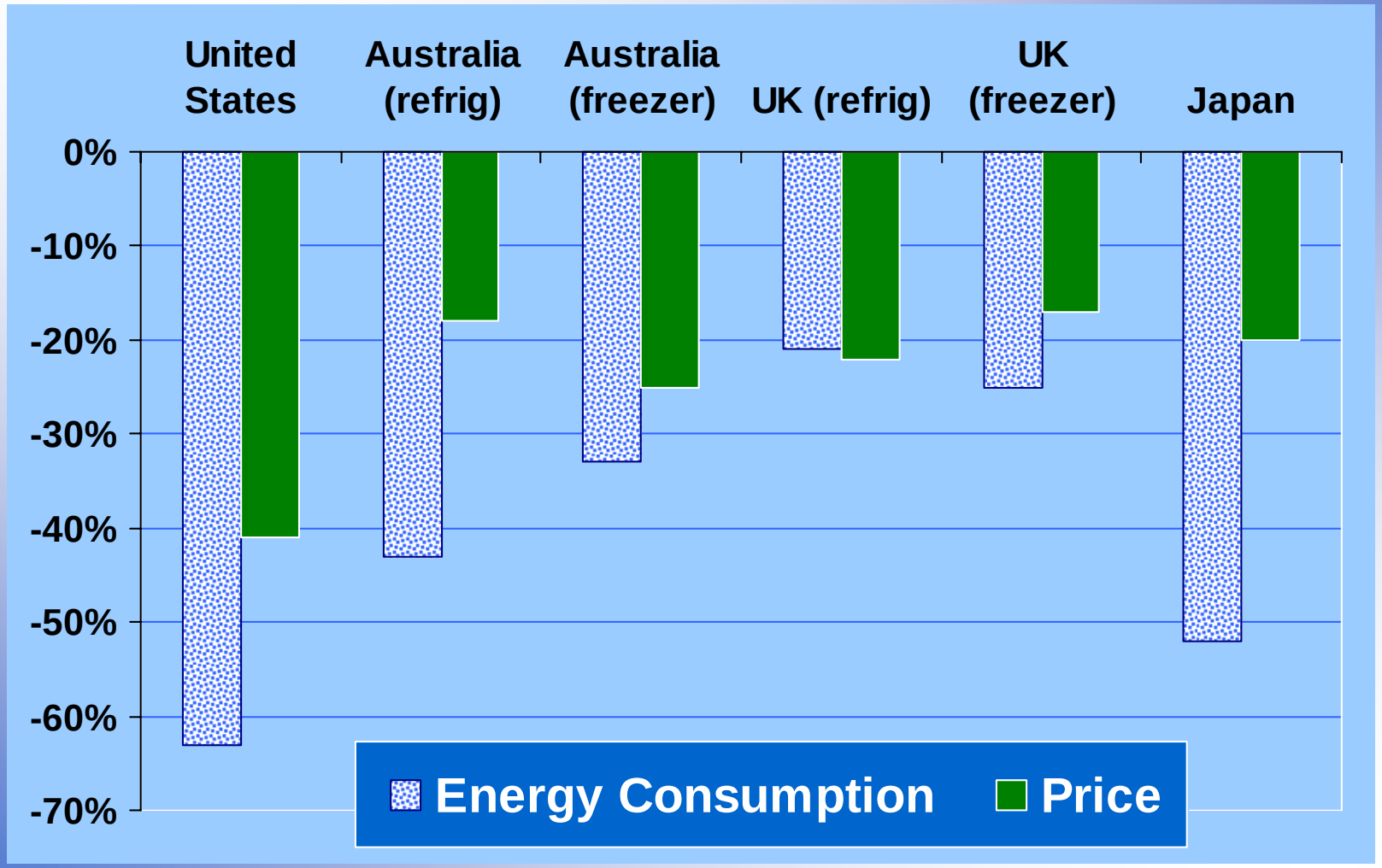
Data example

Australian Refrigerators, 1993-2005: % Change

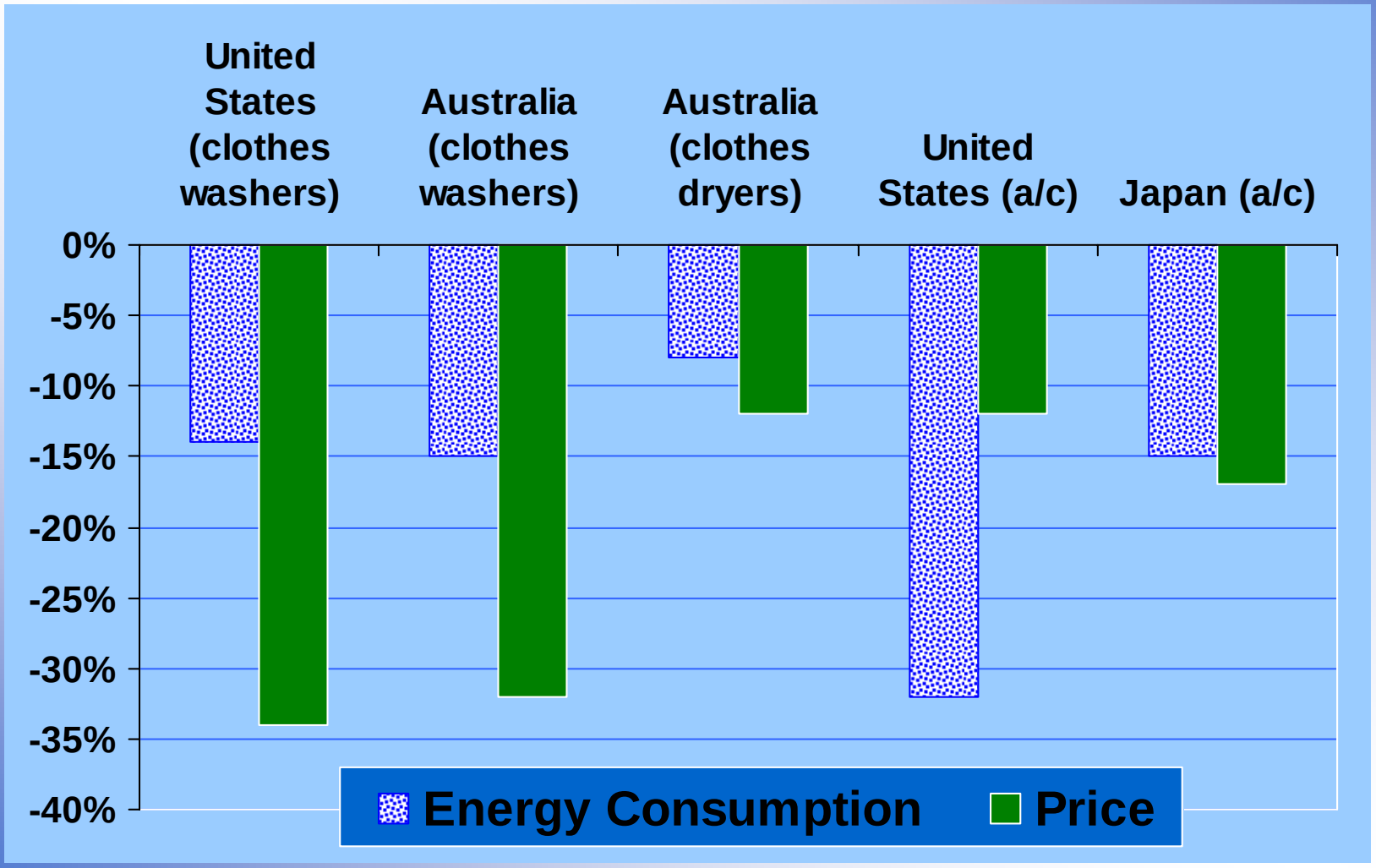


Av. Energy consumption: **- 43%**
Av. Volume: **+ 21%**
Av. Price: **- 18%**

Cold appliances: % change



Other appliances: % change

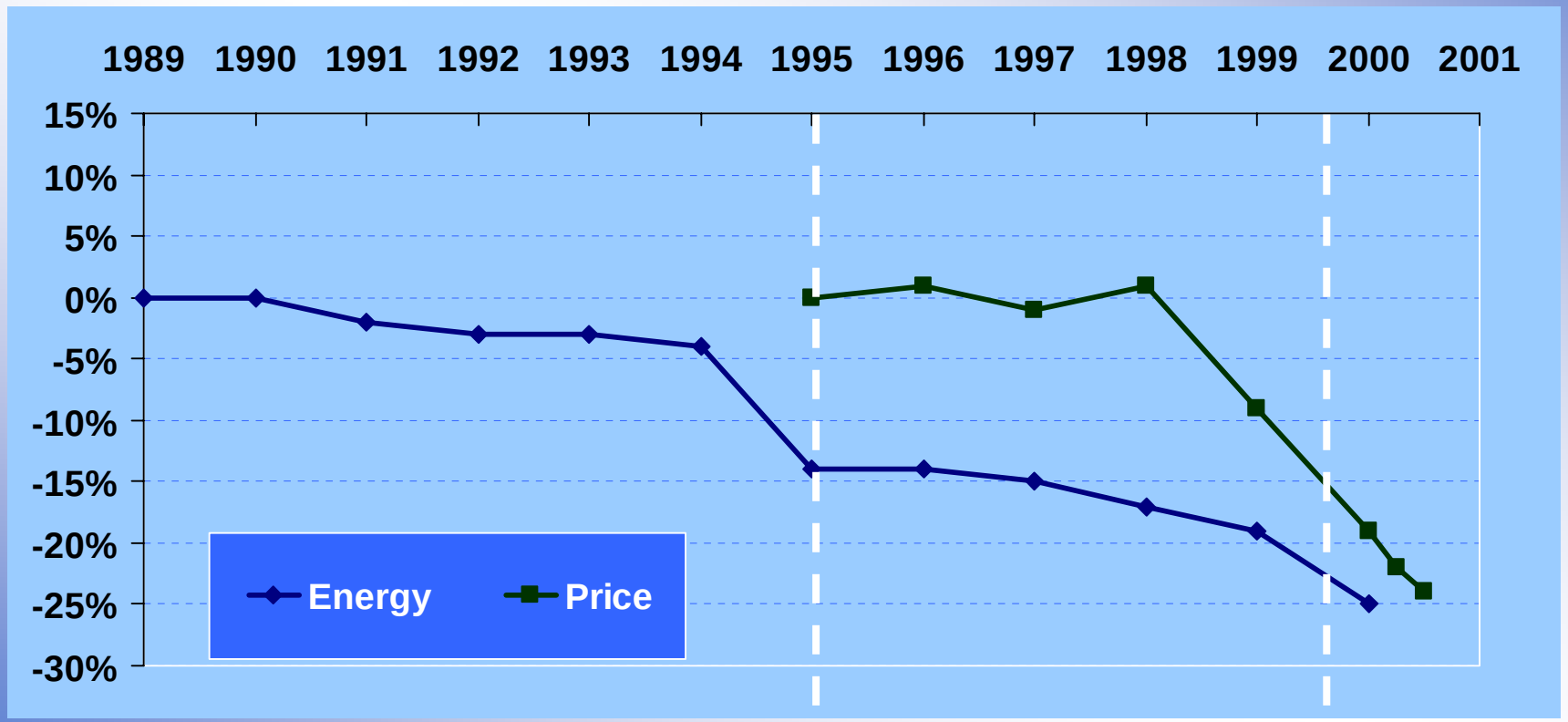


Findings (1)

- **Consumers are paying *less* for more efficient appliances**
- **Consumers also getting increased levels of service**
- **Consistent across US, Japan, EU & Australasia**
- **Relation to imposition of mandatory minimum energy performance standards (MEPS) or labelling of appliances**

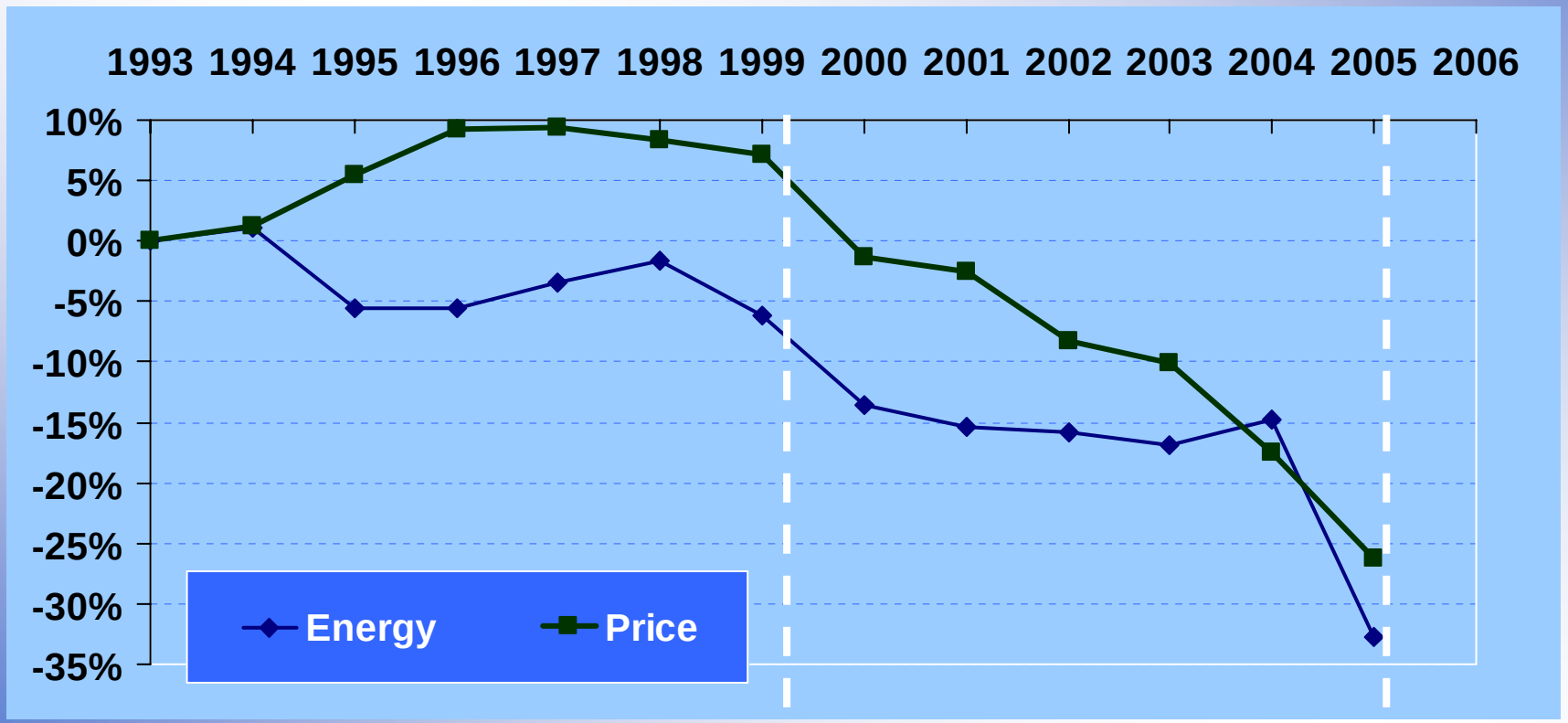
Impact of regulations

UK refrigerator-freezers



Impact of regulations

Australian freezers

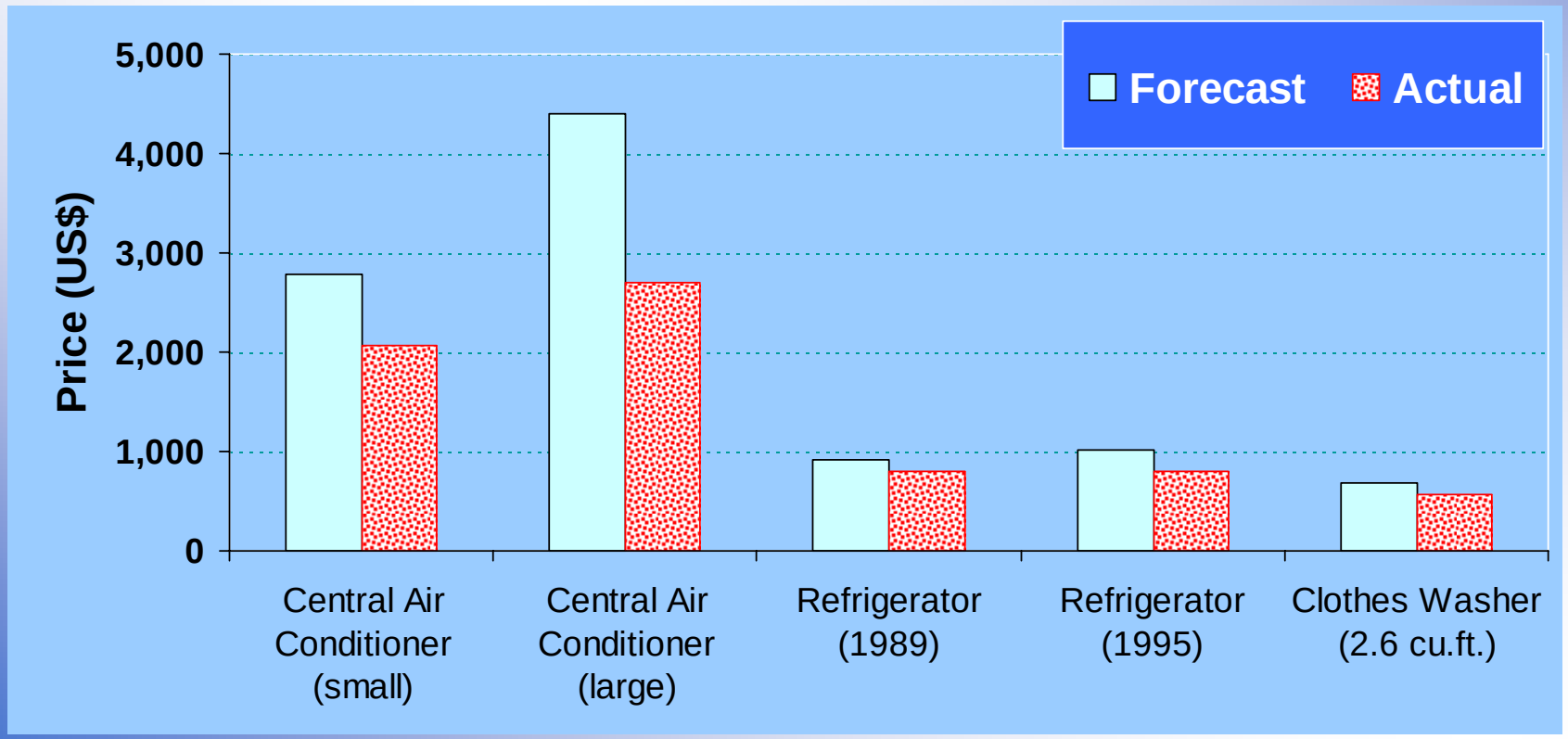


Findings (2)

- **No evidence that Standards and Labeling policies have increased real prices to consumers**
- **Given notice, energy efficiency requirements can be absorbed into design process with little or** *no extra cost*
- **Higher priced products tend to reflect:**
  - branding (a better product)
  - other features (stainless steel, looks)
  - ***Not*** energy efficiency costs
- **Policies can be more stringent and still show positive benefits**

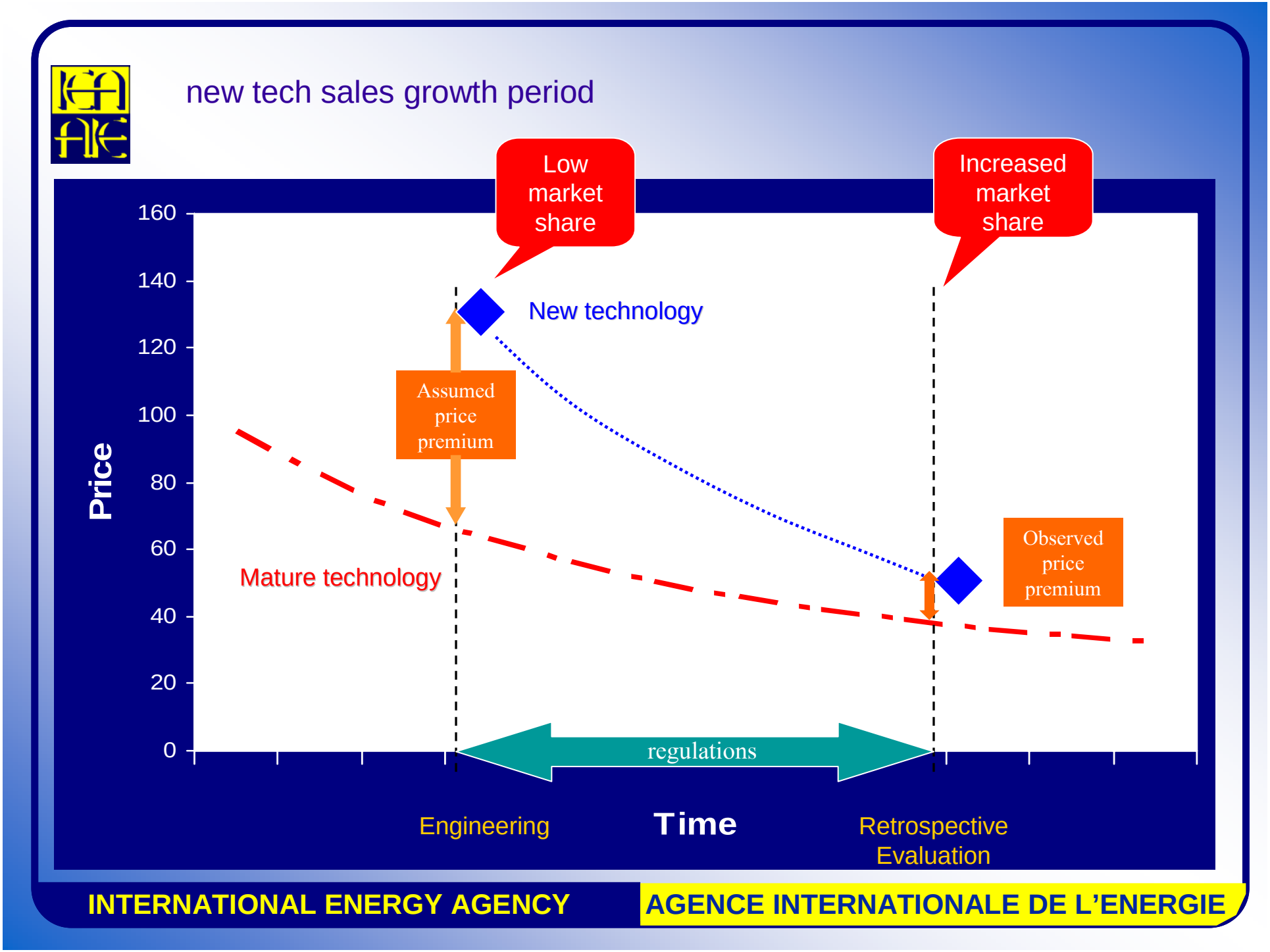
Predictions of future costs

Most forecasts say: ***more efficient appliances = price increases***
In fact, ***more efficient appliances & price reductions***



What's going on?

- **Predictions made prior to regulations**
- **Regulations stimulate growth in the market for efficient technologies**
- **Costs have reduced as the market share has grown**
- **Companies found innovative means to reduced energy consumption**


new tech sales growth period
Low market share
Increased market share
New technology
Assumed price premium
Observed price premium
Mature technology
regulations
Price
160
140
120
100
80
60
40
20
0
Engineering
Time
Retrospective Evaluation
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Findings (3)

- **Current cost-benefit analysis tends to overstate the future costs of efficient appliances**
- **Observations fit *'learning-by-doing'* model: cost goes down as cumulative production increases**
- **Explains why policies which support markets for efficient appliances lead to relatively *lower* prices**

Preliminary Recommendations

- Governments need to re-examine assumptions on cost of efficient appliances used in policy development

- Governments should invest more in tracking micro-indicators for appliances (prices, performance, market shares, unregulated products…)

- Further work required to develop methodologies for predicting costs, eg.
  - Typical learning by doing rates
  - Engineering analysis

Contact

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