Energy Efficiency Training Week
Indicators and Evaluation

Session 6: How to tell if your policy made a difference

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Introduction

- Impact evaluation needs to demonstrate cause and effect
- Policy and programmes operate in a complex environment – multiple causes contribute to an effect
- Different methods of impact evaluation are suited to different policies and programmes and different types of questions
- Aim of this session is to introduce main impact evaluation approaches and their strengths and weaknesses
- And consider where data will come from to implement each approach

What is impact?

*Positive and negative, primary and secondary long-term effects **produced** by an intervention, directly or indirectly, intended or unintended.*

From OECD DAC

- What does impact mean for appliance and equipment policy – energy saving:
  - Compared to what (BAU, baseline)
  - By whom (rural, urban)
  - What energy (e.g. kerosene lamps to electricity)
  - Does it translate into $$$ and CO2?

- What else might we be interested in?
  - Fairness
  - Prices
  - Jobs/economic development
  - Exports
  - Energy security

Estimating energy consumption and savings – appliances/equipment

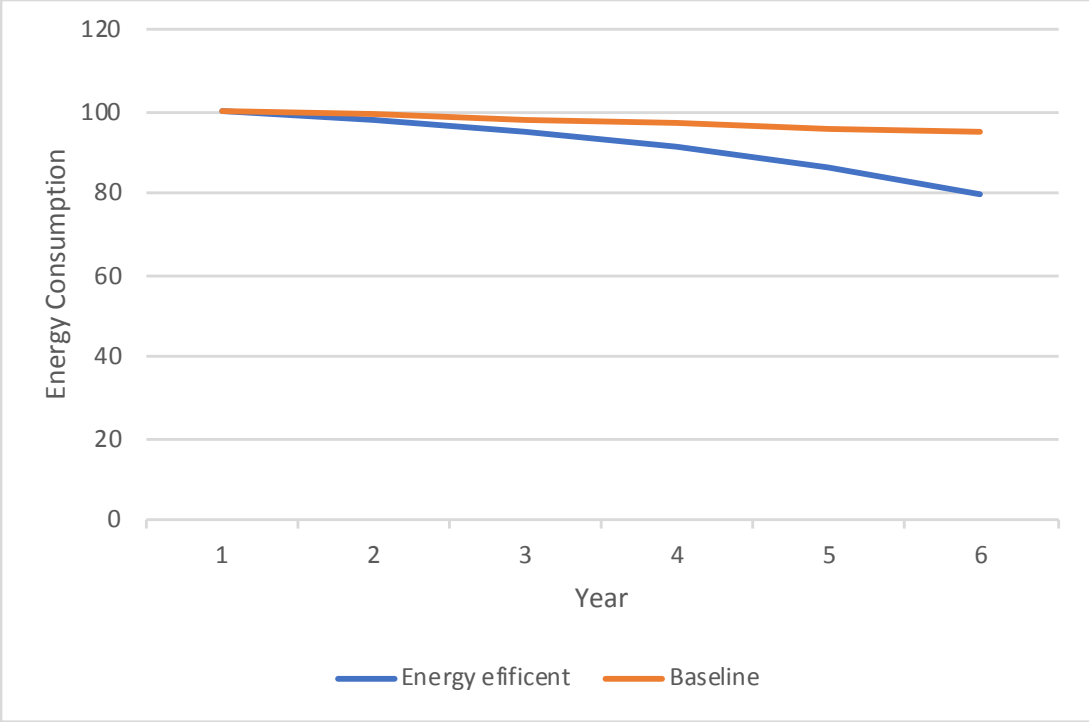
- Annual energy consumption (kWh) = kW in an hour x hours of use in a year
- Cost = kWh x cost per kWh

Refrigerator example	Standard	Efficient
kW	50	18
Hours of use	8760	8760
Annual consumption	438kWh	158kWh
Cost @ 10c/kWh	USD 44/year	USD 16/year

- Multiply by the number of products in use

Measuring energy saving – baseline/business as usual

- Compare energy consumption with policy to energy consumption without policy

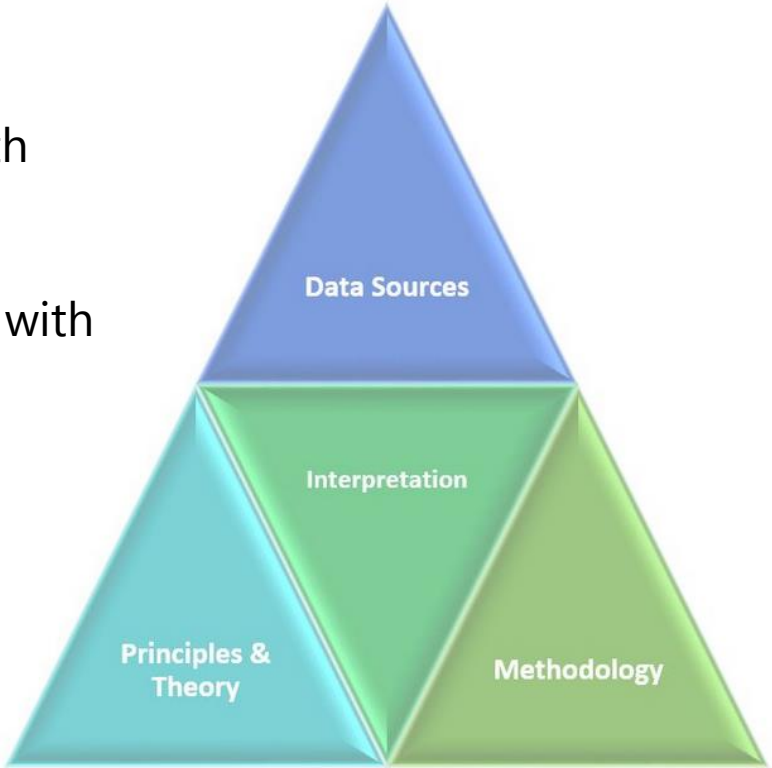


What data do you need and where can you get it?

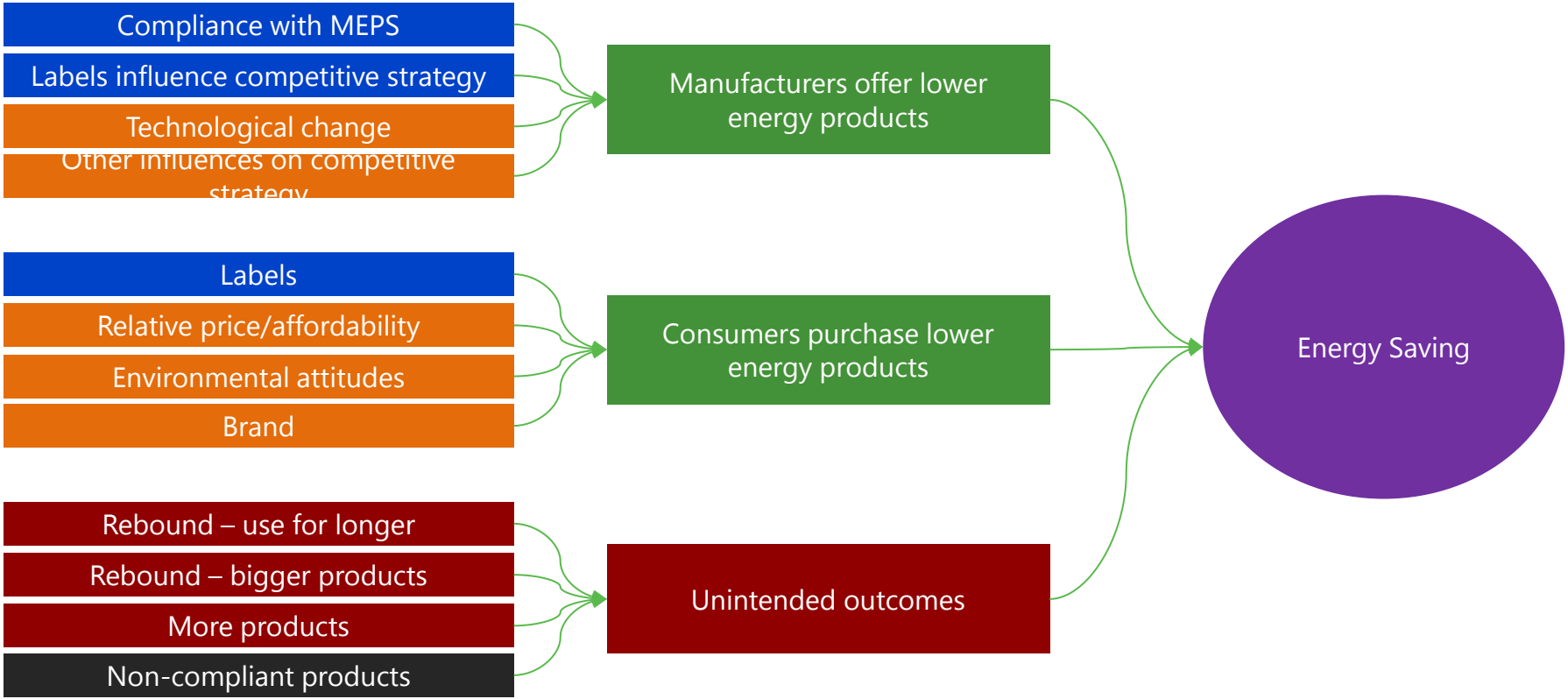
Data	Source
Ownership levels	Household survey/national statistics
Historic sales	Manufacturers
Current sales	Registration system/market survey
Replacement rate	Household survey/international experience
Annual hours of use	Household survey
Average energy consumption before policy	Market survey/manufacturers/assumption/ past household surveys
Energy consumption of efficient products	Registration system
Compliance levels	Market survey/enforcement action

Triangulation

- Do data from different methods, sources and approaches align?
- Are the economy wide indicators consistent with the estimate of programme savings?
- Do data from manufacturers and retailers align with results of household surveys?



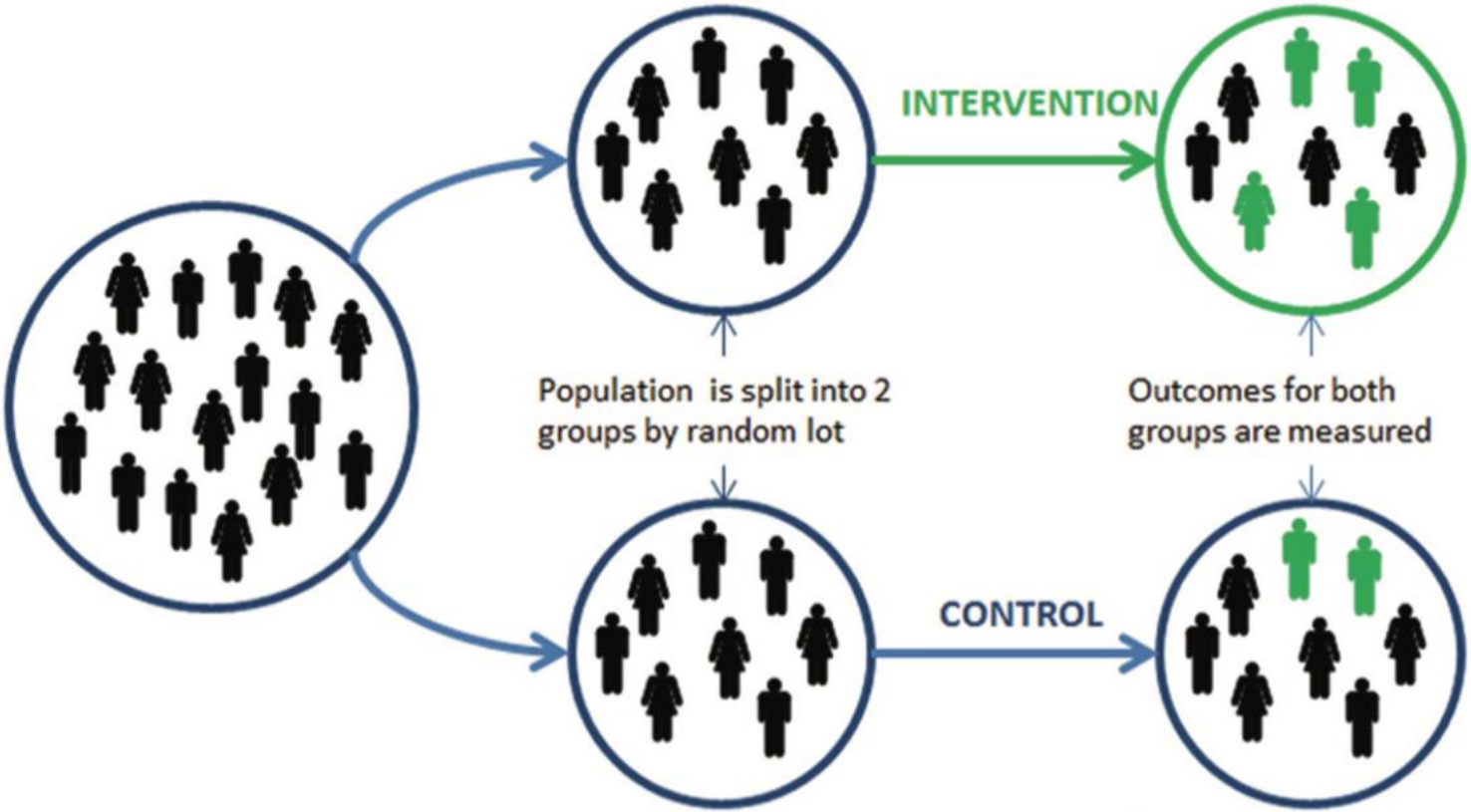
Did appliances and labelling policy make a difference?



Did the policy make a difference?

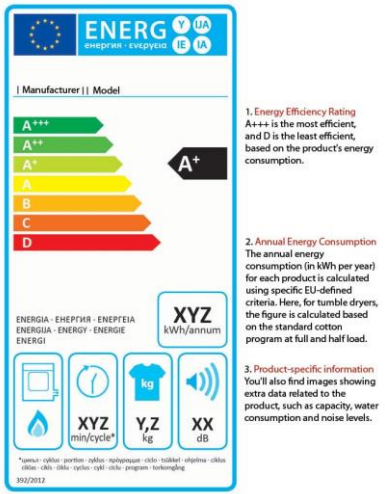
- Randomised control trial
- Statistical tests
- Contribution analysis

Approaches to causal attribution 1 – randomised control trial



Approaches to causal attribution 1 – randomised control trial

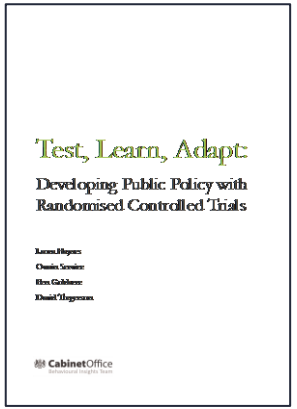
- Test the inclusion of costs on energy label + staff training
- UK Government + John Lewis department store
- Trial group of stores compared to control group
- Small difference for washer dryers, no difference for other prod

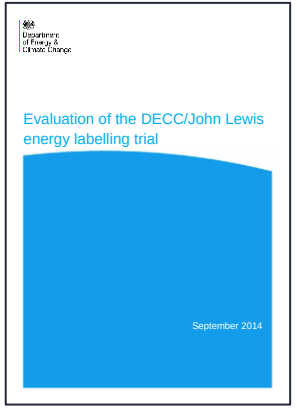


Approaches to causal attribution 1 – randomised control trial

- Strengths
  - "Prove" effect of policy
  - In the circumstances of the test (when, where)
  - For the indicator being measured

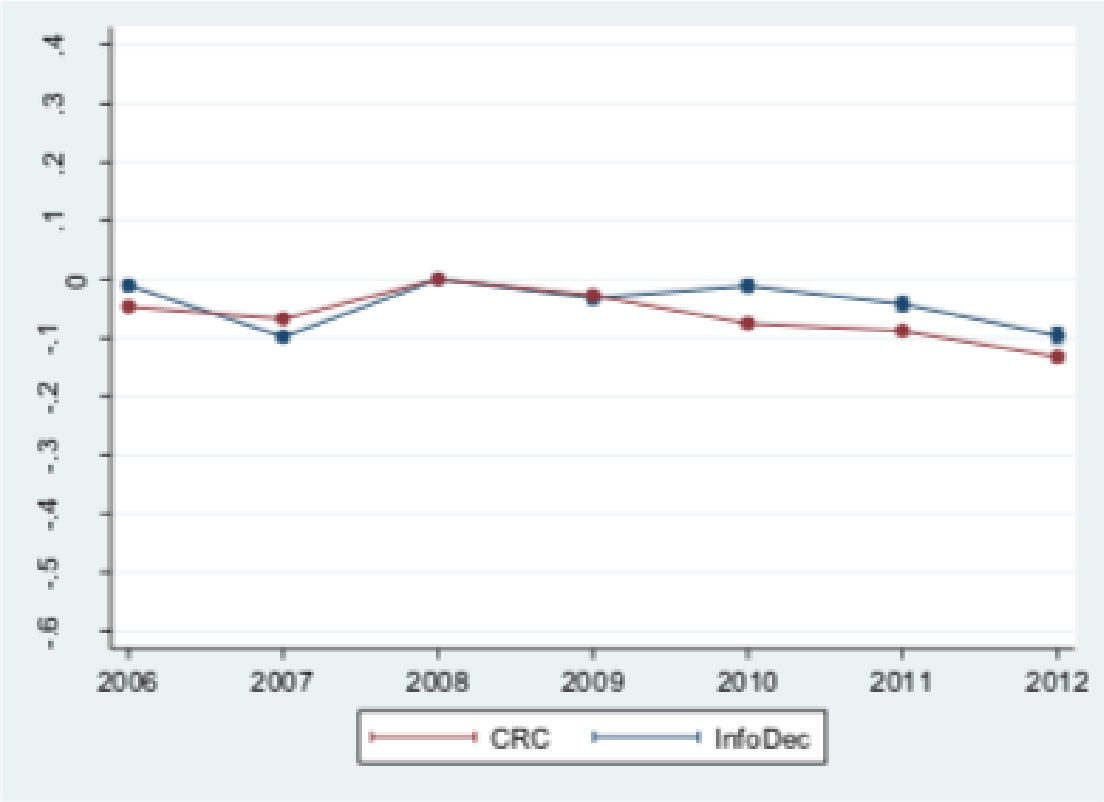
- Weaknesses
  - Doesn't tell you why the policy worked/doesn't work
  - Doesn't tell you if the policy will work in other circumstances
  - Challenging to design and implement





Approaches to causal attribution 2 - statistical

- Difference in difference
- Using meter data can compare changes in energy consumption between the group subject to the policy and a comparison group (difference in difference) before and after the policy implementation.



Approaches to causal attribution 2 – statistical

- Strengths
  - "Prove" effect of policy
  - In the circumstances of the test (when, where)
  - For the indicator being measured

- Weaknesses
  - Doesn't tell you why the policy worked/doesn't work
  - Doesn't tell you if the policy will work in other circumstances
  - Depends on ability to obtain data

Approaches to causal attribution 3 – contribution analysis

- Develop theory of change
- Consider alternative explanations, develop contribution story
- Gather evidence of the results, the causal links and other influencing factors
- Refine contribution story, repeat as necessary
- Validate with stakeholders

Estimating the effect of energy labels – contribution analysis

- Contribution story, labels reduce energy consumption because:
  - Consumers have a reliable way of choosing energy efficient products
  - Manufacturers are motivated to produce more energy efficient products

- Theory based evaluation tests:
  - Whether the policy was implemented as intended
  - Whether there is evidence to support the theory
  - What else might explain what has happened

Evidence

- Vietnam Energy Efficiency Labels
  - Implemented for a range of products in 2014

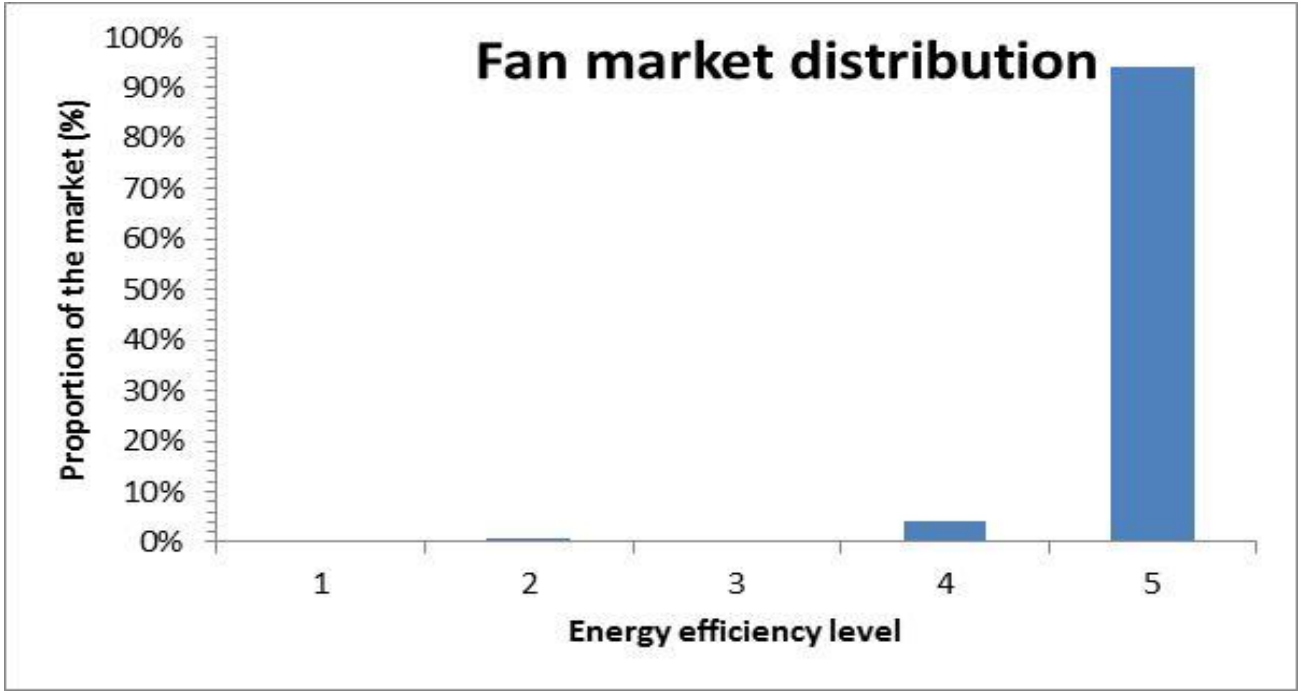
- Evidence from
  - Interviews with manufacturers
  - Consumer interviews and survey
  - Registration system
  - Label compliance survey

Results

- Interviews with manufacturers found that labels had a:
  - Significant influence on manufacturers of air conditioning and refrigerators
  - Moderate influence on manufacturers of fans, rice cookers and lighting
  - No influence on manufacturers of washing machines and televisions
- Survey of consumers found that labels influenced 85% of purchases to some extent
- Alternative explanations
  - Technological change
  - Spillover from other markets
  - Brands

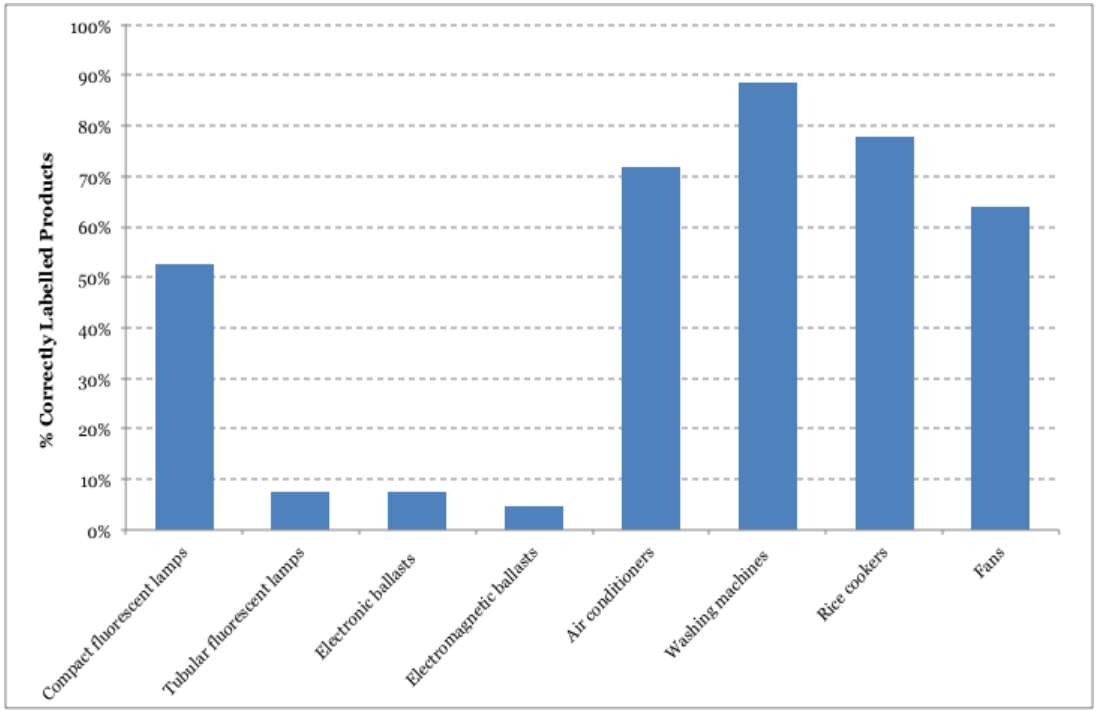
Example of theory based evaluation

- But in some cases policy not implemented as intended:



Example of theory based evaluation

- And there isn't full compliance with the policy



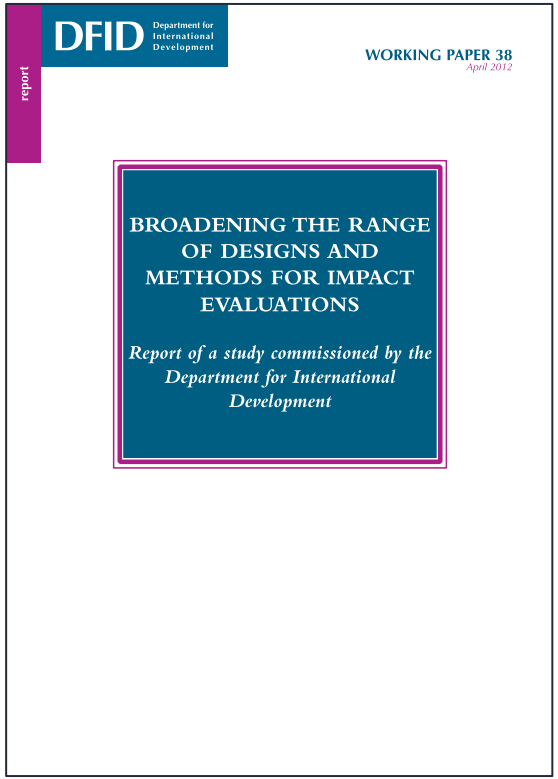
Effect of Vietnam Energy Efficiency Standards and Labels

Product	Manufacturers	Consumers	Compliance	Net effect
Air conditioning	Significant	85%	71%	60%
Refrigerator	Significant	85%	n/k	63%
Fans	Moderate	No	64%	32%
Rice cookers	Moderate	85%	78%	33%
Washing machines	None	No	88%	0
TVs	None	No	n/k	0

Approaches to causal attribution 3 – contribution analysis

- Strengths:
  - Reflects more of the influences on outcome
  - Explains why and how change happens
  - Utilises diverse evidence
- Weaknesses:
  - Approximate impact estimate
  - Doesn’t provide proof of impact
  - Complexity can be challenging to communicate

Approaches to causal attribution – further reading



Things to think about during the site visit

- What is the theory of change?
- How do they tell if they are achieving their aims?
- What indicators do they use?

- 5 minutes for each group to report tomorrow morning

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