Appliances & Equipment Stream: Day 4, Thursday 5 May

Meet the team

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Learning outcomes – slide on what we are covering today

Appliance & Equipment Stream - Thursday 5 May		
Time		**Activities**
Paris	Panama	
15.00 – 16.30	08.00 – 09.30	Opening Lecture: ▪ Incentives, Industry Transformation and Incentives
16.30 – 18.00	09.30 – 11.00	Self-study and Assignment: Quiz, and Exercise
18.00 – 19.00	11.00 – 12.00	Group Work ▪ Group Assignment: Understanding Incentives
19:00 – 19:30	12.00 – 13.30	▪ Group report back and discussion
		▪ Final activity Discussion

Incentives and Industry Transformation

The ideal policy package for appliances, equipment and lighting

Regulation

Regulations, which lay out legal requirements…

- Minimum energy performance standards that eliminate the least efficient products in the market by setting minimum performance requirements – applicable especially for appliances, lighting and also some industrial products.
- Specifications for how to claim high performance.

Information

Information that help users make choices.
Examples of these include:

- Labels – including QR codes on products.
- Information campaigns – advertising in store, in the media.
- Education and training of people selling products or installing them.

Incentives

Incentives applied to highly efficient products to transform markets
Examples of these include:

- Rebates or on bill-financing to help consumers
- Public procurement to generate demand to help build a domestic market for energy efficiency products.
- Innovation awards to manufacturers

The most effective policy approach is a combination of all three of these mechanisms

Regulations or standards remove the least efficient products from the market.

Information campaigns encourage consumers to purchase more efficient products by providing information about full life-cycle costs.

Incentives encourage the development of markets for highly efficient products.

Question

List examples of incentives that you can think of?

https://www.menti.com/r4ed7gyvio

or

Go to www.menti.com and use the code **4875 8127**

Incentives

Rebates are often used to reduce the costs of efficient appliances for consumers – these drive the market for more efficiency appliances and can lead to economies of scale that in the longer term reduce the price of products.

A common variant is **targeted rebates** for low income households - these have often been used for fridges because purchase costs are high as are running costs so an efficient fridge has a very long term benefits to a low-income household.

Government Procurement of highly efficient appliances is often used to drive the market for more efficient appliances for example US ENERGYSTAR.

Private sector companies may join similar procurement programmes to demonstrate their **Corporate Social Responsibility,** for example companies belonging to EP100.

Bulk procurement works by guaranteeing markets for large numbers of products of a given specification, the most famous example being India's UJALA programme implemented by the Super ESCO Energy Efficiency Services Limited

Product lists, for example those used by EBRD for loans issued by partner banks or by governments to provide tax reductions

Technology Procurement works by publishing a specification for a highly efficient product that is not yet on the market and requires manufacturers to design, build and test products to meet the specification for some sort of award be that financial or a market guarantee the L Prize and the Global Cooling Prize are two influential examples

Incentivising industry

- Support for new products designs, e.g. technical assistance and provision of Intellectual Property.
- Facilitate access to finance for re-tooling, e.g. low interest loans or access to industry development/restructuring funds. This can bring forward investment in new more efficient production facilities for more efficient products.
- Assist the manufacturers in reducing their operating costs by improving their own operational energy efficiency.
- Introduce a consumer-friendly endorsement label for highly efficient (HEPS) products.
- Mandate public procurement of HEPS by government departments.
- Provide rebates to HEPS products to kick start the market and bring initial prices down.
- Support sales efforts to encourage exports to neighbouring markets to benefit from economies of scale.

Question

Your government is proposing to introduce MEPS for electric fans. Several local fan manufacturers are upset, claiming that the MEPS in force in several neighbouring economies would ban most of their current products lines, and threaten their businesses.

What steps could you take to gain the support of local industry for the introduction of MEPS?

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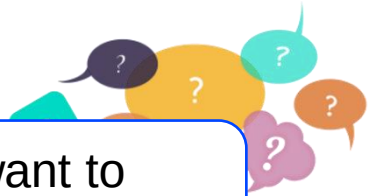
Question



List some of the reasons why a manufacturer might not want to switch to producing more efficient products!

https://www.menti.com/r4ed7gyvio

or

Go to www.menti.com and use the code **4875 8127**

What are the key issues?

- Is the claim correct or reasonable?
  - Assess product range against potential MEPS levels
  - What is required to make local products more efficient e.g.
    - Import different components
    - Re-tooling
- What are the barriers?
  - Capital for investment
  - Time required to change contractual arrangements
  - Insufficient confidence that the MEPS will be enforced
  - Perceived reduction in manufacturer’s profitability
  - Inertia, lack of will
- What can governments do to help the transition?
  - Design and implement consumer campaigns to give people confidence in efficient and new technologies
  - Lead by example and only buy highly efficient products themselves
  - Ringfence industry development funds and other incentive schemes for energy efficiency

What have countries done: China

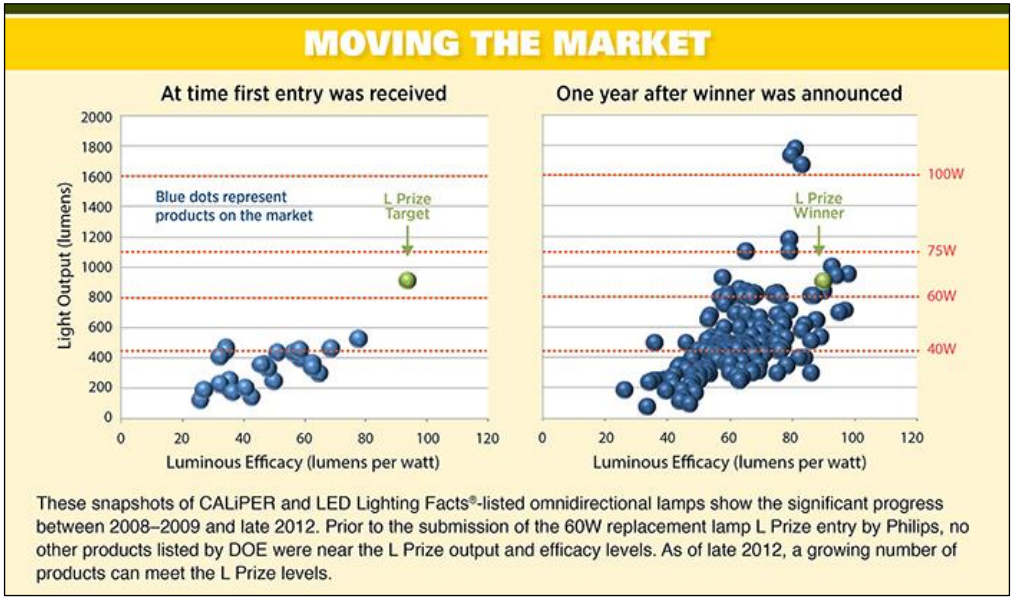
- Standards and Labelling Programme
- High Efficiency Performance (HEPS) Specification
- Manufacturers compete to place qualified products on a list
  - Rebate for consumers based on those listed products
  - Government procurement
- Why?
  - Increase the number/range of efficient products
  - Increase number of manufacturers able to produce more efficient products
  - Increasing the production volume leading to cost reductions
  - Increase domestic sales of efficient products by reducing their cost

What have countries done: US L Prize

- Published an LED Specification
- Rigorous testing requirements
- 1 million dollar award
- Why?
  - *To maintain the US as a base for manufacturing high tech products*
  - *To keep the US role in new technology (clean energy) development*
  - *To keep jobs in the high tech industry*
- Effect on the market?

US L Prize: Effect on the Market

The Effect of US L Prize on the Market (source: U.S. DOE)



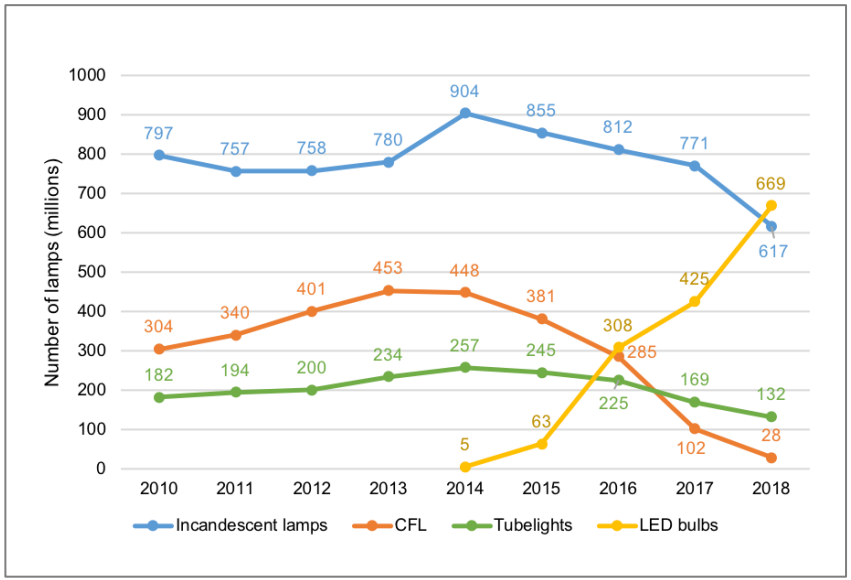
US L Prize entry helped catalyze market competition and pushed the whole industry toward a clear target.

What have countries done: Energy Efficiency Services Limited - India

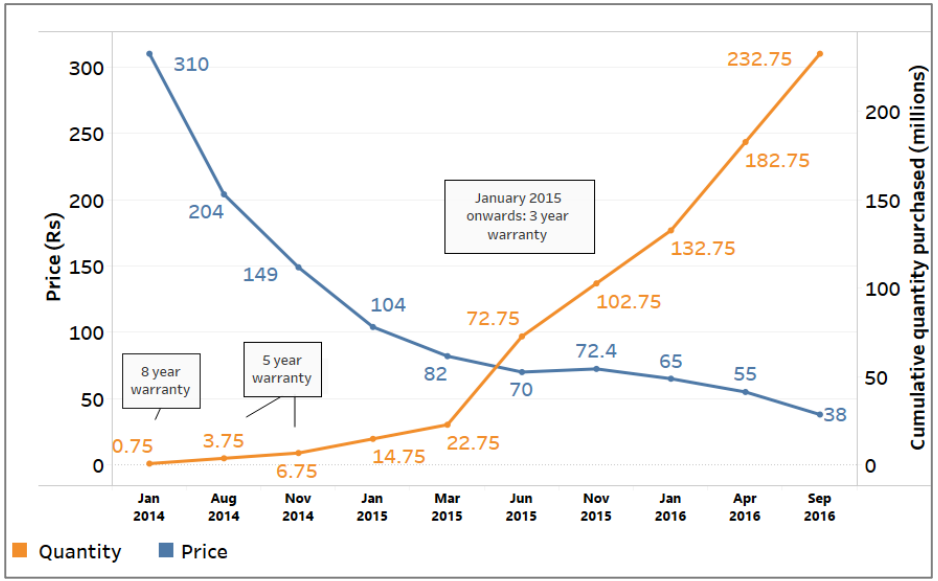
- Super ESCO rolling out efficient products at scale (e.g. 270m LEDS; 1.3m Fans)
- The massive scale reduced purchase price significantly with products being made available at less than the cost of a conventional light bulb therefore needing no subsidies
- Consumers could choose to pay through monthly power bills or buy up front
- Why?
  - *Stimulates high quality Indian LED lamp manufacturing industry*
  - *Enables utilities to meet growing electricity demand (especially peak demand)*
  - *Households can use the saving of 15% off power bills to improve their quality of life leading to economic growth and prosperity*

What have countries done: India “UJALA”

Quantity of sales of lamps with different technologies in India



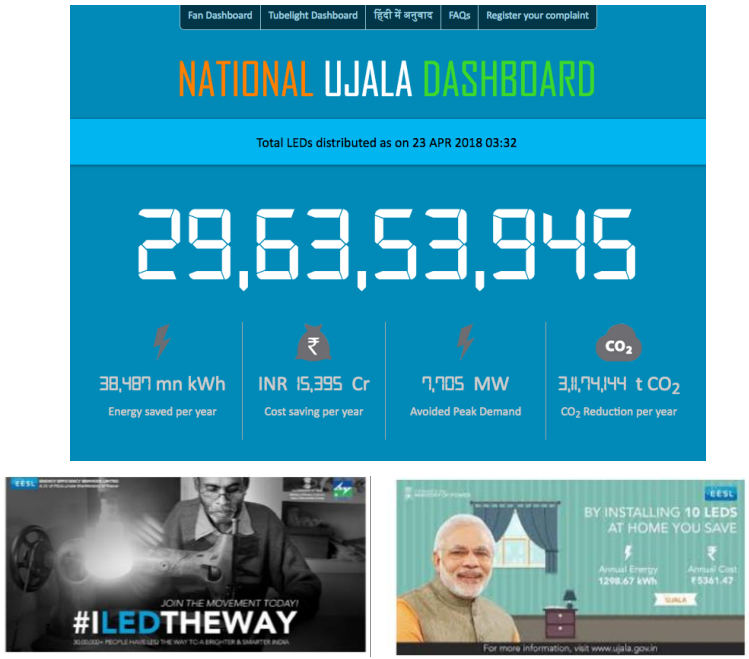
Price evolution in respect to the LED quantity



LED Lighting market has sky-rocketed

Demand aggregation, transparency, and a speedy bidding process

What have countries done: India “UJALA”



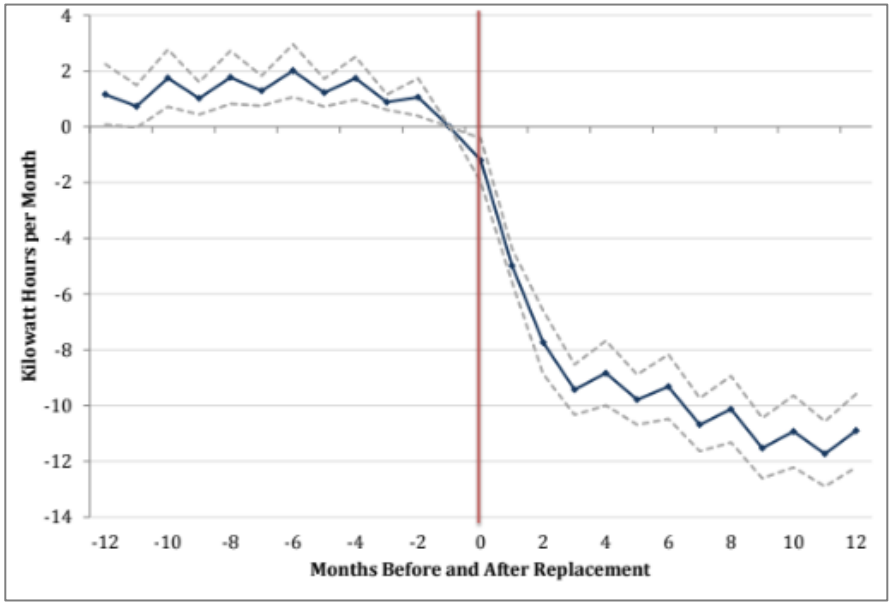
UJALA Marketing Campaign

Innovative Marketing Campaign

- Dashboard an effective marketing tool promoted by media and politicians
- #ILEDTHEWAY campaign, saw more than 75 million citizens committing to buy LED bulbs
- TV ads, Newspaper ads, mobile advertising vans all gave consumers information and confidence of the legitimacy of the scheme

Mexico: Cash for Coolers (C4C) Program 2009-2011

The Effect of Refrigerator Replacement on Household Electricity Consumption



How it Worked?

- Subsidy when a retailer replace an old cooling appliance (>10 yrs: refrigerators/AC) with a new efficient one.
- One appliance per household, mostly +90% refrigerators

Results

- About ~25 million eligible household (15%) had participated.
- **Refrigerator replacement reduced energy consumption by 7%, about ¼ of what was predicted.**
- **Air conditioner replacement increased electricity consumption**. More energy-efficient ACs cost less to use, which lead households to use them more.
- **The program was expensive to reduce externalities** – reducing electricity consumption at a cost of $0.30/kWh and reducing CO_2 emissions at a cost of $500/ton.

Evaluation - Mexico: Cash for Coolers (C4C) Program 2009-2011

Reasons for disappointing performances… (Davis et al., 2012)

Rebound effect…

- Increased usage of more efficient appliance – particularly for A/C (rebound effect). Results find that household end up increasing their energy consumption.

Bigger and Better…

- Appliance sizes have increased over time. Modest increases in size, substantially offset the potential efficiency gains of replacement.
- Appliance feature have also increased, for example: ice-makers, side-by-side doors, and through-the-door ice and water. These features are energy intensive

Sub – optimal targeting…

- The program does not appear to particularly effective at targeting households with very old appliances. A disproportionate fraction of old appliances were reported to just barely meet this requirement.
- Appliances were supposed to be working to be eligible but enforcement was performed by the participating retailer and neither the participant nor the retailer had much incentive to hold up a mutually beneficial purchase

Davis, L., Fuchs, A., & Gertler, P. (2012). Cash for coolers. *National Bureau of Economic Research*. https://doi.org/10.3386/w18044

Evaluation - Mexico: Cash for Coolers (C4C) Program 2009-2011

What can be improved?

- Some argued that C4C would have been more cost effective if participants had been required to purchase **more energy efficient appliances**.
- Programs rules **only required participants to purchase appliances that exceeded the MEPS by 5%**, this standards date back to 2002.
- **Currently there were dozens of available models that exceeded the standard by 20% or more**.

Pakistan: high efficiency fans

- Government procurement (offices and schools) have stimulated a new market segment.

- Nine manufacturers in Punjab now producing efficient fans.

Take-aways

- Local jobs and manufacturing capacity are very important to governments
- Getting local suppliers on-side is vital!
- Transitioning to production of more efficient products can provide significant opportunities:
  - For Companies:
    - Opening up export markets
    - Increased profitability
  - For Government:
    - Employment potential in future technologies
    - Improved energy supply reliability
    - Lower energy bills – increased disposable household expenditure
    - Better comfort levels – improved productivity and lower medical costs
  - For Utilities:
    - Lower cost supply of energy services to consumers & businesses

A packaged approach from government

- The details need to depend upon the barriers, which may be multiple
- Other ideas include:
  - Support for new products designs, e.g. technical assistance
  - Facilitate access to finance for re-tooling, e.g. low interest loans through banks, etc
  - Introduce a consumer-friendly endorsement label for high energy performance (HEPS) products
  - Mandate public procurement of HEPS products by government departments
  - Provide rebates to HEPS products to kick start the market and bring initial prices down
  - Support sales efforts to encourage exports to neighbouring markets
  - Assist the manufacturers in reducing their operating costs by improving their own operational energy efficiency

How to cover the costs?

- Use industry restructuring funds
- Value the deferred investment in power generation
- Value the reduction in peak load
- Value the reduced energy imports or exports
- Value increase in GDP through growth in manufacturing
- Value the jobs created
- Use funds saved through phasing out fossil fuel subsidies
- Undertake a holistic cost benefit analysis

Benefits

Energy Security

Reducing overall demand, efficiency can reduce reliance on fossil fuel

Energy bill savings

Cheaper efficient products for all

Job Creation

Growth in economy through growth in manufacturing jobs

Emission Reduction

Green house gas emissions reductions

Health and well-being

Reduced air pollution from reduced fossil fuel power generation

Collaboration between ministries is essential

- Energy
- Industry
- Environment
- Others?

Summary – What are the steps

- Assess how disadvantaged local manufacturers might be
- Identify the key barriers to transition
- Identify the time needed to transition
  - Agree MEPS but vary when it comes into force to allow for transition
- Identify all the potential benefits
- Put together a whole of government response to tackle barriers
  - Other ministries might include: Energy, Industry, Environment, Health, Others?
- Involve other stakeholders
  - Utilities, ESCOs, etc

Summary - How to cover the costs?

- Use industry restructuring funds
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Evaluation

What is evaluation?

- Evaluation is an **objective** process of understanding **how** a policy or programme was implemented, **what** effects it had, for whom and **why.**

- Leads to **more effective** policies and programmes

OECD Development Assistance Committee criteria for evaluation

RELEVANCE
is the intervention doing the right things?

EFFECTIVENESS
is the intervention achieving its objectives?

IMPACT
what difference does the intervention make?

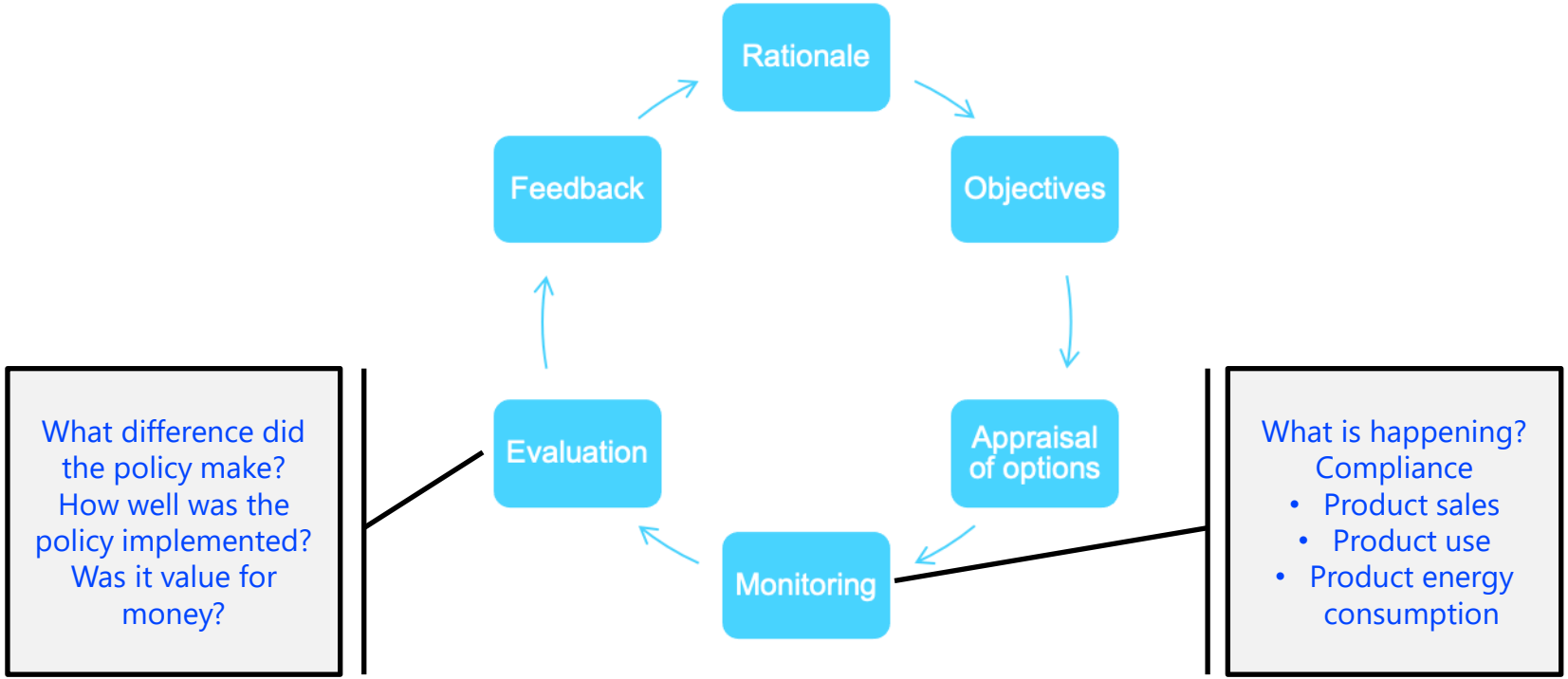
COHERENCE
how well does the intervention fit?

EFFICIENCY
how well are resources being used?

SUSTAINABILITY
will the benefits last?

http://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm

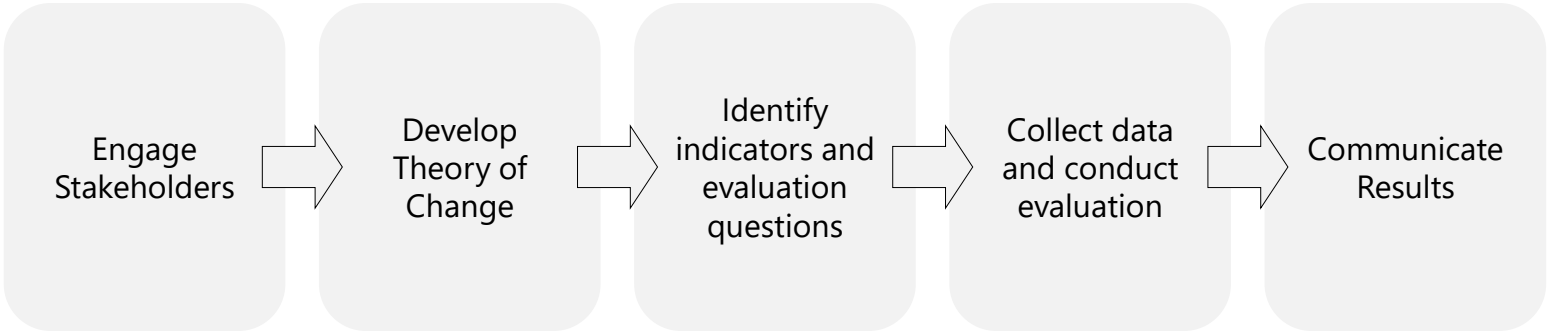
Monitoring and evaluation in the policy process



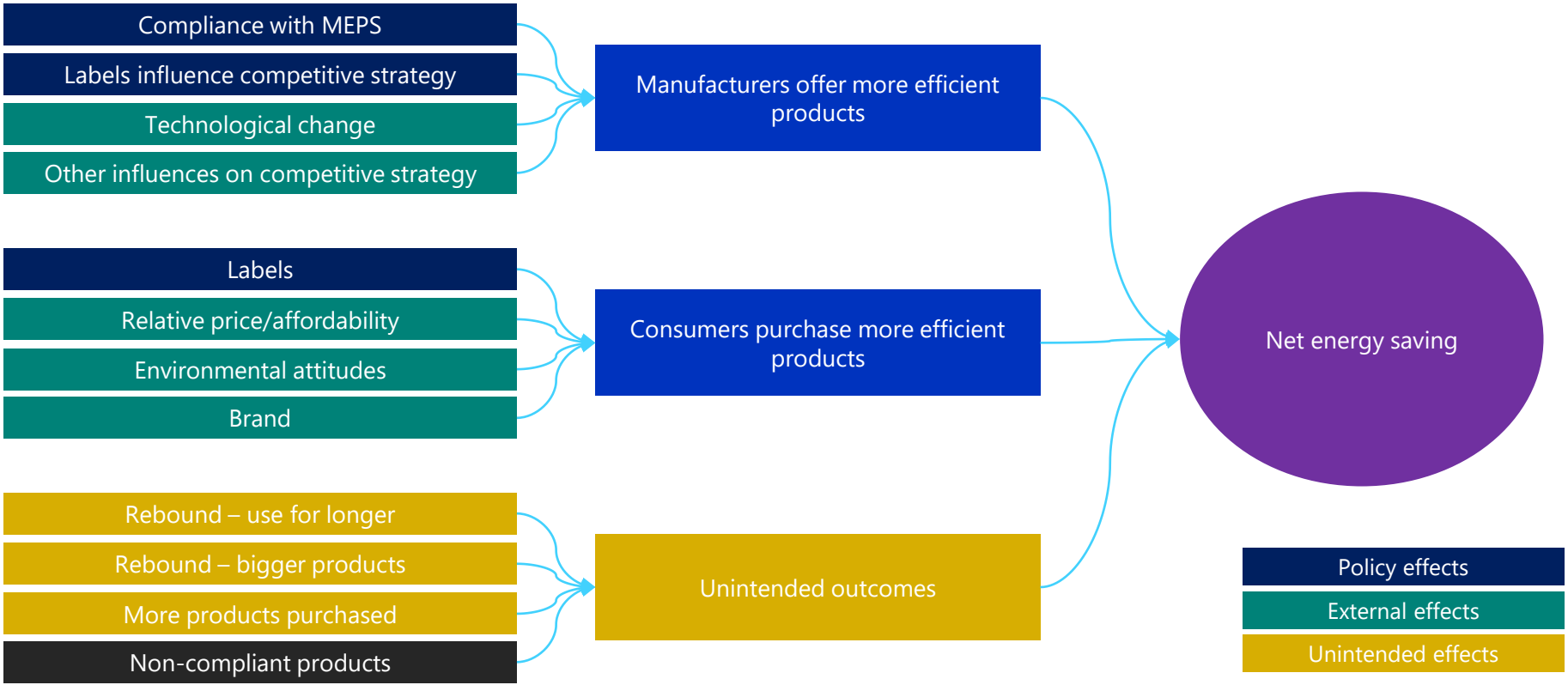
Why is evaluation important?

- Course correction
- Securing investment
- Understanding (multiple) benefits
- Assessing Gender Equality and Social Inclusion implications
- Communicating with stakeholders
- Designing new programmes

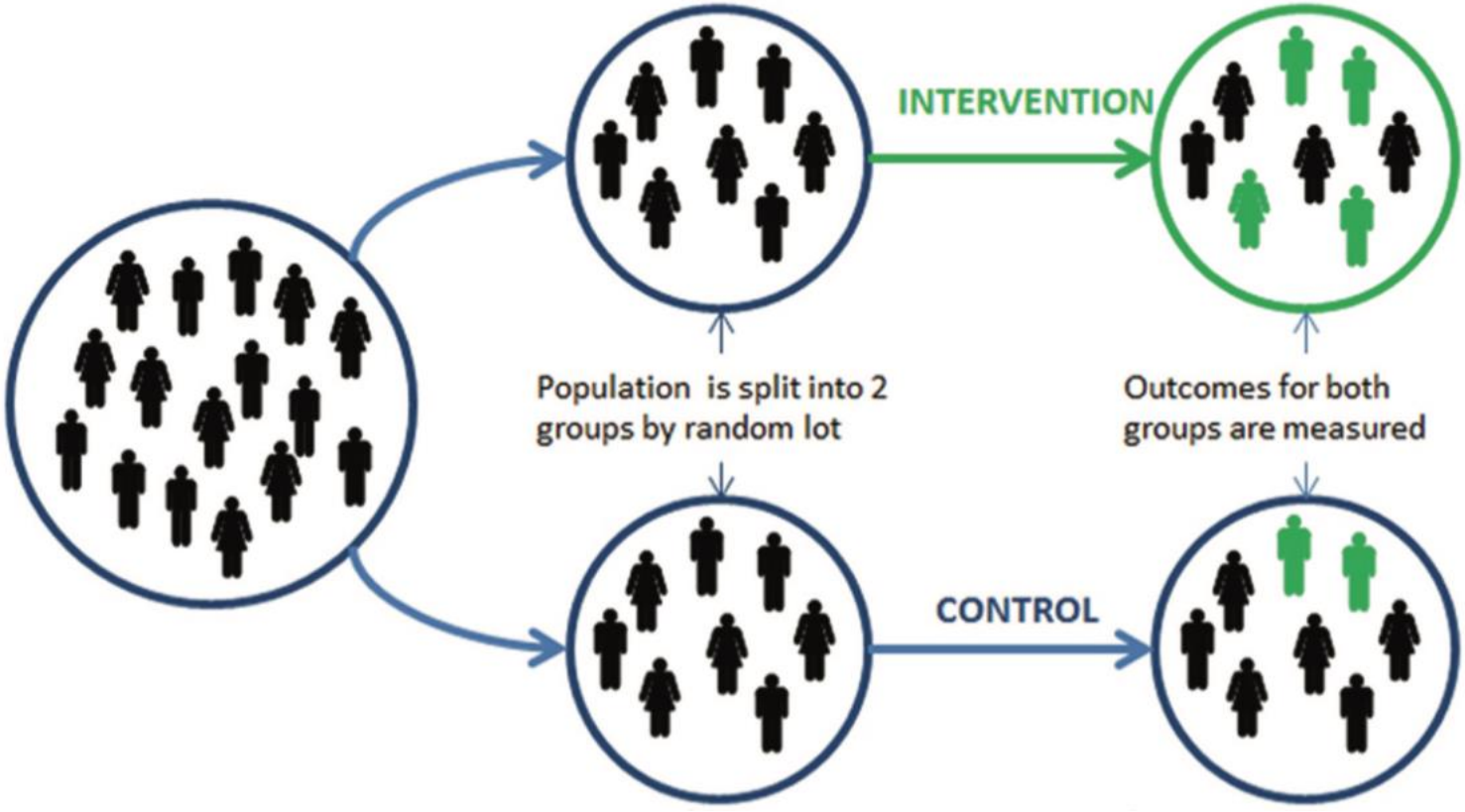
Evaluation process



How do appliance policies work?

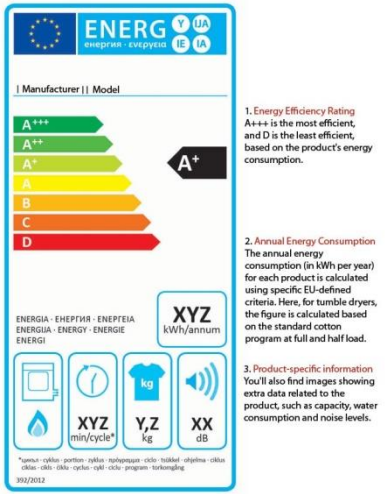


Estimating the effect of energy labels – randomised control trial



Example – randomised control trial

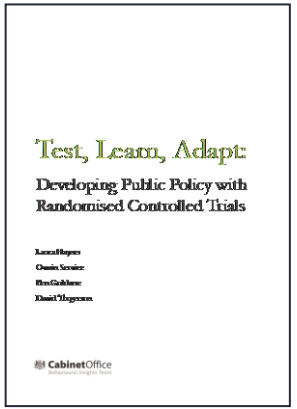
- Test the inclusion of costs on energy label + staff training
- UK Government + John Lewis department store
- Trial group of stores compared to control group
- Small difference for washer dryers, no difference for other products

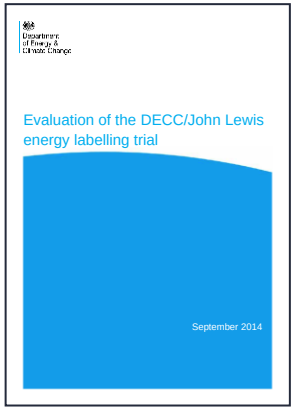


Randomised control trial

- 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





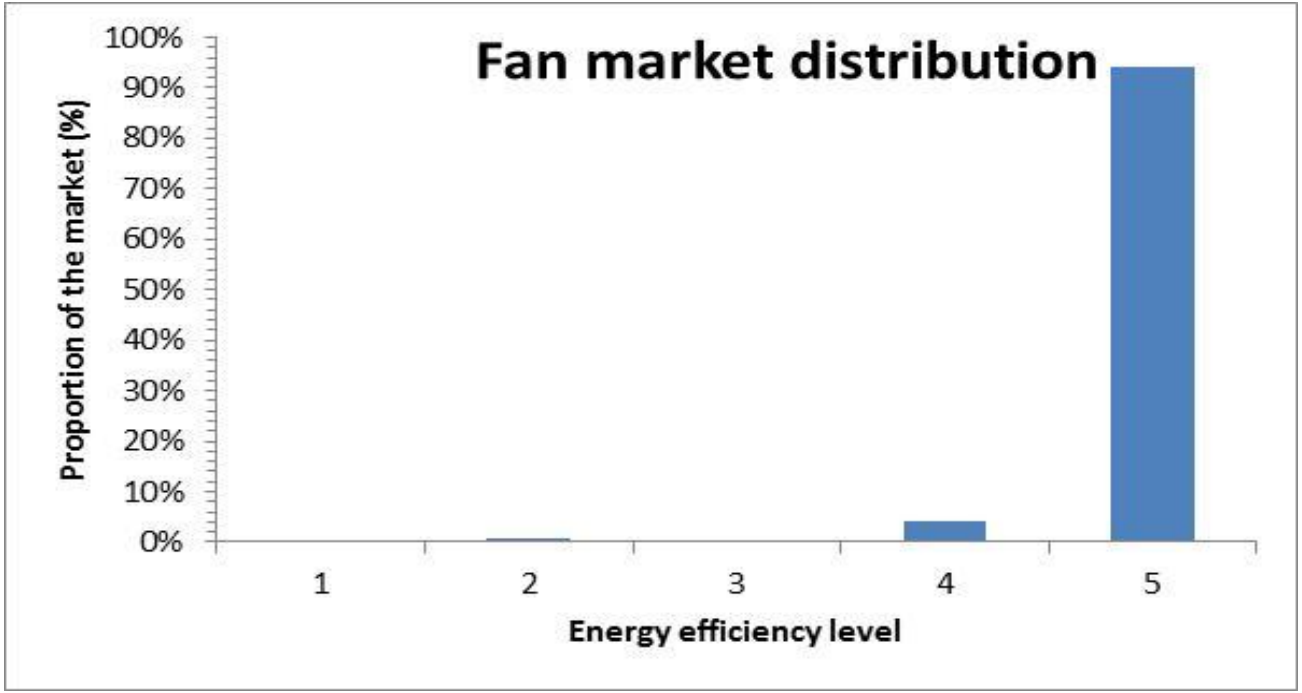
Estimating the effect of energy labels – theory-based

- In theory, 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
- Contribution analysis assesses the contribution to the change made by:
  - The policy
  - Alternative explanations
- Assess plausibility with a diverse range of stakeholders

Example of theory-based evaluation

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

Could more energy be saved?



Self-study

Instructions

- Review the slides from today's session
- Complete the self-assessment quiz here: https://eu.surveymonkey.com/r/79XXBZT

- Complete the self-study exercise: Understanding Incentives (**Read the Word Document provided**)
- Please email your answers to: Energy.Efficiency@iea.org
  - Please label file: Last Name_First Name_05May
- If you have any questions don’t hesitate to reach out!