International Energy Agency

Energy Efficiency Training Week

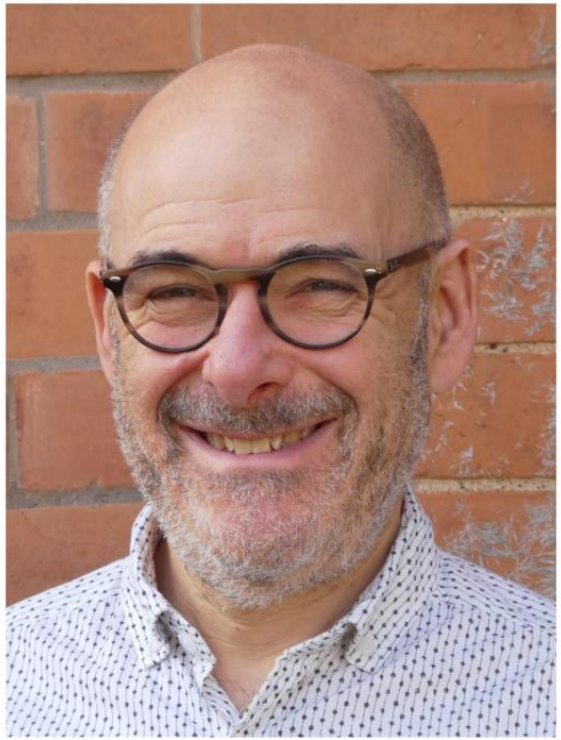
Indicators and Evaluation

Charles Michaelis, Mafalda Silva and Fabian Voswinkel

2nd – 6th May 2022

Course leaders

- Charles Michaelis
  - From the UK with experience in Indonesia, Vietnam, China and Australia
  - Monitoring and evaluation of energy efficiency policies for 30 years
  - Indicators and evaluation helps to deliver better policies with better results for people and the environment
  - Hoping to build understanding of indicators and evaluation to help you in your work in future



Course leaders

- Mafalda Silva
  - From Portugal with experience in development and methodologies for efficiency indicators and indicators analysis
  - Former IEA official – Statistics manager at the IEA leading the efficiency indicators work stream (2017 – 2021)
  - Coordinator and principal researcher in research projects around sustainable development and energy efficiency
  - Good policies need evidence: data and indicators are central to policy design and evaluation in any field
  - Hoping to provide useful takeaways on indicators and evaluation for daily work in your countries and to learn from your experience

Course leaders

- Fabian Voswinkel
  - From Germany with experience in Brazil, EU and the Balkans
  - Experience in evaluation of large scale energy efficiency policies and development of methodologies
  - Working at the IEA Energy Efficiency Division in evidence-based policy analysis
  - We design policies to make an impact.
    Let’s make that count and get to know the impact!

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Indicators and Evaluation

Focus on how to assess the results of energy efficiency policies and programmes. The course will cover:

1. **Key data and indicators,** and how to use them to inform different stages of the policy cycle.
2. Understanding **policy progress and effectiveness** and what can be improved.
3. **Designing** new policies and programmes and refining existing ones.
4. Principles of **monitoring and evaluation** techniques and how to implement them.
5. How to **collect data to address gaps**.

Agenda: Day 2 – Indicators and Evaluation stream

Indicators and Evaluation	Time
Trainers: Charlie Michaelis, Mafalda Silva and Fabian Voswinkel Welcome and introduction to the indicators and evaluation element of the course Introduction to the case studies Key concepts in indicators and evaluation: • Policy cycle • Indicators (IEA statistics) • Evaluation (OECD DAC criteria) Questions Comfort break Practical exercise Introduction to Theories of Change as the foundation for policy monitoring and evaluation Gender, Equity and Social Inclusion (GESI) implications Introduction to self-study; materials and assignment Questions	1.5 hrs Live instruction 60 participants
Self-study (TOC)	1.5 hrs Self-study
Group assignment on TOC for case studies Facilitators G1: Charles Michaelis & Luiz Oliveira (Brazil) G2: Mafalda Da Silva & Ludmilla Diniz (UNDP) G3: Fabian Voswinkel /Domenico Lattanzio & Juan Ignacio Navarrete (CONUEE, Mexico)	1 hr Facilitated breakout group work 3 groups of 20 participants
Report back	30 minutes 60 participants
Closing	15 minutes 60 participants

Agenda: Day 3 – Indicators and Evaluation stream

Indicators and Evaluation	Time
Trainers: Charlie Michaelis, Mafalda Silva and Fabian Voswinkel Welcome and recap of day 1 Using TOC to identify which indicators to monitor Introduction to the IEA energy balances and efficiency indicators Questions Comfort break Developing and using bespoke indicators including GESI implications Introduction to self-study; materials and assignment Questions	1.5 hrs Live instruction 60 participants
Self-study (efficiency indicators)	1.5 hrs Self-study
Group assignment on TOC to identify indicators Facilitators G1: Charles Michaelis & Luiz Oliveira (Brazil) G2: Mafalda Da Silva & Ludmilla Diniz (UNDP) G3: Fabian Voswinkel /Domenico Lattanzio & Juan Ignacio Navarrete (CONUEE, Mexico)	1 hr Facilitated breakout group work 3 groups of 20 participants
Report back	30 minutes 60 participants
Closing	15 minutes 60 participants

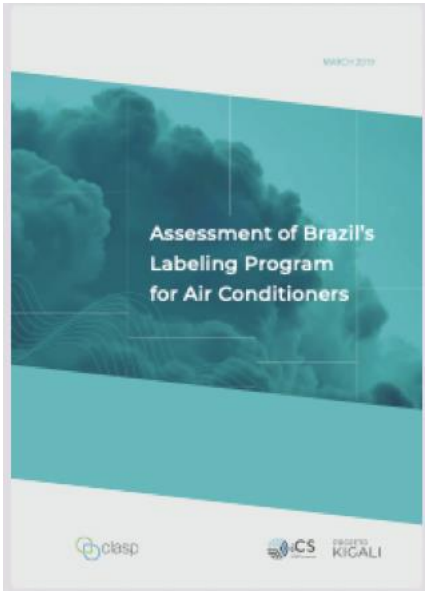
Agenda: Day 4 – Indicators and Evaluation stream

Indicators and Evaluation	Time
Trainers: Charlie Michaelis, Mafalda Silva and Fabian Voswinkel Welcome and recap of day 2 How to use OECD-DAC evaluation criteria and TOC to identify evaluation questions Approaches to assessing the difference made by a policy of programme (attribution) and when to use them Questions Comfort break Content of an evaluation plan GESI implications Introduction to self-study; materials and assignment Questions	1.5 hrs Live instruction 60 participants
Self-study (evaluation approaches)	1.5 hrs Self-study
Group assignment on developing evaluation questions Facilitators G1: Charles Michaelis & Luiz Oliveira (Brazil) G2: Mafalda Da Silva & Ludmilla Diniz (UNDP) G3: Fabian Voswinkel /Domenico Lattanzio & Juan Ignacio Navarrete (CONUEE, Mexico)	1 hr Facilitated breakout group work 3 groups of 20 participants
Report back	30 minutes 60 participants
Closing	15 minutes 60 participants

Also...

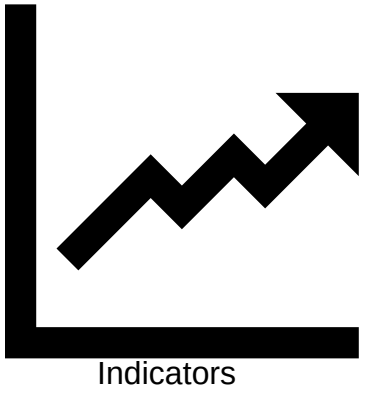
- Networking tables
- End of day check in

Introduction to the case study – energy labels in Brazil



Efficiency Indicators

Energy efficiency indicators: first things first



What is energy efficiency?

- Using **LESS** energy to provide the **SAME** service

  e.g. replace incandescent bulbs with LED

- Consume the **SAME** energy to provide **MORE** service

  e.g. increased production with the same energy input

What is energy efficiency?

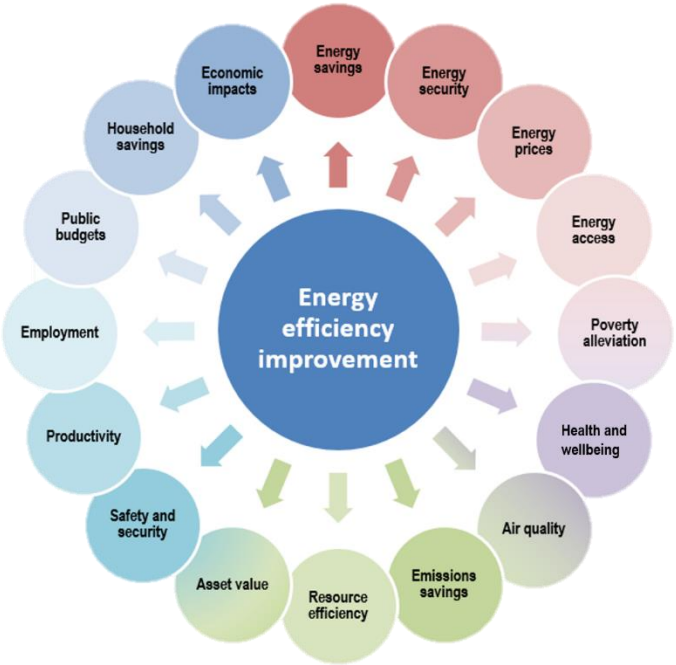
- Consume **LESS** energy because of **CHANGE** in service

  e.g. economic restructuring

- Consume **LESS** energy and provide **LESS** service

  e.g. soft modes instead of driving

The importance of energy efficiency

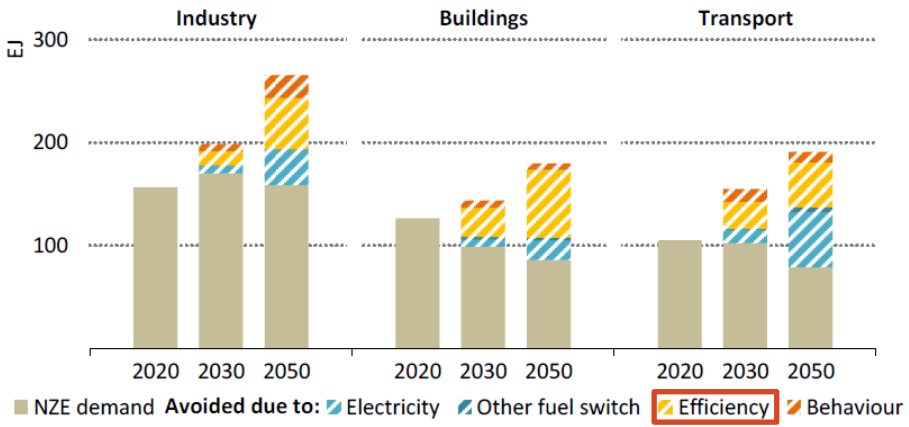


Source: IEA (2014), *Capturing the multiple benefits of energy efficiency*, *All rights reserved*.

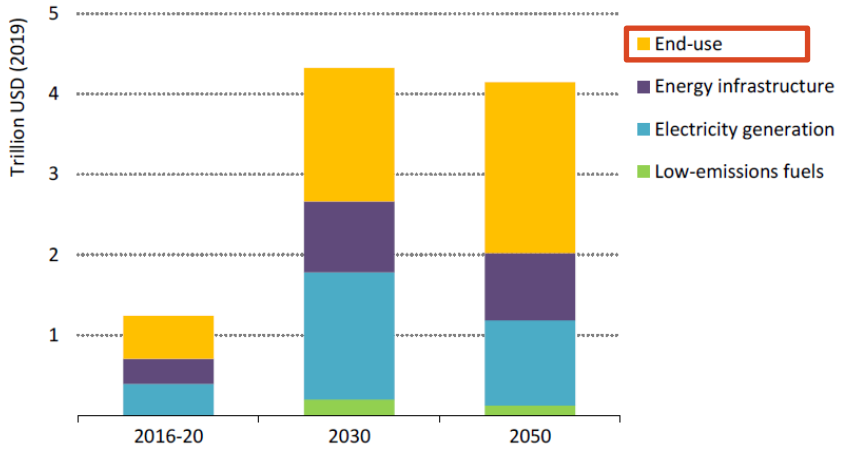
There are multiple benefits (environmental, economic and social) from energy efficiency

Global net-zero by 2050 only possible with energy efficiency

Total final consumption and demand avoided by mitigation measures in the NZE



Clean energy investment in the net zero pathway



Source: IEA Net-zero by 2050 - https://www.iea.org/reports/net-zero-by-2050

A large potential is still untapped. Tracking efficiency progress is key.

What are Indicators?

Indicators are **clues, signs** or markers that describe **observable** changes or **events** which relate to a programme or policy and show how close a programme or policy is to its **desired path** and outcomes.

Indicators provide the **evidence** that something has happened – e.g. an **immediate** effect or a **long-term** change.

The dictionary definition of indicators:

Cambridge dictionary (UK): Something that shows what a situation is like.

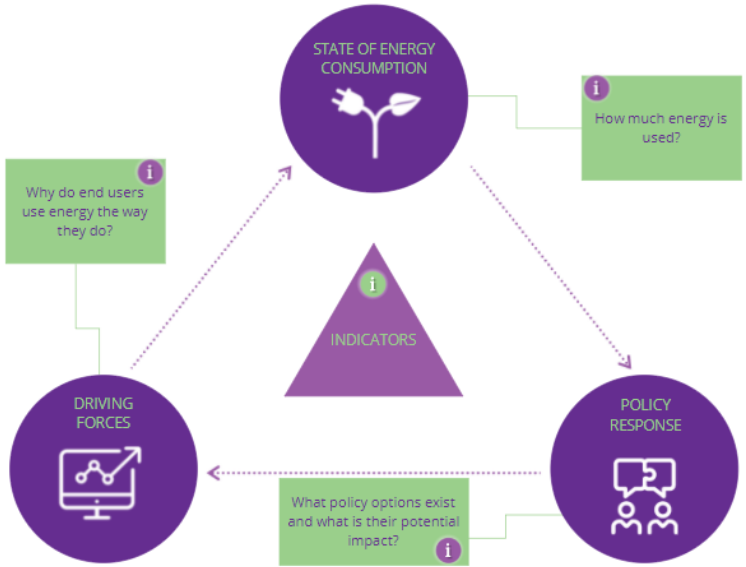
Cambridge dictionary (US): A sign or signal that shows something exists or is true, or that makes something clear.

What is an energy efficiency indicator?

$$Energy\ efficiency\ indicator\ = \frac{Energy\ consumption\ (by\ fuel\ or\ as\ a\ total)}{Activity\ (by\ end\ use)}$$

A given indicator explains how much energy is needed to provide a certain service

The role of efficiency indicators



Source: IEA elearning courses (course 1)

Data protection (DP)

- EU's General Data Protection Regulation (GDPR) is considered one the toughest privacy and security law in the world.

- It aims to enhance individuals' control and rights over their personal data.
  - **Personal data** — Personal data is any information that relates to an individual who can be directly or indirectly identified (e.g. names and email addresses). Location information, ethnicity, gender, biometric data, religious beliefs, web cookies, and political opinions can also be personal data.

  - **Data collection and processing** — Any action performed on data, whether automated or manual. The examples cited in the text include collecting, recording, organizing, structuring, storing, using, erasing...

- In Latin America, Chile was the first country to adopt DP law in 1999, followed by Argentina (2000). Several countries have followed: Uruguay (2008), Mexico (2010), Peru (2011), Colombia (2012), Brazil (2018), and Panama (2019). There are different privacy approaches though, for example in the way that countries define anonymized data.

(Source: Electronic Frontier Foundation)

Monitoring and evaluation

What is monitoring?

- Ongoing measurement of evidence relating to policy and programme implementation (indicators). This can include activities, outputs, outcomes and contextual information.

- For an appliance label policy, indicators could include:
  - Market size, proportion of products labelled
  - Consumer awareness and attitudes
  - Compliance with policy
  - Sales by brand and efficiency level
  - Average energy consumption
  - Residential and commercial buildings energy efficiency for the economy

- Frequency and accuracy of measurement depends on policy type and policy maker needs

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

Purpose of monitoring and evaluation

- What we have achieved

- How we can improve

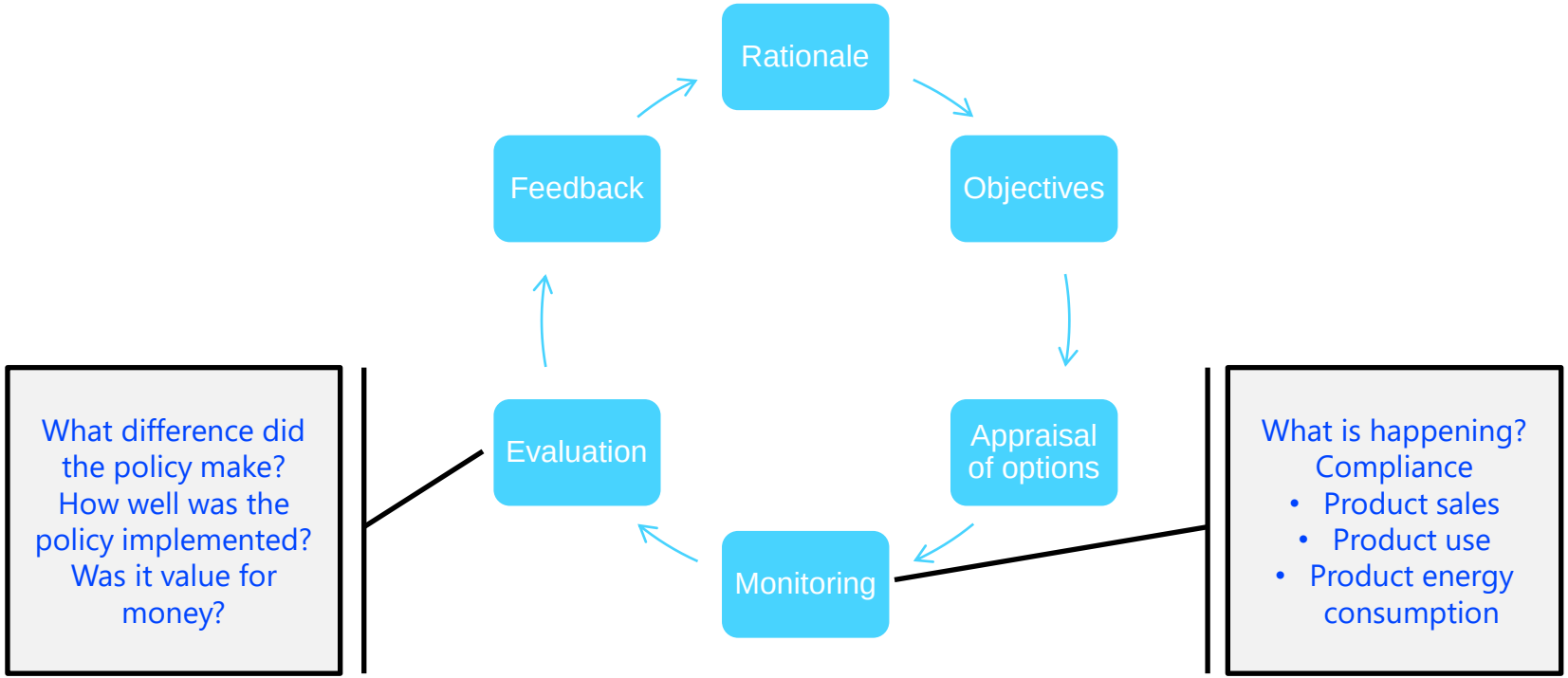
Different questions for different needs

- Regulators
- NGOs and public

- Programme managers
- Partners

- Funders
- Treasury

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

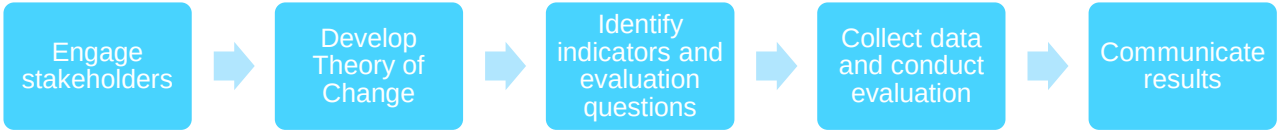
Communicating with stakeholders

Designing new programmes

Critical questions for energy efficiency policy makers

- What impact are energy efficiency policies having? Consider the impact on energy security, costs to consumers and energy consumption/CO2 emissions as well as multiple benefits. Are we on track to meet our energy efficiency goals?
- How well are existing policies and measures working?
  - How could existing policies and measures be made more effective?
  - What new policies and measures could be implemented?
- Is energy efficiency being delivered at a fast enough rate? If not, what needs to be done to address this issue?
- Are energy efficiency policies and measures providing good value for money?

Evaluation process



OECD Development Assistance Committee criteria for evaluation

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

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Questions?

5 minute break

Gender Equality and Social Inclusion (GESI)

What does GESI entail?

- Gender
  - Unlike sex, gender is not a biological determinant, but rather **socially constructed differences between males and females**, which include (but are not limited to): **rights**, **entitlements**, and **obligations**. The way in which a society defines gender determines the roles, behaviours, activities, and attributes that a given society at a given time considers appropriate for men and women. (UK PACT, 2021)

- Gender equality
  - The **absence of any discrimination** based on gender, with **equal rights, responsibilities**, and **opportunities** for everyone, without distinction depending on their gender. […] It means ensuring that everyone has **equal access** to socially, economically, and politically **valued goods**, **resources**, **opportunities**, **benefits**, and **services**. (UK PACT, 2021)
  - “Gender equality is not just about women, but about inequalities that cut across social, economic and cultural systems and norms. A gendered perspective helps to identify these inequalities and address the wider issues of voice, representation and participation in decision making.” (Tacoli et al, 2014)

What does GESI entail?

- Social Exclusion
  - Involuntary exclusion of individuals and groups from society's political, economic and societal processes, which prevents their full participation in the society in which they live.
    (UN Department of Economic and Social Affairs, 2010)

- Social Inclusion
  - Refers to the process of **improving the terms** for individuals and groups to **take part in society**, and the process of **improving the ability**, **opportunity** and **dignity** of people **disadvantaged** on the basis of their identity to take part in society. It is essentially **making the 'rules of the game' fairer where there are imbalances**. (UK PACT, 2021)

- Poverty
  - The lack of economic resources, and so defined, is an important cause of social exclusion in as much as the lack of those resources prevents participation. (UN Department of Economic and Social Affairs, 2010)

GESI in Green Transition policies

- Climate change affects people differently
  - Differences among gender, unequal access to resources, rights and opportunities
  - Impacts of climate change and disasters weigh more heavily on disadvantaged people
- Decisions on energy use require equal rights, entitlements and obligations
  - Equal access to goods, resources, opportunities, benefits, and services

Just Transition considerations for energy policies

- Energy policy has benefits and burdens
  - Changes in energy cost affect low-income households more
  - Investment in energy efficient technologies requires upfront investment
    - Access to information, credit or investment security not equal among society
  - Different energy sources more relevant for certain societal groups
    - Benefits from retrofit subsidies may be reaped more by home owners than renters
    - Costs of higher petrol prices more relevant for car drivers
  - Multiple benefits benefit groups differently
    - Created jobs in engineering are often benefitting men more than women
    - Increased air quality benefits urban population or neighbours of industrial plants most
  - Public finance impacts society depending on tax regime and other factors
    - Direct taxes (e.g. income tax) can be designed to be progressive
    - Indirect taxes (e.g. VAT) are generally regressive, affecting those more that spend more of their income on consumption

Theories of change

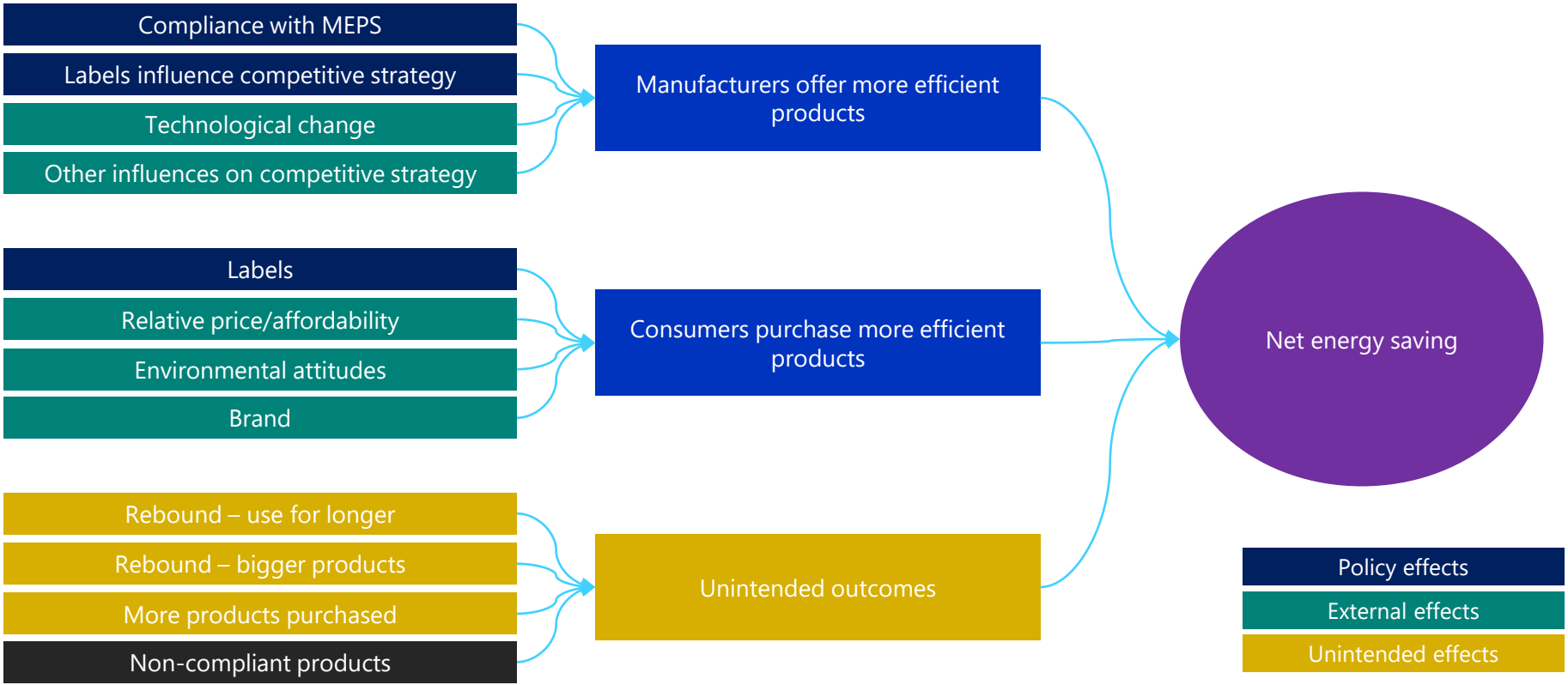
Theory of change

- Forms the basis of monitoring and evaluation
- Should be developed alongside policy/programme design
- Participative process
- Refine in the light of evidence

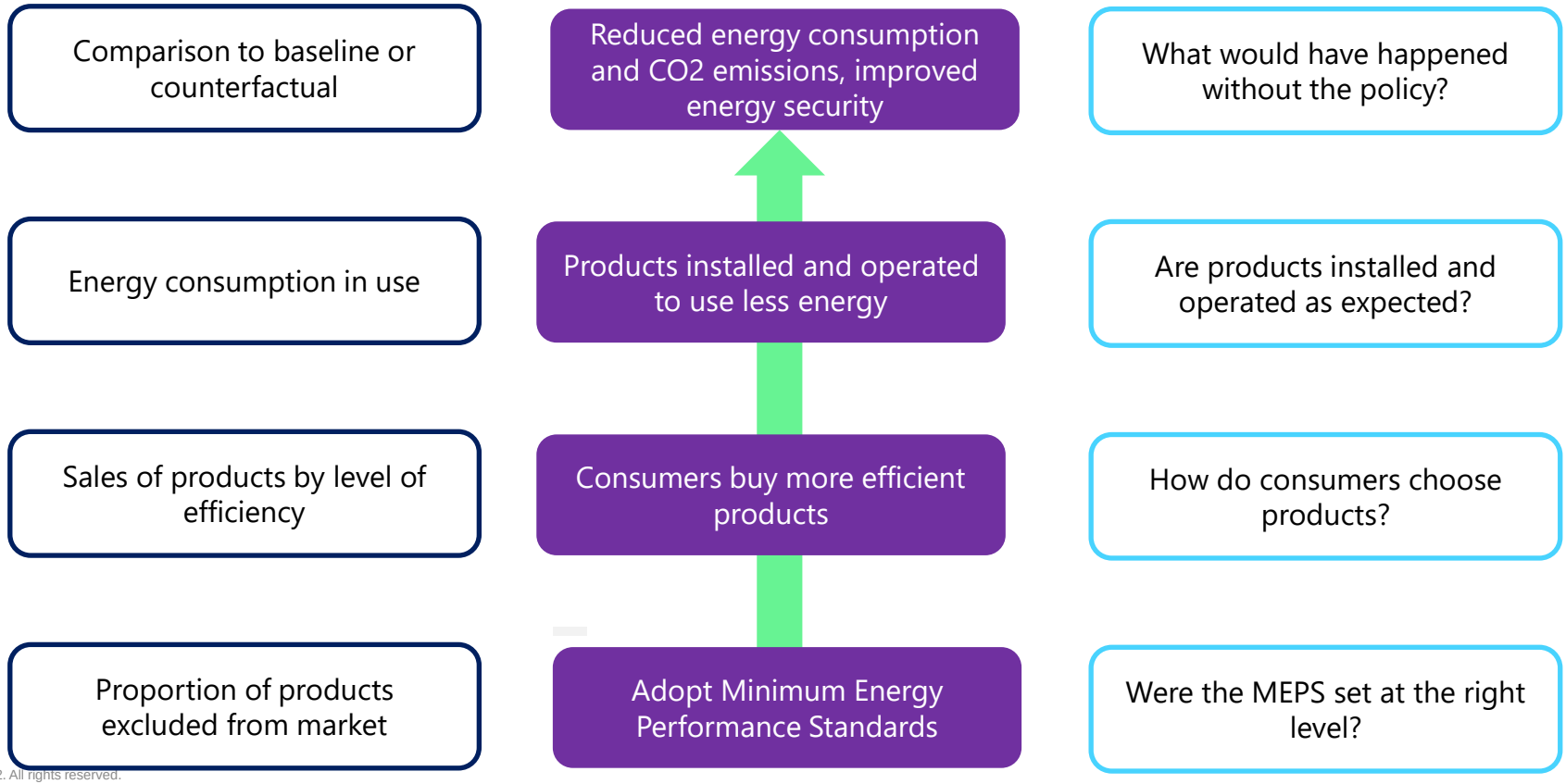
Generic theory of change for MEPS

Input	Activity	Output	Outcome	Impact
Resources used to deliver the programme /policy – time and money	What is done e.g. determine and implement MEPS	What happens as a direct result – inefficient products removed from market	Effect of the change – installed product stock becomes more efficient	Wider effects – reduced energy consumption and CO_2 emissions, multiple benefits

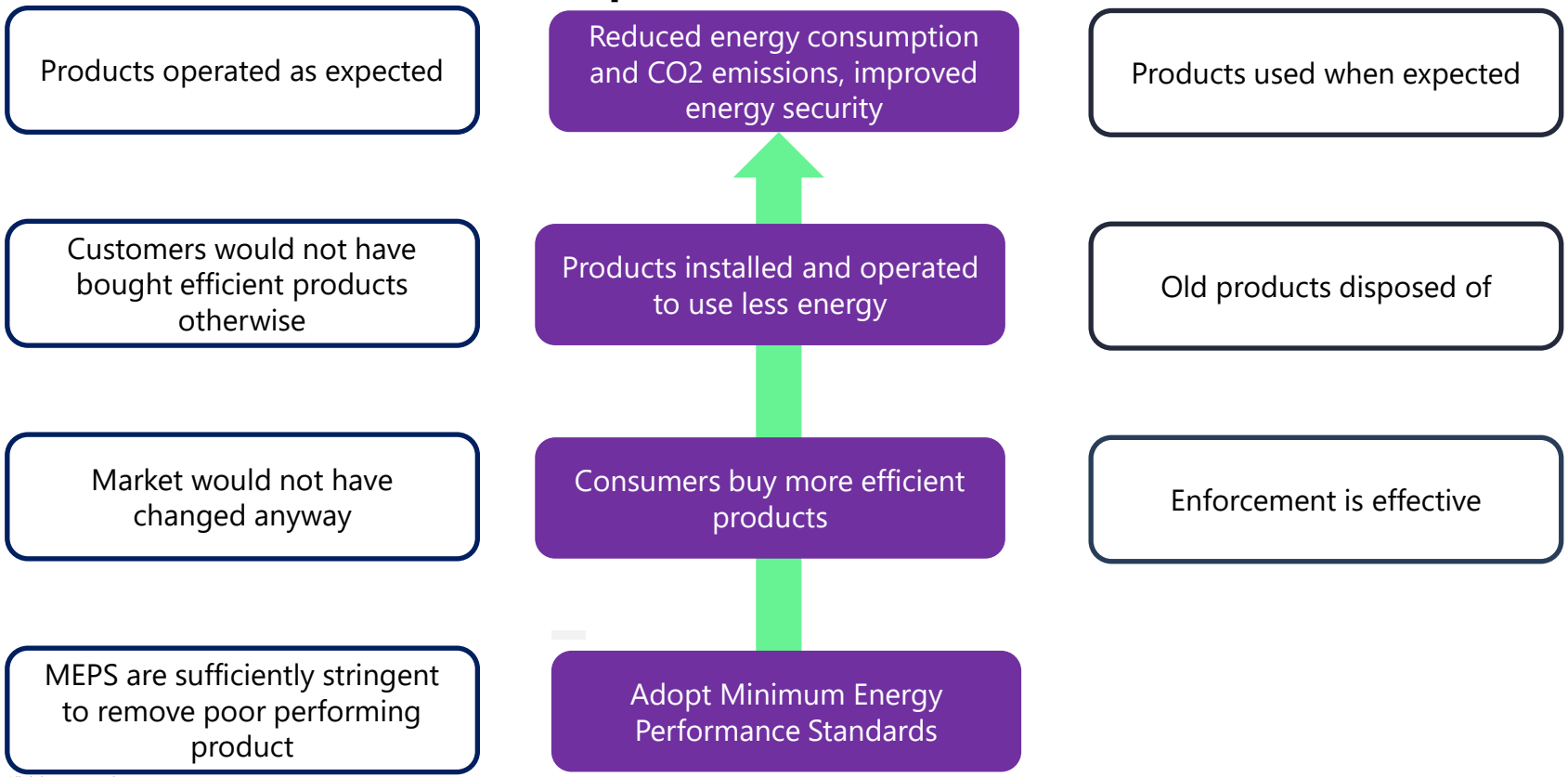
How do appliance policies work?



Example indicators and evaluation questions for MEPS



Evaluation should test assumptions



Self Study

Self-study assignment

Latin America Energy Efficiency Policy Online Training Week

Day 2, Indicators and Evaluation

Self-study session instructions

The self-study session is intended to build on the content of the lectures and to prepare for the break out groups.

Please read the references below and then answer the two questions.

Please submit responses via google forms here or if this is not possible to Alison.Pridmore@iea.org

Reading:

- UK Government Magenta Book pages 24-27. Link here
- Vogel – section C pages 28-31
  here
- DECC evaluation guide pages 6, 7 and 8 here
- Assessment of Brazil's Energy Labelling Programme pages 10-19
  Portuguese here
  English here

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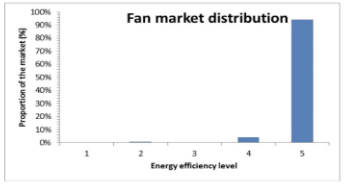
Questions:

1. The chart below shows the energy efficiency label rating for the fans on the market in an Asian economy; it can be seen that nearly all fans on the market meet the highest energy efficiency rating.

   What policy changes would you recommend to improve the energy efficiency of fans in this economy and why?



2. The chart below shows the distribution of air conditioner energy efficiency prior to the introduction of MEPS and labelling. The horizontal lines on the chart show the proposed levels for MEPS (the lowest line) and three higher label grades.

   What effect do you think this policy will have on the efficiency of products on the market and why?

   Note: The EER (Energy Efficiency Rating) provides the ration of useful cooling output to electricity input. The higher the EER, the more efficient the device.

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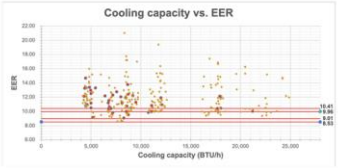

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Breakout groups

Breakout groups

- Your mission:
    - Develop a Theory of Change for either:
        - Air conditioner labels
        - MEPs for refrigerators
- What are the key assumptions?
- What are the risks and potential negative outcomes?
- Materials; TOC template in ppt format (problem description, activities, outputs, outcomes, impacts), considering other supporting policies, assumptions, unintended outcomes, risks.

Theory of Change template – Problem description

What is the problem that the policy is designed to address?
How will it do that?

Theory of Change template – Activities

What will the policy do to address the problem?
Are there other relevant policies, do they support or obstruct the desired change?
What key assumptions have you made?

Theory of Change template – Outputs

What will be different as a result of the activities?
What key assumptions have you made?
What are the risks?

Theory of Change template – Outcomes

What will be different as a result of the outputs?
What key assumptions have you made?
What are potential unintended outcomes?

Theory of Change template – Impact

What impact do you expect on energy consumption?
What key assumptions have you made?
What multiple benefits might be obtained?

Reporting back from breakout groups

Close + most memorable learning point