Energy Efficiency Training Week
Indicators and Evaluation

Session 3: The role of indicators and evaluation

Charles Michaelis and Mafalda Silva

Paris 21 May 2019

IEA #energyefficientworld

What's in this session

- Indicators and evaluation as part of policy making

- Types of indicator

- Types of evaluation

- Introduction to theories of change

- Choosing indicators and setting evaluation questions

- What we have achieved

- How we can improve

CERTIFIED TRAINER

Different questions for different needs

Impact, what did we achieve?

Process, how did it go?

Economic, did we get value for money?

- Regulators
- NGOs and public

- Programme managers
- Partners

- Funders
- Treasury

Indicators and evaluation in the policy making process
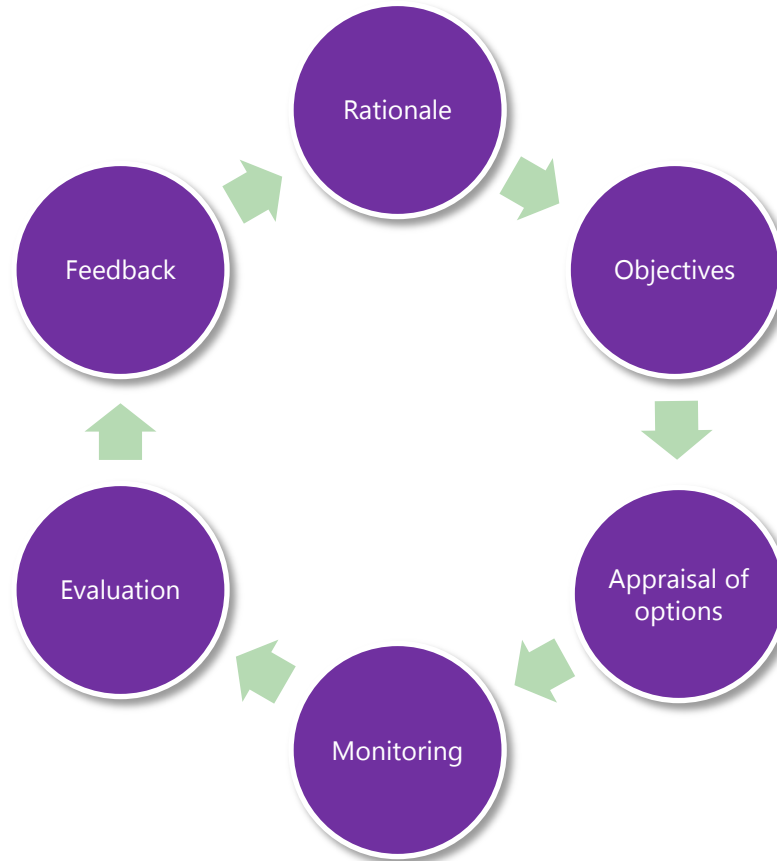
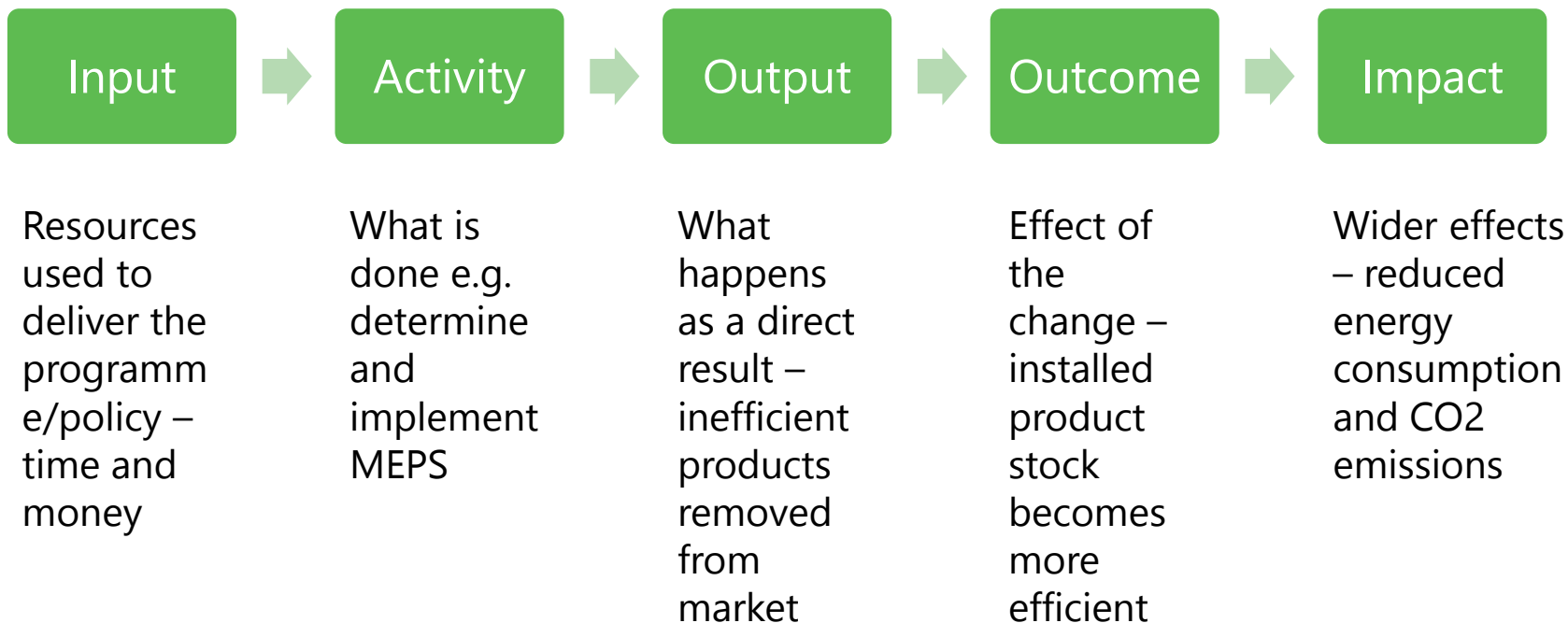# What indicators are we interested in?

- Economy...
  - Whole economy
  - Sector e.g. industry
  - End use e.g. food and drink

- Policy/programme
  - Compliance/uptake
  - Technology adopted
  - Behaviour change
  - Energy saved

OECD Development Assistance Committee criteria for evaluation

- Relevance – are the objectives still valid, are the activities consistent with the objectives?

- Effectiveness – to what extent did the policy achieve its objectives?

- Efficiency – was the policy good value for money?

- Impact – what difference did the policy make?

- Sustainability – will the benefits be sustained after the funding ceases?
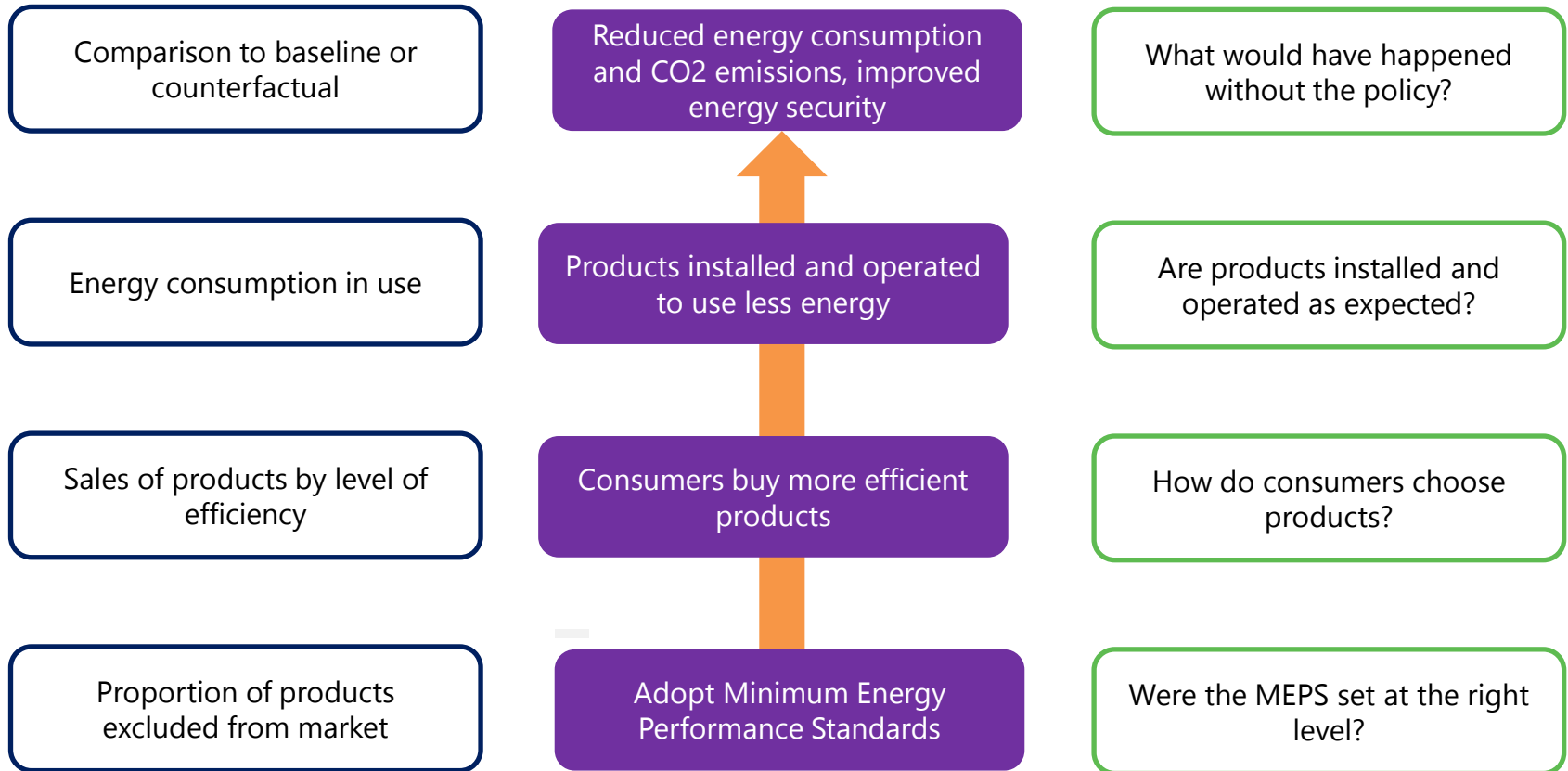
http://www.oecd.org/dac/evaluation/daccriteriaforevaluatingdevelopmentassistance.htm

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

Input → **Activity** → **Output** → **Outcome** → **Impact**

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 CO2 emissions

Example indicators and evaluation questions for MEPS

Comparison to baseline or counterfactual	Reduced energy consumption and CO_2 emissions, improved energy security	What would have happened without the policy?
Energy consumption in use	Products installed and operated to use less energy	Are products installed and operated as expected?
Sales of products by level of efficiency	Consumers buy more efficient products	How do consumers choose products?
Proportion of products excluded from market	Adopt Minimum Energy Performance Standards	Were the MEPS set at the right level?

Evaluation should test assumptions

Products operated as expected

Reduced energy consumption and CO2 emissions, improved energy security

Products used when expected

Customers would not have bought efficient products otherwise

Products installed and operated to use less energy

Old products disposed of

Market would not have changed anyway

Consumers buy more efficient products

Enforcement is effective

MEPS are sufficiently stringent to remove poor performing product

Adopt Minimum Energy Performance Standards

Are the MEPS and label grades set at the right level?

Cooling capacity vs. EER

EER vs. Cooling capacity (BTU/h)

Reference lines: 10.41, 9.96, 9.01, 8.53

Are the MEPS set at the right level?

Fan market distribution

(Vertical axis: Proportion of the market (%), 0% to 100%. Horizontal axis: Energy efficiency level, 1 to 5.)

Main sources of evidence
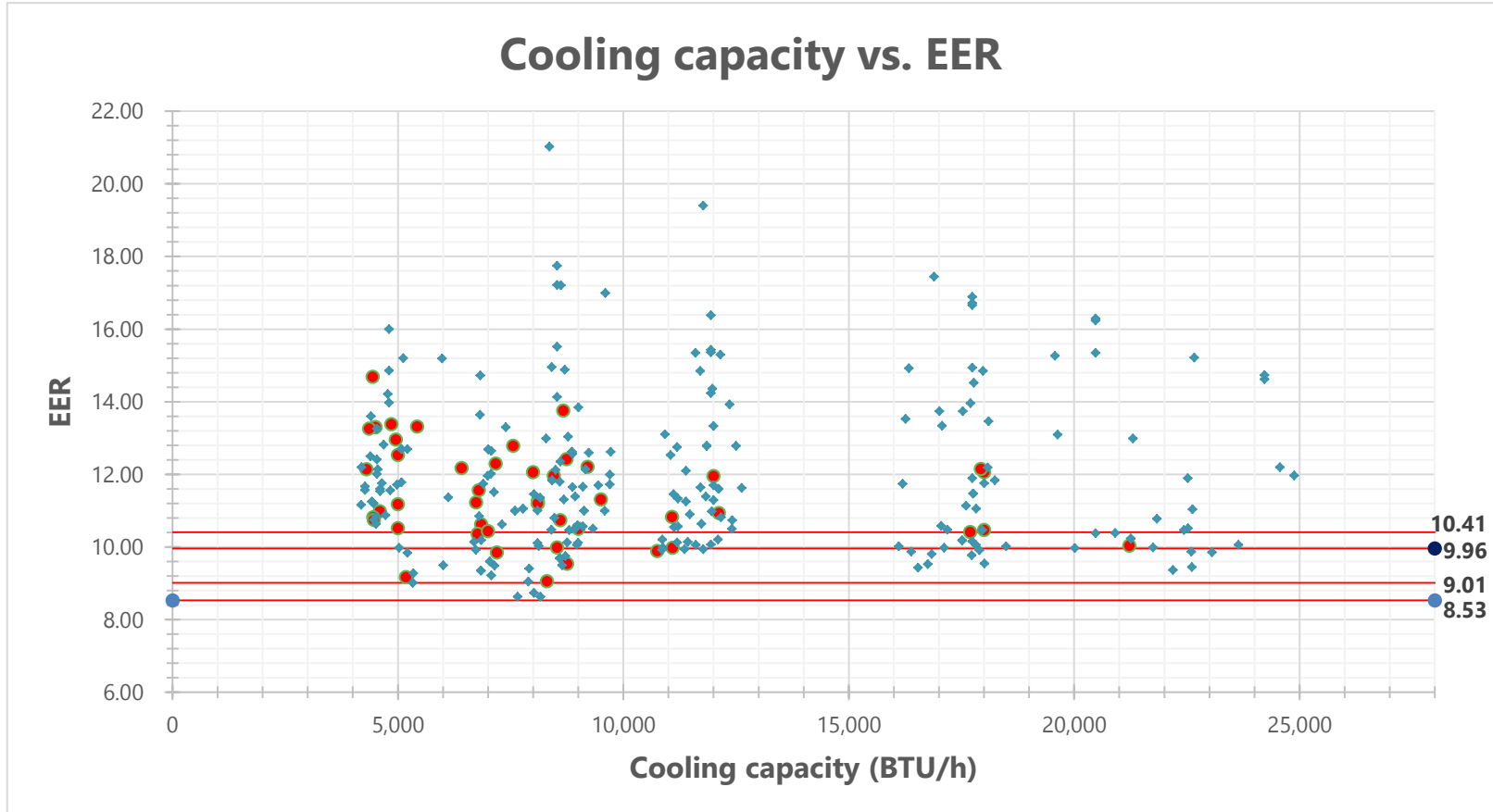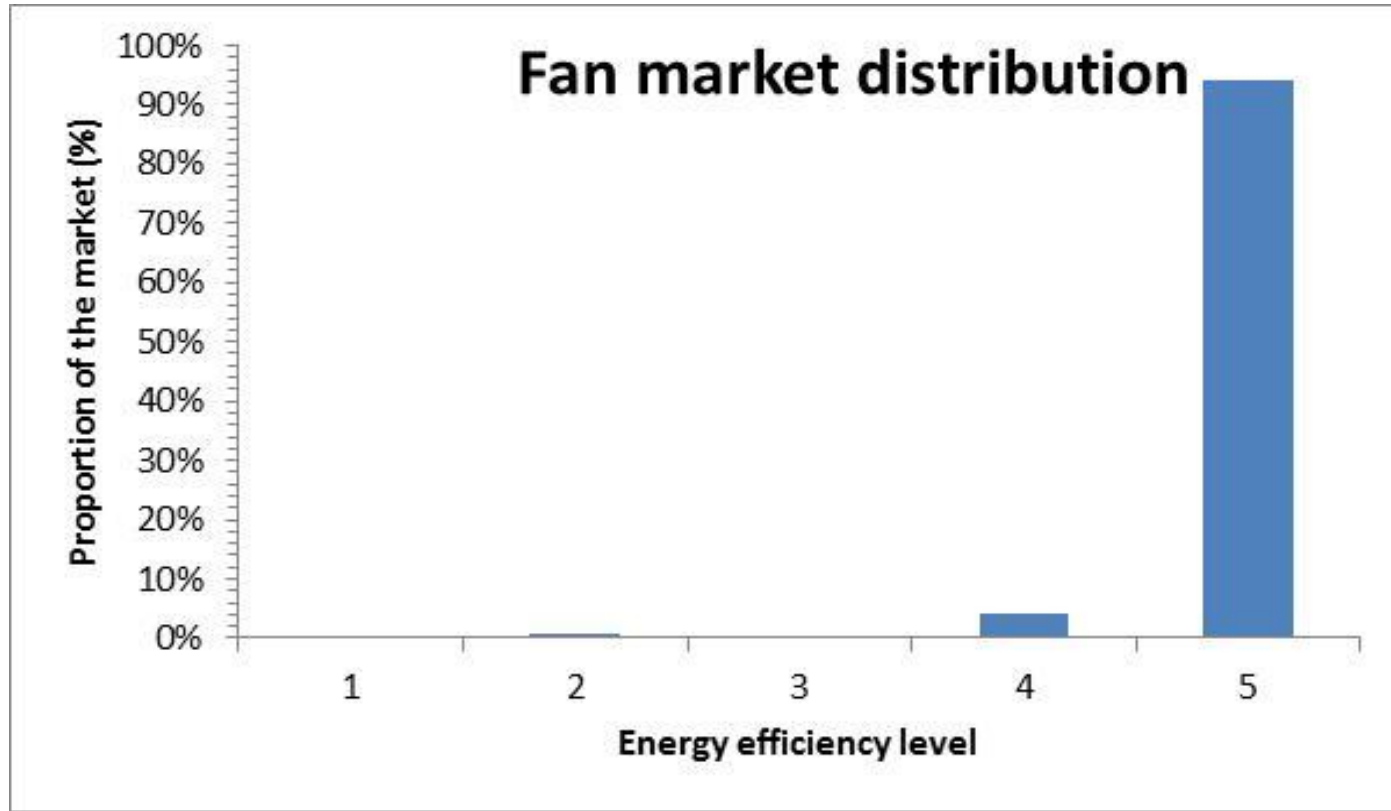
- National statistics e.g. product sales, ownership levels

- Utilities e.g. meter readings

- Management information/reporting e.g. registration scheme

- Measurement e.g. meter readings, compliance data

- Modelling e.g. LEAP

- Surveys e.g. household energy consumption, label compliance

- Interviews and focus groups

Construct Validity

- Consider whether indicators are a good representation of the outcome of interest

- Average consumption might not represent real consumption e.g.
  - Heavy users might be more likely to buy efficient products
  - Annual consumption may not be a good indicator of peak demand

- Number of products sold might not be a good indicator for energy savings...often assumes:
  - Inefficient products retired at end of useful life
  - Operated for the same hours as inefficient product
  - Maintained properly

- Some sectors of interest may behave differently from the average e.g. rural consumers, poor households, women

- https://www.youtube.com/watch?v=PTpQYDTgq7E

External validity

- Can we generalise from a sample to the population as a whole?

- Consider:
  - Sample size
  - How data were collected
  - Systematic biases e.g.
    - House to house survey excludes people who are out during data collection
    - Views/behavior of women/minorities might be under-represented
    - Online surveys exclude people without internet access (older, poorer, more rural)
  - Extrapolation method:
    - Basis for extrapolation (e.g. number of households or number of people)
    - Were different weights applied to groups with different behaviour
    - Reliability of population data

Who pays and who benefits?

- Wealthier consumers benefit most from product policy
  - Buy more products
  - Use them more
  - Spend more on energy

- Who pays for subsidies/incentives/scheme costs
  - Manufacturers?
  - Consumers e.g. levy on bills?
  - General taxation?

- Are your policies fair?

Discussion

- Are indicators and evaluation relevant to your job?

- How can you use indicators and evaluation?

- Who else would be involved?

- What are the benefits to your organization?

www.iea.org

IEA #energyefficientworld