Evaluation Guidance

&

The IEA DSM Evaluation Guidebook

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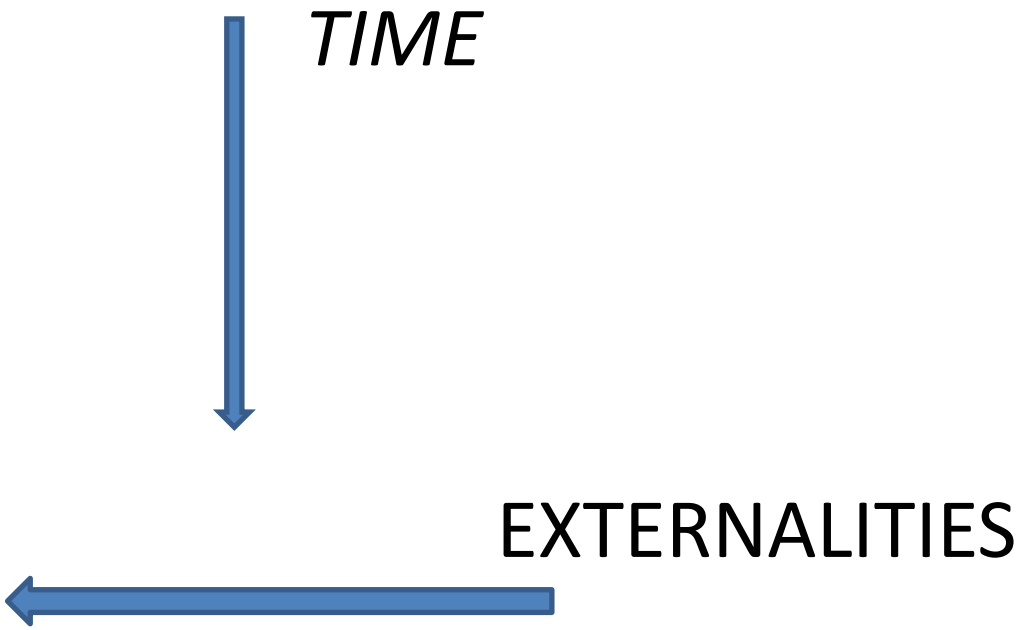
Overview

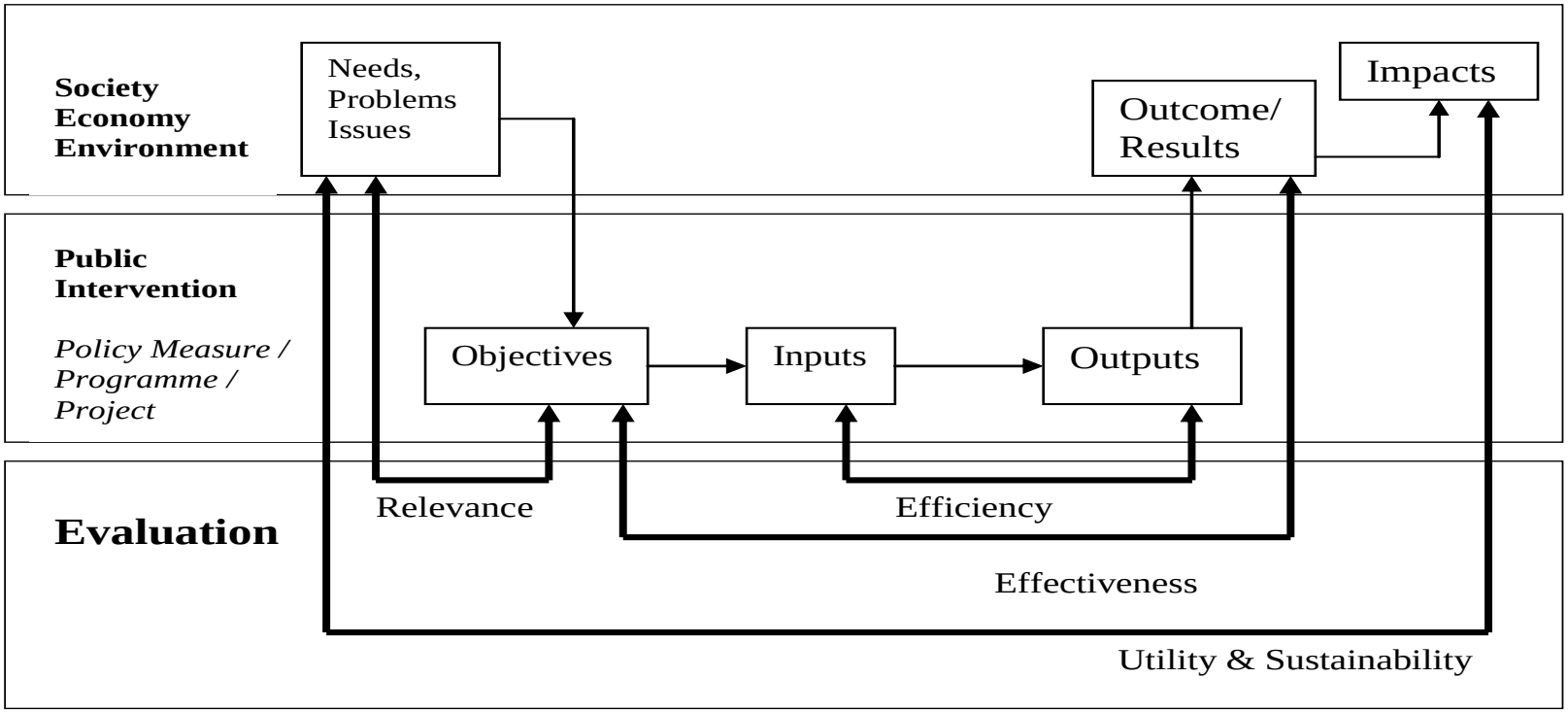
- **Evaluation framework**
- **7 key analytic elements**
  - **With experiences**
- **Recent developments**

Evaluation framework

- Input
- Output
- Outcome/results
- Impact



Evaluation framework for a normative evaluation



Evaluation Questions

- *Relevance*: To what extent are the objectives justified in relation to needs?
- *Effectiveness*: To what extents have the expected objectives been achieved?
- *Efficiency:* Have the objectives been achieved at lowest cost?
- *Utility & Sustainability*: Do the expected or unexpected effects contribute to a net increase in social welfare and sustainability?

Adapted from European Commission 1999 and Technolopolis France 2001

Key analytic elements

- What should be addressed in an evaluation?
- How to ensure that relevant topics are considered?
- Seven key elements

Seven Key Elements

1. Policy measure **theory**
2. **Indicators** showing the success
3. **Baselines** for selected indicators.
4. Assessment of **outputs and outcomes**
5. Assessment of **energy savings**, emissions reductions and other relevant impacts
6. Calculation of **cost**, cost-efficiency and cost-effectiveness
7. Choice of level for **evaluation efforts**

Key Element 1:
Statement of Policy Measure Theory

Provides the basic framework for the evaluation

A. Specification of Policy Measure Domain

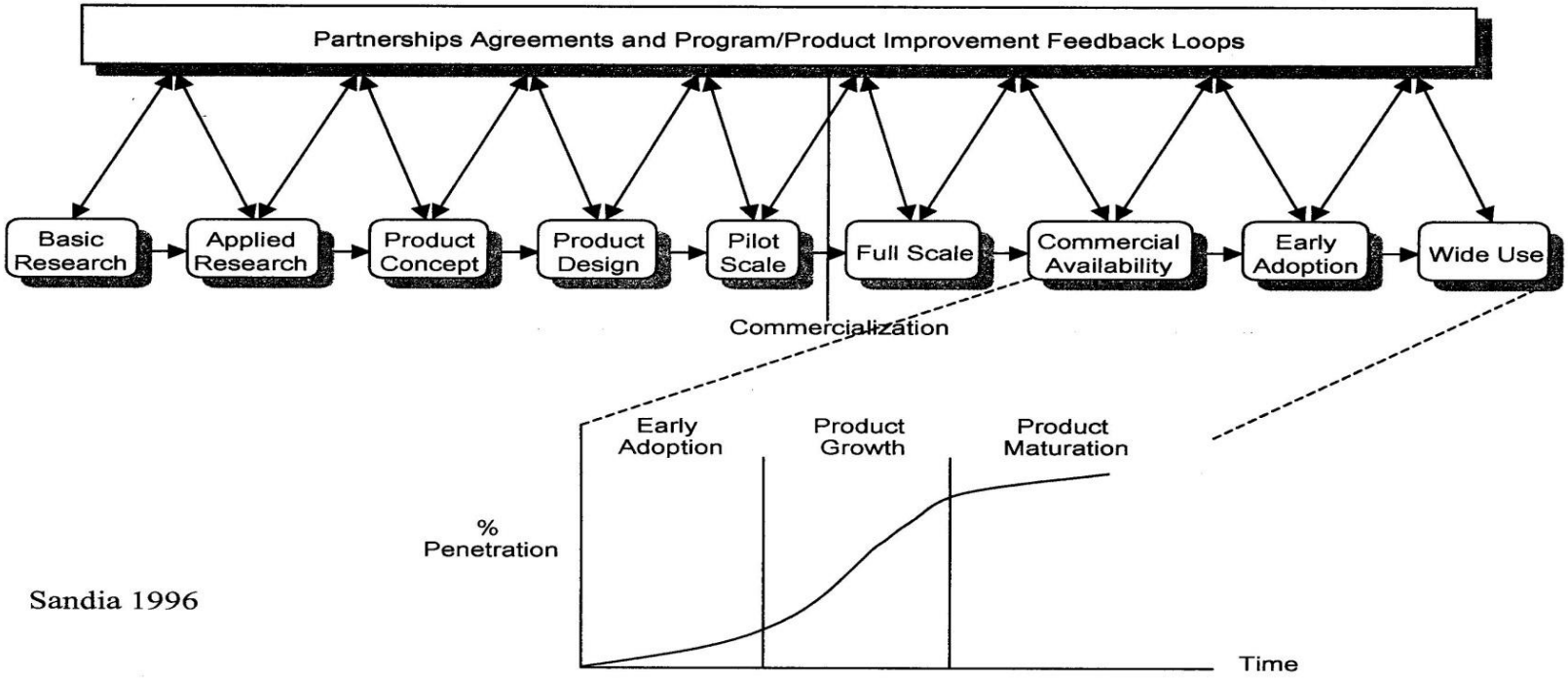
- End-user market segment
- Supply-side market segment
- Participation status
- Location

B. Effects Hypotheses

- Qualitative and quantitative effects
- Timeframe over which effects are expected

Key Element 1:
Statement of Policy Measure Theory

Example An existing theory: Typical product development and market saturation process



Elements of Programme Theory by Type of Policy Measure

Example

Type of Policy Measure (Example)	*Domain Specification* (Target Group Examples)	*Effects Hypothesis* (Examples)
Regulation Building Code Enforcement	Builders	Builders increase frequency of using code-prescribed building methods. Building codes for new building also influence the existing buildings through retrofit
Information Programmes Labelling Programme	Purchasers of products subject to labelling Manufacturers and retailers of these products	Awareness of energy-efficient equipment increases among targeted consumers. Manufacturers increase share of efficient models in catalogues.
Residential Energy Audits Programme	Homeowners in programme area	Participants increase level of awareness and knowledge of efficiency opportunities in their homes. Participants implement targeted improvements more frequently than non-participants.
Economic Incentives Equipment Rebate Programme	Purchasers of equipment covered by programme Vendors and installers	Market share of efficient models increases. Proportion of vendors and installers promoting supported equipment increases.
Voluntary Agreements Industrial Programme	Owners of facilities in sectors covered by agreements	Owners and managers increase awareness of efficiency opportunities. Owners increase adoption rate for efficient production technologies.

Key Element 2:
Specification of Indicators

- Inputs (resources)

- Outputs: under the control of the management
- Outcomes or results: initial up to long term elements
- Impacts: tend to be longer-term elements

- Cost indicators level

Example

Example from Case Red Hot (DK)

Stated evaluation objectives		
What is the impact on energy saving behaviour of families of children involved?		
Produced output	**Assessed outcome indicators**	**Energy impact**
•Teaching material •Prize competition •No. of children/classes taught	•No. who browsed through material •No. who read material •No. who had discussions with family •No. who remember seeing TV-campaign •No. who changed energy saving awareness •No. who turn off stand-by	(Not assessed)

Key Element 3:
Development of Baselines

What would market actors who participated in (or who were exposed to) the programme have done in the absence of the programme?

A range of baseline types:

-Static

-Dynamic

Example

Key Element 3: Development of Baselines

Type of Policy Measure/	Example Programme Baseline Development Strategies
Regulation Building Code Enforcement	Building code provisions covering the targeted building components and end uses.
Energy Audits Residential Programme	Non-participants' adoption of measures supported by the audits, properly adjusted for differences between the participant and non-participant groups.
Labelling Programme	• Market share of qualifying equipment in areas not covered by the labelling programme. • Historical trends in percentage of qualifying models sold by manufacturers and/or displayed by retailers.
Economic Incentives Equipment Rebate Programme	• Market share of qualifying equipment in areas not exposed to rebate programmes, • Non-participants' level of adoption of targeted technologies or end-use consumption, with appropriate statistical controls.

Key Element 4:

Example

Assessment of Output and Outcome

Type of Policy Measure / Example	Example Output Indicators
Regulation Building Code Enforc.	Number of residences inspected and certified.
Information Energy Audits Resident.	• Number of audits. • Number of courses for energy auditors.
Labeling Program	• **%** of equipment that contains a label. • **%** of qualifying models displayed with appropriate labels.
Econ. Incentives Equipment Rebate	• **%** of eligible facilities that participate • Market share of qualifying products.
Volunt. Agreements Industry	• **%** facilities in the sector that sign the agreement. • **%** signatories that comply with the agreement.

Example

Free-of-Charge Elec. Audits (DK)

Stated evaluation objectives	
•What types of advice are implemented? •What is the lifetime of the implemented advice?	
Produced output	**Assessed outcome indicators**
• Audits reports • Audit concepts • No. of audits offered	• No. of audits • No. of implemented advice by type • Lifetime of implemented advice • Customer satisfaction with audits and auditors

Example

Key Element 5: Assessment Impacts

Benefits	Typical Items Required
Energy	• Net program energy savings • Gross program energy savings
Environmental	• Volume of emissions reductions • Unit value of emissions reductions
Non-Energy	• Volume of water and other non-fuel resource savings • Unit value of non-fuel resource savings • Non-energy benefits: increased productivity, increased safety, and accelerated collections

Example

Key Element 5:
Energy Savings Methods

Method	Typical Policy Measures
Engineering	• Econ. incentives: tax-related measures and rebates • Informationon programs: labeling • Energy Audits
Engineering with building simulation modelling	• Regulation: building codes • Econ. incentives: tax-related measures rebates • Information programs: labeling
Engineering with monitoring	• Economic Incentives: rebates • Energy Audits • Voluntary Agreements • Regulation: building codes and equipment standards
Bill Analysis	• Economic Incentives: rebates • Voluntary Agreements
End-Use Metering	• Economic Incentives: rebates • Voluntary Agreements

Key Element 5: Energy Savings

Example

Industrial Energy Audits (S-Korea)

Classification	Replace Transformer	Efficient Motors	Replacement Refrigerators	Lighting	Others	Total
Saving (MWh/Year)	549.5	2,077.6	1,416.8	509.7	6,183.9	10,737.5
Saving (million won)	52.7	215.8	121.5	42.5	1,006.2	1,438.7
Investment (million won)	353.9	768.0	690.0	207.6	2,061.0	4,080.5
Recovery Period (Year)	6.7	3.6	5.7	4.9	-	2.8

Seven Key Elements

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7. Choice of level for **evaluation efforts**

Key Element 6: Assessment of Costs, Cost-Efficiency and Cost-effectiveness

Example

Costs	Typical Items Required	Comments
Admini-strative	• Administrative personnel and overhead costs • Outsourced program administration • Marketing and promotional costs • Measurement and evaluation costs	In most social cost-effectiveness schemes, incentives paid directly to customers or vendors are identified as transfer payments (not as costs)
Incre-mental	Incremental costs of measures implemented as a result of the programme.	Cost estimates for both the energy-efficient measure and its baseline alternative.
Others	Measure-specific items, such as costs to properly dispose of used fluorescent ballasts and lamps or downtime for installation.	Judgement whether the probable magnitude of these costs is sufficiently high to justify measurement expenses.

Key Element 7:
Level of Evaluation Effort

- Level A: Comprehensive evaluation:
  - outcome indicators including net behavioural change
  - impact indicators on energy savings
  - additional internal and external information sources are needed

- Level B: Targeted evaluation:
  - including outcome indicators as gross behavioural change
  - some additional information sources

- Level C: Programme review evaluation:
  - focus on input and output indicators,
  - only use existing (written) information sources.

Level of Evaluation Effort, Cases in Volume 2

Level			Case	Country
	B/C		Building codes	B
	B		Energy Efficiency Regulations for Residential Equipment	CA
	B		Energy management scheme for large buildings	DK
		C	Minimum energy performance standards	Korea
A/B			Energy Performance Standard (EPS) for houses	NL
		C	Local energy efficiency information centres	B
	B		Energuide for houses	CA
	B		Energy labelling of small buildings	DK
A			Free-of-charge electricity audit	DK
A			Project 'Red-Hot' (element of stand-by campaign)	DK

Developments related to *Key Element 5:* Assessment Impacts; Harmonisation of energy savings calculations

- More harmonisation
- Starting of standardisation

Ongoing work

- USA
  - Uniform Methods Project
  - regional initiatives e.g. NEEP and SEE Action
- European Commission: Energy Efficiency Directive (EED) & National Energy Efficiency Action Plans (NEEAPs)
- IEA DSM Task 21: harmonisation of energy savings calculations
- International standardisation
  - European standardisation: CEN
  - International standardisation: ISO

Standarisation

- CEN and ISO are in the process of creating general standards on energy savings and energy savings calculations and holding more general guidance
- Publication of the CEN standard EN16212:2012; no foreseen work in the short time
- ISO is working on different areas to provide very general standards including one on ESC (for actions/projects)

Energy savings calculation, key elements in practise

- In almost all reports and studies researched in Task 21 several to all of the key elements in energy savings calculation are present
- Baselines: the most critical common element
- Unitary savings: still often a 'new' start point for savings
- Saving life-time: not a major topic, but when used, often treated in different ways

IEA DSM Agreement: Evaluation Guidebook

Volume 1: Guidebook

- **7 key analytic elements** (chapter 1)
- **5 types of policy measures** (chapter 2-6)
- **Conclusions and recommendations** (chapter 7)

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Volume 2: Country reports with case examples:

Sweden, Netherlands, Korea, Italy, France, Denmark, Canada and Belgium

Thank you

The 7 key analytic elements:

1. Statement of policy measure theory
2. Specification of indicators for evaluation
3. Development of baselines for indicators
4. Assessment of output and outcome
5. Assessment of energy savings and emissions reductions and other relevant impacts
6. Calculation of costs, cost-efficiency and cost-effectiveness.
7. Choice of level (evaluation efforts)