

Where to start:

Planning energy efficiency programmes

Lighting, Appliances & Equipment: Session 1 Mark Ellis, IEA 4E

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There has been a change of government and the incoming government wants a range of options for interventions to rapidly increase **residential** energy efficiency for appliances, equipment and lighting.

How do you identify, prioritise and quantify these options?

Marginal emission reduction costs for the global energy system, 2050



End-use Energy Efficiency is the cheapest and often the quickest means to reduce CO₂

Why is your minister so keen on energy efficiency?



- In 11 IEA countries*, energy savings exceeded the output from any other single fuel source in 2010
- The result of cumulative investment in energy efficiency since 1974

*Australia, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Sweden, the United Kingdom and the United States



Source: IEA, Energy Efficiency Market Report 2013



List all the different kinds of government interventions we could consider?





- MEPS/Labels
 - MEPS
 - Comparative labels
 - Endorsements labels
- Mandatory obligations on utilities
 - Green certificates
 - White certificates
- Financial incentives
 - To consumers/retailers/suppliers/third parties (architects, plumbers, etc)
 - Grants and subsidies
 - Loans
 - Tax relief
 - Taxes
 - Procurement by institutions/government

Policy Measures [page 2/2]



- Awareness raising campaigns
- Information
 - Appliances labels
 - Retail and/or trade staff training
 - Advice Centres, hotlines, publications, etc.
- Education
 - School programmes
 - Professional training and qualification/accreditation
- RD&D
 - Research
 - Demonstration
 - Commercialisation



• What are the issues we need to consider when ranking these different types of programmes?



What to consider when ranking these different government options? 🛛 😡 🥝

- Do they best help meet our programme objectives?
- How effective are they likely to be?
- Do they act on a small or large part of the relevant market?
- How certain are the outcomes?
- What resources will each require costs, time, people, admin support, other?
- How fast acting are they?
- Are the outcomes sustainable in the long term?
- How difficult are each to organise? What partners could help?

Market Transformation: impact of different policies





incentives for higher energy efficiency across the whole distribution

mechanisms

Market

increase

* Research and Development

Summary of policy measures, by measure type for selected countries, 2013



Source: Harrington, L., J. Brown, and M. Caithness, Energy standards and labelling programs throughout the world in 2013, 2014, Energy Efficient Strategies

Energy Efficiency Standards and Labelling – amongst the most widespread and significant programme types



- EESL programmes include:
 - Minimum energy performance standards (MEPS)
 - Mandatory comparison labels (usually stars or numbers)
 - Endorsement labels (the best in class)
- EESL programmes operate in >80 countries, covering >50 different types of equipment in all sectors.
- Provide the <u>foundation</u> for many other programme types
 - Financial incentives
 - Procurement
 - Utility programmes



- The energy efficiency of major appliances have increased at more than 3x the underlying rate of technology improvement in countries with EESL programs.
- One-off improvements of more than 30% have been observed.
- The most mature national EESL programs covering a broad range of products are estimated to save between <u>10% and 25%</u> of national or relevant sectoral energy consumption.
- In all programmes reviewed, the national benefits outweighed the additional costs by a ratio of at least <u>3 to 1.</u>



- EESL programmes have substantially reduced energy use and CO₂ emissions very much cheaper than could have been achieved by other clean energy supply options.
- This conclusion takes into account any rebound effect.
- Improved health from higher thermal comfort and/or avoided air pollution; job creation and energy security - provide added justification for these programs.
- All EESL programs have the potential to expand in scope and ambition to deliver more energy and CO₂ savings.
- Governments should note these findings when determining investment options and priorities for meeting energy demand.

Standards and Labels



Figure ES1. Contribution from various programs to greenhouse gas abatement .



Australia's emissions projections 2010, http://www.climatechange.gov.au/publications/projections/australias- emissions-projections.aspx

ASEAN Plan of Action for Energy Co-operation (APAEC) 2016-2025 💿 🥯



Energy Efficiency S&L a key strategy to reduce energy intensity by 20% by 2020 – 30% by 2025

ASEAN Roadmaps: Air conditioners





Co-operation on S&L reduces barriers to trade, reduces costs for governments and ensures better outcomes

Initial assessment process



- Process to assess and rank best options
- Assess policy options against your important indicators



Data availability and accuracy



Indicators		Quantified assessment		Qualified assessment			
Impact	Average appliance consumption						
	Overall energy reduction, peak load, ghg reduction, etc		 Only very approved to the second secon	oximate			
Resource Use	For government		ontions				
	For householders						
	For industry	-	• Make use of over	erseas			
Employment	Overall employment impact	-	experience e.g i	mpacts on			
Competition	Will competition increase?	-	prices and jobs				
Speed & Ease of implementation	How fast will the impacts occur?	-	 Sometimes your 'best 				
implementation	Support from key stakeholders	-	guess' may be sufficient				
Sustainability	Will the impacts be long lasting?		• Can add new da	ata when			
Side-effects	Impact on appliance prices		available				
	Impact on local industry	_					



Complete a simple evaluation table for two different policies.

Objective: Reduce Total Energy Consumption

1. <u>Policy 1:</u> MEPS on residential water heaters



 Policy 2: Rebate on super high residential efficiency water heaters (10% capital cost of equipment)

Evaluation Exercise



Indicators		Policy 1	Policy 2		
1. Impact	Overall energy reduction				
2. Resource Use	For government	-			
3. Employment	Overall employment impact	-		Scale: 1-10	
4. Competition	Will competition increase?			Positivo	
5. Speed & Ease of implementation	How fast will the impacts occur?			(good) 10	
6. Sustainability	Will the impacts be long lasting?	_			
7. Side-effects	Impact on appliance prices	-			
	Impact on local industry			Negativ e (bad)	
TOTAL		SUM-1	SUM-2		

Evaluation Exercise



Indicators	Policy 1	Policy 2				
1. Impact	Overall energy reduction	8		Control 1		10
2. Resource Use	For government	3			2cale: 1-10	
3. Employment	Overall employment impact	5			Positive	10
4. Competition	Will competition increase?	8		(good)		
5. Speed & Ease of implementation	How fast will the impacts occur?	5				
6. Sustainability	Will the impacts be long lasting?	7			Negativ	1
7. Side-effects	Impact on appliance prices	3		e (bad)		1
	Impact on local industry	4				
TOTAL		43	Y			



- Often more than one policy is required to create market transformation
- Some policies work well together
 - MEPS removes worst products; Labels incentivize best products
 - Procurement and financial incentives used to support highest labelled appliances

Receive a PG&E rebate with qualifying smart thermostats

Save on your home's heating and cooling costs by replacing your manual or programmable thermostat with a new smart thermostat.

Purchase a qualifying ENERGY STAR® smart thermostat to receive a \$50 rebate from PG&E.

Am I eligible for the rebate?

All ENERGY STAR smart thermostat rebate applications must be received within 60 days from date of purchase.

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- More indicators
- Add data where available
- Extend scale
- Add weighting to prioritize some factors

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You will need to know about the attributes of different programme types:

- Industry /consumers often ask why government is doing more or focusing elsewhere
- Many regulatory impact processes require analysis of other policy options

An analytical approach is used throughout S&L programme planning

- Need to assess what level of information is sufficient
- How to deal with a lack of information
- Be aware of a range of concerns and particular sensitivities



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scale = more sensitivity

Evaluation Table - weighted



Options	Indicator 1	Indicator 2	Indicator 3	Indicator 4	Total
	GHG savings	Lifecycle costs	Employment	Competition	
Option 1	4	2	2	3	11
Option 2	2	4	3	2	11
Weighting	x1	x2	x2	x1	
Option 1 (weighted)	4	4	4	3	15
Option 2 (weighted)	2	8	6	2	18