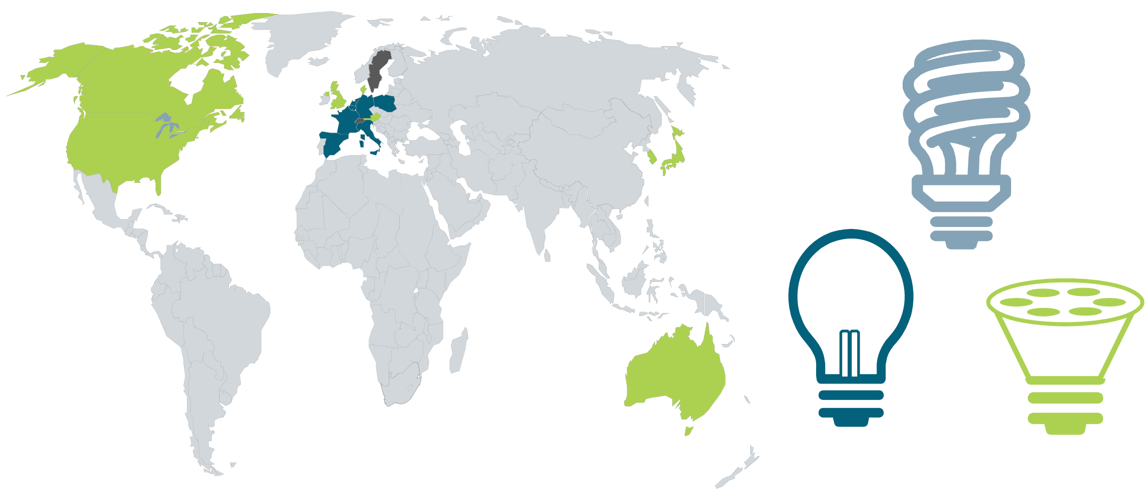
IEA 4E Mapping and Benchmarking

Benchmarking Report: Impact of ‘Phase-Out’ Regulations on Lighting Markets: 2015

(updating 2011 report)



Mapping and Benchmarking

Agenda

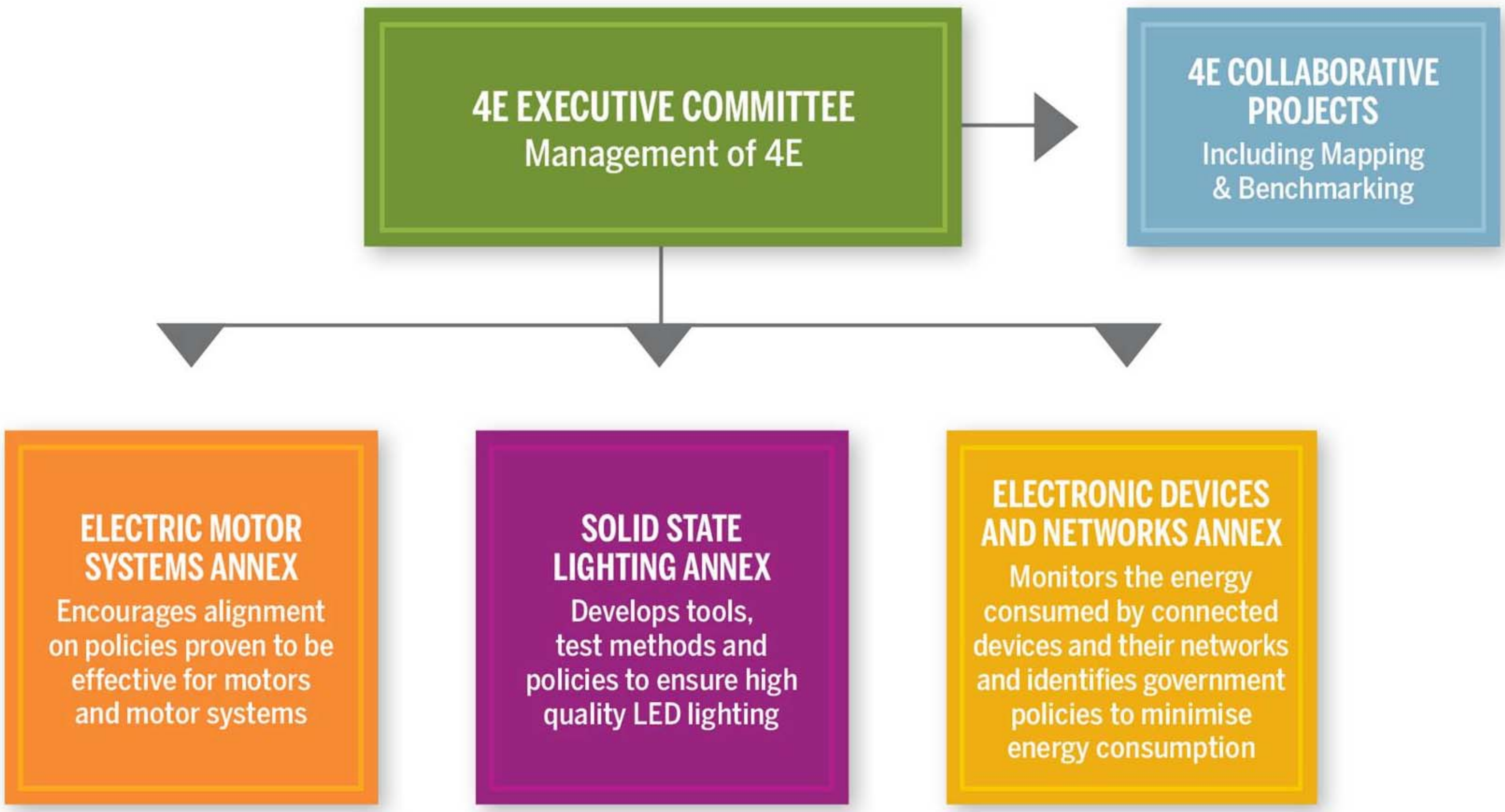
- Overview of IEA 4E Mapping and Benchmarking
- Main presentation:

  Benchmarking of the market impact of phase-out of inefficient domestic lighting products

- Q&A

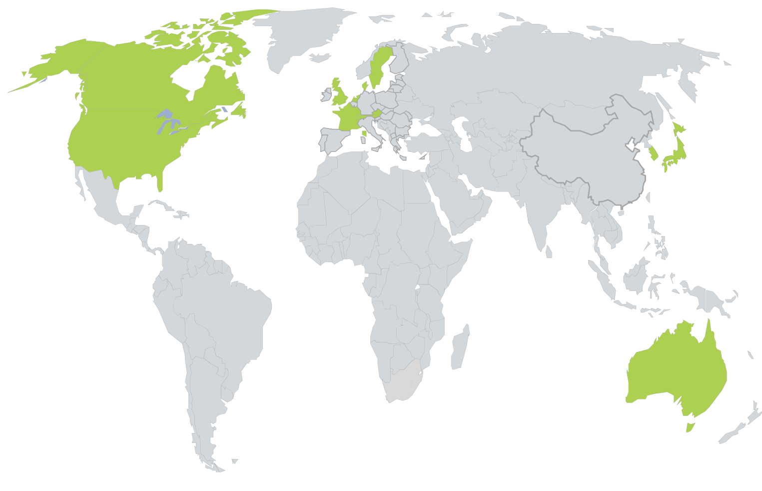
Introduction to the 4E

- Mapping and Benchmarking is part of *the IEA Implementing Agreement for a Co-operating Programme on Energy Efficient End-Use Equipment (4E)*



Participating Countries

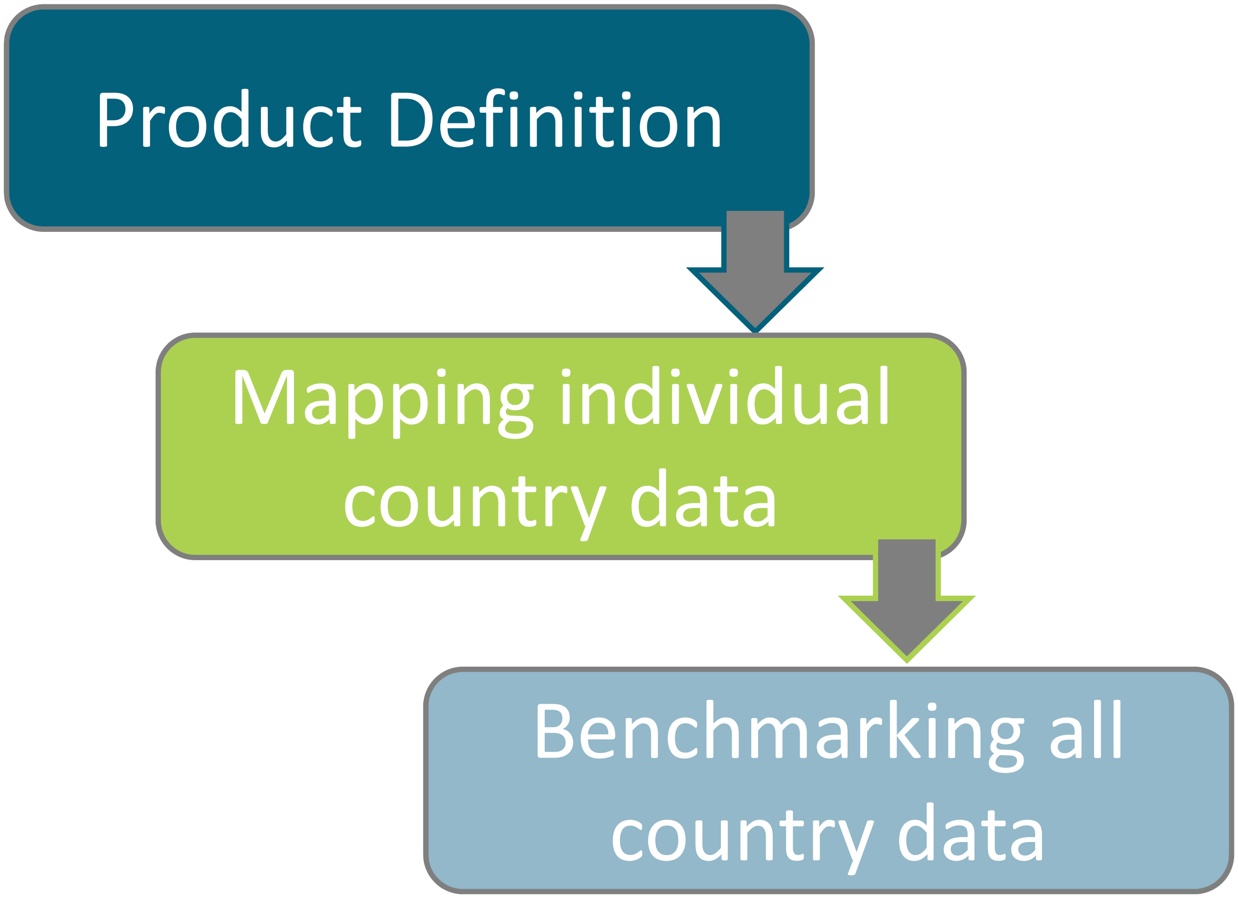
- Australia
- Austria
- Canada
- Denmark
- France
- Japan
- The Netherlands

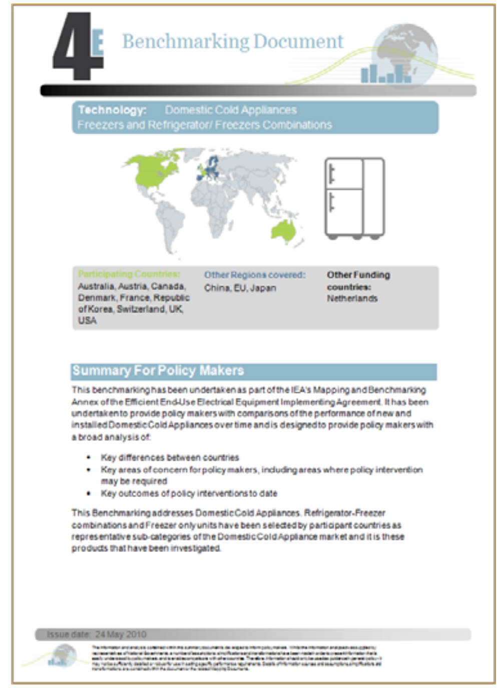


- Republic of Korea
- Sweden
- Switzerland
- United Kingdom
- United States of America

Also seek information from other major trading blocks eg: EU, China, etc

How the Mapping and Benchmarking Activity Works





4E Benchmarking Document

Technology: Domestic Cold Appliances
Freezers and Refrigerator/ Freezers Combinations

Participating Countries:	Other Regions covered:	Other Funding countries:
Australia, Austria, Canada, Denmark, France, Republic of Korea, Switzerland, UK, USA	China, EU, Japan	Netherlands

Summary For Policy Makers

This benchmarking has been undertaken as part of the IEA's Mapping and Benchmarking Annex of the Efficient End-Use Electrical Equipment Implementing Agreement. It has been undertaken to provide policy makers with comparisons of the performance of new and installed Domestic Cold Appliances over time and is designed to provide policy makers with a broad analysis of:

- Key differences between countries
- Key areas of concern for policy makers, including areas where policy intervention may be required
- Key outcomes of policy interventions to date

This Benchmarking addresses Domestic Cold Appliances. Refrigerator-Freezer combinations and Freezer only units have been selected by participant countries as representative sub-categories of the Domestic Cold Appliance market and it is these products that have been investigated.

Issue date: 24 May 2010

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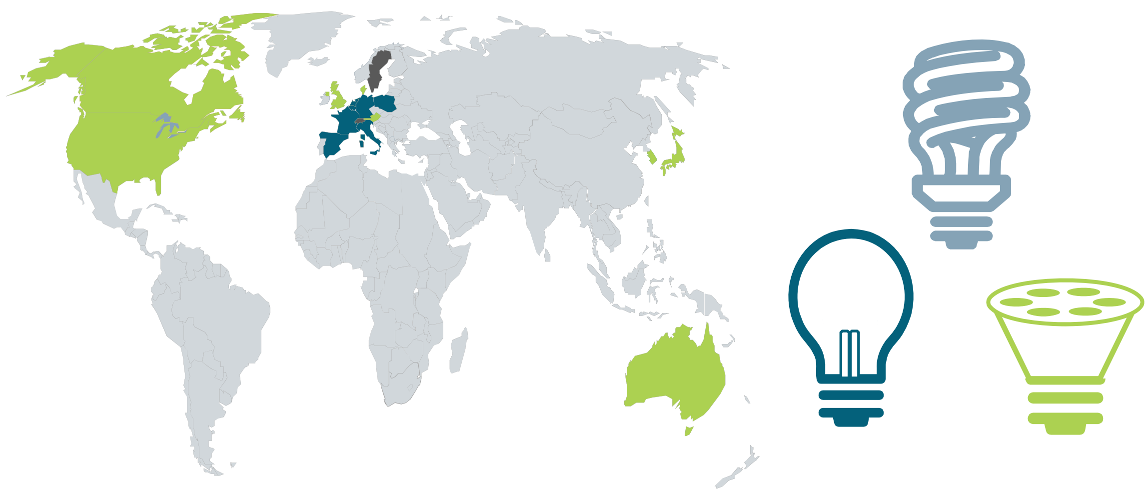


Goal and Scope of the Benchmarking

- Examines:
  - The **approach and stringency of 'phase-out' regulations**;
  - Changes in the **type of products** entering each market (**indicating major policy outcomes**);
  - Changes in the **overall average efficiencies of products** entering the market (**indicating longer term efficiency improvements** of the installed stock); and
  - Key areas of concern for policy makers where **additional or modified policy intervention may be required**.
  - ***NOT*** a comparison of the efficiency of individual products

- Products investigated are those applicable to the domestic sector (i.e. general service Incandescent, halogen, compact fluorescent and LED lamps)

Data quality

Country	Policy information	Benchmarked sales data	Efficacies
Australia	Robust	All data Indicative except LEDs and double ended halogen which are Illustrative	Indicative
Austria	Robust	All data Indicative	Indicative
Canada	Robust	All data Indicative	Indicative
Denmark	Robust	All data Illustrative	Illustrative
Japan	Robust	All data Illustrative	Illustrative
Korea	Robust	Majority of data Indicative. All halogen data illustrative	Indicative
UK	Robust	All data Indicative	Indicative
USA	Robust	Not applicable	N/A
EU	Robust	All data Indicative	Indicative

- **Robust**: solid lines on graphs
- **Indicative**: dashed lines on graphs
- **Illustrative**: dotted lines on graphs

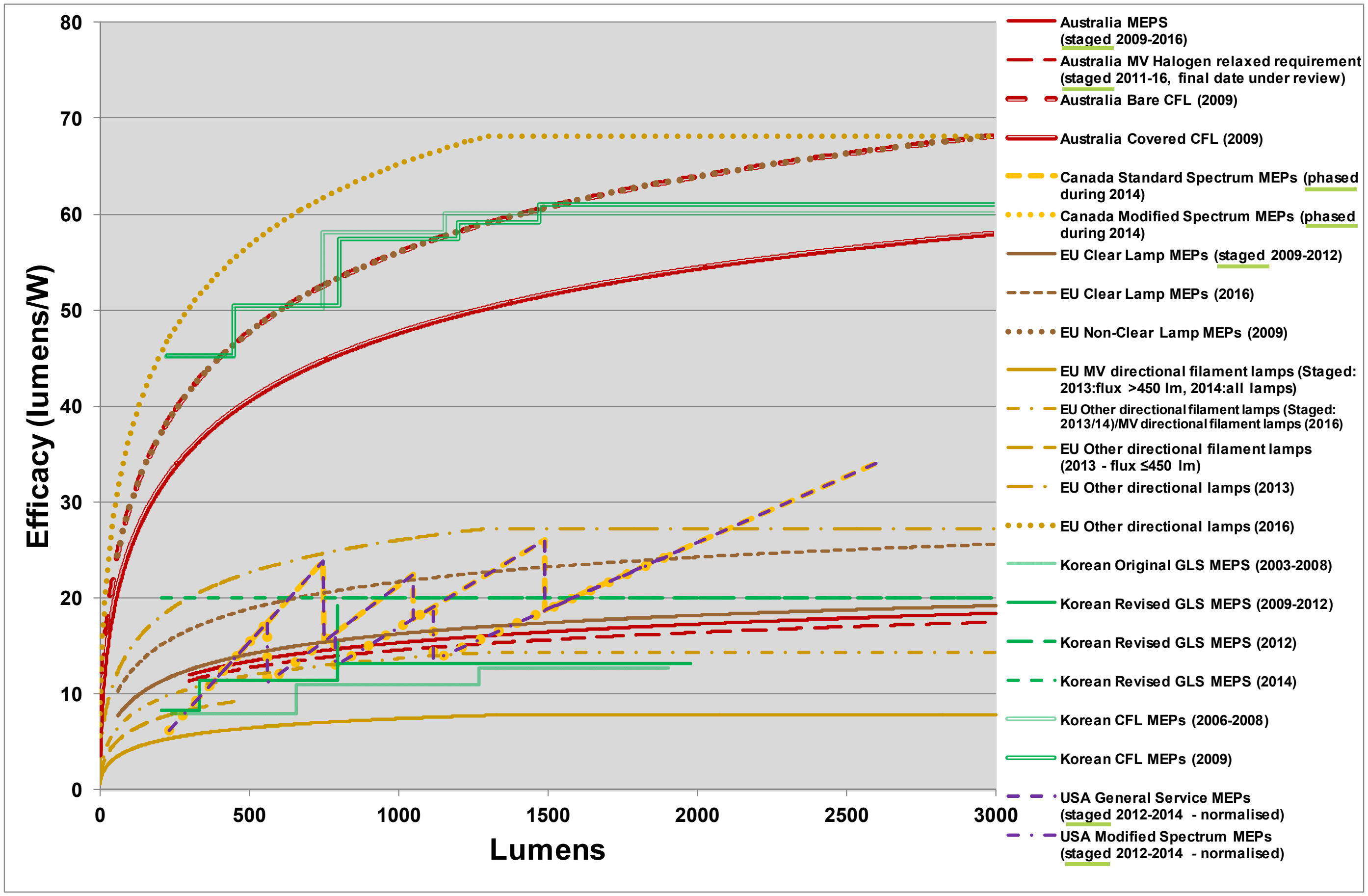
Normalisation of Results for Comparison and Cautions

- Lamp efficiencies (efficacies) based on international averages
  - adjusted for estimated efficiencies in previous years
- No normalisation undertaken for lamps with internal or external ballasts (integral or external), ie CFLs and LEDS
- Lamps with filaments adjusted for voltage differences based on IEC 60064 comparisons and empirical data.
  - Applies to “Incandescent” and Halogen

Cautions:

- A number of cautions apply, most critically:
  - Improvements in the efficiency of the average installed lamp (stock) will be more rapidly than improvements in the average efficiency of sales
  - Lamp sales are falling, therefore percentage of sales not *true* metric
  - Very limited account taken of cultural factors affecting purchase

Phase Out Regulations:
Overall Timing, Stringency and Scope



- Regulations do not ban technologies but set minimum standards for all
- Normally implemented in stages, larger lamps first, with exclusions for specific circumstances
- Generally have extra requirements to satisfy consumers – in some cases extending to minimum performance requirements for certain lamps, eg CFLs, “covered lamps”, etc.

Phase-out regulations: Significant differences in detail

When examined in more detail, some significant differences in approach:

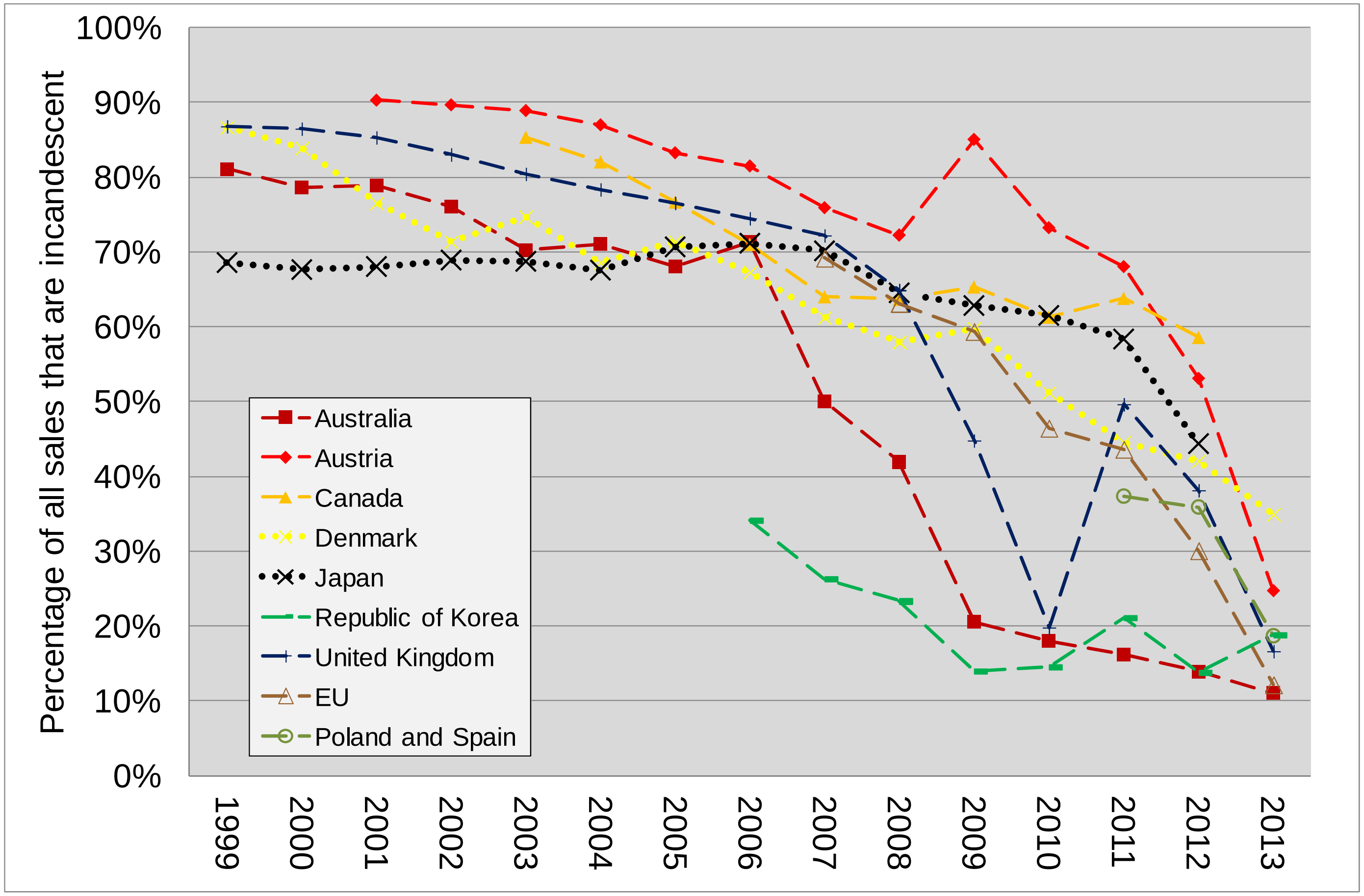
- The **overall regulatory approach** to performance levels.
- The **stringency** at which the required performance levels are set and the associated **phasing or speed** with which the required actions come into force.
- The **range of light outputs and products** included in the regulations.
- The **products exempted** or requiring lower performance levels.
- The **tolerances and allowances** applicable in testing and declaring product performance

Phase-out regulations: Key Issues for Policy Makers

- **Lamps are the most globally traded consumer durable**, yet there remains major differences in regulations.
- If the political will exists **alignment** of efficiency requirements scopes and exclusions should be **technically *relatively* simple**
- Such alignment would result in:
  - Substantial additional energy savings; better supplier understanding and compliance; potential for local and cross border enforcement actions; increased global trade; and likely cost reductions for consumers.

- Efforts ongoing (eg IEA 4E SSL Annex and IEC), but limited success to date – Smart Lamps present new opportunity

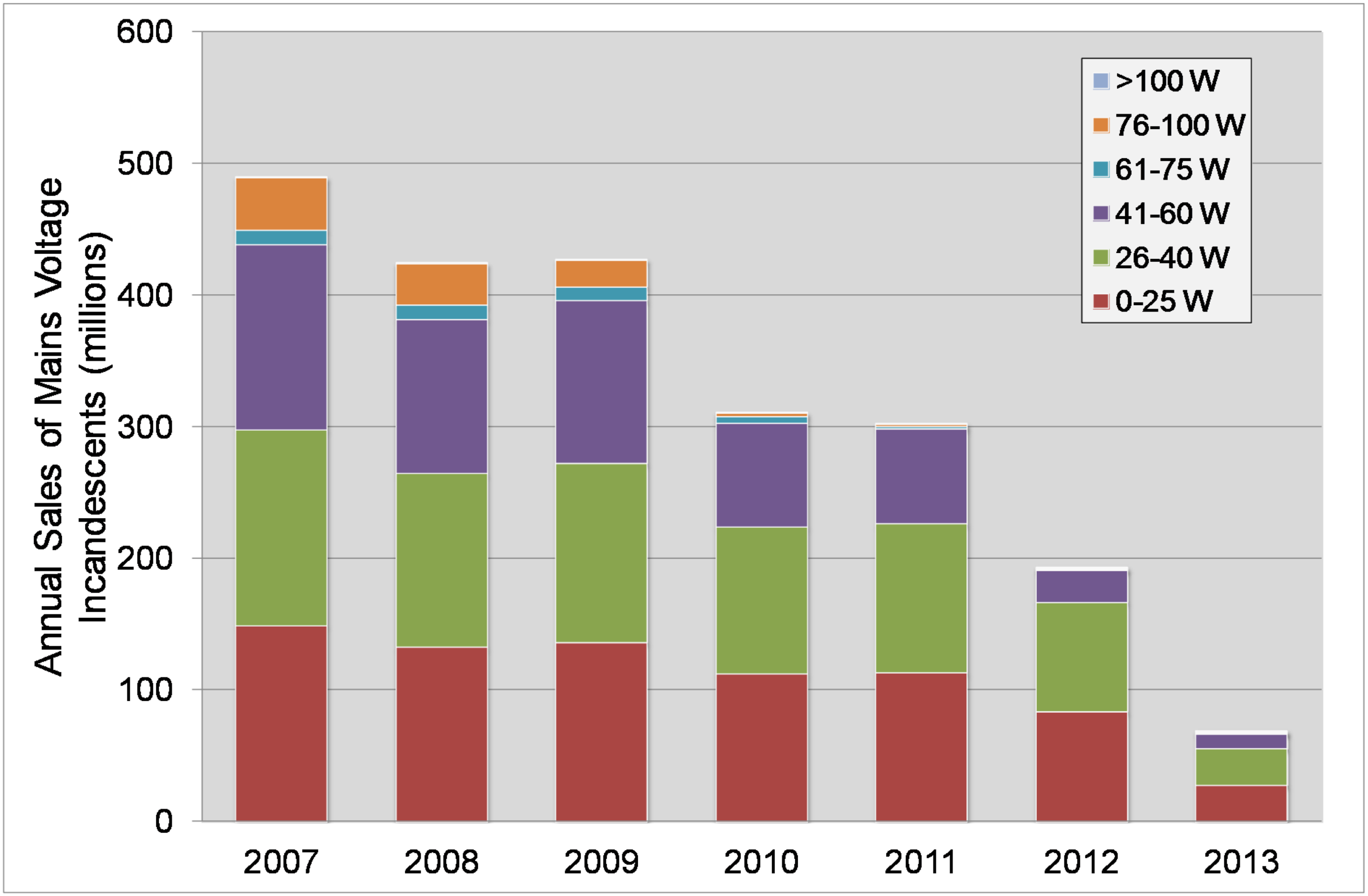
Impact of Phase-out: Big Fall in Incandescent Sales



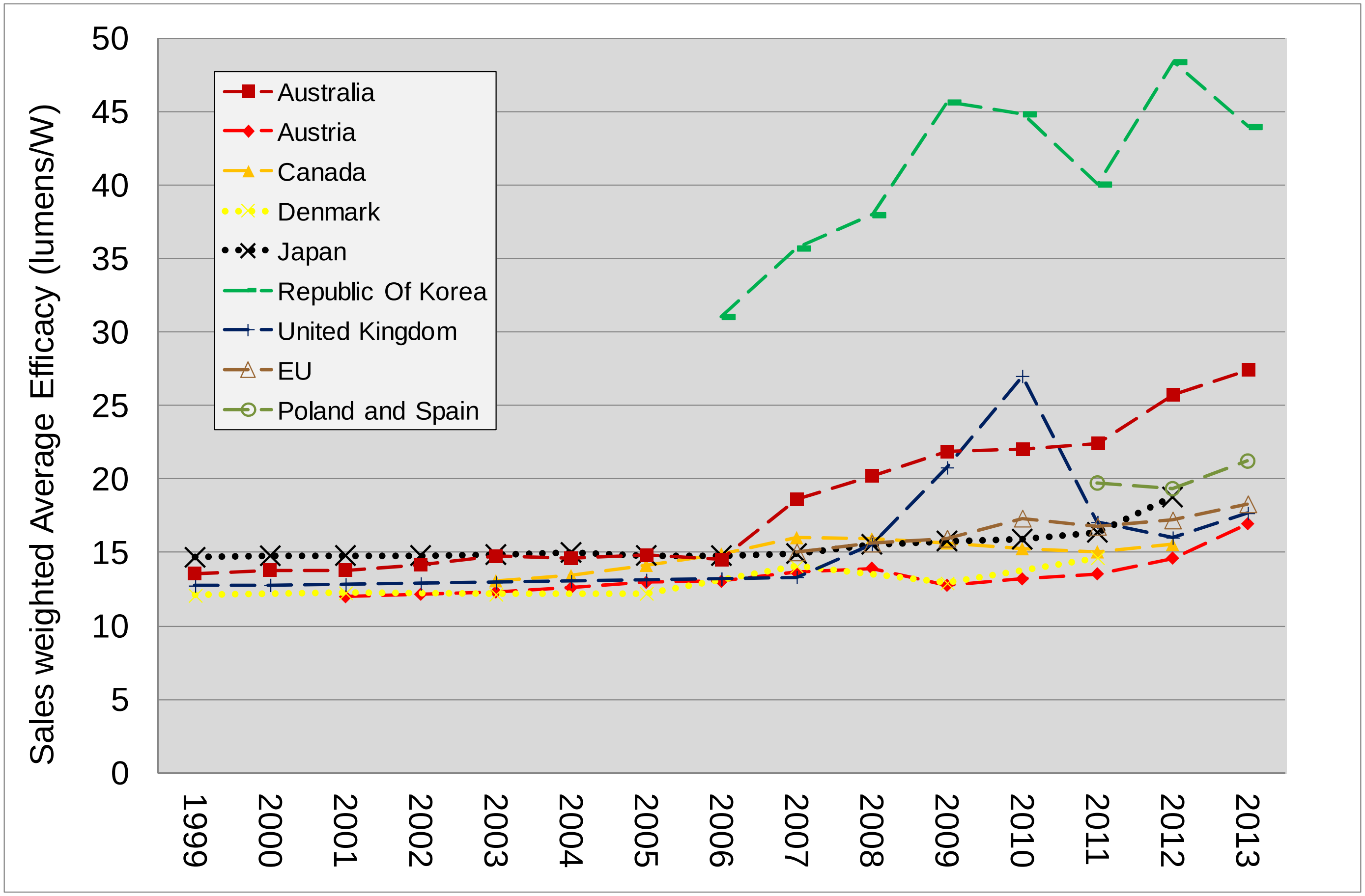
- Prior to introduction of phase-out regulations, slow decline in sales
- Regulations in Australia (09) and EU (09-12) result in precipitous fall in sales.
- Korean regulations begin 2003 and revised twice = best results

- Canada: CFL push 04-08 but no market movement anticipating 2014 regulation
- No regulation in Japan, but voluntary agreement and impact of 2011 tsunami have driven cultural change.

Impact of Phase-out: Incremental regulation in EU

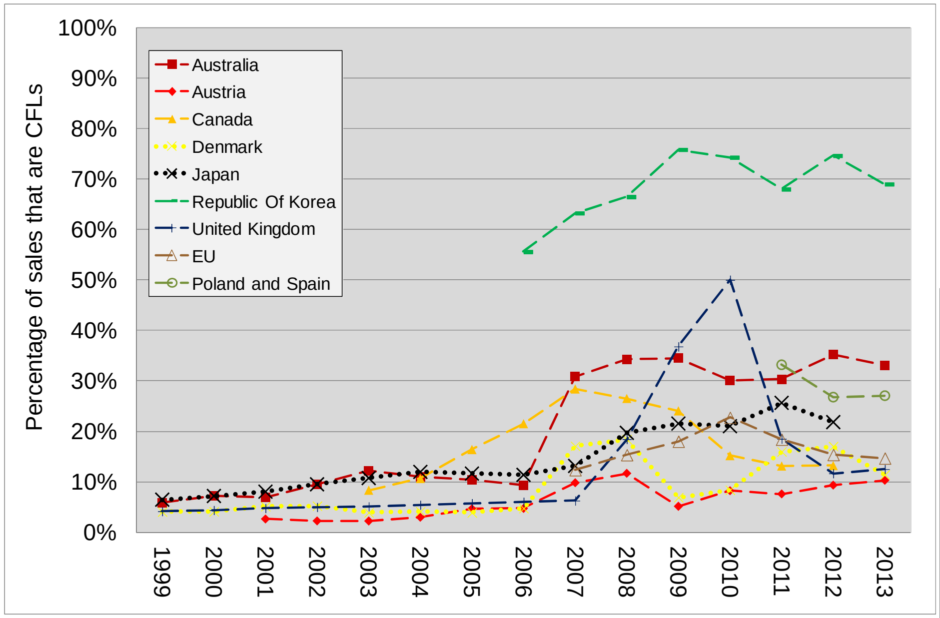


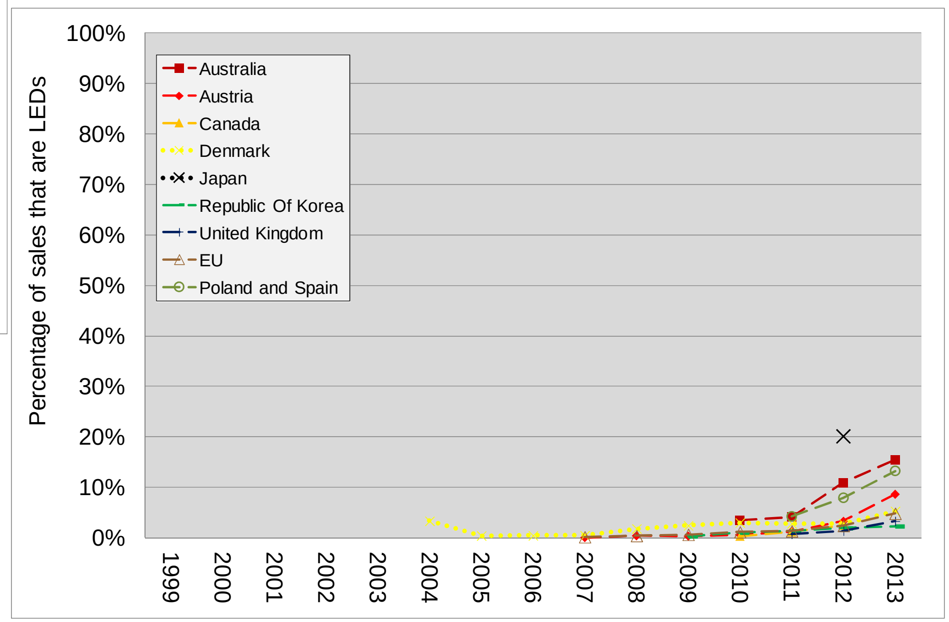
Impact of Phase-out: Disappointing Increases in Efficiency



- Typically increase from 12-15lm/W to 17-20lm/W
- Australia (14lm/W to 27lm/W) and Korea (mid-40lm/W) two outliers

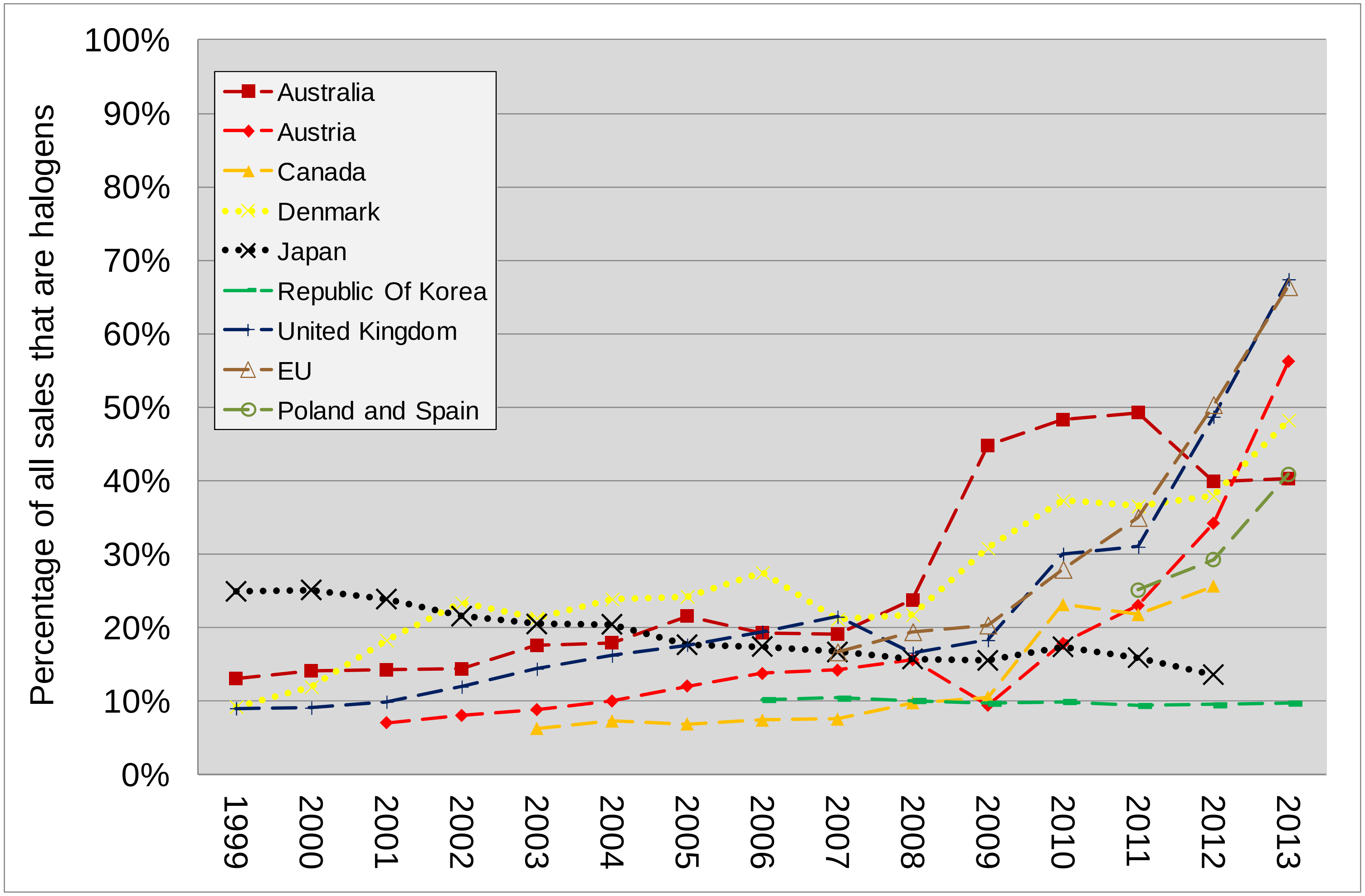
Impact of Phase-out: So Why Little Increase in Efficacy? CFL and LED Sales



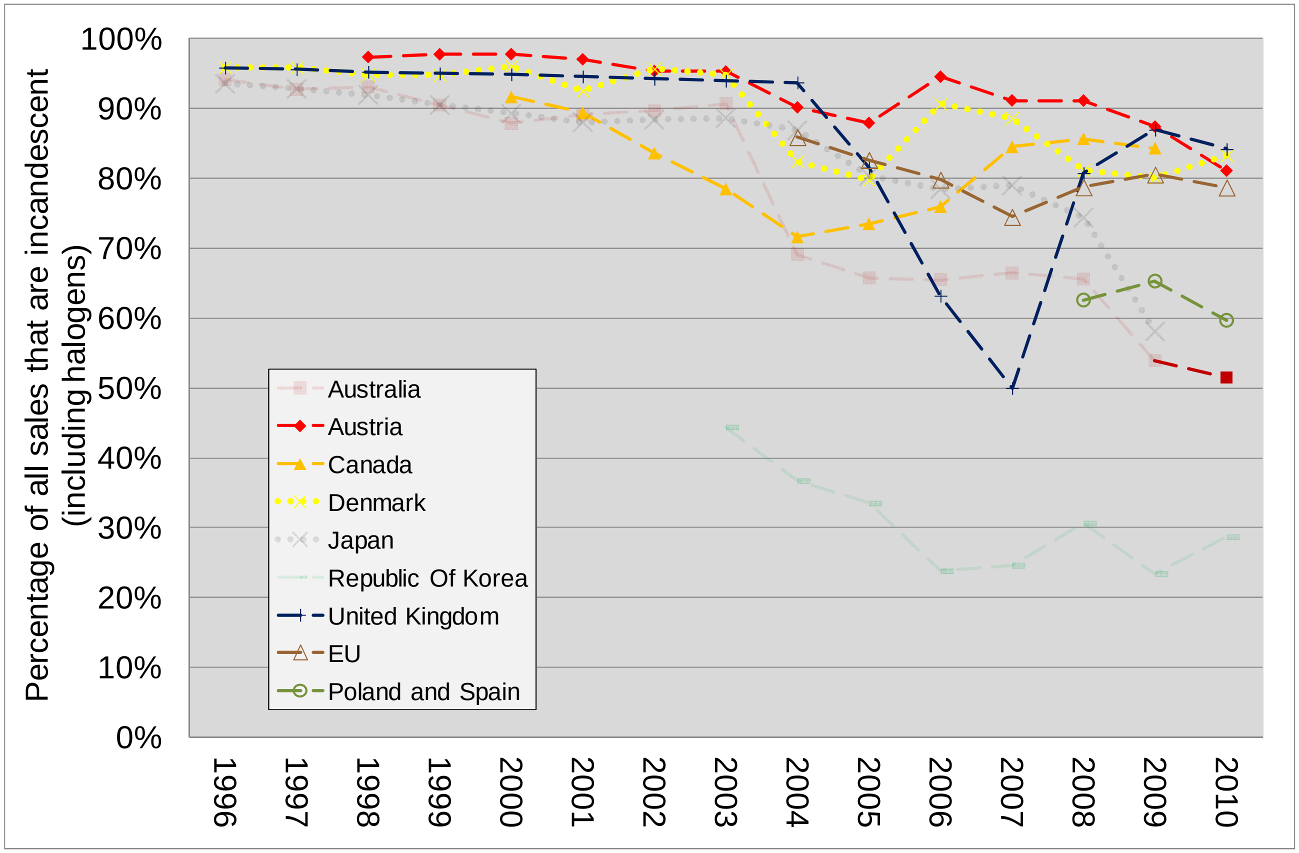


- CFLs: Increase in sales generally small (Australia, Japan and Korea excepted)
- LED received much hype, but in 2013 still only 3-15% of any market

Impact of Phase-out: So Why Little Increase in Efficacy? Increasing Halogen Sales



Impact of Phase-out: Combined Incandescent/Halogen Sales



- EU sales appear to be stabilising at around 80% of market, Canada appears to be following the same path (also Australia to a degree)
- Rapid policy interventions required to maintain momentum and prevent halogens becoming the new "default" consumer choice.

Market Knowledge is Limited

- Despite efforts by many countries, **limited market knowledge is hampering policy development, monitoring and enforcement**
- **Better knowledge of sales** allows monitoring of existing policy implementation to understand new product developments and/or circumvention of existing regulations;
- **Improved knowledge of in-home application and usage patterns** improves modelling of planned future regulations and evaluating impact based on sales

Key Issues for Policy Makers

- Where mandatory regulation has been introduced for a significant period (Australia, the EU and Korea):
  - The reaction of the market has been substantial with precipitous falls in the sales of Incandescent lamps. Canada appears to be following a similar path.
  - Not reflected in increase in limited increase efficacy due to significant migration to Halogens
  - Market interventions urgently required to stop Halogens becoming the new consumer default purchase (eg implementation of EU 2016 phase 6 regulations, accelerating US 2020 regulations, or similar)
  - The results from regular revisions in Korea show what is possible.

Key Issues for Policy Makers

- Non-regulatory interventions in the lighting market require ongoing commitments with impact rapidly tailing when intervention ceases.
- Better market and usage data is required to enable policy makers to develop more robust policy, to monitor the implementation of that policy, and to measure resultant impacts.

http://www.iea-4e.org/

http://mappingandbenchmarking.iea-4e.org/matrix?type=productreports

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Questions?

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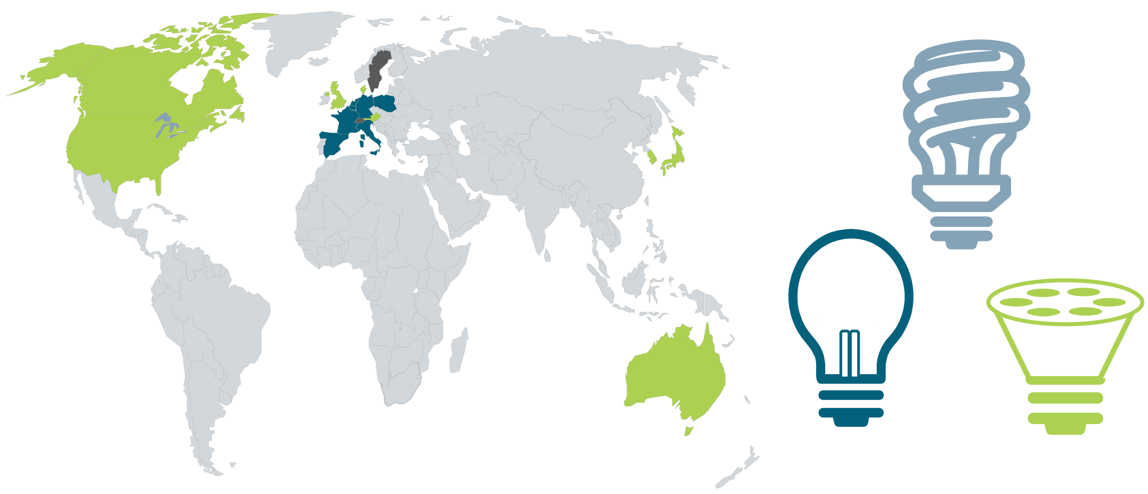

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