

Implementing Best Practice in Energy Efficient Lighting

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Light Naturally

Each country is different!

- Every country has a different set of challenges in terms of achieving energy efficient lighting due to:
 - Climate - geography
 - Political structures
 - Population size and wealth
 - Electricity infrastructure, generating capacity and cost
 - Existence, size and condition of local lighting industry
 - International trade and border controls

Harmonisation

- For economies considering development of an Energy Efficient Lighting Strategy the most effective and efficient process is to consider regulation which facilitates harmonisation with established international lamp performance requirements or with trading economies.

This assists with

- The speed of implementation
- Keeping costs low for manufacturers' lamp approvals.
- Managing the demand on laboratories for product approval testing.

World Snapshot

- Countries with energy efficient lighting regulations
 - Approximately 76 countries active
 - Approximately 23 countries with firm proposals
 - (Gross national income per person of 23 of these countries is lower than Indonesia. Lowest is USD240 in Burundi)
- Harmonisation examples
 - EU ecodesign regulations – approximately 41 countries (including the 28 EU members)
 - USA regulations – USA, Mexico, Brazil, Argentina
 - Australia & New Zealand

The framework is the same

- Consider the specific needs and conditions of your country, then determine appropriate
 - Minimum Energy Performance Standards
 - Supporting policies and programs
 - Monitoring, verification and enforcement programs
 - Programs for any associated environmental issues

Minimum Energy Performance Standards

Aim is to set criteria to:

- Remove inefficient technologies
- Maintain quality of alternative technologies

Including

- Lighting performance
- Health aspects
- Environmental issues
- Electrical issues

Australian inefficient lamp phase-out

Incandescent MEPS

- Incandescent lamps and extra low (ELV) voltage halogen lamps (2009)
- Mains voltage halogen non-reflector lamps (2010)
- ELV halogen reflector lamps (2012)

Ensuring quality performance standard of alternate technology

- CFLi (2009)
- LED (currently under consideration)

Supporting policies and programs

- Voluntary higher efficiency performance standards (HEPS)

- Labelling of products

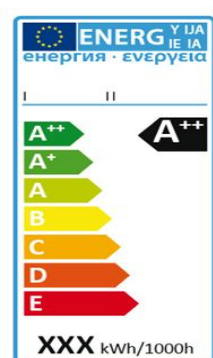
– Endorsement labels (linked to HEPS)

- Indicates achievement of a set high level of performance



– Comparative labels

- Allows comparison of performance between products



Lighting Facts Per Bulb	
Brightness	820 lumens
Estimated Yearly Energy Cost \$7.23	
Based on 3 hrs/day, 11¢/kWh	
Cost depends on rates and use	
Life	1.4 years
Based on 3 hrs/day	
Light Appearance	
Warm	Cool
2700 K	
Energy Used	60 watts

Voluntary
programs

**High Efficiency
Performance
Standards
(HEPS)**

**Endorsement
Labels**

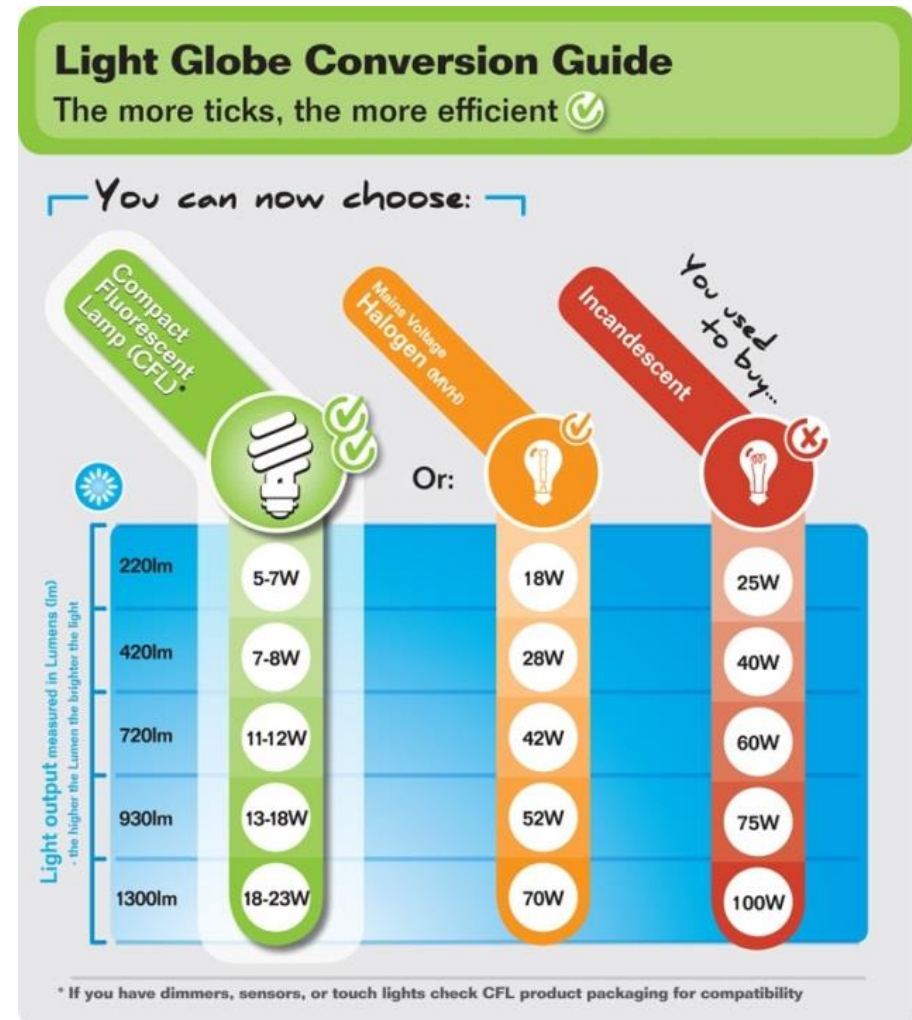
Mandatory
Requirements

**Minimum Energy
Performance
Standards (MEPS)**

**Comparative
Labels**

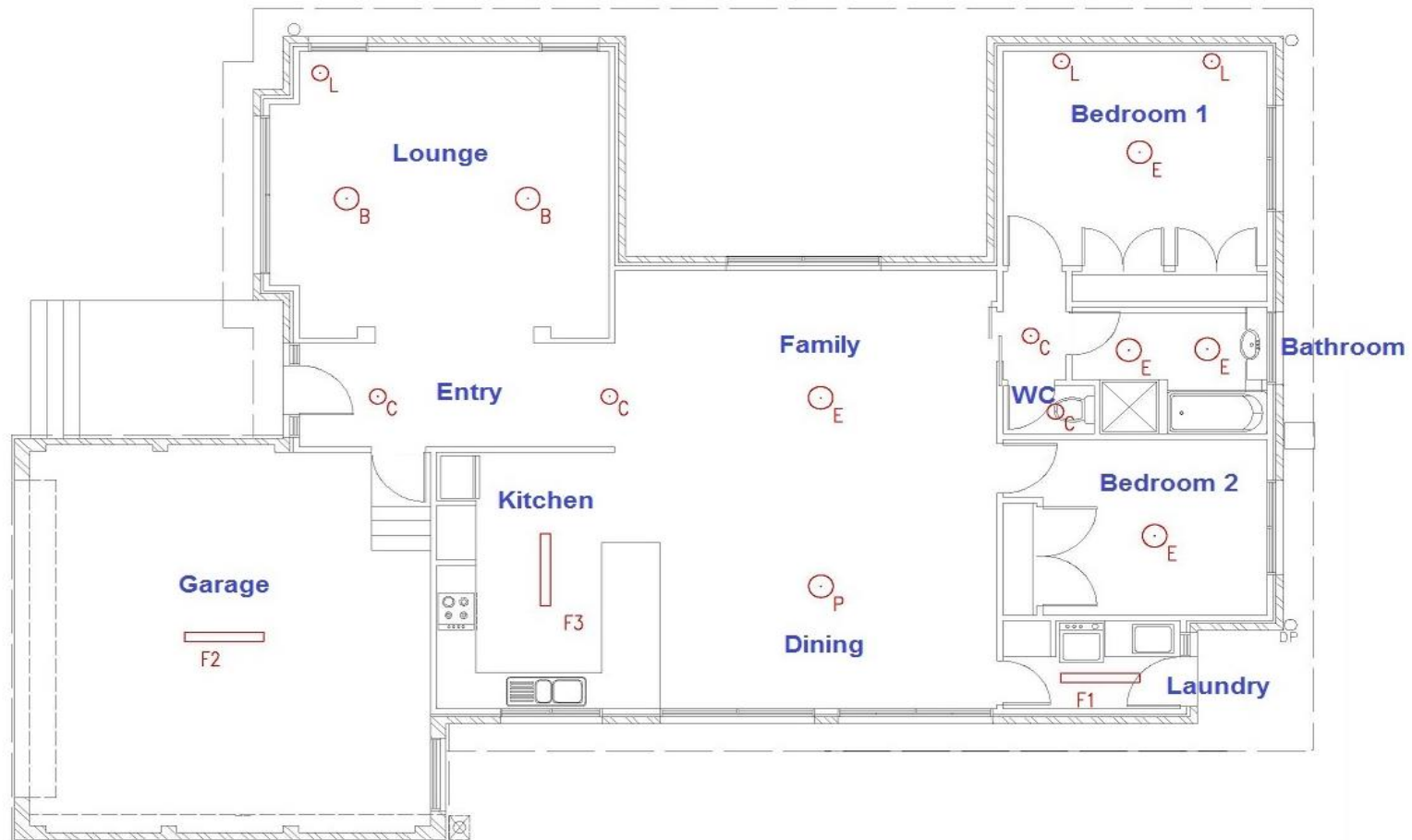
Supporting policies and programs

- Consumer Information
 - Lamp selection guide for point of sale
 - Fact Sheets on health issues
 - UV
 - Flicker
 - Mercury



Supporting policies and programs

- Retailer training packages
 - With examples of house lighting designs



Supporting policies and programs

- Financing options
 - Lowering market price
 - Bulk procurement by government agencies of HEPS products

Supporting policies and programs

- Financing options
 - Increasing transformation rate
 - Government funded free distribution to select community groups
 - Rebate schemes
 - Variable product taxes (import tax, sales tax)
 - Accelerated asset depreciation rates for incompatible equipment for local manufacturers transitioning to efficient technology products

Monitoring, Verification and Enforcement

- Registration database for all regulated lighting products
- Market surveillance (purchases from retailer) conducted regularly including existence of labels
- Application of penalties for non compliant products

Monitoring

Registration
Database

+ annual sales log

Customs /
Border control

Compliance
lamp selection
process

Point of sale
purchasing
(multiple sites)

Panel of Independent labs
for Verification tests
(use more than one lab)

Verification

Test Results
Analysed

Report Back
Industry
Workshops

Failures
Informed

Enforcement

Penalty
system

Programs for environmental issues

- Mercury and phosphor recovery programs



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Find out more about FluoroCycle here



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JOIN OUR NEWEST SIGNATORIES



FOR MORE INFORMATION ON HOW TO APPLY

Why should we recycle our waste lights?

Mercury in landfill converts into the toxic Methyl Mercury which can then spread to the wider environment.



What are the benefits of becoming a Signatory?

Signatories will receive public recognition for their commitment to the environment & full use of

What recycling services are available across Australia?



FluoroCycle is a voluntary product stewardship scheme that seeks to increase the national recycling rate of waste mercury-containing lamps. Lamp recycling can help reduce the amount of mercury being sent to landfill. The scheme targets the commercial and industrial sectors where the bulk of waste lamps are generated.

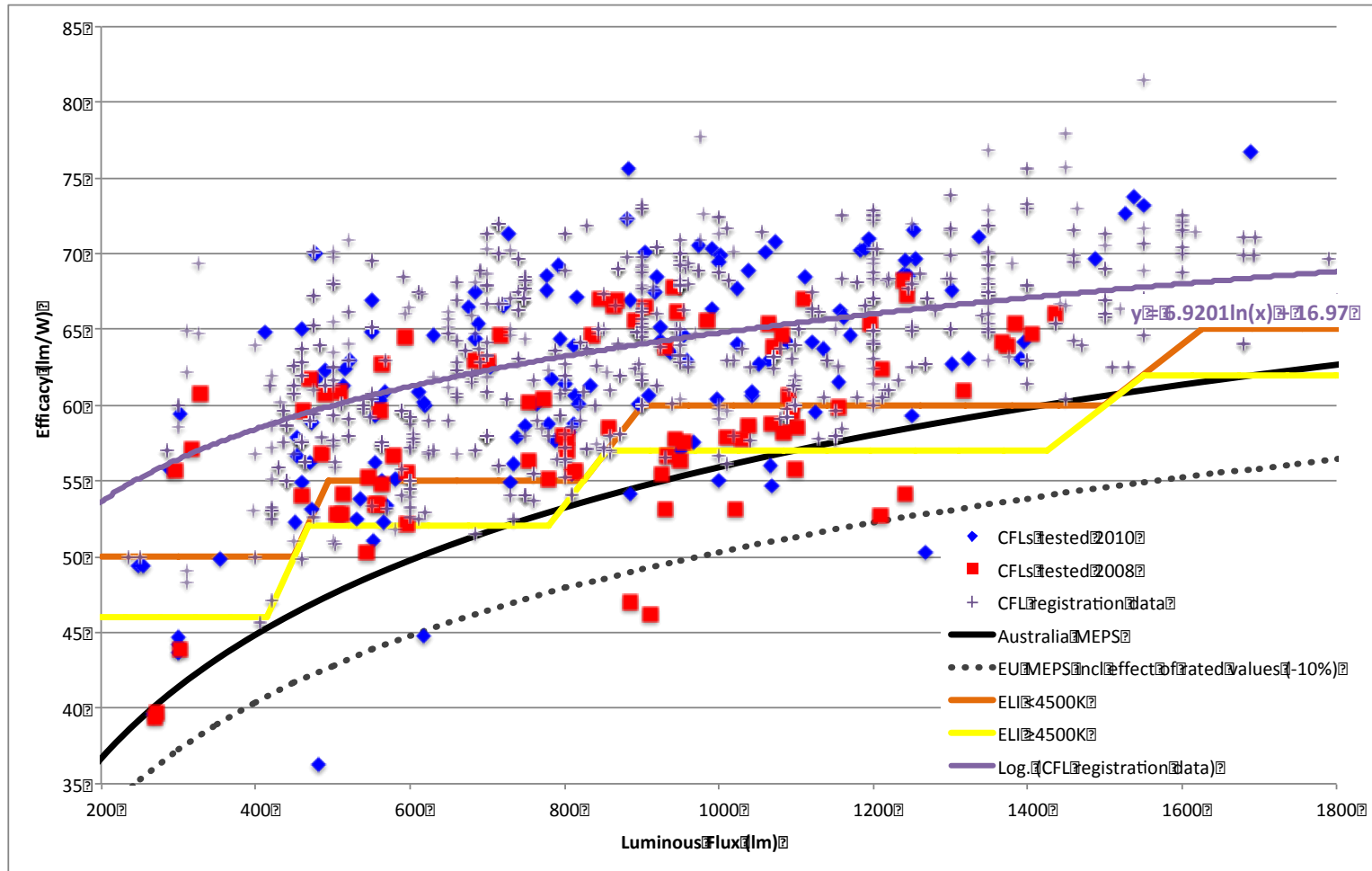
Start following FluoroCycle today

Technology updates

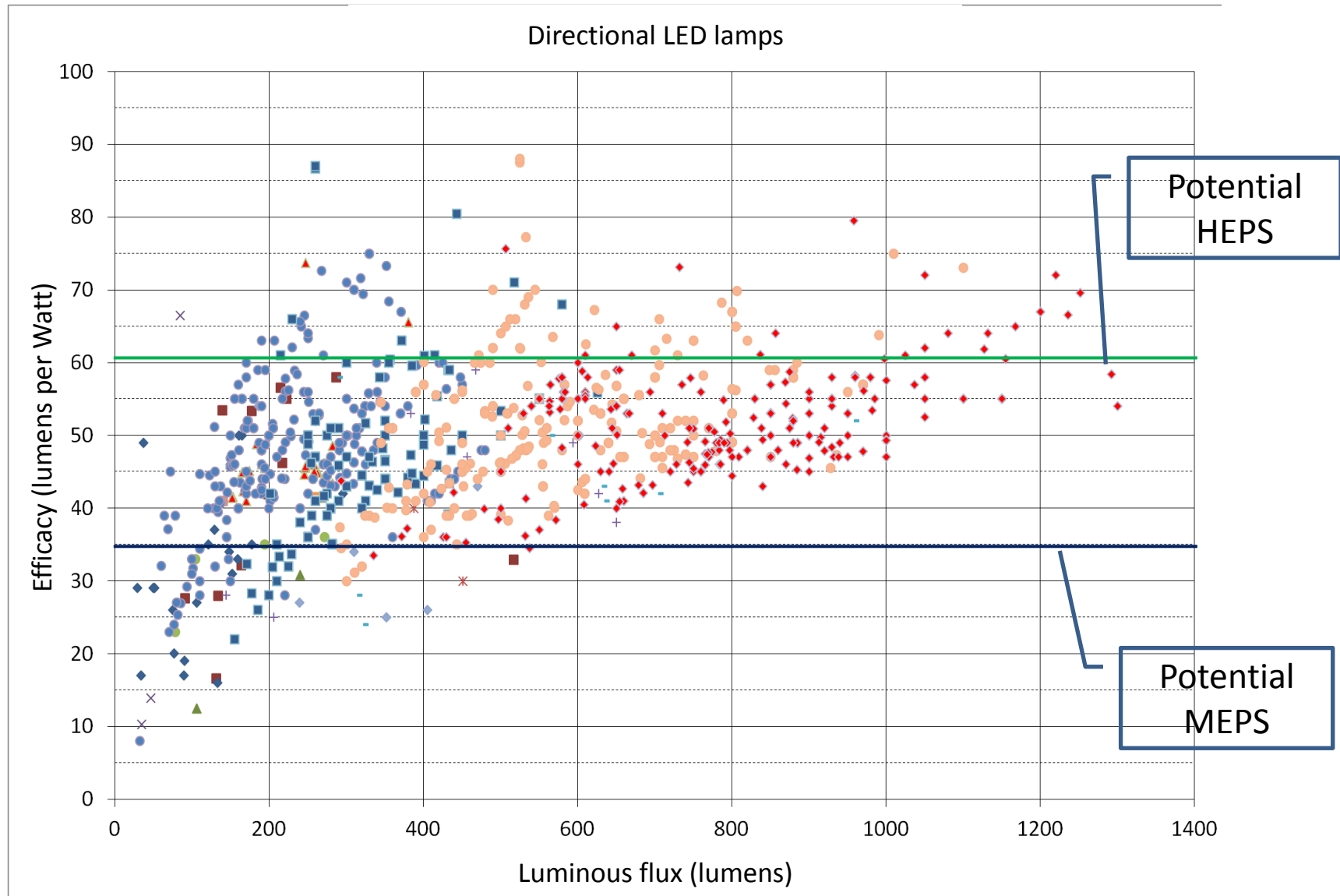
- Review of performance status of products currently under MEPS
- CFL, linear fluorescent lamps and ballasts
- Possible development of MEPS and HEPS
 - Review of international product performance data (benchmarking)
 - LED, FCL, troffer LF luminaires
- Example assessment of CFL and LED lamps in Australia
 - performance reviewed over the last 5 years

Average tested efficacy of bare CFLs (source: lamps tested by the Australian Government 2008 and 2010)

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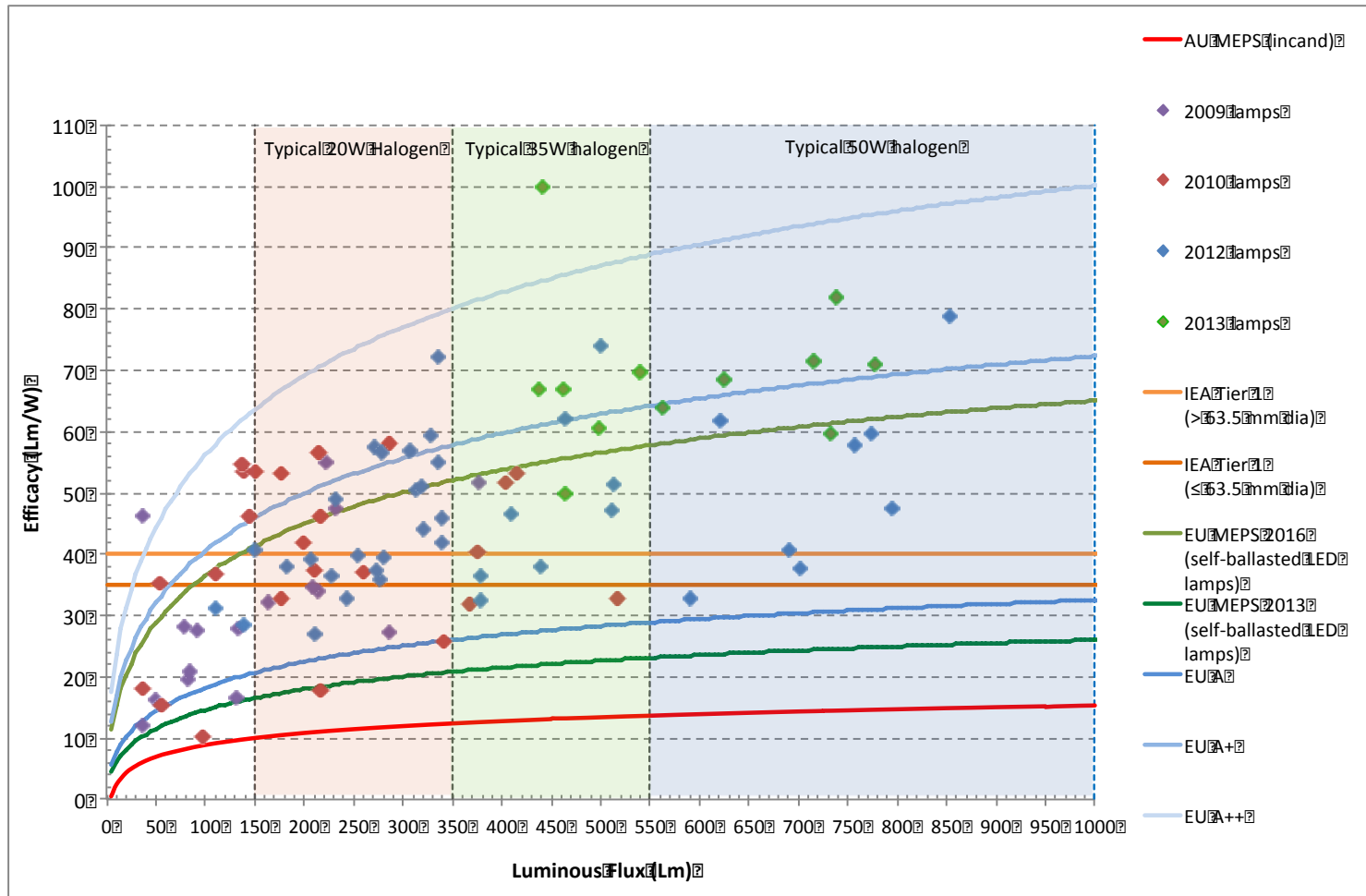


Example: International product benchmarking



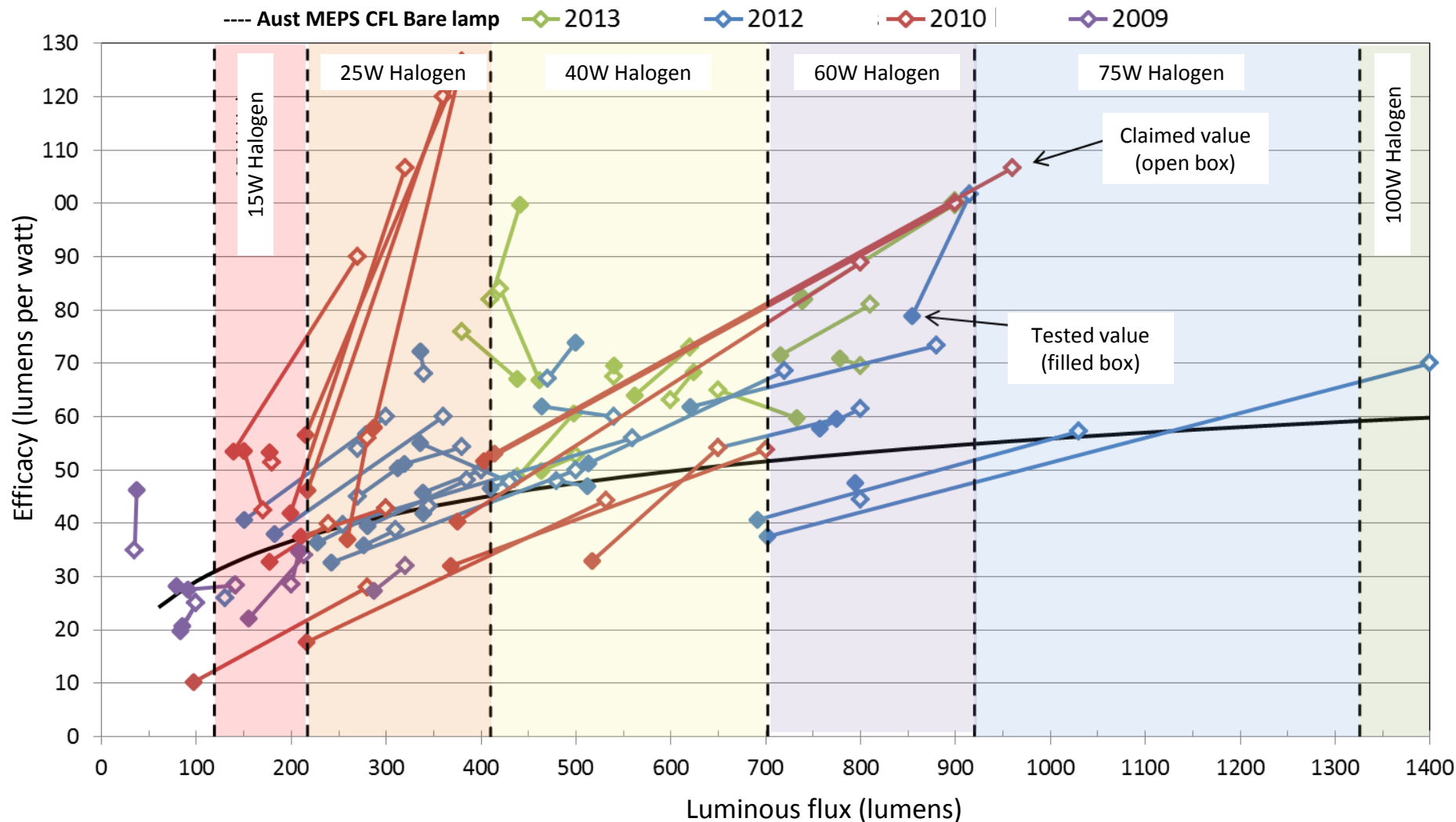
Tested efficacy of LED directional lamp technologies purchased in Australia between 2009 and 2013 (source: lamps tested by the Australian Government)

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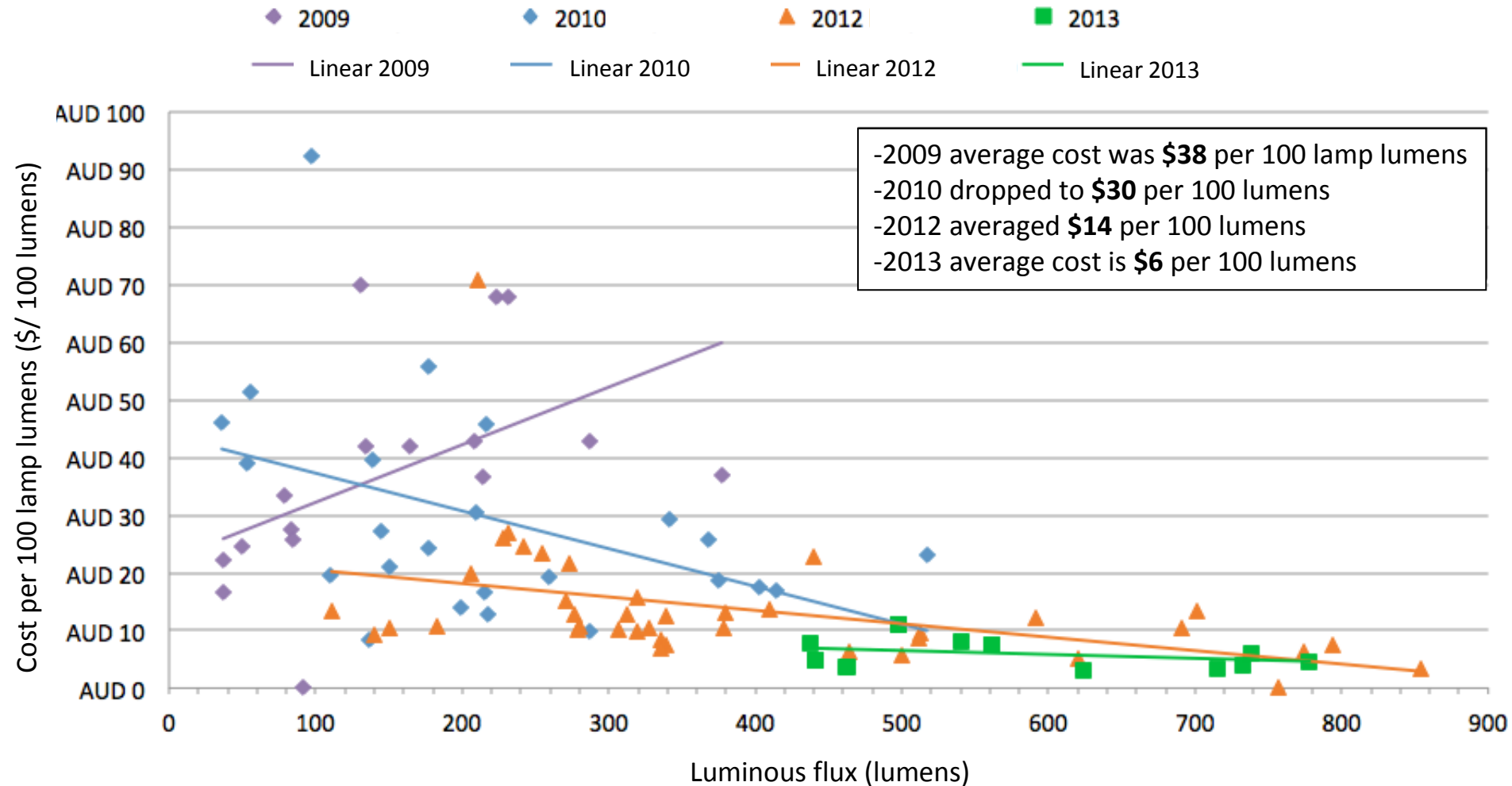
Australian LED Performance– Claim Vs. Test

Difference between claimed and tested efficacy of LED lamps
purchased in Australia between 2009 and 2013
(Equivalent halogen luminous flux ranges shown)



Australian LED Performance – Price changes

**LED Lamp Normalised Cost per tested 100 Lamp Lumens
vs Luminous Flux (by purchase year)**



Current International Collaborative programs

- International Energy Agency – Energy Efficient end-use Equipment – Solid State Lighting (IEA 4E SSL)
 - Performance tiers for developed for LED
 - Omni-directional lamps
 - Directional lamps
 - Downlights
 - Street lights
 - Linear LED lamps

<http://ssl.iea-4e.org/about-the-annex>

Indonesia Trade perspective

Comtrade data

Table 1. Indonesia's 2013 exports and imports of lamps

Lamp category	Trade value of exports (thousand USD)	Units of lamps exported	Top three export partners (descending order of trade value)	Trade value of imports (million USD)	Units of lamps imported	Top three import partners (descending order of trade value)
Filament lamps, tungsten halogen	744	489,076	Australia, Singapore, Germany	23.86	17,080,786	China, Japan, Germany
Filament lamps, <200 watts and >100 volts	36	N/A	Brazil, USA, Canada	5.87	N/A	China, Rep. of Korea, Singapore
Fluorescent lamps, hot cathode	112,626	74,174,535	Japan, USA, Australia	196.04	112,109,199	China, Thailand, Singapore
Mercury or sodium vapour	5,574	506,315	Japan, Rep. of Korea, China	8.49	678,826	China, Belgium, Germany

Comtrade data

Table 2. Indonesia's lamp exports to Southeast Asian trading partners.

Country	Percentage of lamp imports from Indonesia (in terms of aggregated trade value for the lamp categories presented above)
Brunei Darussalam	3.04% (in 2012, excluding mercury/sodium vapour lamps)
Cambodia	0.66% (in 2012, excluding mercury/sodium vapour lamps)
Malaysia	7.6% (in 2012, excluding mercury/sodium vapour lamps)
Myanmar	5.67% (in 2010, only for fluorescent lamps, hot cathode)
Philippines	29.57% (in 2010, excluding mercury/sodium vapour lamps)
Singapore	0.99% (in 2011, for all lamp categories)
Thailand	4.39% (in 2009, excluding mercury/sodium vapour lamps)
Timor-Leste	59.19% (in 2005 – last reported year, excluding mercury/sodium vapour lamps)
Viet Nam	17.95% (in 2011, excluding mercury/sodium vapour lamps)

Indonesia 2015 budget

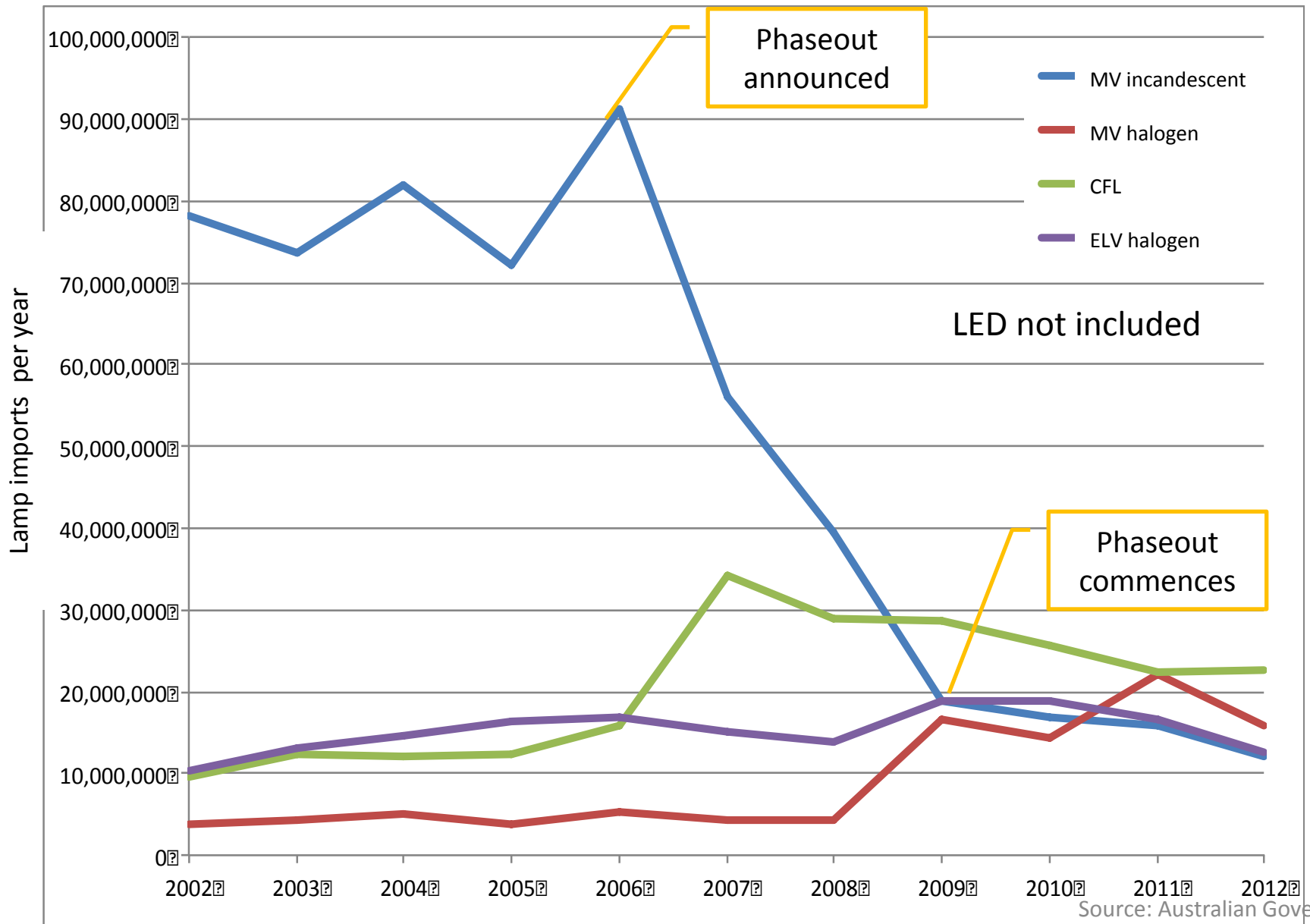
- 15% - energy subsidies
- Suggestions that to stimulate economic growth may need cuts in subsidy
 - (short term pain – long term gain)
- Energy efficient lighting presents such an opportunity. Supporting market transition will reduce energy consumption and thereby reduce subsidy requirements without financial impact on consumer

Possible industry directions

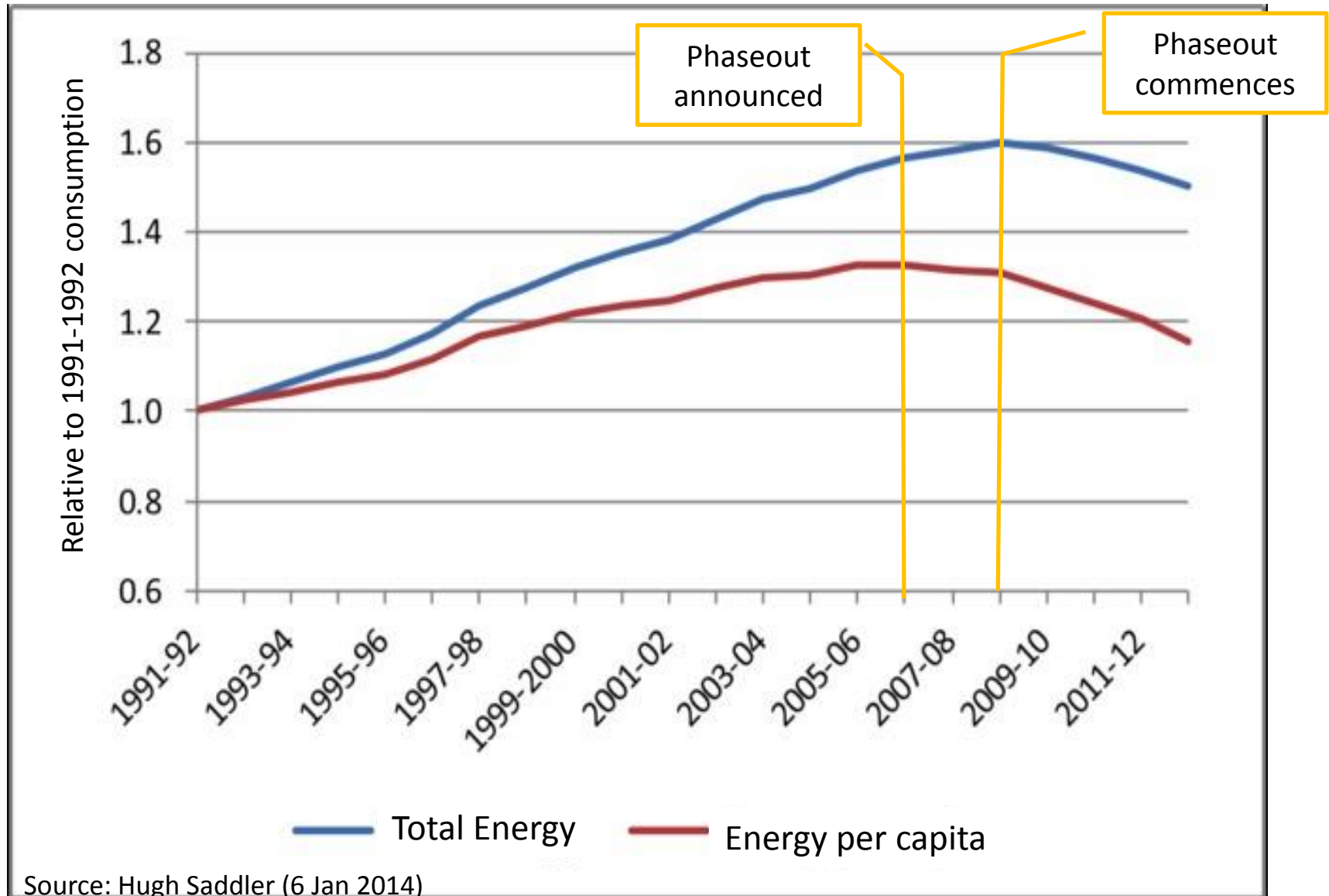
- Commercial analysis of local manufacturing to produce higher efficacy products
- Enable security of
 - Existing export markets which are implementing MEPS
 - Local markets where competing against higher efficacy imports
- Increase opportunity to export to other economies already with MEPS
- Increase overall production and profit

Australian example

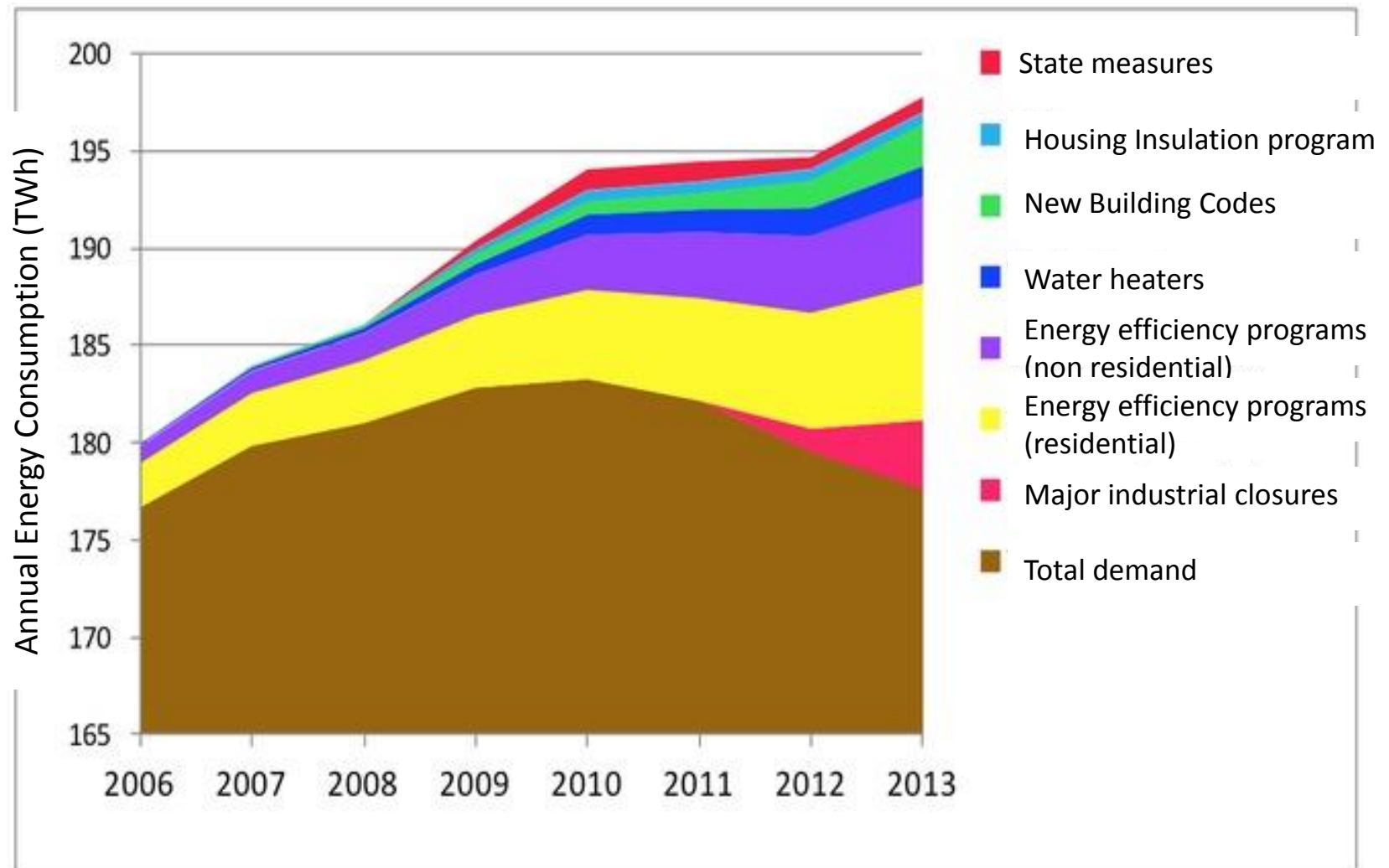
Eg Results: Australian yearly import data



Impact on electricity consumption in Australia



Contributions to savings by different programs



Source: Hugh Saddler (6 Jan 2014)

Now time for discussion