



# Independent Review of the Greenhouse and Energy Minimum Standards (GEMS) Act 2012

## DISCUSSION PAPER

February 2018

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The GEMS Review Team invites written submissions on the Discussion Paper.

Submissions are due by **5:00pm AEDT, Wednesday, 28 March 2018**. Any submissions received after this date will be considered at the Government's discretion.

### Submission instructions

Where possible, submissions should be sent electronically, preferably in Microsoft Word or other text-based formats, to the email address listed below. Submissions may be sent to the postal address below.

**All submissions must include a cover sheet, available at:**

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Submissions can be forwarded to:

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# List of abbreviations

AS	Australian Standard
COAG	Council of Australian Governments
E3	Equipment Energy Efficiency
EEAT	Energy Efficiency Advisory Team
ERL	Energy Rating Label
GEMS	Greenhouse and Energy Minimum Standards
MEPS	Minimum Energy Performance Standards
the GEMS Act	The Greenhouse and Energy Minimum Standards Act 2012

# 1. Introduction

## 1.1 Why the review is being undertaken

The *Greenhouse and Energy Minimum Standards Act 2012* (the GEMS Act) came into effect on 1 October 2012. Section 176 of the Act specifies a review of the operation of the Act be commenced as soon as possible after the fifth anniversary of its commencement date. This statutory requirement provides an opportunity to review the legislation at an early stage and ensure its effectiveness. As a program that is expected to continue well into the future, and face changing market conditions and technology advancements, the operation of the Act must also be reviewed every ten years after the first review.

## 1.2 Purpose of the legislation

The GEMS Act implemented a commitment by the Australian Government and the Council of Australian Governments (COAG) to establish national legislation to regulate energy efficiency and labelling standards for products. The national framework replaced seven separate state and territory legislative frameworks. See **Box 1** in relation to the transition to the national regime.

The national legislation permits the Australian Government to set mandatory minimum efficiency requirements for products, which helps drive greater energy efficiency and excludes the poorest performing products from the market. The GEMS Act also allows the Australian Government to set nationally-consistent labelling requirements, to increase Australians' awareness of options to improve energy efficiency and reduce energy consumption, energy costs and greenhouse gas emissions.

The GEMS Act is the underpinning legislation for the Equipment Energy Efficiency (E3) Program. The E3 Program, which commenced in 1992, is a cross-jurisdictional program through which the Australian Government, state and territory governments and the New Zealand Government<sup>1</sup> collaborate to deliver a single, integrated program on energy efficiency standards and energy labelling for equipment and appliances. The program currently regulates 22 products by way of Minimum Energy Performance Standards (MEPS) and the Energy Rating Label (ERL).

The GEMS Act also gave effect to certain commitments under the United Nations Framework Convention on Climate Change to adopt national policies and measures to mitigate climate change and limit Australia's emissions of greenhouse gases. It aims to promote the development and application of technologies and practices that control emissions of greenhouse gases.

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<sup>1</sup> New Zealand participates under the *Energy Efficiency (Energy Using Products) Regulations 2002*, which is not part of this review.

**Box 1: Rationale for transition to national legislation**

The evolving expansion of the E3 Program under separate state and territory laws resulted in inconsistencies which increased the regulatory burden for businesses and government agencies. These included:

- a lack of coordination of the implementation date for agreed regulations
- some jurisdictions implementing requirements that were more stringent than nationally agreed MEPS levels
- differences in how registration, compliance and enforcement were dealt with between jurisdictions.

These issues resulted in delays in implementation, increased costs to industry and reduced benefits expected to flow to consumers.

In response to these problems, a Regulation Impact Statement (RIS) process examined options to improve the regulatory framework. The RIS explored several framework options and concluded that the most cost-effective option was to establish a streamlined nationally-consistent regulatory framework.

## 1.3 Terms of Reference and methodology

### Scope

The review will evaluate, advise and report on:

1. The extent to which the framework (including systems and procedures) established by the GEMS Act is achieving its purpose.
2. Improvements that could be made to the operation of the GEMS Act, including any costs and impacts on stakeholders.
  - a. Particular attention should be given to improvements that will lead to an increased reduction in greenhouse gas emissions.
3. Implementation and transition actions to facilitate improvements to the Act identified at point 2.
4. Any other matters including environmental, cost, technical and regulatory issues relevant to the operation of the Act.

The TOR provides that the reviewer will be assisted by considering the following issues in relation the GEMS Act:

- The level of actual and required agility of the Act to respond to changing dynamics (for example, technological changes, increasing proportion of online sales, integrated products, less specific product categories).
- The ability of the Act to provide for adequate compliance arrangements for new and bespoke products.
- Administrative challenges (current and anticipated) faced by businesses and the GEMS Regulator.
- Whether there is a role for guidance about when mandatory standards are more useful and when other approaches might be more suitable.

The full Terms of Reference for the review are at **Appendix A**.

### Governance and Deliverables

The Minister for the Environment and Energy has appointed Ms Anna Collyer to undertake the review. Ms Collyer is supported by the GEMS Review Team in the Department and will provide regular updates to the COAG Energy Council's Energy Efficiency Advisory Team.

A written report of the review will be submitted to the Minister for the Environment and Energy.

### Methodology

This review will assess the performance of the Act in terms of:

- its efficacy compared with the previous state based regimes
- its ability to reduce energy use and emissions.

- its ability to reduce power bills for consumers and minimise regulatory costs on industry.

In doing so, the review will consider the problems identified in the Regulation Impact Statement (RIS) referred to in the Explanatory Memorandum that the GEMS Act was intended to address. These problems include those related to:

- the governance and administration of the program
- scope of the program and appropriate targeting of products
- associated environmental impacts
- monitoring
- targeting information to purchasers.

The assessment will focus primarily on standards and labelling interventions implemented through GEMS. It will not review the Inter-Governmental Agreement for GEMS, as this was undertaken in the 2015 GEMS Review.

Stakeholder feedback will be very important to the assessment and outcomes of this review. Feedback can be provided by making a written submission on the Discussion Paper (this document) and the Draft Report. Public consultation sessions on the Draft Report will also be conducted to assist the development of a Final Report.

## 1.4 Structure of this Discussion Paper

Sections 2 and 3 of this Discussion Paper provide further background context to this 2018 review, including information in relation to the impact of GEMS.

Sections 4, 5 and 6 consider each of the key elements of the regulatory regime established by the GEMS Act:

- process for making GEMS determinations by which products come within the regulatory regime
- requirements in relation to the registration of GEMS products
- the monitoring and compliance activities undertaken under the GEMS Act.

Each section provides a high level summary of relevant parts of the legislation, and includes a brief discussion of a number of issues which arise, or may arise in the future, under the regulatory regime. Section 7 sets out a brief discussion of a number of overarching issues.

Section 8 provides direction in relation to the input sought by this Discussion Paper, including a list of the questions for consideration. It is not intended to limit responses, but provides a framework to consider and raise issues.

Section 9 sets out the next steps in relation to the review and opportunities for further consultation (as noted above).

## 2. Impact of the GEMS Act

By consolidating a multi-jurisdictional scheme into national legislation, the GEMS Act has reduced regulatory burden on industry and led to further efficiencies in implementing regulations. GEMS regulations have driven significant improvements in energy efficiency and have contributed to reduced energy consumption, energy costs and greenhouse gas emissions.

The 2015 Review found that:

The GEMS scheme, as a national program compared to the previous multi-jurisdictional scheme, provides consistency within the market; is more economical to comply with, mainly due to reduced uncertainty and administrative burden; and is less confusing for consumers.

In its response to the 2015 Review, the COAG Energy Council noted that further steps had been taken to reduce the regulatory burden on industry. These included streamlining the registration system to simplify the process and moves to increase international harmonisation (for both test methods and energy efficiency standards).

GEMS regulations save the average Australian household between \$140 and \$220 on their electricity bill each year. The bulk of the benefits of GEMS regulations for households are delivered through appliances such as air conditioners, lighting and refrigerators. See **Box 2** for examples of the type of household savings on energy bills resulting from GEMS regulations.

Between 2000 and 2014, the E3 Program delivered a net benefit to consumers of between \$4.3 and \$7.8 billion. The program also reduced Australia's emissions by between 23 and 35 million tonnes.

From 2015 to 2020, the GEMS regulations are projected to deliver a further net benefit of between \$5.1 and \$11 billion. In this same period, the program is projected to deliver between 27 and 44 million tonnes of greenhouse gas emissions savings.

In 2016, the net savings of GEMS regulations to the Australian economy was in the range of \$870 million to \$1.58 billion, with greenhouse gas emissions savings of between 4.5 and 6.9 million tonnes. That is the equivalent of half of Queensland's annual household emissions.

Over the 2020 emissions reduction period, equipment and appliances standards are expected to deliver between 50 and 79 million tonnes of greenhouse gas emissions savings, which equates to nine to 15 per cent of Australia's 2020 emissions reduction target.

A guide to the calculations of the impact of the GEMS Act is at **Appendix B**.

**Box 2: Examples of potential household savings using GEMS information**

Purchasing appliances that are more energy efficient may cost more upfront but they can save consumers money in the long term. For example:

- For an upfront cost of an additional \$366, a family using an 8kg clothes dryer twice a week could save \$1150 over 10 years by using a 7 star dryer (e.g. a heat pump dryer) over a 2 star dryer (e.g. a condenser dryer).
- For an upfront cost of an additional \$360, purchasing an 8 star swimming pool pump over a 2 star pump could save the household over \$540 per year in electricity.
- For no additional upfront cost, a 4 star 600L fridge, on average, could save families with two fridges \$514 over their lifetime compared to a 3 star fridge. Energy efficiency does not greatly affect the cost of fridges.

## 3. Context

### 3.1 Key prohibitions

The GEMS Act gives effect to the policy objectives outlined above by placing key, high-level obligations – the key prohibitions – on manufacturers, importers, and suppliers in terms of the supply and use for a commercial purpose<sup>2</sup> of regulated products in Australia. The key prohibitions in the GEMS Act are set out in Division 2 and Division 3 of Part 3.

Division 2 relates to the circumstances in which the supply, or offer to supply, of a GEMS product is not permitted. These are when:

- the product does not comply with the requirements of the relevant GEMS determination, or when a requirement of that determination is not complied with in supplying the product (section 16).
- the product is not registered against the relevant GEMS determination (section 17).

Division 3 relates to the circumstances in which using GEMS products for commercial purposes is not permitted. Similar to Division 2, these are when:

- the product does not comply with the requirements of the relevant GEMS determination, and the use is the person's first use of the GEMS product (section 18).
- the product is not registered against the relevant GEMS determination, and the use is the person's first use of the GEMS product (section 19).

### 3.2 Governance and administration

An Inter-Governmental Agreement provides the framework for national cooperation on the E3 Program.<sup>3</sup> A similar arrangement has also been developed to ensure alignment with New Zealand.

#### **The GEMS Regulator**

The GEMS Regulator is based in the Australian Government Department of the Environment and Energy and is responsible for administering the GEMS Act, maintaining the GEMS register, and monitoring and enforcing compliance with the Act.

Performance of the GEMS Regulator is evaluated through an annual stakeholder survey, the Regulator Performance Framework<sup>4</sup> and ongoing feedback from industry and consumer stakeholders.

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<sup>2</sup> *Use for a commercial purpose* is where a company manufactures a product in, or imports it into, Australia for use in its own business. A supply event does not take place in Australia in these circumstances.

<sup>3</sup> <http://energyrating.gov.au/document/gems-iga-signed>

<sup>4</sup> <https://www.cuttingredtape.gov.au/resources/rpf>

## Energy Efficiency Advisory Team

The E3 Program (see **section 1.2**) is managed by the COAG Energy Council's Energy Efficiency Advisory Team. The EEAT is made up of representatives of Australian, state and territory governments who are signatories to the Inter-Governmental Agreement and the New Zealand government. The EEAT recommends actions through the Senior Committee of Officials to the COAG Energy Council for decision.

## E3 Review Committee

Industry and consumer groups participate through the E3 Review Committee and product specific working groups, such as the Air-Conditioner and Commercial Refrigeration Advisory Committee. The E3 Review Committee is a formal advisory group that consults with the E3 Program officials on issues that affect industry and consumers.

## 3.3 2015 GEMS Review

In 2014–15 the COAG Energy Council commissioned an independent review of the Inter-Governmental Agreement and GEMS legislative scheme and the GEMS Act (the 2015 GEMS Review).<sup>5</sup> This review will consider and build on the findings of the 2015 GEMS Review. The 2015 GEMS Review concluded that:

- The GEMS Act supports the delivery of significant economic and environmental benefits in a cost-effective manner by increasing the energy efficiency of a range of energy using equipment sold in Australia.
- The Inter-Governmental Agreement provides a strong framework for national cooperation in implementing GEMS and the E3 Program.
- The program is being delivered effectively.
- There was a strong case for continued mandatory appliance standards and labelling to address market failures which lead to consumers and businesses purchasing energy inefficient products.

Following the 2015 GEMS Review the Commonwealth worked with state, territory and New Zealand governments and the E3 Review Committee to implement the report recommendations agreed by the COAG Energy Council. This has included the following actions:

- The development of an E3 Prioritisation Plan to achieve greater cost, energy and emissions savings under GEMS (see 2.5 below).
- Undertaking a review of fees associated with the delivery of registration and compliance services under the GEMS Act. The fees review is currently being finalised and will not be part of this 2018 review. More information regarding the fee review can be found at <http://www.energyrating.gov.au/consultation/gems-fee-review-supplementary-paper>.

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<sup>5</sup> <http://www.energyrating.gov.au/news/gems-review-released>

- Prioritising and increasing the visibility of compliance and enforcement activities.
- Streamlining processes. This has included trialling a new approach to developing GEMS determinations, working actively with the Office of Best Practice Regulation and leveraging Department of the Environment and Energy resources to develop an E3 Regulation Impact Statement (RIS).
- Continuing to examine options through the E3 work program to harmonise with international test methods and international efficiency standards. International harmonisation options have been considered in recent E3 regulatory proposals. For example, on 24 November 2017 COAG Energy Ministers approved an E3 Decision RIS for household refrigerators and freezers that recommended: (a) Australian MEPS levels be tightened and aligned to those adopted in the United States, and (b) an Australian/New Zealand test standard be replaced with an International Electrotechnical Committee test standard.
- Amending the Inter-Governmental Agreement to clarify funding arrangements between the Commonwealth and the states and territories for Regulator and policy activities.
- A program of registration system enhancements to address useability issues identified by industry stakeholders (see **Box 4** in Section 5 below for more detail).

### 3.4 Products currently regulated under the GEMS Act

**Table 1: GEMS regulated products (as at 19 February 2018)**

Regulated Product	MEPS	ERL
Air conditioners – single phase	Yes	Yes
Air conditioners – three phase	Yes	Yes (Voluntary)
Ballasts for fluorescent lamps	Yes	Other*
Close control air conditioners	Yes	No
Clothes dryers	Yes	Yes
Clothes washing machines <sup>^</sup>	No	Yes <sup>^</sup>
Commercial chillers	Yes	No
Compact fluorescent lamps	Yes	Other*
Computers	Yes	No
Computer monitors	Yes	Yes
Dishwashers <sup>^</sup>	No	Yes <sup>^</sup>
Distribution transformers	Yes	No
Electric motors (three phase)	Yes	Other*
Electric storage water heaters	Yes	No
External power supplies	Yes	No
Gas storage water heaters	Yes	No
Incandescent lamps	Yes	Other*
Instantaneous gas water heaters	Yes	No
Linear fluorescent lamps	Yes	No
Refrigerated display cabinets	Yes	No
Refrigerators and freezers	Yes	Yes
Set top boxes	Yes	No
Street and public lighting	Yes (Voluntary)	No
Swimming pool pumps	No	Yes (Voluntary)
Televisions	Yes	Yes
Transformers and converters for halogens	Yes	Other*

\* While no ERL is required, GEMS labelling requirements do apply - see relevant GEMS determination

<sup>^</sup> The ERL has proven to be an effective and appropriate mechanism to ensure increased efficiency. E3 has undertaken several reviews and the application of MEPS would not be cost effective at this time.

### 3.5 E3 Prioritisation Plan

Setting priorities for the E3 Program is critical to ensuring that opportunities to save energy, lower energy costs for households and business and reduce greenhouse gas emissions, are realised as soon as possible. Evidence-based prioritisation of opportunities provides a basis for planning for future regulatory work and allocation of resources.

In the short- to medium-term, prioritising means focussing resources on a smaller number of higher-value policies so they can be delivered earlier than they would be otherwise. The plan identified six priority areas in 2016 with a further three added in 2017.

**Table 2: E3 Prioritisation Plan priority products**

	Priority product category	Proposed actions
Priority areas identified in 2016	Air conditioners	New climate zoned labelling and enhanced MEPS
	Domestic refrigerators and freezers	Enhanced MEPS
	Lighting	Enhanced MEPS and new regulations
	Non-domestic fans	New regulations
	Refrigerated storage and display cabinets	Enhanced MEPS and new regulations
	Swimming pool pumps.	New regulations
Added 2017	Hot water systems	Under investigation for future opportunities
	Industrial products	Under investigation for future opportunities
	Televisions	Under investigation for future opportunities

### 3.6 Consultation questions specific to this section

- Are the actions taken following the 2015 GEMS Review leading to better outcomes?
- Are the appropriate products covered by the current GEMS regulations?
- Are the priority product categories the correct areas to be targeting?

## 4. GEMS determinations

The specific requirements for each product regulated under the GEMS Act — including MEPS and ERL requirements — are set out in a legislative instrument specific to that product type called a GEMS determination.<sup>6</sup>

A GEMS determination sets out the requirements to be met by products (in each product class covered by the determination) in order to be legally registered, supplied, or offered for supply in Australia. These can include relevant clauses from Australian and/or International Standards.

Standards are separately published documents that set out specifications and testing procedures to ensure that products are safe, reliable, and consistently perform the way they are described. Standards can also set out specifications to ensure products meet certain energy performance levels and other energy efficiency requirements.

A GEMS determination implements the outcomes of a GEMS policy development process. The steps involved in GEMS policy development include product analysis work, formulating a proposal, and multiple rounds of consultation and approval (see **Box 3**).

### 4.1 Summary of key parts of the GEMS Act relating to GEMS determinations

- *Section 22 – Part 4 of the GEMS Act is about how GEMS determinations are made, and the requirements (GEMS requirements) which are imposed by the determinations.*
- *Division 2 provides for GEMS determinations to be made by ministerial determination, subject to the consent of a certain number of states and territories to the making and replacement of GEMS determinations.*
  - *GEMS determinations must contain requirements relating to energy use or greenhouse gas production (GEMS level requirements) or requirements about labelling (GEMS labelling requirements). They may also contain other requirements including in relation to efficiency levels, performance, the environment and human health.*
- *Division 3 provides for GEMS determinations to be updated by replacement determinations. Replacement determinations must specify whether they affect the registration of models of GEMS products.*
  - *If a replacement determination affects a model's registration, the registration ceases to be in force from the time the replacement determination comes into force. This occurs when a model is not able to comply with the requirements set in the replacement determination, and might affect a person's ability to supply or use for a commercial purpose products of the model imported into, or manufactured in, Australia after that time.*

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<sup>6</sup> <http://www.energyrating.gov.au/suppliers/registration/regulated-products>

- *Stock of a model whose registration is affected that was in Australia prior to the commencement of the replacement determination is covered by the 'grandfathering' provisions of section 16(2)(c) of the GEMS Act, and may continue to be supplied until the stock is exhausted, even though the registration has ceased to be in force. No new stock of such models may be manufactured in Australia or imported however.*
- *If a replacement determination does not affect a model's registration, the model is taken to continue to be registered against the replacement determination, and may continue to be supplied (or offered for supply) and used for commercial purposes relying on that registration.*
- *Division 4 allows product models to be exempted from requirements of GEMS determinations.*

## 4.2 Issues for discussion

### **Regulatory framework and innovation**

A common challenge for regulation is that it takes time to develop standards and determinations while product innovation may progress rapidly. This means that, by the time regulations are established, there may be innovations that have not been considered in the drafting process. This is a potential problem under any framework.

GEMS determinations can potentially be replaced more quickly than standards can be revised (due to the nature of the standards development process). While the GEMS framework is intended to have more flexibility to deal with innovation than the previous framework, this can still take some time, as appropriate consultation processes are still required.

If a replacement determination will only lead to minor changes, this can occur relatively quickly. Where the changes being proposed are more significant, a COAG RIS process is undertaken as part of the policy development work.

### **Determinations process**

#### *Consultation*

Some industry stakeholders have expressed concern about the potential lack of clear obligations around consultation where regulation is progressed through a GEMS determination directly, rather than through the standards process. The determinations process is a new path the E3 Program is taking to develop performance criteria for MEPS and ERLs.

At the moment there is not the same level of detail or formality regarding consultation requirements as those in the standards process. E3 Program officials are working with stakeholders to provide more clarity regarding this new approach.

### *Timeline*

GEMS determinations implement the outcomes of a GEMS policy development process. The GEMS policy development process includes multiple rounds of consultation and approval. The time this takes is affected by the anticipated impact of the proposed regulation and the complexity of issues to be worked through with industry. As a general guide, the approximate time from the start of the policy development process to a finalised GEMS determination is three years (if a COAG RIS process is required). However, the timing is dependent on the technical details and the level of industry support.

The E3 Program has been implementing approaches to streamline the process for introducing or strengthening GEMS requirements. This has included undertaking activities in parallel where possible, such as drafting GEMS determinations at the same time as progressing a decision RIS.

### **Removing GEMS determinations**

To date, no GEMS determinations have been removed. The E3 Program undertakes analysis to test the impact that GEMS regulations are having in terms of net benefits, and reducing energy use and emissions. If the costs of regulation were outweighing the benefits, a policy decision could be taken to remove a GEMS determination.

#### **Box 3: Introducing or strengthening GEMS requirements**

The process for introducing or strengthening GEMS requirements consists of formulating a policy proposal, gaining approval and then establishing the requirement by issuing a GEMS determination under the GEMS Act.

**Step 1:** Identify and define the product class

**Step 2:** Undertake technical, economic and market analysis

**Step 3:** Develop a consultation Regulation Impact Statement

- Includes approval from EEAT and the Office of Best Practice Regulation (OBPR)

**Step 4:** Undertake stakeholder and public consultation

**Step 5:** Develop a decision Regulation Impact Statement

- Includes approval from EEAT, OBPR and the COAG Energy Council

**Step 6:** Develop a GEMS determination in consultation with stakeholders

- Includes approval from EEAT and the Commonwealth Minister

**Step 7:** Undertake stakeholder consultation

### 4.3 Consultation questions specific to this section

- Does the current framework support the appropriate balance of being responsive to innovation and consulting adequately before introducing new or updated regulations?
- Is the GEMS determinations process adequate in terms of the consultation process and the timeline?
- What issues would need to be taken into account in considering a decision to remove a GEMS determination?

## 5. Registration

A product regulated under the GEMS Act must be registered before it can be offered for supply or used for a commercial purpose<sup>7</sup>. It is the responsibility of manufacturers, suppliers, and commercial users to find out what the regulatory requirements are for their products and to ensure they are operating in accordance to those requirements. Specific requirements for regulated products can be found in the relevant GEMS determination.

Registrants can be a manufacturer, importer, or another organisation with an appropriate connection to the supply of the product in Australia. An appropriate connection to supply could include, but is not limited to, a wholesaler or retailer. In the case of manufacturers, the registrant may be an offshore company.

Registrants may be required to provide a full laboratory test report as part of the registration application, demonstrating that the product meets the regulatory requirements in accordance with the test methods outlined in the relevant GEMS determination and relevant Australian/International Standards referred to in the determination.

A product's registration may be for a single product or a product family as specified under the relevant GEMS determination.

A product's registration remains valid for five years from the date on which it was approved, as long as it continues to meet the requirements specified in the relevant determination.

The GEMS Registration Database, which lists all products that are registered, is available at [http://reg.energyrating.gov.au/comparator/product\\_types/](http://reg.energyrating.gov.au/comparator/product_types/).

### 5.1 Summary of key parts of the GEMS Act relating to registration

- *Section 38 – Part 5 of the GEMS Act relates to registering models of GEMS products on the GEMS Register against GEMS determinations.*
- *Division 2 establishes the GEMS Register and sets out what information is to be contained in the register.*
- *Division 3 determines how models of GEMS products are registered, and allows for registration of families of models. A manufacturer or importer of a model of a product in Australia, or someone else connected to the supply of the model in Australia, may apply for registration. To be registered against a GEMS determination, the model must comply with the requirements of the determination.*
- *Division 4 sets out how registrations may be varied to cover additional models, or to record a change in the identity of the registrant.*

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<sup>7</sup> Use for a commercial purpose is where a company manufactures a product in, or imports it into, Australia for use in its own business. A supply event does not take place in Australia in these circumstances.

- *Division 5 determines when a registration comes into force, and when it ceases to be in force. Generally, registrations last for 5 years.*
- *Division 6 provides for suspending and cancelling registrations. This may happen, for example, if inaccurate information is given with an application, or the model or the registrant does not comply with this Act.*
- *Division 7 sets out a number of requirements for registrants, including requirements to give information and to have products tested.*
- *Division 8 deals with a variety of matters, including determining when a model complies with a GEMS determination, making and determining applications and notifying applicants of decisions.*

## 5.2 Issues for discussion

### Large number of models

Large numbers of registrations, including from large numbers of models from a single supplier, are seen by some stakeholders as overly burdensome. The GEMS Regulator has introduced arrangements to reduce this burden, and has engaged in a program of useability enhancements to make the registration system easier to interact with (see **Box 4**).

From a legislative perspective family arrangements can allow large numbers in the family, with testing only required for the least efficient member of the family. While providing more flexibility, some suppliers have raised concerns that large families increase complexity in terms of establishing what models are allowed within a family, when updates are required, and compliance implications in terms of the impact on the family where one or more models is found to be non-compliant.

#### **Box 4: Improvements to the GEMS registration system**

Improvements to the GEMS registration system have been made in response to issues identified in the 2015 GEMS review and to assist the day-to-day management of the system. Recent changes have included:

- A bulk application process that allows multiple applications to be submitted through excel spreadsheets.
- “Copy to new” functionality that allows registrants to create a pre-populated application based on an existing, similar approved registration. Only fields where details are different need be edited.
- A supplier dashboard to provide registrants with a management tool to assist with their registrations.
- Removal of non-mandatory questions.
- New payment options, including American Express and debit cards.

## **Model numbers for products devised only for GEMS**

The GEMS registration system requires a unique model identifier (usually a model number) to be provided in a registration application. For some regulated products, model numbers are typically not used in offering the products to consumers in the market and in many cases model numbers for these products are created for the purposes of a GEMS registration (usually based on common features of the products). As a consequence, the formats might not be consistent from registrant to registrant, making it difficult to match individual units in the field to a registration in the GEMS Register. Examples of products this issue applies to include electric motors and some lighting products.

## **Registration obligation for customised products**

A product must be registered before it can be offered for supply in the Australian market. For standardised consumer products, what constitutes an offer to supply is generally very clear. However, for customised products, whose specifications are often settled through conversation between the supplier and the customer, this is not necessarily the case.

Stakeholders have expressed some confusion at what point in the back-and-forth process between the supplier and customer the obligation to register or the “offer to supply” is triggered. Additionally there are practical concerns raised by industry in that the GEMS Act requires a registration when a sale may never be made.

Examples of products this issue applies to include low-volume/bespoke refrigerated display cabinets, customised air conditioners and chillers. (See **Box 5** for an example).

## **Multiple registration requirements**

Some GEMS products are required to be registered under other sets of regulations, which increases costs for industry. The GEMS Regulator has fairly broad discretion in regard to the manner and form in which registration applications are made, so there is sufficient flexibility from a legislative perspective to explore streamlining with other registration systems as suggested by some stakeholders.

## **‘Grandfathering’ and the registration of newly regulated products**

The approach to grandfathering under the GEMS Act is different to the approach that was taken under the previous state and territory legislative frameworks. Broadly speaking, state and territory regulators generally took the position that no product which was in Australia prior to new requirements taking effect needed to comply with those requirements (though there were differences between jurisdictions around the period for which this was the case). In practice, this was applied to both MEPS/labelling requirements and registration requirements.

Under the GEMS Act grandfathering arrangements are only made for products that cannot comply with new or revised requirements. Products covered by these arrangements are allowed to be supplied unregistered because the Act does not allow a non-compliant product

to be registered. Aside from this, the general presumption in the Act is that a regulated product must be registered – for newly regulated products that can comply with the requirements of a GEMS determination, no distinction is made between stock that was in the country prior to the requirements taking effect and stock that arrives afterward for the purposes of the registration obligation. Therefore all products that can comply with the new MEPS/labelling requirements must be registered/labelled by the effective date regardless of the date of importation of the product.

#### **Box 5: Problems with registering chillers**

Chillers are large refrigeration units designed to chill water for circulation through the air handling units of a building's heating, ventilating and air conditioning system.

The capacity (cooling power output) of a single large chiller can be varied according to the application for which it is being sold. For instance, two physically identical chillers could be rated at 1,200 kilowatts (kW) and 1,400 kW (or anything in between).

There is confusion as to whether a catalogue of nominal models constitutes an offer to supply, triggering the requirement to register them all. These 'nominal models' generally only represent indicative performance of what the range can do; they may not actually ever be built or supplied.

Exact model numbers and capacities for large chillers are often not finalised until a customised product is ordered by a customer. For instance, the rated capacity (in kW) generally forms part of the model number string. However, the exact capacity is specified by the buyer based on their building's requirements.

### 5.3 Consultation questions specific to this section

- Is the balance between flexibility and risk set at the appropriate point for family registrations where a large number of models are allowed in the family?
- Are there improvements that should be made to the GEMS registration system (in addition to those summarised in **Box 4**)?
- Are there changes that could be made which would make the link between the model number provided at registration and the product offered in the market more clear?
- Is there a more practical point for the registration obligation to be triggered for customised products, which would still provide some assurance for consumers at the point they make the purchasing decision that the product meets MEPS requirements?
- What are the pros and cons of seeking to harmonise the GEMS registration system?
- Are the 'grandfathering' provisions under the GEMS Act appropriate?

## 6. Compliance

Under the GEMS Act, the GEMS Regulator is responsible for monitoring and enforcing compliance with the Act and does so by:

- check testing selected models of products in accredited laboratories to ensure energy efficiency levels and claims are met
- market surveillance conducted by GEMS inspectors in the field to ensure registration and labelling requirements are met
- the receipt, assessment, and investigation of allegations of non-compliance received from a range of entities, but most notably, the industry itself.

There are penalties for suppliers who do not comply with the energy efficiency regulations. The GEMS regulator may:

- suspend a model's registration
- cancel a model's registration
- issue an enforceable undertaking
- issue an infringement notice
- impose a civil penalty order
- impose an injunction.

The GEMS Act also allows the GEMS Regulator to publicise details relating to enforcement responses including the names of registrants and the model numbers of GEMS products.

The results from recent compliance activities can be found at <http://www.energyrating.gov.au/suppliers/compliance>.

### **Box 6: GEMS compliance approach**

The GEMS Regulator's compliance objective is to maximise the number of responsible parties who choose to voluntarily comply with the Act, whilst implementing strategies and responses to identify, and then deter, non-compliance. To achieve this, the Regulator takes an intelligence led, risk based approach to compliance. Compliance activities are targeted strategically, as the regulator's activities are limited by staffing and resources.

In cases of non-compliance, the GEMS Act provides the GEMS Regulator with educative, administrative, civil, and criminal response options. Each response considers a responsible party's history, behaviour, motivation, and intention; and, is proportionate to the risk posed by the non-compliance.

## 6.1 Summary of key parts of the GEMS Act relating to compliance

- *Part 5 Division 7 of the GEMS Act sets out a number of requirements for registrants, including requirements to give information and to have products tested.*
- *Section 57 relates to the requirement for a registrant to give product to the GEMS regulator to determine whether a model complies with the GEMS determination against which the model is registered.*
- *Section 61 relates to the requirement for a registrant to have products tested in certain circumstances, or cancel the product's registration.*
- *Section 81 – Part 7 of the GEMS Act relates to ensuring compliance with this Act (Note: that much of the content of Part 7 and Part 8 of the GEMS Act will be moved to the Regulatory Powers (Standard Provisions) Act 2014 on 6 November 2018 (commencement of Schedule 7 of the Regulatory Powers (Standardisation Reform) Act 2017)).*
- *Division 2 provides for officers of Commonwealth, state or territory agencies to be appointed as GEMS inspectors.*
- *Division 3 authorises GEMS inspectors to enter public areas of premises used in connection with the supply of GEMS products. Inspectors may purchase GEMS products there (and exercise certain other powers) in order to investigate compliance with the Act.*
- *Division 4 (monitoring) authorises a GEMS inspector to enter premises and exercise a range of monitoring powers for the purposes of monitoring compliance with the Act. An inspector may do so with the occupier's consent or under a monitoring warrant. If evidence of a contravention of the Act is found, the inspector may secure the evidence for up to 24 hours (or for an extended period authorised by an issuing officer).*
- *Division 5 (investigation) authorises a GEMS inspector to enter premises and exercise a range of investigation powers, if the inspector has reasonable grounds for suspecting that there is something on the premises that is connected with a contravention of the Act. An inspector may enter the premises with the occupier's consent or under an investigation warrant.*
- *Division 6 contains rules relevant to both monitoring and investigation, such as the obligations and other powers of GEMS inspectors when entering premises, and the rights and responsibilities of occupiers.*
- *Division 7 requires a person, on demand, to give a GEMS inspector information, or to appear for an examination, in relation to an investigation, or to prevent a contravention of the Act.*
- *Division 8 deals with the powers of a GEMS inspector to test, examine or sample GEMS products to determine whether the products, or models of the products, comply with the Act (including any relevant GEMS determination).*
- *Division 9 deals with the powers of issuing officers in relation to the issue of warrants.*

## 6.2 Issues for discussion

### **Short market life products**

The two stage check testing process can be lengthy, which can be problematic for GEMS products with a short market life. Acquiring products, testing to the requirements mandated in determinations and standards, liaising with registrants, and ensuring procedural fairness necessarily takes time.

If the product of the model fails, test results are reviewed and the registrant given an opportunity to respond before being given a section 61 GEMS Act notice requiring the model's cancellation or "stage two" testing. **Box 7** explains the two stage check testing process.

### **Unique and bespoke products**

Since the mid-2000s, the scope of appliance and equipment under energy efficiency regulation has expanded. The GEMS Act now regulates 22 different products, including larger, commercial or industrial products such as:

- close control air conditioners
- chillers
- power transformers
- refrigerated display cabinets.

Section 61 of the GEMS Act allows the GEMS Regulator to give a Registrant a notice requiring the Registrant to take specified action if he or she believes on reasonable grounds that a model does not comply. The GEMS Act requires that the registrant either cancels the registration or arrange for further testing and examination and notify the GEMS Regulator of the results of the testing. This currently works well for products such as whitegoods which are readily available to purchase and there is sufficient laboratory capacity. It is more complicated for products that are bespoke or where there is not laboratory capacity in Australia.

## 6.3 Consultation questions specific to this section

- Is the current compliance regime delivering effective outcomes?
- Is the two stage check testing process the most appropriate approach for all GEMS products?

### **Box 7: The two stage check testing process**

Check testing refers to the activities undertaken by the GEMS Regulator to ensure that models meet the performance and labelling requirements set out in relevant GEMS determinations. The following summarises the stage 1 and 2 process taken from the GEMS Check Testing Policy.

**Stage 1:** Usually a single product is tested to check it meets the requirements of the relevant GEMS determination. However, for some products (for example, lamps) a single product is not considered representative of the model. In these situations the relevant determination will specify how many products will be tested.

- If the product meets the requirements of the GEMS determination, the GEMS Regulator notifies the registrant and no further action is taken.
- If the product does not meet the requirements of the GEMS determination, the registrant will be notified; supplied with the check test results; and given an opportunity to provide information for the GEMS Regulator to consider in deciding whether to issue a notice under section 61 of the GEMS Act. A section 61 notice requires that the registrant either elect to cancel the registration of the model or arrange for Stage 2 check testing at the registrant's expense.

**Stage 2:** If the registrant believes that the results of the Stage 1 check test do not accurately reflect the model, then the registrant may arrange for Stage 2 check testing at the registrant's expense in accordance with the section 61 notice. The notice details, amongst other requirements; how products will be selected, how many products will be selected, and where the products will be tested. For products such as lamps, two or three products are not considered representative of the model. In these situations, the GEMS Regulator will determine how many products will be tested.

- If the test results reveal that the products meet the requirements of the GEMS determination, then the model passes. The GEMS Regulator notifies the registrant and no further action is taken.
- If the test results reveal that the products do not meet the requirements of the GEMS determination, then the GEMS Regulator may suspend (under section 49 of the GEMS Act) or cancel (under section 54 of the GEMS Act) the model's registration. The GEMS Regulator may also consider additional enforcement responses.

# 7. Overarching issues

## 7.1 Mandatory versus voluntary standards and labelling

Almost all products currently regulated under the GEMS Act have mandatory standards and labelling regulations. The 2015 GEMS Review examined the case for mandatory energy performance standards and energy labelling for equipment and appliances, and whether these government interventions should be mandatory or voluntary. It found that there was a strong case for intervention and that:

“MEPS are generally mandatory because regulation, with good compliance, delivers certainty and consistent outcomes for businesses and consumers. Voluntary agreements... appear successful only in specific circumstances, such as when markets are dominated by a limited number of domestic manufacturers, with similar (high) technical competency and incentives to develop energy efficient product. These circumstances do not apply to the Australian and New Zealand markets.”

“Mandatory comparison labels provide authoritative and trusted information for consumers and for this reason the large majority of stakeholders support their use.”

In 2017, research commissioned by the International Energy Agency’s (IEA) 4E Technology Collaboration Programme analysed 51 voluntary agreements between governments and industry since 2000. The study found that these agreements are “best applied when policy action is desirable but regulation currently not feasible, for example when there are regulatory hurdles, unusual markets, lack of information or lack of government resources.”<sup>8</sup>

The E3 Program has voluntary standard for demand response interfaces for some equipment and appliances (see **Section 7.3**) and a voluntary Energy Rating Icon for online and print advertising (see **Section 7.2**).

## 7.2 Online labelling and print advertising

While the GEMS Act mandates the display of the Energy Rating Label in stores on some regulated products, the use of the Energy Rating Icon (a simpler version of the Energy Rating Label for use online and in print advertising) is voluntary.

Increasingly, consumers purchasing appliances online are provided with energy efficiency information (by a text description of the star rating and energy consumption). Increased use of the Icon would provide a more recognisable, consistent and credible source of energy efficiency information.

The COAG Energy Council considered mandatory online labelling and print advertising while developing the GEMS Act and decided further work was required with regard to the costs and benefits before introducing mandatory regulation.

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<sup>8</sup> <https://www.iea-4e.org/document/408/effectiveness-of-energy-efficiency-voluntary-agreements>

The E3 Program is currently undertaking research into the effect online energy efficiency information, and the format of that information, has on purchasing decisions.

### 7.3 Demand response

Household appliances with demand response interfaces (smart appliances) give consumers the choice to allow their electricity provider to remotely control their appliances during peak periods. Significant uptake of smart appliances could reduce demands placed on network capacity and save network costs, energy and emissions.

Currently, no products regulated under the GEMS Act are required to include a demand response interface. However, the E3 Program, in conjunction with industry, developed Australian Standard 4755 (AS 4755) for demand response interfaces for air conditioners, pool pumps, water heaters and electric vehicle charges<sup>9</sup>.

Voluntary compliance with AS 4755 has led to consistent technology being used to control appliances on the electricity network. This has allowed significant market uptake of demand response capability in air conditioning units and will provide a good platform for electricity retailers, networks and other businesses to develop demand response programs as this market develops.

### 7.4 Potential to expand to energy systems

The scope of the GEMS Act allows coverage of products that do not use energy themselves but can affect the energy consumption of other products, directly or indirectly. Examples might include insulation, window glass or ducting as these products will affect the amount of energy used by heating and cooling systems. This broad scope (compared with previous state-based schemes) provides the flexibility to consider which interventions will deliver the greatest benefits at least cost to industry and consumers.

Experience has shown that GEMS has worked well for standardised consumer products. However, consideration needs to be given to whether the GEMS Act is the most appropriate instrument to regulate energy systems in the future.

### 7.5 Integrated products

The equipment and appliance market is seeing the emergence of products with multiple functions. One example is lighting products, which are increasingly offering additional functionality. This includes features such as network connectivity (via wifi or Bluetooth), security (including microphones, cameras), speakers to play music and temperature sensors linked to intelligent house management systems.

Other examples include fridges with TV screens and the range of appliances with internet connectivity. These additional functions all require additional power and may also require or encourage the product to remain on standby, or a higher level of standby power use than would otherwise be required just for the core product. These trends raise questions about

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<sup>9</sup> It is also a registration requirement to declare whether a device is demand response capable.

how products are defined and how energy use is measured, and whether or not the GEMS Act has sufficient flexibility to deal with these emerging products.

## 7.6 International efficiency standards and testing

Australia is a relatively small market for appliances, making up about two per cent of global sales. Many product registrations, particularly the more recently regulated products, now rely on test reports undertaken in overseas testing facilities to international test standards.

As noted in Section 3.4, the E3 Program has continued to consider options through its work program to harmonise with international test methods and international efficiency standards since 2015. Additional opportunities to progress international harmonisation efforts will be considered during this review.

## 7.7 Consultation questions specific to this section

- What specific issues arise in relation to the aspects of the GEMS program, and potential expansions of the GEMS program, described in this section?

## 8. Consultation questions

Below are some questions to consider when responding to this Discussion Paper.

### Box 8: Consultation questions

1. The proposed methodology for the review is outlined in section 1.3. Is there anything else the review should consider when assessing the performance of the GEMS Act?
2. What has been achieved through the GEMS Act?
3. What are the Act's strengths and weaknesses?
4. How could the operation of the GEMS Act be improved?
  - a. Are the actions taken following the 2015 GEMS Review leading to better outcomes?
5. What are the emerging opportunities and challenges for product energy efficiency?
  - a. Are the appropriate products covered by the current GEMS regulations?
  - b. Are the priority product categories the correct areas to be targeting?
6. What are the opportunities and challenges associated with the development of GEMS determinations?
  - a. Does the current framework support the appropriate balance of being responsive to innovation and consulting adequately before introducing new or updated regulations?
  - b. Is the GEMS determinations process adequate in terms of the consultation process and the timeline?
  - c. What issues would need to be taken into account in considering a decision to remove a GEMS determination?
7. What are the opportunities and challenges associated with the registration of GEMS products?
  - a. Is the balance between flexibility and risk set at the appropriate point for family registrations where a large number of models are allowed in the family?
  - b. Are there improvements that should be made to the GEMS registration system (in addition to those summarised in **Box 4**)?
  - c. Are there changes that could be made which would make the link between the model number provided at registration and the product offered in the market more clear?
  - d. Is there a more practical point for the registration obligation to be triggered for customised products, which would still provide some assurance for consumers at the point they make the purchasing decision that the product meets MEPS requirements?
  - e. What are the pros and cons of seeking to harmonise the GEMS registration system?
  - f. Are the grandfathering provisions under the GEMS Act appropriate?

**Box 8: Consultation questions continued**

8. What are the opportunities and challenges associated with compliance and testing activities?
  - a. Is the current compliance regime delivering effective outcomes?
  - b. Is the two stage check testing process the most appropriate approach for all GEMS products?
9. What specific issues arise in relation to the aspects of the GEMS program, and potential expansions of the GEMS program, as described in section 7 of this paper?
10. Is there anything that can be learned from other jurisdictions in relation to product energy efficiency regulation that is relevant to this review?
11. Are there any issues not mentioned in this Discussion Paper that should be considered in the review?

## 9. Next steps

Stakeholders have opportunities to participate in this independent review by making a submission on the Discussion Paper (this document) and the Draft Report. Public consultation sessions on the Draft Report will inform the development of a Final Report. The details of the public consultation sessions will be available shortly at:

[www.energy.gov.au/publications/greenhouse-and-energy-minimum-standards-review-act](http://www.energy.gov.au/publications/greenhouse-and-energy-minimum-standards-review-act).

If you wish to register your details to be advised once the arrangements for these sessions have been finalised please email [GEMSreview@environment.gov.au](mailto:GEMSreview@environment.gov.au).

The Final Report incorporating feedback and responses will be made publicly available upon the completion of the Review.

<b>Date</b>	<b>Activity</b>
28 February 2018	Discussion Paper released
28 March 2018	Submissions on Discussion Paper close (see instructions on page 1)
May/June 2018	Draft Report released
June 2018	Roundtable consultations
June/July 2018	Written submissions on Draft Report close
Mid-2018	Final Report released

# Appendix A: Terms of Reference

## Introduction

The *Greenhouse and Energy Minimum Standards Act 2012* (GEMS Act) implements the commitments of the Australian Government and the Council of Australian Governments (COAG) to establish national legislation to regulate energy efficiency and labelling standards for appliances and other products. The national legislation permits the Australian Government to set mandatory minimum efficiency requirements for products to drive greater energy efficiency. The Act also allows the Australian Government to set nationally-consistent labelling requirements, to increase Australians' awareness of options to improve energy efficiency and reduce energy consumption, energy costs and greenhouse gas emissions.

Clause 176 of the GEMS Act requires a review of the operation of the Act as soon as possible after the fifth anniversary of its commencement date (1 October 2012). As a program that is expected to continue well into the future, and face changing requirements necessary to meet the significant challenge of reducing Australia's energy consumption and greenhouse gas emissions, the operation of the Act also must be reviewed every ten years after the first review.

## Scope

The independent review will fulfil the requirements of Clause 176 of the GEMS Act. The review will evaluate, advise and report on the items listed below:

1. The extent to which the framework (including systems and procedures) established by the GEMS Act is achieving its purpose.
2. Improvements that could be made to the operation of the GEMS Act, including any costs and impacts on stakeholders.
  - a. Particular attention should be given to improvements that will lead to an increased reduction in greenhouse gas emissions.
3. Implementation and transition actions to facilitate improvements to the Act identified at point 2.
4. Any other matters including environmental, cost, technical and regulatory issues relevant to the operation of the Act.

The reviewer will be assisted by considering the following issues in relation to the GEMS Act:

- The level of actual and required agility of the Act to respond to changing dynamics (for example, technological changes, increasing proportion of online sales, integrated products, less specific product categories).
- The ability of the GEMS Act to provide for adequate compliance arrangements for new and bespoke products.
- Administrative challenges (current and anticipated) faced by businesses and the GEMS Regulator.

- Whether there is a role for guidance about when mandatory standards are more useful and when other approaches might be more suitable.

As far as possible, the review will meet the requirements of a RIS-like process and as such, will answer the questions as per the guidance note on Independent Reviews, RIS-like Processes and the Regulation Impact Statement requirements: <http://www.dpmc.gov.au/resource-centre/regulation/independent-reviews-and-ris-process-guidance-note>.

### **Governance and Deliverables**

The review will be undertaken by an independent reviewer contracted by the Department of the Environment and Energy. The independent reviewer will be supported by a secretariat in the Department and will provide regular updates to the COAG Energy Council's Energy Efficiency Advisory Team.

A written report of the review will be given to the Minister.

### **Timeframe and Methodology**

The independent review will commence as soon as possible after 1 October 2017, and provide a written report to the Minister by mid-2018.

The independent review will, as relevant, consider:

- submissions from, and consultations with, business, consumer groups, the community and relevant Commonwealth, New Zealand, state and territory agencies;
- the reports and outcomes of recent reviews in relation to GEMS, such as the *2014-15 Review of the Inter-Governmental Agreement for the GEMS Legislative Scheme* and the *2016-17 GEMS Fees Review*.

The independent review will meet the requirements of the COAG Best Practice Regulation Guidelines and Australian Government Guide to Regulation.

# Appendix B: GEMS impact calculations

## Data

The costs and benefits estimates for GEMS have been calculated using historical data on regulated appliances. The sales of white goods and consumer electronics have been recorded since 2000. Every product that is regulated under GEMS and sold in Australia has submitted a test report on efficiency. Matching these two data sets provides very detailed data on the efficiency, cost and sales number of almost every product regulated by GEMS. In some cases, sales data is not available and in these cases biannual surveys of over 1000 sales are used to estimate sales trends.

## Efficiency calculations

Using this data, the department builds up stock models of previous years. The department then overlays information about the regulations that were put in place so it can be seen which products the regulations removed and how suppliers reacted to the regulation. For example did they all manufacture products that just met the new efficiency standard or did they make significant improvements? The trends over time are investigated to see how long it took suppliers to substantially improve to the point at which the regulation no longer had an effect. This will often correspond to a technology change or moves internationally to increase efficiency levels which have flow on effects domestically. The difference in cost between the old and new products is taken as the cost to the consumer of the regulations. Often there is no noticeable cost to the consumer from a regulation, however in some cases the costs can be significant.

## Labelling

The impact of how consumers are responding to information provided on energy rating labels is estimated by comparing the average efficiency of products manufacturers place on the market, with the sales weighted efficiency in any one year. The theory being, manufacturers will put a range of products out to the market, and if the label is having an impact, then consumers will purchase more of the higher star products.

## Range of estimates

The net benefits are always described as a high and low figure, this includes all the statistical errors that are inherent to the data being used. The high and low figures, represent around an 80 per cent confidence interval. Without the ability to meter every appliance in every home before and after a regulation the department could not provide a single point estimate of the costs and benefits