STANDBY PRODUCT PROFILE 2004/14

NOVEMBER 2004

PRODUCT PROFILE

REMOTE GARAGE DOOR OPENERS

AUSTRALIA'S STANDBY POWER STRATEGY 2002 - 2012

AN INITIATIVE OF THE MINISTERIAL
COUNCIL ON ENERGY FORMING
PART OF THE NATIONAL
GREENHOUSE STRATEGY

Cover graphic courtesy of Merlin Garage Openers

The National Appliance and Equipment Energy Efficiency Committee seeks comment on this proposal from any interested person or organisation.

Please email comments to:

energy.rating@deh.gov.au

Alternatively, hard copy comments can be mailed to:

Equipment & Appliances Team
Australian Greenhouse Office
Department of Environment and Heritage
GPO Box 787
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Comments received by 28 February 2005 will assist in determining the final form of the policy proposals taken to government.

An electronic version of this Standby Product Profile and other Profiles released for public discussion can be obtained from www.energyrating.gov.au

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PRODUCT DESCRIPTION

Remote garage door openers enable users to open their garage door without the need to get out of the vehicle. The opening unit can be installed on virtually any tilt, sectional or roller door on the market, and can be custom installed for unique door styles and shapes. Remote opening units were first introduced into the Australian market in the mid to late 1970's and through the 1980's and early 1990's were present but were relatively uncommon. They have been increasing in popularity in recent years. This standby profile covers remote controlled garage door openers that are intended primarily for use in the domestic sector. This includes those used on roller, sectional or tilt doors. It does not cover remote controlled openers for other residential products (external gates or windows) or openers intended primarily for use in the commercial and industrial sectors.

Each remote opening unit has a FM transmitter and receiver to communicate between the vehicle and the door. The FM frequency of 433MHz appears to be used by most manufacturers as this has been allocated for general purpose low power applications. Many remote opening units have in-built security features, like random code-hopping, which stop access by unrelated transmitter signals. Many remote opening units also have the option of an in-built laser sensor system that stops door closure if the laser is broken. There is also another safety feature that causes a reversal in the door drive if an obstruction is encountered. This safety feature comprises of an in-built sensor, which monitors the load characteristics of the motor during operation and alters the direction where load limits exceed expected values. There is often an automatic close feature which closes the door after a pre-set amount of time.

The opening system comprises primarily of an AC or DC motor, which together with a worm or chain driven system, raises and lowers the garage door. Generally units driving roller doors utilise a DC motor, which enables better controllability in the raising and lowering of the door, although technically AC or DC motors can be used on any of the major door types and opening systems.

AC motors tend to have no standby associated with them because the controller switches the mains supply off when the motor is not operating. DC motors may have some significant standby associated with their design if the controller switches the DC side of the supply to control the motor operation: in this case the DC power supply is connected to the mains but is operating in no load mode when the door is not operating (the rectifier remains connected to the mains at all times). Generally DC power supplies are 24V or higher (some operate on 240V DC).

All remote control systems will require a DC supply (typically 5V or 9V) to run the FM receiver and the associated electronics and control gear. The power requirements for the monitoring operation are likely to be very small (fractions of a Watt). However, the controller has to operate relays or solid state switches to control the door when operating and all of these functions are likely to be fed by a single power supply (to save costs) which will not be optimum for the low power monitoring function. It is unclear whether any designers have used separate power supplies to minimise standby power consumption.

The IEC standard IEC 60335.2.95 (2nd edition, November 2002) and AS/NZS3350.2.95 (published on 30 August 2000 and based on IEC Edition 1 (1998) together with IEC Amendment 1), set performance and safety requirements for remote garage door opening units. Not all performance aspects in these standard are mandatory for industry, but they do set out essential safety elements for remote control garage door openers. Garage door openers are not prescribed items[1] for the purposes of electrical safety, so manufacturers are not required to have their product certified to the standard as a pre-requisite for sale. However, general electrical safety regulations require all items to be safe for users. As a general trend, governments are trying to reduce the number of prescribed items under electrical safety regulations so it is unlikely that remote garage door openers will become prescribed items in the near future.

The IEC and AS/NZ standards cover issues corresponding to hazards encountered with vertical moving garage doors used for residential use. The issues covered by the IEC and AS/NZS standards include:

- General requirements for vertical moving garage doors
- Classification, instructions and marking information
- Live part performance and safety requirements
- Stability and mechanical requirements; including entrapment protection information.

The above standards actively refer to IEC 60335.1 (1991) and AS/NZS3350.1 (2002) respectively. These are referred to as Part 1 and pertain to general household electrical appliance safety requirements.

It should be noted that there are related residential products which perform similar tasks to remote garage door opening units such as automatic gate openers, automatic window shutters and automatic sliding doors. There are also remote door opening units manufactured for commercial and industrial purposes. While both the related residential products and the commercial and industrial remote door opening units have not been covered in this profile, they will certainly have some standby power consumption associated with them.

1 Under electrical safety regulations in Australia prescribed items must be certified against the relevant standard and registered with a state regulator for electrical safety. Non-prescribed items are required to be safe and the manufacturer may elect to obtain a certificate of suitability against the relevant standard as a safeguard.

CURRENT OWNERSHIP AND TRENDS

Not much is known about the current ownership of remote garage door openers. This appears to be a product that has not been the subject of any comprehensive surveys by any of the major market research organisations in Australia, so no accurate estimates of the installed stock are available. Anecdotal estimates suggest that around 10% of households may have one or more remote control garage door opener installed. Many houses have double doors which have separate openers. This would put the installed stock at approximately 1 million units in Australia in 2004. However, this estimate is rather uncertain.

Consultation with industry revealed that total annual sales of remote opening units is possibly as high as 220,000 units per annum, with the majority of these sales being made on a wholesale basis to tradespersons who install the unit when building or renovating a home. Some of these may be used in non-residential applications. There also appears to be a general increase in annual sales share of remote control units (as a proportion of all garage door sales) which could be attributed to a strong housing market over recent times and that relative prices of remote openers have decreased due to market competition and improved technology. Annual sales are estimated to be increasing at around 10% per annum.

RELEVANT MODES FOR THE 'ONE WATT' POWER PLAN

Remote Garage Door Openers available in Australia have three main operational modes:

- On mode – the opener is operating (either opening or closing) the garage door. This mode may involve additional sensors, electronics to monitor the operation of the motor/door and courtesy light(s) in addition to the motor. This mode is not relevant for this standby profile.
- Post On mode – this mode occurs for a short period after the completion of an a door opening (or closing) before the receiver/control reverts back to a steady state condition. In this mode a courtesy light feature is usually operating and some residual electronics may be operating for a limited time (eg timer for a timed closing, post close locking feature). This mode is typically present for 2 to 5 minutes after each operation of the door but may be longer depending on the control program and design. This mode is not relevant for this standby profile.
- Passive standby mode – the steady state condition where the receiver is waiting for a signal from a remote controller. In this mode the opener is not operating the door nor is it in post on mode. Remote garage door openers spend the vast majority of their operating life in this mode.

The above modes are described in more detail below.

On mode is where the remote garage door opener is performing its primary functions of either opening or closing the garage door and the courtesy light function is activated at this time. Some models also have a profiling function (electronic control) which enables the unit to better respond to door load and speed characteristics and sensors to detect obstructions in the path of the door (either objects that are hit by the door or that break light sensors). An opening or closing event typical takes around 30 seconds.

Post on mode occurs for a short period after the completion of an a door opening or closing before the receiver/control reverts back to a steady state condition. In this mode is the courtesy light function is usually enabled. When the unit initially commences opening or closing, this light remains on for a period of between two and five minutes, depending on brand and model. This courtesy light function is a relatively standard feature for remote garage door units. Its primary purpose is practical, allowing a safe, lit exit from the area in which the door is installed. Some residual electronics may be operating for a limited time in this mode (eg timer for a timed closing, post close locking feature). Many models have an optional automatic close mode, which causes the door to close (initiates another on mode) after a pre-set amount of time. This can be used in conjunction with laser sensors that enable effective safety responses while the door is closing.

Passive standby mode is the steady state condition where the receiver is waiting for a signal from a remote controller. This mode is present on all remote garage door openers that use a remote control. In this mode the door is fully open or closed and the mechanisms that govern profiling functions, safety responses and the courtesy light are not operating or have reverted to steady state operation. Depending on the design of the product, some or all of the circuits required for on mode or post on mode may still be active in passive standby mode.

Only the passive standby mode is applicable for the One Watt Initiative; this is effectively the only mode in which remote door openers are consuming standby power. Due to the nature and application of remote garage door openers, unless they are in on mode or post on mode, they are in passive standby mode as units are generally not switched off at the mains (they can't perform their primary function without power).

KNOWN STANDBY DATA FOR NEW PRODUCTS

Garage door openers tend to be sold through wholesale suppliers direct to builders or through speciality outlets. For this reason, remote control garage door openers have not been included in any of the previous retail standby surveys of appliances and equipment which have been conducted over the period 2001 to 2004 so there is no baseline data for this product.

In order to collect data for this standby profile, visits were made to a number of specialty outlets and showrooms and passive standby measurements were taken with the permission of the proprietors. Through this survey of selected outlets a total of 19 readings of new remote garage door openers on display in showrooms were collected and the passive standby power consumption for theses measurements varied from just less than 2 Watts to about 11 Watts with an average value of 3.8 Watts. Table 1 below summarises the results of the 2004 store survey.

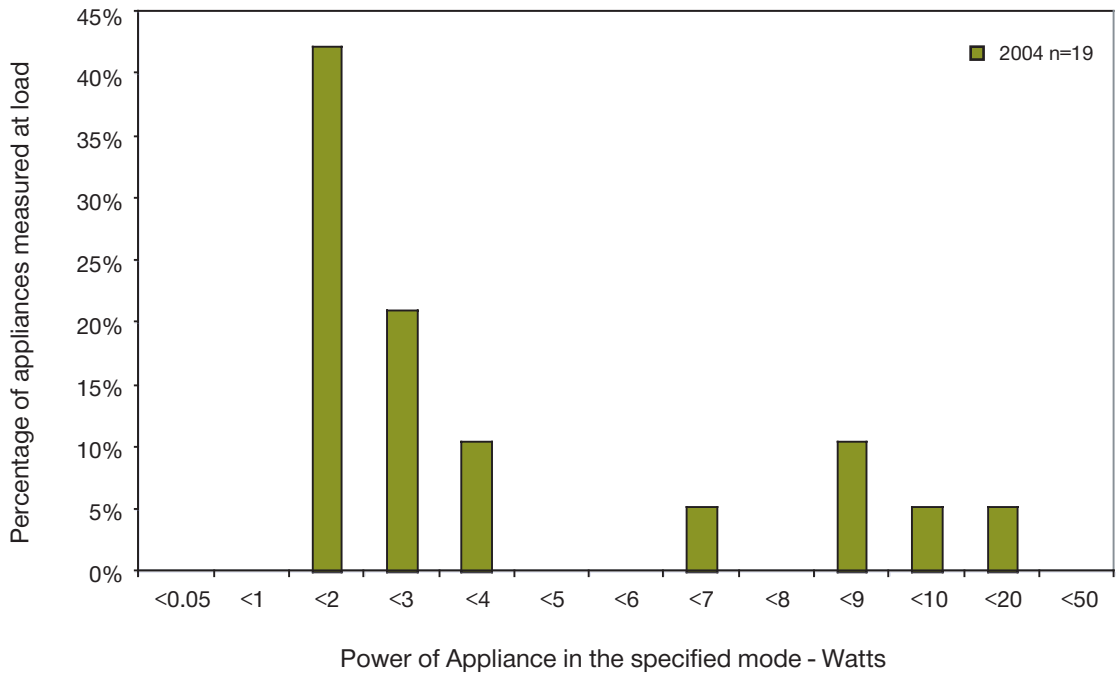
TABLE 1: SUMMARY OF 2004 SHOWROOM SURVEY

Reading	Watts: n=19
Average Passive Standby	**3.8**
Minimum Passive Standby	1.6
Maximum Passive Standby	10.8

Note: n is the total sample size in survey

Figure 1 below shows the distribution of measurements taken in the 2004 store survey. The majority of remote opening units (42%) were found to have a standby power consumption of less than 2 Watts. The remaining proportion of units had a range of power consumptions.

FIGURE 1: DISTRIBUTION OF PASSIVE STANDBY POWER CONSUMPTION – NEW REMOTE GARAGE DOOR OPENERS IN SHOWROOMS – 2004



KNOWN STANDBY DATA FOR INSTALLED STOCK

There is limited data available on the passive standby power consumption of installed remote control garage door openers. For this profile, two data sources have been used.

The first measurements were collected as part of the intrusive standby survey which was undertaken in late 2000. In this survey a total of 6 units were measured (from a total of 61 houses). The average passive standby value for these units was 4.8 Watts (with a minimum of 1.2 Watts and a maximum of 9.6 Watts). These values are reported in Harrington and Kleverlaan (2001).

In order to obtain a more substantial data set of installed remote garage door openers, a survey of selected households was undertaken in Sydney, Canberra, Melbourne and rural Victoria in mid 2004. This survey yielded a total of 23 readings. Only the passive standby mode was measured in this survey. The survey found that the passive standby power consumption of installed remote garage door openers varied from 1.4 Watts to just greater than 11 Watts, with an average value of 4.4 Watts. Table 2 below summarises the results of the 2004 survey.

Figure 2 below shows the distribution of measurements taken in the 2004 household survey with the addition to the values measured in 2000. It can be seen from Figure 2 that there is a range of passive standby power consumptions for the 2000 survey were comparable to the 2004 survey, although the small sample size for this data set should be taken into account. For the 2004 survey around 65% of the units had a passive power consumption of less than 4 Watts, the remaining 35% had a range of consumptions greater than 4 Watts.

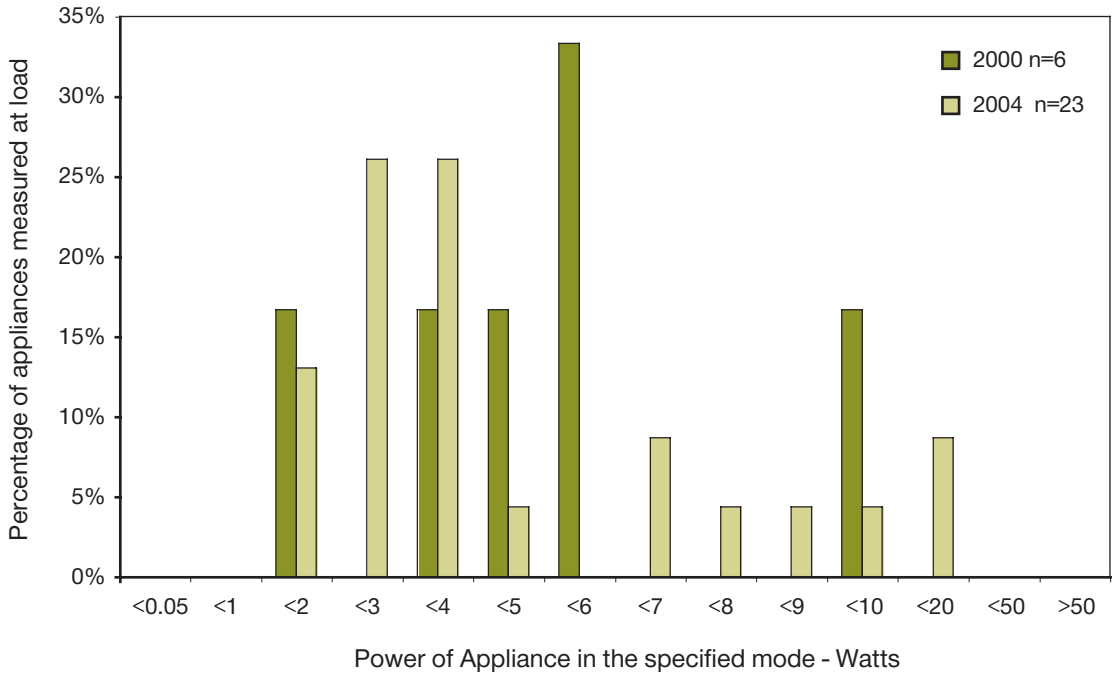
These figures, together with data for new door openers, suggest that there has been little change in the passive standby readings in recent years (within the level of certainty possible from the small sample sizes). The base case for new garage door openers is assumed to be 3.8 Watts in 2004 decreasing to 3.4 Watts in 2015.

TABLE 2: SUMMARY OF RESULTS FOR 2000 AND 2004 SURVEYS

Reading	Watts: 2000 Survey n=6	Watts: 2004 Survey n=23
Average Passive Standby	**4.8**	**4.4**
Minimum Passive Standby	1.2	1.4
Maximum Passive Standby	9.6	11.2

Note: n is the total sample size in survey

FIGURE 2: DISTRIBUTION OF PASSIVE STANDBY POWER CONSUMPTION – INSTALLED HOUSEHOLD REMOTE GARAGE DOOR OPENERS



GREENHOUSE EMISSIONS

For the purposes of estimating greenhouse emissions it has been assumed that remote garage door opening units are in on mode or post on mode for 207 hours per year based on an assumed on mode and post on mode period of 3.75 minutes 8 times per day (4 open and close operations). For the remaining 98% of time in the year, remote opening units are assumed to be in passive standby mode.

The GHG emissions reductions potential for the proposed standby target of 1 Watt for passive standby is in the order of 22 kt CO_2-e pa by 2012 and 35 kt CO_2-e pa by 2015.

These savings will continue to grow to beyond 2025 due to ongoing turnover of stock. Figure 3 shows the potential GHG emissions reduction by year. The cumulative energy savings from the implementation of a 1 Watt target is shown in Figure 4.

FIGURE 3: BAU VS POLICY TARGET GHG EMISSIONS FOR REMOTE GARAGE DOOR OPENERS

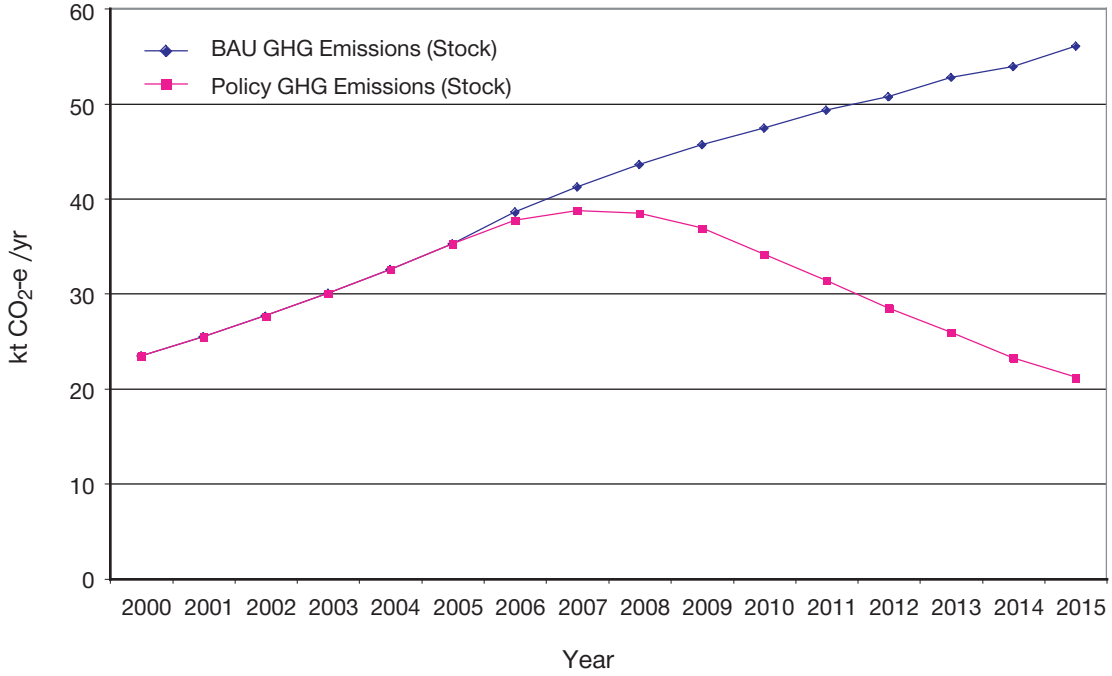
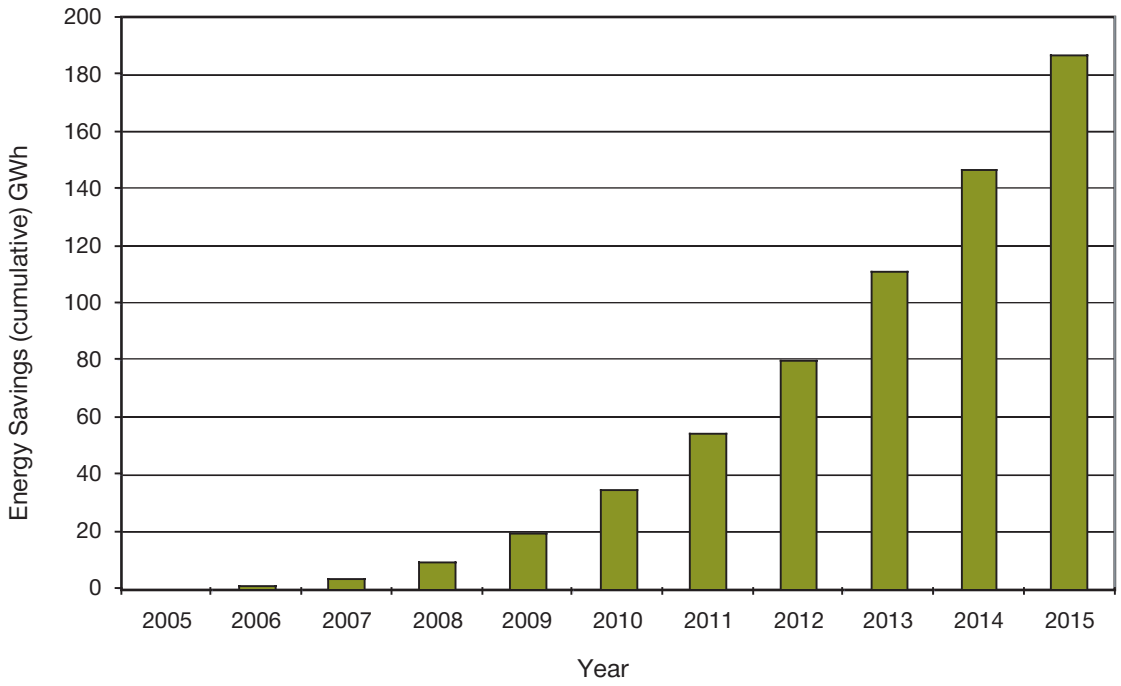


FIGURE 4: ENERGY SAVINGS FROM STANDBY TARGETS FOR REMOTE GARAGE DOOR OPENERS



CURRENT OVERSEAS POLICIES AND TRENDS

When this profile was written, there was no available information to suggest that there were any overseas policies on standby requirements for remote garage door openers.

GOVERNMENT TARGET

In accordance with the National Standby Strategy, NAEEEC intends to recommend to the Ministerial Council on Energy an 'interim' target. The purpose of which is to provide governments with confidence that Australian products will meet the ultimate target, of one watt in 2012. If the 'interim' target is not met in the specified year, government will commence dialogue with industry to explore other options, including the possibility of moving to Stage 2 mandatory measures.

Some segments of the garage door industry felt that voluntary targets for these products would not be effective because of extreme price competition. However, a range of measures are proposed to reduce standby of new systems. As indicated below, whether these voluntary targets are successful will be reported at the NAEEEC forum in 2009.

1. INTERIM TARGET – 2008

Passive Standby Mode (W)
< 3

This target applies to all residential remote garage door openers sold in Australia that year. NAEEEC proposes to monitor the sale of remote garage door openers in that year and to move toward regulation should that target not be met by a significant number of products.

2. NATIONAL STANDBY STRATEGY TARGET – 2012

Passive Standby Mode (W)
< 1

The National Standby Strategy sets out the target of 1W, to be achieved by 2012. This target should apply to all residential remote garage door openers.

The above requirements will be inserted into the relevant Australian Standard.

GOVERNMENT PROPOSALS TO ACHIEVE THIS TARGET

Government agencies intend to take the following actions to assist industry meet the standby targets for remote garage door openers:

Voluntary Tool Available	Action / Rationale	Date
Government procurement list	• MCE are considering a policy of preferencing the purchase of low standby remote garage door openers where available and fit for purpose. Qualifying products to be included on the government Energy Allstars procurement database.	2005/6
Australian Standard	• To communicate government expectations in the relevant Australian Standard, likely to be related to or a sub-part of AS/NZS 62301 for standby.	2005
Annual survey	• To collect data on new remote garage door openers and analyse trends. This data will be published annually.	Ongoing

Government will announce whether this product should be targeted for stage two intervention under the National Standby Power Strategy (involving possible regulatory intervention) or whether the abovementioned actions together with industry intervention have been successful in meeting the target at the NAEEEC Forum in the year:

2009

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