

Latest Developments Concerning Standby at the IEC

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About the Presenter

- **Director of Energy Efficient Strategies in Australia: EES are technical consultants to Australian federal and state governments on appliance efficiency issues (incl. standby)**
- **Has been involved in standby within Australia policy and programs since 1999**
- **Has been chair of IEC TC59 WG9 (standby) since its formation in 2001**



What is the IEC?

- **The International Electrotechnical Commission is the world standards body for electrical equipment and electrical issues (including safety and performance)**
- **Based in Geneva**
- **Related to ISO (mechanical) and ITU (telecommunications)**
- **No duplication of standards coverage between these international standards bodies**



Background to IEC62301

- IEC TC59 (household appliances) identified standby as an issue as early as 1999
- TC59 formed an ad-hoc working group to investigate whether a test method was warranted - the group found there was much policy activity and a test method for standby power measurement was required
- Formed Working Group 9 in October 2001
- IEC62301 published in mid 2005



Overview of IEC62301

- **Applicable to a wide range of products**
- **Specifies ambient temperature and conditions, electricity supply quality and power instrumentation, mode stability**
- **Provides measurement methodology including various product configurations**
- **Reporting requirements**
- **Gives guidance on a range of measurement issues including instrumentation**



Technical details: IEC62301

- **Stable clean power supply (<2% harmonics)**
- **Stable ambient test room conditions**
- **Digital power meter with fundamental active power accuracy of 0.5% or better – capable of measurements of 0.01W or better, capable of including components up 49th harmonic (2.5kHz) strongly recommended**
- **Data logging capability recommended (as part of the proposed amendment)**



IEC62301 - application

- Intent is to measure average power where the product is in a stable state
- Most “stable” states include considerable variation in reading so accurately interpreting the meter readout can be risky/hard
- Stable state can include cyclic events – need to include whole number of cycles
- Care is required where the product changes state automatically (eg DVDs, VCRs, computers, products with automatic power management) - short duration modes

IEC62301 - getting a copy

Available from www.iec.ch

Cost is about US \$100 - buy PDF on line

IEC Member countries can republish as a local standard - recommended

Eg AS/NZS 62301 (Australia and New Zealand)
KS IEC 62310 (Korea)

Revision of IEC62301

(new edition)



IEC62301 - proposed changes

In 2006 WG9 proposed and TC59 agreed to an amendment that will include: (see IEC 59/462/INF)

- Using integration as the preferred method
- Longer initialisation before reading (30 min)
- Longer reading period (10 min)
- Mandating integration for short duration modes or modes that have cyclic aspects
- More rigorous stability requirements (1%)
- Advice on the use of metering equipment
- May be designated as a “horizontal standard”



IEC62301 - proposed changes

At the TC59 meeting in Korea in Oct 2006 there was a long debate about modes as many felt that the current “standby mode” (lowest power) is inadequate:

- As a result, TC59 directed WG9 to differentiate between off mode and standby mode in IEC62301
- WG9 was also instructed to work with the sub-committees under TC59 to assist them in the development of relevant modes for their products and to implement these into their standards in a timely manner – in progress



IEC62301 - proposed changes

- **WG9 is preparing guidance on modes in IEC62301 – framework of definitions**
- **However, mode definitions in many cases will continue to be defined externally to IEC62301**
- **Approach will be: “off mode” = no user oriented function; “standby” = some user oriented function - broadly in alignment with Fraunhofer approach (Europe – Eco-Design)**
- **Some products have modes that do not fit well into a definition - eg “left on mode” for dryers, dishwashers and washing machines**



IEC62301 – current status

- **WG9 met in Frankfurt in May 2007**
- **A committee draft revision was released November 2007 and comments closed in February 2008 (IEC 59/490/CD)**
- **Comments have been compiled and a meeting to resolve comments is scheduled for May 2008**
- **A committee draft for voting could be issued after approval from TC59 in September 2008**



Practical Application of IEC62301



Application of IEC62301

- IEC62301 is designed to be referenced by other test procedures and regulations
- It needs to be thought of as a means of ensuring that a technically accurate measurement of power is determined
- The scope of products covered needs to be defined in the external standard or regulation which references IEC62301
- It is also preferable to externally define all modes to be covered
- IEC62301 only provides guidance on modes



Application of IEC62301

- Accurate measurement of standby power needs care, but is technically straight forward in most cases when IEC62301 is followed
- Understanding the product, its modes and operation can be more complex
- Internal power management and a range of possible user functions requires careful investigation and documentation
- Comparison of standby modes across products requires a good understanding of functions present to be meaningful



Application of IEC62301

- Need to recognise that different products may have one or more functions active in one or several relevant low power modes
- We need to cover all relevant low power modes, not just the lowest
- Need to make sure that power consumed in all relevant modes is as low as practicable
- Must ensure that products power manage themselves to go to the lowest power state possible whenever possible



Policies to Reduce Standby: How Can We Make Them Work?



What policies are already in use?

We know there are lots of policies out there - we have heard about many of them at this conference:

- Mandatory limits (MEPS)
- Voluntary targets and codes of conduct
- Comparative labels (information)
- Endorsement labels (identify low standby - good ones)
- Dis-endorsement (warning) labels (identify bad ones)
- Vertical measures (standby energy with on mode)
- Databases and websites
- Government procurement specifications (USA, Korea and China)
- Changes to user behaviour (but will it persist?)



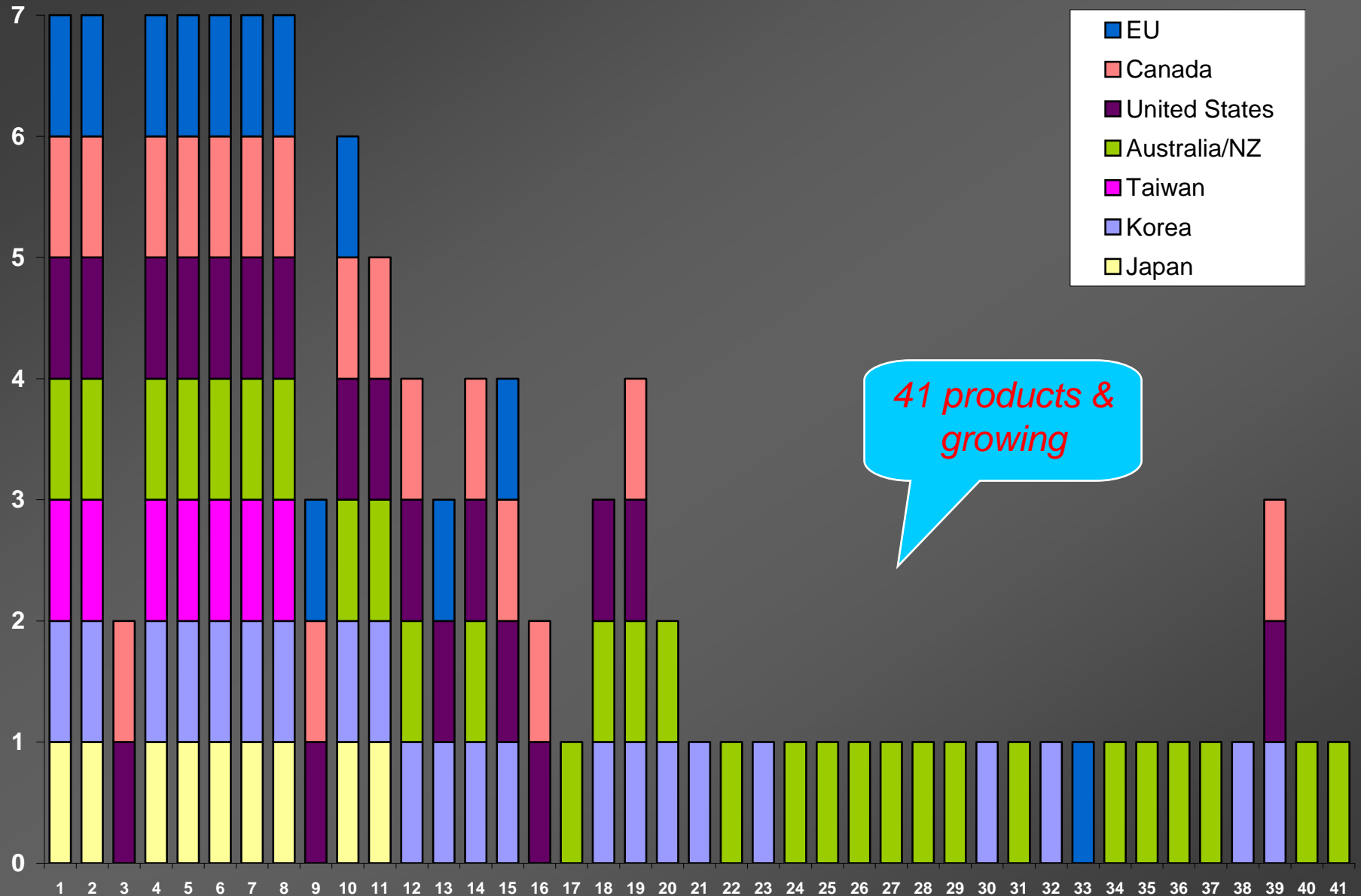
What is the nature of the problem?

- We know there are literally 100's of product types that could be defined
- Most use small amounts of power most of the time (but not all)
- Many have a short life
- Many are low cost
- Could be 50 or more products in each home
- Householders could be buying 5 to 10 items per year (many transactions)
- It is like sand scattered on the floor = messy

Standby Coverage by Product



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What are the main options?

OPTIONS UNLIKELY TO BE VERY EFFECTIVE

- Information - this is too hard convey, transaction costs too high, too many products/ decisions for consumers
- Voluntary targets - may be effective in a tightly controlled market, but competition could lead to poor compliance

OPTIONS THAT ARE LIKELY TO BE MORE EFFECTIVE

- Setting mandatory targets at a product level:
pro = realistic requirements for each product type
con = too many products, product definitions changing
- Vertical approach - combine standby + on mode energy
pro - puts standby into perspective within total energy
con = need usage profile, limited number of applicable products - probably those already regulated for energy

Vertical vs Horizontal



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On mode

*'Vertical
standard'*

Low power
modes

'Horizontal standard'

On mode is significant (few products): most major appliances, TVs, PCs, power supplies, many are already regulated

Low power modes dominate energy (large number of products): mostly 'small' electronic devices, microwaves, many computer peripherals, some home entertainment, clocks, radios, security systems, sensors, home network equipment, few are regulated



Horizontal versus Vertical?

- For some products it makes good sense to bundle low power energy with on mode energy consumption
- This is an ideal approach as it keeps off mode and standby in perspective
- Best suited to products with large on mode energy consumption that may already be regulated for energy in any case
- However, there is a practical limit of 10 or 20 product types - likely to only cover 25% of all standby energy at a maximum



What are the main options?

- **Horizontal mandatory target such as 1 Watt**
 - pro - applies to all products, simple, clear, easy to apply and enforce
 - cons - does not take into account the range of active functions present (may be easy or very difficult to achieve), generally only applies to lowest mode, need for exceptions and variations, could encourage elimination of low power modes to avoid requirements, “blunt instrument”
- **While none of the above is ideal, a uniform target like 1 Watt provides a solid footing for moving forward on standby**
- **However, for the medium term, a new approach is needed to address the shortcomings of a single uniform target**



**Is there a more effective way
to approach this?**

**(do we have a broom to
sweep up the sand?)**



Horizontal Functionality

- A “horizontal functionality” approach would set a target at a product or even model level
- A power budget for each valid function would be provided - would cover a wide range of generic functions
- Functions would need to be user oriented and can be verified by users/ third parties
- Active functions in any mode would set maximum permissible power for that mode
- Product type is not relevant - would apply to all products and all low power modes
- Has already been adopted for some products



Horizontal Functionality

- Recognises that different products may have one or more functions active in one or several relevant low power modes
- Covers all relevant low power modes, not just the lowest, can cover networked equipment
- Makes sure that power consumed in all relevant modes is as low as practicable
- An associated requirement should be to ensure that products power manage themselves to go to the lowest power state possible whenever possible



Horizontal Functionality

How would this power allowance be applied?

- MEPS - mandatory limit for all products will be the most effective (easier to enforce)

However, other options may be effective too:

- Sales weighted targets - average for each supplier to meet the target (harder to enforce) (eg Japan)
- Endorsement Labels - but you need to mark the good ones AND the bad ones (eg Korea and Japan)

Comparative labels (information) are not recommended



Where to from here?



Moving forward

- As an expedient first step, adopt a 1 Watt limit across the board for “standby” modes (IEA)
- Set more stringent limits for off mode (0.3W?)
- Require more products to have power management
- Develop a more sophisticated “functional adder” approach to set targets for all products based on active functions that are present
- Functional allowances need to be strict, functions need to be legitimate, need to ensure low power modes are not eliminated (eg off switch removed, standby removed leaving only on)



In the medium term.....

- **Require that any “exemptions” from a horizontal 1 Watt approach use a functional adder allowance to calculate a power limit**
- **Review best available technology - passive standby remote control can now be as low as 30mW - high standby is now just poor design**
- **Set maximum power targets for minimum acceptability for each required function**
- **Set targets for “best practice” low standby design (could be a range of levels eg EPS)**
- **Eventually migrate all products to a functionality adder approach**



Conclusions

- Standby power is mostly just wasted energy
- We can quickly move to 1 Watt for most products - there are already many products that meet this limit for most product types - it is technically feasible
- We need to think beyond 1 Watt in the medium term
- International cooperation and program evaluation is critical to develop the most effective solutions
- But much of the hard work is still ahead of us....



The End

More information see:

www.energyrating.gov.au

www.iec.ch

- - thank you