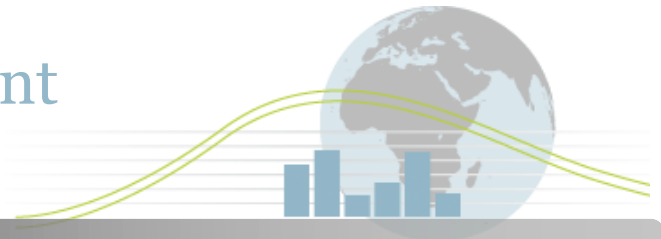


4^E

Mapping Document



Country:	Republic of Korea
Technology:	Notebook Computers
Sub Category:	(equivalent to ENERGY STAR category A, B and C)

Introduction

The first stage in the Mapping and Benchmarking process is the definition of the products, i.e. clearly setting the boundaries that define the products for use in data collection and analysis. Doing this ensures that comparison between the participating countries is done against a specific and consistent set of products.

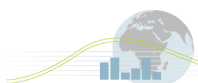
The summary definition for this product is:

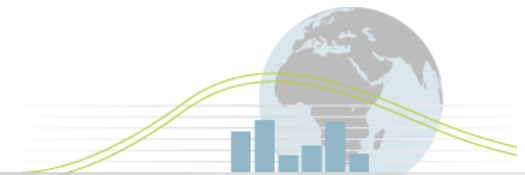
Definition & scope	<p><i>'A portable computer that performs logical operations and processes data designed to be operated for extended periods of time without a direct connection to an ac power source (using an integrated battery) and typically designed to have similar functionality and software to that of desktop computers. Notebook computers are composed of, at a minimum: (1) a central processing unit (CPU) to perform operations; (2) user input devices such as a keyboard, mouse or digitizer; and (3) an integrated computer display screen to output information.'</i>¹</p> <p>Limited to screen sizes of 7 inches and above.</p>		
ENERGY STAR category	ENERGY STAR V5 Category A	ENERGY STAR V5 Category B	ENERGY STAR V5 Category C
Other physical variables to be noted	<p>Size of screen Design input voltage for external power supply</p>		

Note: Energy consumption requirements of the external power supply are included in energy consumption data.

- Docking stations are considered accessories and therefore energy consumption of these products is not within scope of this analysis.
- Tablet PCs which use touch sensitive screens along with or instead of other input devices are included in the scope.

¹ Adapted for this project purposes from ENERGY STAR® Program Requirements for Computers Eligibility Criteria (Version 5.0), US EPA.

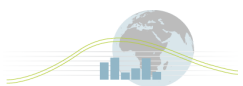




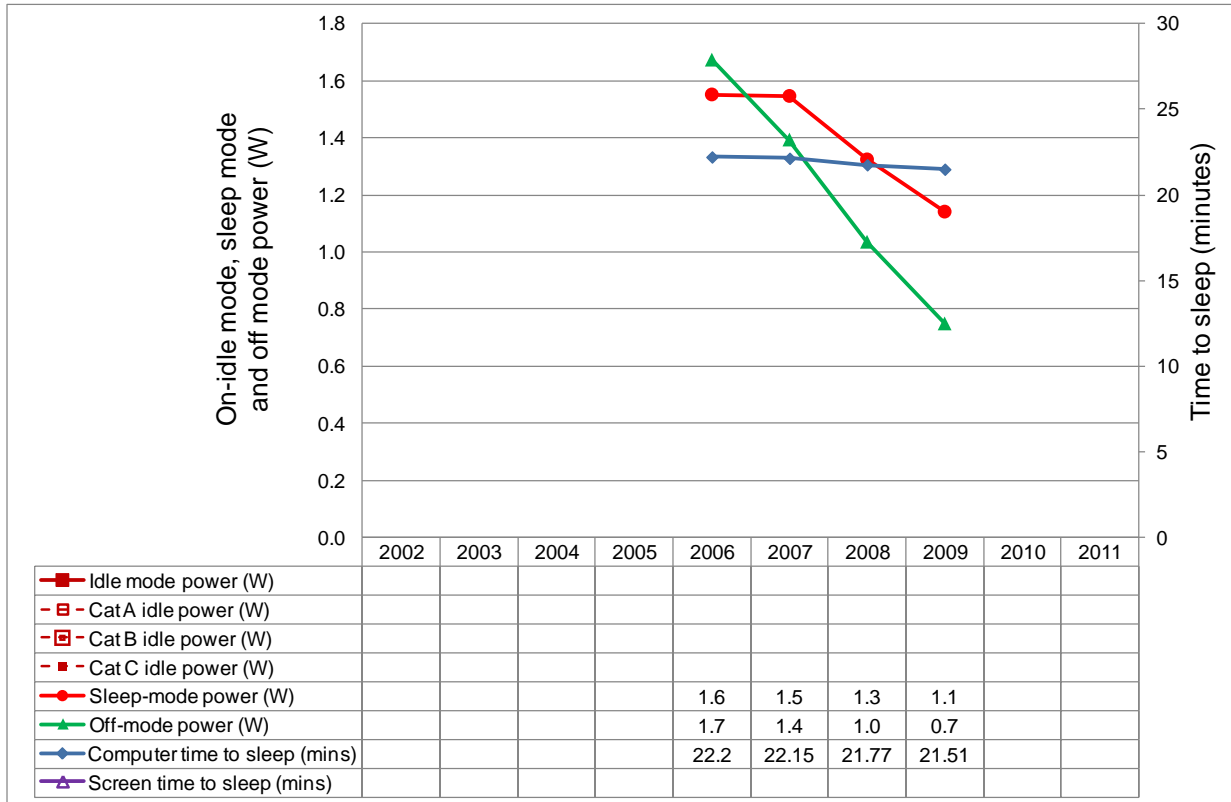
Typical Energy Consumption (TEC) of New Notebook Computers - Republic of Korea

Key notes on Graph (see notes section 1)

- No data available on idle mode power and so TEC could not be calculated.

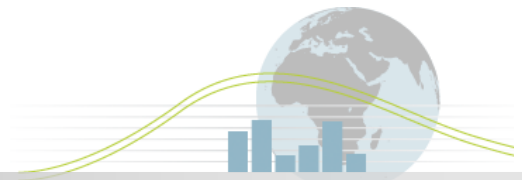


Power by mode for New Notebook Computers - Republic of Korea

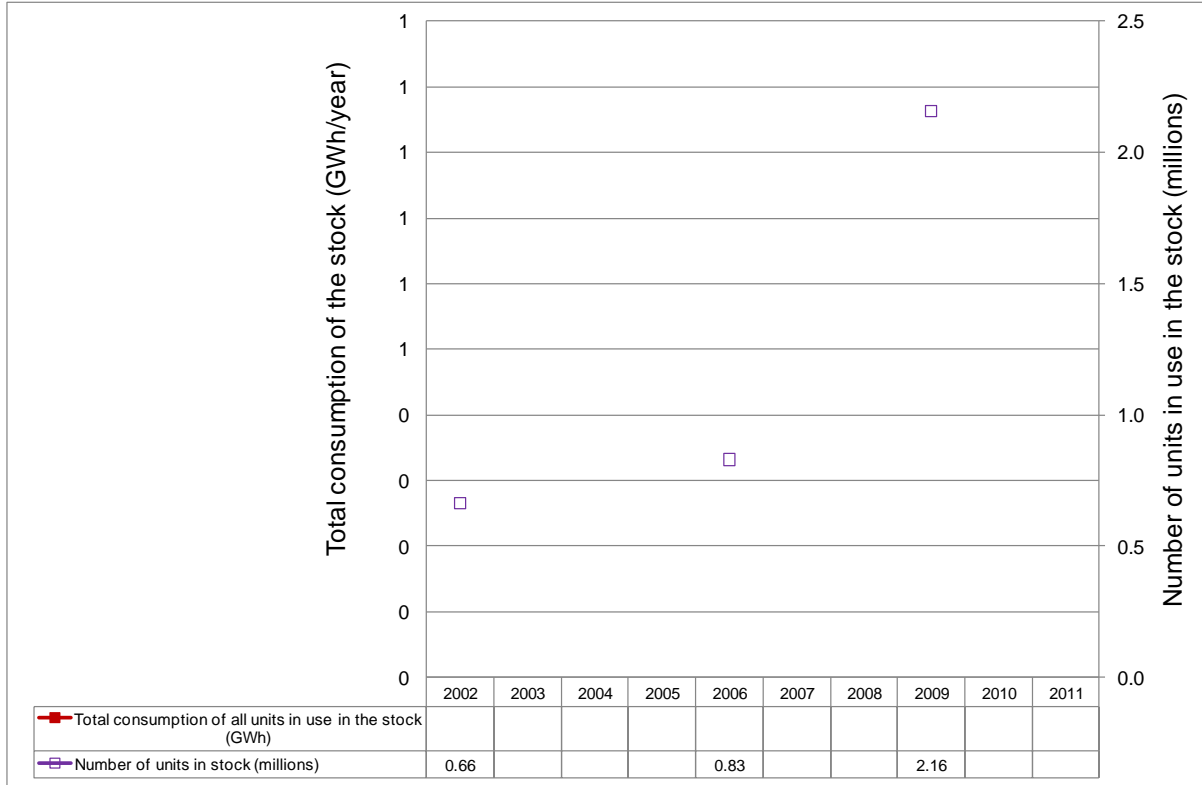


Key notes on Graph (see notes section 2)

- Overall sales weighted average figures were calculated from the product database made available that included sleep mode and off mode power. Data for idle mode were not available.

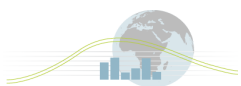


Total Energy Consumption in the existing Notebook Computers Stock - Republic of Korea



Key notes on Graph (see notes section 3)

- No data available on consumption of stock, only total products in the stock.



Major Policy Interventions (See notes Section 4)

The Republic of Korea has had a focus on reducing standby power since 1999 when the government introduced their eStandby programme².

A mandatory warning label for products exceeding a certain standby power (first in the world) was introduced in August 2008 for televisions. Computers and other ICT products were added in July 2009³. In this scheme, every manufacturer and importer of target products must register their products with a test report. A warning label must be attached to any products that do not meet the standby power standards.



Voluntary

For products that meet standby power standard



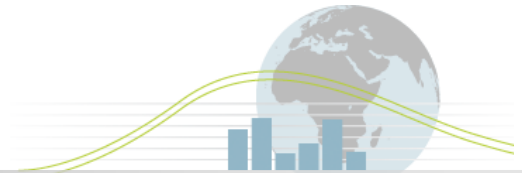
Mandatory

For products that don't meet standby power standard

The requirement for computers is that they must have sleep mode power less than 1.7W and off mode less than 1W. An additional 0.7W is permitted on sleep and off modes if wake on LAN functionality is present.

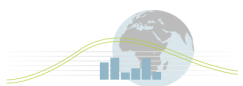
² The eStandby Programme is explained at <http://www.kemco.or.kr/new%5Feng/pg02/pg02100300.asp>

³ The regulation document is 'eStandby Power Program', Regulation on Standby Power Reduction Program, 2010. 2. 25, Ministry of Knowledge Economy (MKE) and Korea Energy Management Corporation (KEMCO).



Cultural Issues (See Notes Section 5)

No information available.



Notes on data

Section 1: Notes on Product Efficiency

1.1 Test methodologies, Performance Standards and Labelling Requirements

Typical Energy Consumption (TEC) is adopted as the 'efficiency' metric for notebook computers. This requires power demand figures for idle, standby (sleep) and off modes to calculate the TEC as defined in the ENERGY STAR criteria version 5. This defines a typical annual usage profile⁴, the 'conventional duty cycle', which consists of 60% of the time in off mode, 10% in sleep mode and 30% in idle mode.

$$\text{TEC} = [(0.6 \times P_{\text{off}}) + (0.1 \times P_{\text{sleep}}) + (0.3 \times P_{\text{idle}})] \times 8,760$$

Where:

TEC = Typical Energy Consumption (annual) (kWh)

P_{off} = Power in off mode (W)

P_{sleep} = Power in sleep mode (assumed equivalent to standby for the Swiss data) (W)

P_{idle} = Power in idle mode (W)

Since the data available for the Republic of Korea only included sleep and off mode power, no TEC could be calculated.

The average sleep and off mode power demands were calculated for each year from the products reported in the government database as having had sales in that year⁵. These figures were sales-weighted.

1.2 Product Efficiency Graphic

No further information to add to that above.

Section 2: Notes on product power demand

2.1 Test methodologies, Performance Standards and Labelling Requirements

Sales weighted average sleep mode and off mode power demands were calculated from the data provided for 2006, 2007, 2008 and 2009. A total of 1,350 notebook products were included in the list.

⁴ ENERGY STAR Version 5 criteria define two possible duty cycle patterns for notebooks in terms of their network connectivity: 'Conventional' and 'proxying'. For this analysis the conventional duty cycle was adopted.

⁵ There was no automatic carry-forward of products from one year to the next etc as is done for some product-weighted data sets to simulate continued availability of products after their initial registration.

The power figures provided on sleep mode and off mode are assumed to be directly comparable with the sleep mode and off mode data derived from ENERGY STAR Version 5 for comparison between countries. As no idle mode data were available, this cannot be included. Products with a dash (-) in the cell for any power modes were assumed to indicate that no data were available and were not included in the analysis.

2.2 Product Power Demand Graphic

No further information to add to that above.

Section 3: Notes on Efficiency of Stock

No data available on efficiency of stock, but total stock of products were provided for 1997, 2000, 2002, 2006 and 2009.

Section 4: Notes on Consumption of Stock

No data available on consumption of stock, but total stock of products were provided for 1997, 2000, 2002, 2006 and 2009.

Section 5: Notes on Policy Interventions

No further information available.