
Standby Power in Japan

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April 2, 2008
International Conference on Standby Power
in INDIA

What is ECCJ ?

ECCJ = the Energy Conservation Center, Japan

an incorporated foundation under supervision of METI (Ministry of Economy, Trade and Industry)

Major activities:

Industry sector

Auditing energy efficiency of factories, support for technological development, providing education and training sessions for energy managers, implementation of State Examination for Energy Managers

Residential/commercial sector

Promotion of energy efficient products (Top Runner program, Energy-saving labeling program, Retailer assessment program, Energy-efficiency ranking catalogue, and ENERGY STAR program), Auditing buildings, ESCO

Cross sector

ENEX (energy conservation campaign & exhibition)

Recognition (Grand Energy Conservation Prize)

Information, data base, publicity, publishing, survey, monitoring

International cooperation & communication

Today's Topics

I. Efforts for Reducing Standby Power

II. Results of the Efforts

III. Future Plan

I. Efforts for Reducing Standby Power

Currently, there is no mandatory regulation on Standby Power only.



Then, how are we dealing with the reduction of Standby Power?

- **Top Runner Program**
- **International ENERGY STAR**
- **Voluntary Efforts by Japanese Industry Associations**
- **Standby Power Research**

I. Efforts for Reducing Standby Power

Top Runner Program

Principle 7. when establishing target standard values for home electric appliances and office equipment, reduction of standby power consumption shall be taken into account.

Among 21 Top Runner target products, standby power is included in the calculation of annual energy consumption efficiency (target standard value) of the following 7 products.

TV sets

Electric toilet seats

Microwave ovens

Copiers

VCRs

Electric rice cookers

DVD recorders

Example of calculation expression: TV sets

$$E = \{ (P_O - P_A / 4) \times t_1 + P_S \times t_2 \} / 1000$$

E : Annual energy consumption (kWh/year)

P_O : Operational power (W)

P_S : Standby power (W)

P_A : Reduced power consumption by energy-saving functions (W)

t₁ : Annual standard operating time (h)

t₂ : Annual standard standby time (h)

I. Efforts for Reducing Standby Power

International ENERGY STAR

Japan has been implementing the ENERGY STAR program for office products since 1995.

The products are...

- **Computer**
- **Monitor**
- **Imaging Equipment**

(Printer, Fax, Scanner, Copier, MFD, Digital Duplicator)

I. Efforts for Reducing Standby Power

Voluntary Efforts by Industry Associations

Electric Appliances

Self-declaration by JRAIA, JEITA, and JEMA (January, 2001 → Target: 2004)

- For home appliances having supporting functions (e.g. remote-control and clock/timer) in standby state, efforts shall be made to reduce the standby power to 1W or below.
- For home appliances other than the above, efforts shall be made to reduce the standby power close to 0 W as much as possible.
- For product groups having an uncertainty in technological development and for products newly developed, efforts shall be made to reduce the standby power consumption as much as possible for now.

Gas/Oil Appliances

Self-declaration by JGKA (May, 2005 → Target: 2009)

- Efforts shall be made to reduce the standby power to the targeted level.
e.g. 1W or below for fan heaters, 2 W or below for water heating unit (main body)

I. Efforts for Reducing Standby Power

Standby Power Research

Start: Since 1999

Structure: Consisting of 3 surveys.

- 1) Actual measurement of appliances owned by household (every 3 years)
- 2) Questionnaire for household members (every 3 years)
 - actual status of usage of appliances at home
- 3) Questionnaire and interview survey for manufacturers (every year)
 - standby power of appliances currently sold in the market
 - current efforts to reduce standby power of appliances

Major Outcomes:

- Annual standby energy consumption in household
- Standby power consumption of appliances in the market
- Case studies of best performers

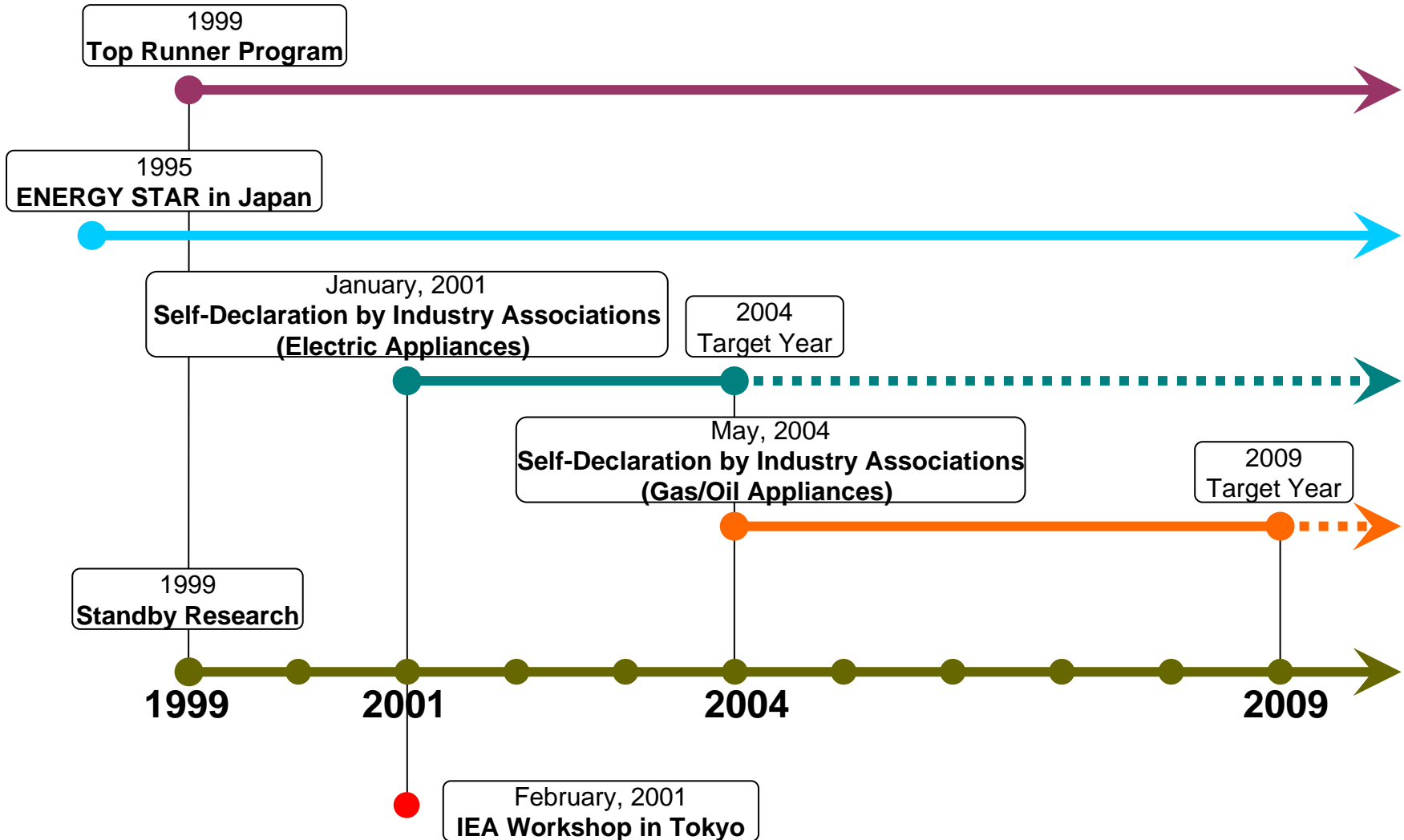
Cooperation:

Exchanging opinions with industry associations.

In charge: ECCJ, commissioned by METI

I. Efforts for Reducing Standby Power

Time-Line of Standby Power Efforts in JAPAN



II. Results of the Efforts

- **Standby Power Consumption (W) of Appliances**
- **Standby Energy Consumption (Wh) in household**
- **Manufactures' View on Unplugging**
 - the simplest way of cutting standby power consumption
- **Interview with Manufacturers**

II. Results of the Efforts

Definition of “Standby Power”

Standby power:

Power consumption of appliances while they are not in use (including power consumed to maintain timer, remote-control, etc. in non-use state).

In other words, power consumption of appliances when their major functions are not active.

Typical mode:

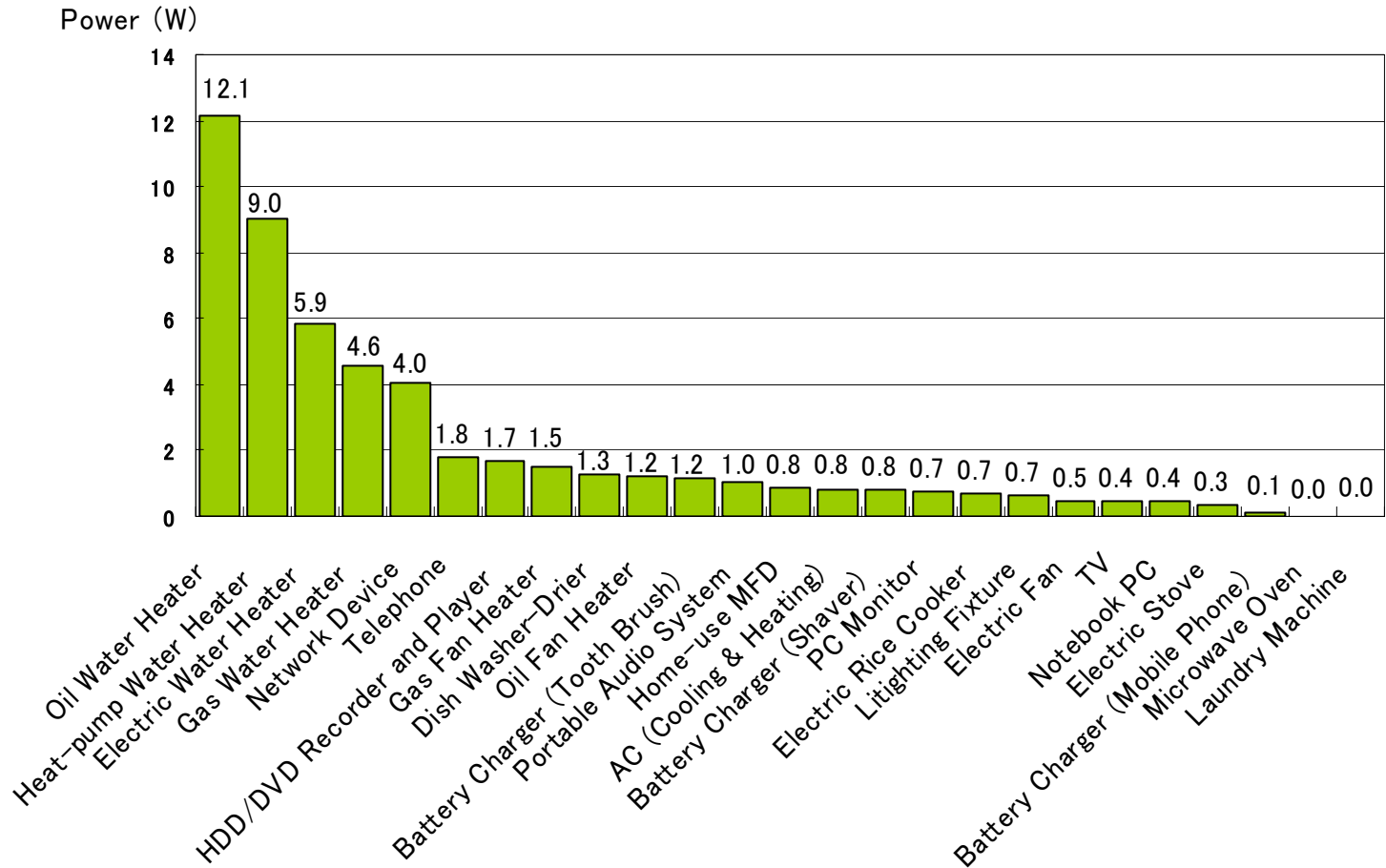
A mode defined and specified for each product category to evaluate standby power consumption. Products are assumed to stay mostly in this mode while they are not in use.

E.G. OFF by main switch --- Portable Audio System
OFF by remote controller --- Air Conditioner

II. Results of the Efforts

Standby Power Consumption (W) of Appliances

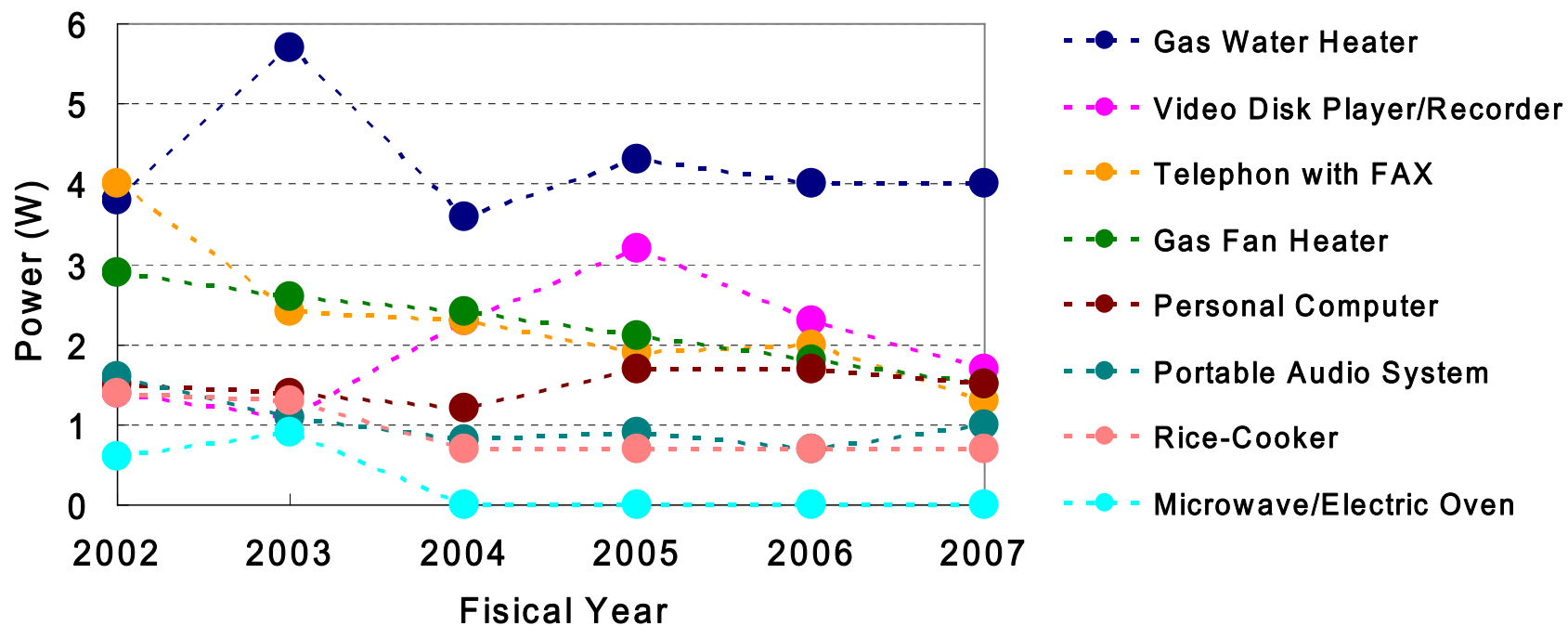
Standby Power of Appliances Sold in FY2007



II. Results of the Efforts

Standby Power Consumption (W) of Appliances

Changes of Standby Power by Product Category

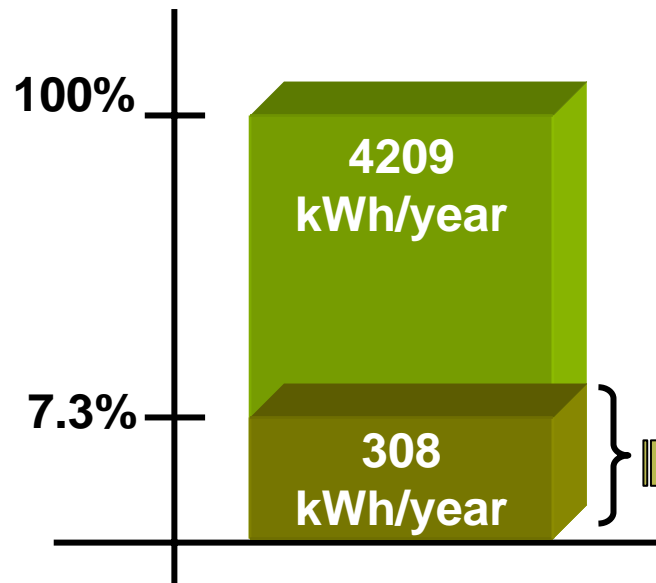


II. Results of the Efforts

Standby Energy Consumption (Wh) at Home

Annual Standby Energy per Household

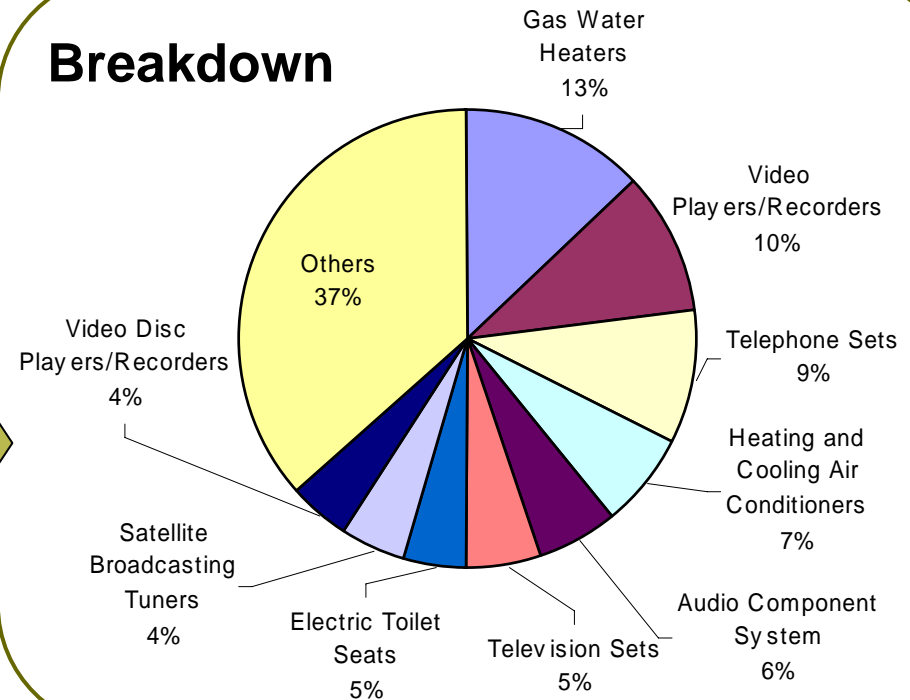
--- Research Result (FY2005) ---



 Total Annual Energy Consumption per Household

 Annual **Standby** Energy Consumption per household

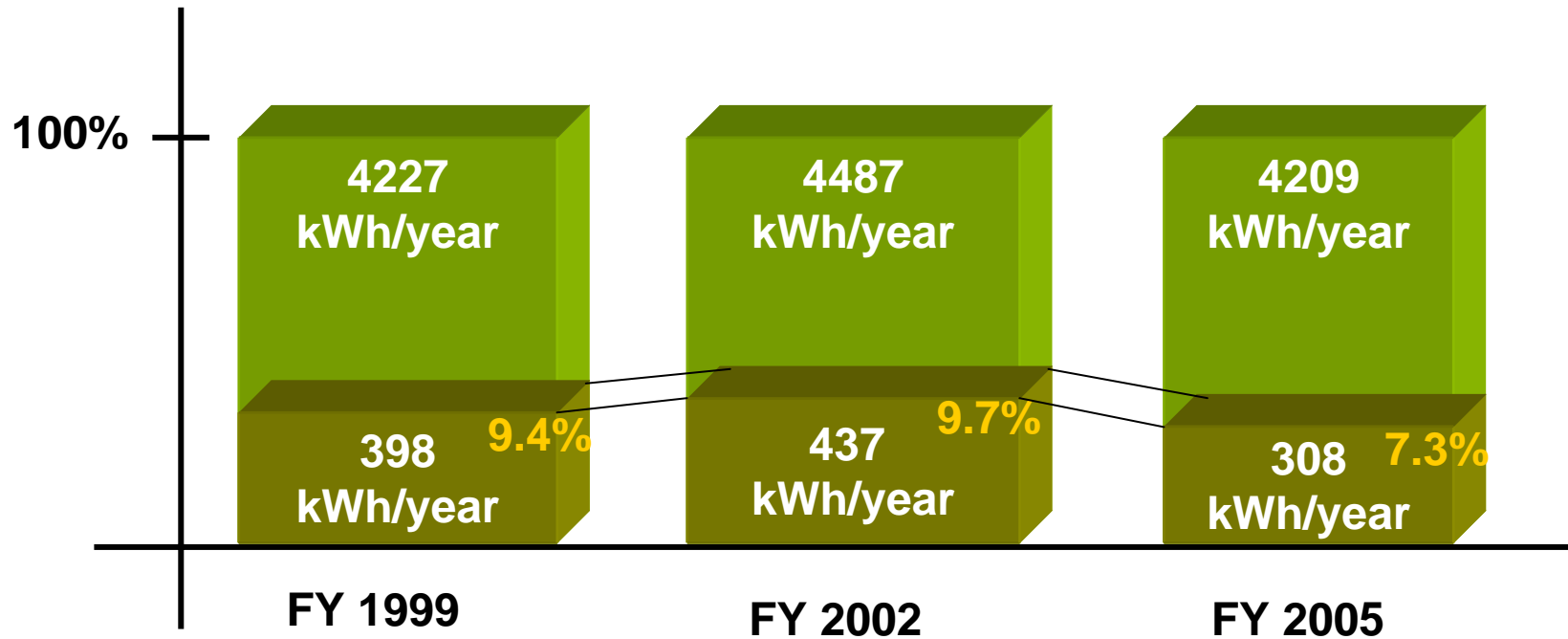
Breakdown



II. Results of the Efforts

Standby Energy Consumption (Wh) at Home

Changes of Annual Standby Energy per Household



Total Annual Energy Consumption per Household



Annual **Standby** Energy Consumption per household

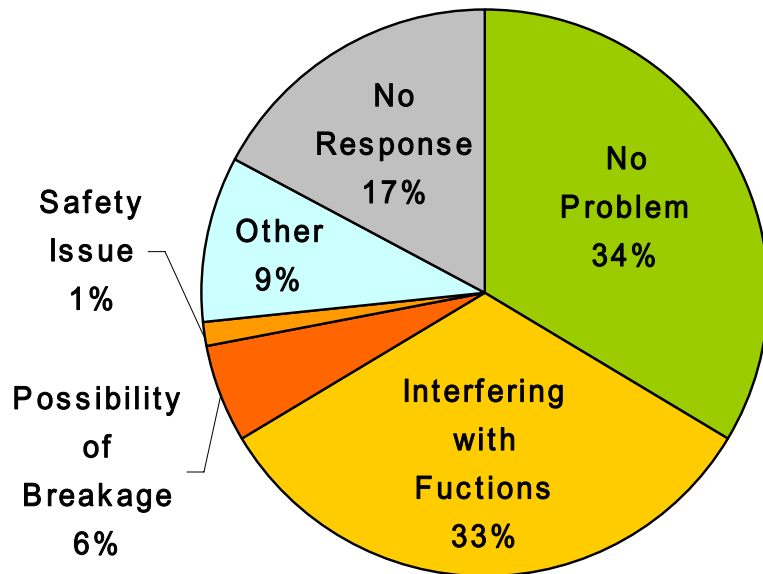
II. Results of the Efforts

Manufacturers' View on Unplugging

Pros & Cons of Unplugging

Unplugging is the simplest way of cutting standby power consumption of appliances. How do manufacturers see this effort?

Response of Manufacturers



No Problem: 34%

Interfering with function: 33%

“Memory and clock function” is the most common. AV manufacturers concern about “EPG function”.

Possibility of Breakage: 6%

Deterioration of components.

Safety Issue: 1%

Unable to monitor water temperature may cause harm to users by supply boiling water.

Information provision is important. Once people know the effects of unplugging, more users may choose unplugging over functions.

If the function is necessary, efforts for lowering standby power is needed.

II. Results of the Efforts

Interview with Manufacturers

Case Studies

Featured Products:

Best performers in terms of reducing standby power, among those predicted to increase in number and/or to affect standby energy of household near future.

Purpose:

To highlight efforts and challenges of best performers.

<Case Studies of FY2007 Research>:

Network Device (NEC Access Technica):

- Increasing number of multi-functional models (gateways)
- Most of network devices at home are provided from Internet Providers.
- Need an environment allowing Internet Providers to choose models with lower standby power.

Heat Pump Water Heater (HITACHI Housetec):

- Reduced to 5W from 10W in 3 years
(In general, standby power of heat pump water heaters varies 5W to 20W.)
- Adoption of a new energy efficiency indicator, besides COP of heat-pump unit, “Annual water heat efficiency” (annual amount of heat used to heat water divided by annual energy consumption of the whole system)

III. Plan for FY2008

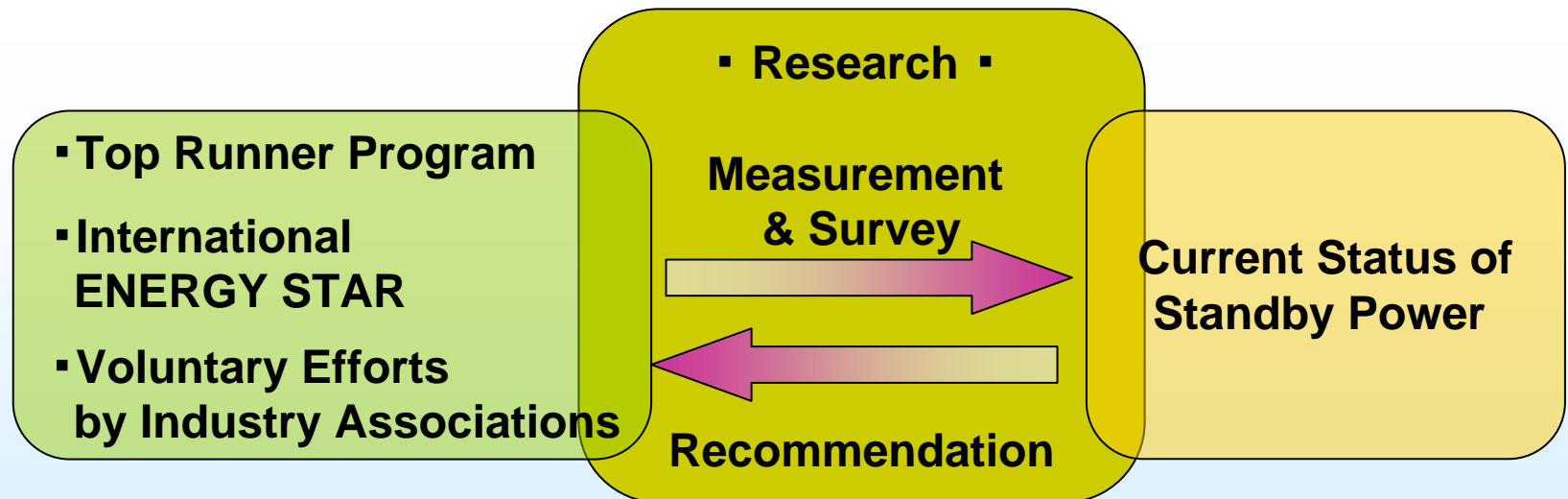
■ Full-Scale Standby Power Research

- 1) **Actual measurement of appliances owned by household** (every 3 years)
- 2) **Questionnaire for household members** (every 3 years)
 - actual status of usage of appliances at home
- 3) **Questionnaire and interview survey for manufacturers** (every year)
 - standby power of appliances currently sold in the market
 - current efforts to reduce standby power of appliances

■ In-Store Measurements for Basket of Products

SUMMARY

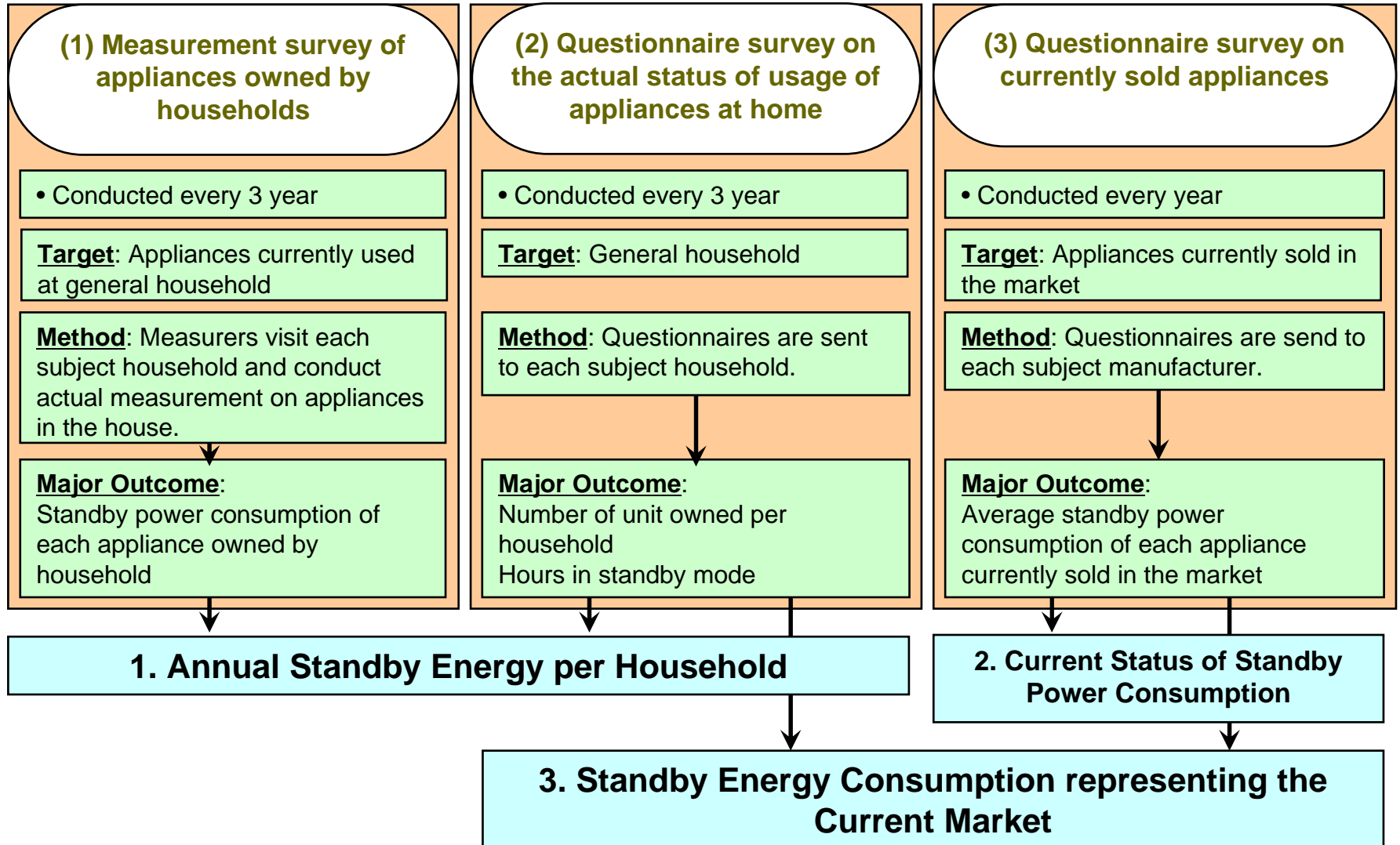
■ Summary of Standby Power Efforts in Japan



Reduction of Standby Power

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Structure of Standby Power Research



Top Runner Program

For household appliances and office equipments, the reduction of standby power consumption is taken into consideration in the development of Top Runner standards.

Top Runner Target Products

- | | | |
|-----------------------|----------------------------|-----------------------------------|
| 1. Passenger vehicles | 8. Computers | 15. Oil water heaters |
| 2. Freight vehicles | 9. Magnetic disk units | 16. <u>Electric toilet seats*</u> |
| 3. Air conditioners | 10. Electric refrigerators | 17. Vending machines |
| 4. <u>TV sets*</u> | 11. Electric freezers | 18. Transformers |
| 5. <u>VCRs*</u> | 12. Space heaters | 19. <u>Electric rice cookers*</u> |
| 6. Fluorescent lights | 13. Gas cooking appliances | 20. <u>Microwave ovens*</u> |
| 7. <u>Copiers*</u> | 14. Gas water heaters | 21. <u>DVD recorders*</u> |

* Standby power is taken into account in the target standard value

Voluntary Efforts by Industry Associations

Electric Appliances Achieving Target Standby Power (2004)

Product	Number of Achieving Models	Average Standby Power (W)
Air conditioners for home use	191	0.81
TV set	230	0.40
DVD player	23	0.43
Stereo system player	56	0.56
CD radio-cassette player	19	0.75
Electric rice cooker	114	0.74
Laundry machine	105	0.02
Electric clothes drier	14	0.01
Microwave oven	46	0.05

JERAIA: The Japan Refrigeration and Air Conditioning Industry Association

JEITA: Japan Electronics & Information Technology Industries Association

JEMA: The Japan Electrical Manufacturer's Association

Gas/oil appliance manufacturers are currently working toward the targeted standby power (e.g. 1 W or below for fan heaters, and 2 W or below for main bodies of water heating units) which should be achieved by the end of FY 2008.

JGKA: Japan Industrial Association of Gas and Kerosene Appliances