

## **Benefits of Domestic Electricity-Saving Measures and Reduced Electricity Consumption**

The Institute of Energy Economics, Japan

In an effort to deal with the current difficulties in supplying electric power, citizens have been asked to cooperate by switching off household electric products and lights with consideration, lowering the temperature settings on heating equipment, and unplugging equipment when not in use. It is particularly important to avoid unnecessary electricity use in the mornings and evenings, when such use peaks in the spring.

Energy-saving measures such as these, along with the avoidance of use during peak times, implemented by domestic households, is calculated to reduce demand in the Tokyo Electric Power area by 3.8 million kW during morning peak hours, and 4.3 million kW during evening peak hours\*. Since Tokyo Electric Power's supply capacity currently stands at 37.5 million kW (including power supplied from other companies), it is thought that energy-saving measures such as these will contribute significantly to reducing the demand pressure.

\*Since planned power outages and energy-saving efforts are already being implemented, it is important to note that this saving is not in addition to the current state of energy saving.

### 1. Energy-saving measures that can be immediately implemented by all households

Given the ongoing pressure on the electric power supply, a range of countermeasures are necessary. On the demand side, domestic households are required to comply with energy saving measures through the careful switching off of lights and household electrical products, lowering the temperature settings on heating equipment, and unplugging equipment when not in use. It is estimated that these activities alone will offer power saving of 2.9 million kW within the Tokyo Electric Power area.

Furthermore, it is extremely important to avoid using household electric goods during the periods of peak demand recorded for early Spring, in other words during the morning (8:00-11:00 a.m.) and evening (6:00-9:00 p.m.). Even if only used for a short time, equipment such as microwaves, vacuum cleaners, IH cooking heaters, washing/drying machines, irons, hairdryers, dishwashing/drying machines, etc., use significant quantities of power. Where possible, please move the times in which you take meals or baths, or take other measures to avoid having to use these items during the time periods indicated above. Avoiding the use of such equipment during peak times is calculated to potentially save 900,000 kW of power in the morning, and 1.4 million kW in the evening.

The following energy-saving measures are particularly effective in the evenings.

- Air conditioned heating: Lowering the temperature setting by 1 degree Celsius saves 490,000 kW of energy within the Tokyo Electric Power area.
- Electric carpet: Lowering the temperature setting by 1 degree Celsius saves 470,000 kW of energy.
- Dishwashing/drying machine: Avoiding peak time use shifts 430,000 kW of energy outside of peak demand.
- Washing/drying machine: Avoiding peak time use shifts 400,000 kW of energy outside of peak demand.
- TV/Video equipment, etc.: Unplugging from the outlets and switching off standby settings saves 380,000 kW of energy.
- Electric rice cooker: Avoiding peak time use shifts 380,000 kW of energy outside of peak demand.

## 2. Extent of energy-saving effects

According to calculations, thorough implementation of energy-saving measures by a standard family can save an average of 192W of power consumption per household during morning peak time, and an average of 214W during evening peak time, compared with the period before the earthquake\*. Assuming peak electric power consumption before the earthquake to be around 1,000W per household, this is a saving of around 20%. If this figure is applied across the Tokyo Electric Power supply area (containing approximately 20 million households), this equates to a saving of 3.8 million kW in the morning and 4.3 million kW in the evening. Normal demand for power during this season is between 40 and 45 million kW, but the current supply capacity of Tokyo Electric Power is only around 37.5 million kW (including electricity supplied by other companies). For this reason, energy-saving measures will contribute significantly to the easing of pressure in demand for power.

\*Since planned power outages and energy-saving efforts are already being implemented, it is important to note that this saving is not in addition to the current state of energy saving.

## 3. Future measures

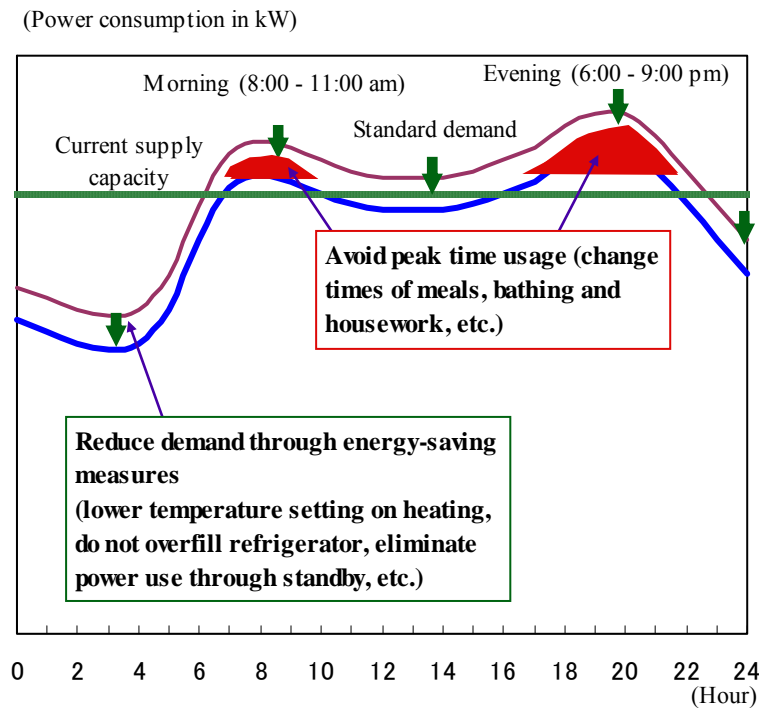
From now on, it is extremely important that anyone purchasing new electrical equipment switches over to energy-saving models. If, for example, every household switched one incandescent light bulb (of which there are, on average, five in use per family) to an LED or fluorescent bulb, this would create an energy-saving effect of 1 million kW across the Tokyo Electric Power area.

Tokyo Electric Power is planning to raise its supply capacity from 37.5 million kW (as of March 23 to a maximum of 50 million kW during the summer. During 2010 (actual results), the maximum demand for electric power experienced by Tokyo Electric Power in March was approximately 47 million kW. This fell to 41 million kW in May, after which it rose to around 50 million kW during

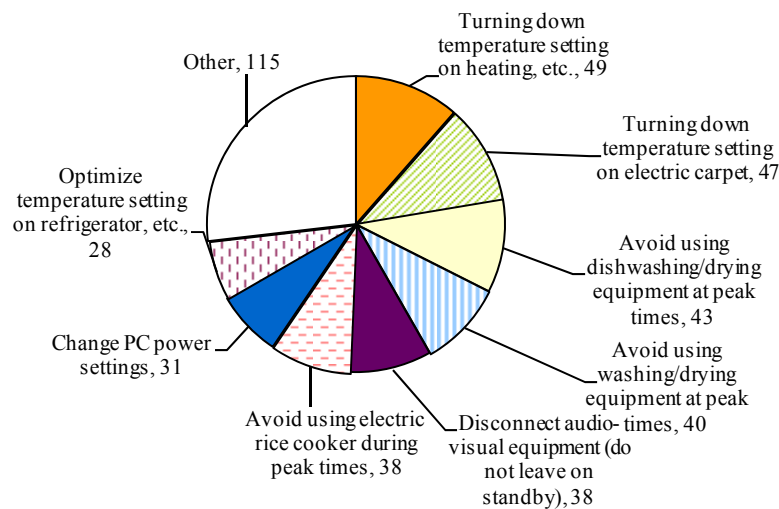
June, when air conditioning begins to be used, and reached a peak demand of around 60 million kW between July and September. Since demand is expected to rise toward the summer, further measures will be required to save energy. For details of projected supply, please see our report entitled “Impacts of East Japan Great Earthquake on Power Supply” (dated 2<sup>nd</sup> March).

A further report on energy-saving measures for the summer period will be produced at a later date.

**(Fig. 1) Reduction in demand for electricity through energy-saving measures, by time period (image)**



**(Fig. 2) Energy saved within Tokyo Electric Power area by household energy-saving measures (evening period, 10,000 kW)**



\*Difference between changing power setting from “Monitor power switch OFF” to “System standby”

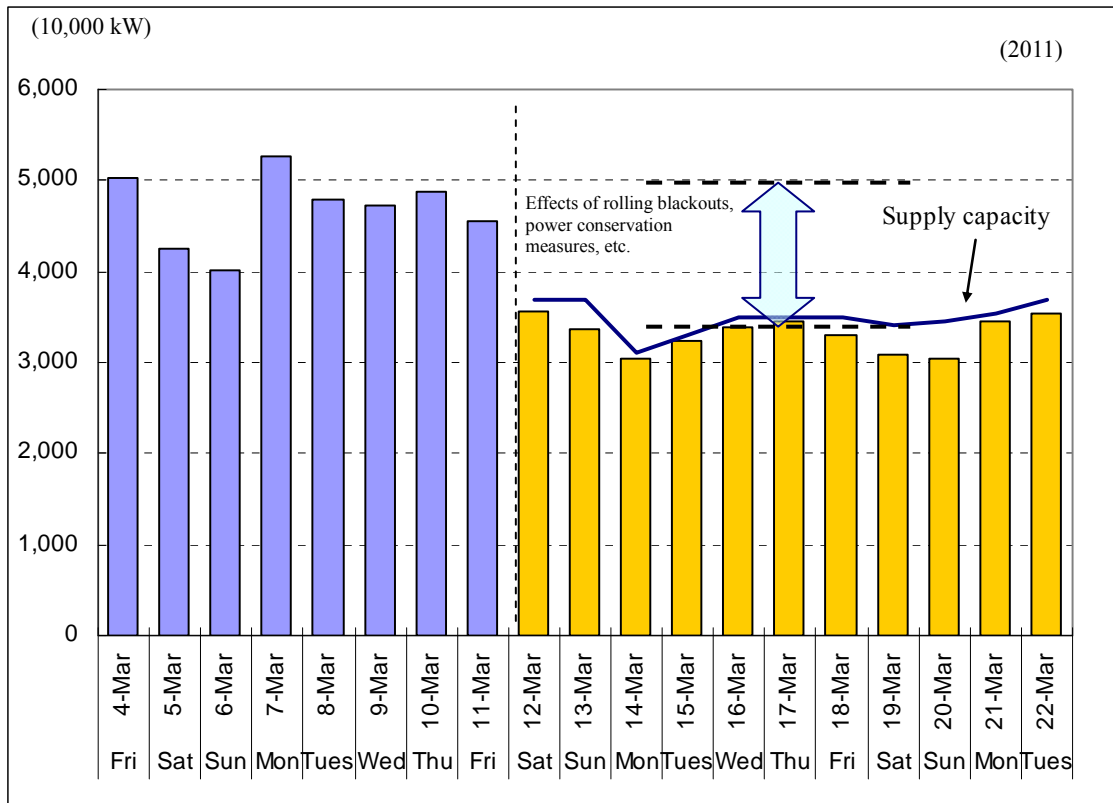
(Fig. 3) List of energy-saving measures that can be implemented immediately by most families

Energy-saving measure		Power consumption (W/household)	
		Careful use	Avoid peak-time use
Air conditioned heating (6-mat room)	Avoid use during peak times		243 ●
	Reduce heating temperature by 1 degree Celsius (21 → 20 degrees)	35	
	Clean filters	21	
	Remove plug when not in use (reduce standby power use)	3	
Electric carpet (3-mat size)	Avoid use during peak times		300 ●
	Turn down setting (strong → medium)	222	
Electric kotatsu	Avoid use during peak times		200 ●
	Turn down setting (strong → medium)	59	
	Place additional quilts on top and underneath kotatsu	39	
Lighting equipment	Avoid use during peak times (incandescent bulbs)		54 ●
	Avoid use during peak times (fluorescent lamps)		12 ●
	Change incandescent bulbs to LED bulbs	52	
	Change incandescent bulbs to fluorescent bulbs	50	
Television	Avoid use during peak times (cathode ray 25 inch)		87 ●
	Avoid use during peak times (LCD 32 inch)		49 ●
	Avoid use during peak times (plasma 32 inch)		204 ●
	Reduce screen brightness (change setting from Max to Medium, cathode ray 25 inch)	18	
	Turn down sound level (change setting from Max to Medium, cathode ray 25 inch)	1	
	Remove plug when not in use (reduce standby power use)	1	
PC	Avoid use during peak times (desktop)		86 ●
	Avoid use during peak times (notebook type)		15 ●
	Change power settings (desktop) ※	74	
	Change power settings (notebook type) ※	9	
	Remove plug when not in use (reduce standby power use)	1	
Microwave	Avoid use during peak times		724 ●
Electric rice cooker	Avoid use during peak times		300 ●
Electric kettle	Avoid use during peak times		350 ●
	Only boil as much water as needed, do not keep warm	7	
IH cooking heater	Avoid use during peak times		2,000 ●
Dishwasher/drier	Avoid use during peak times		432 ●
Heated toilet seat/washer	Avoid use during peak times		50 ●
	Close lid when not in use	4	
	Turn down temperature of toilet seat (high → low)	3	
	Turn down temperature of washing water (medium → low)	2	
	Remove plug when not in use (in models with switch; reduce standby power use)	2	
Washing machine	Avoid use during peak times		300 ●
Clothes drier	Avoid use during peak times		800 ●
Iron	Avoid use during peak times		600 ●
Vacuum cleaner	Avoid use during peak times		896 ●
	Change paper bag	8	
Hairdryer	Avoid use during peak times		600 ●
Video game	Avoid use during peak times		150 ●
Refrigerator	Do not overfill (keep around half capacity)	5	
	Do not open and close unnecessarily (reduce no. of times opened to half)	1	
	Do not keep the door open for longer than 10 seconds	1	
	Optimize temperature setting (strong → medium)	7	
Gas-fired boiler	Switch off when not in use	7	
Oil-fired boiler	Switch off when not in use	1	
Digital recording equipment	Remove plug when not in use (reduce standby power use)	2	
Video recorder/player	Remove plug when not in use (reduce standby power use)	1	
Compact audio	Remove plug when not in use (reduce standby power use)	1	
Other household electric equipment	Remove plug when not in use (reduce standby power use)	11	

\*Difference between changing power setting from “Monitor power switch OFF” to “System standby”

(Note: Energy-saving benefits of 3.8 million and 4.4 million kW do not include those items marked ●. Including these measures could give even greater savings.)

**(Fig. 4) Maximum electric power demand and supply capacity, by day (Tokyo Electric Power)**



**(Fig. 5) Comparison between monthly electric power demand (2010) and current supply capacity (Tokyo Electric Power)**

