For the citizens to be self-supported with renewable energies
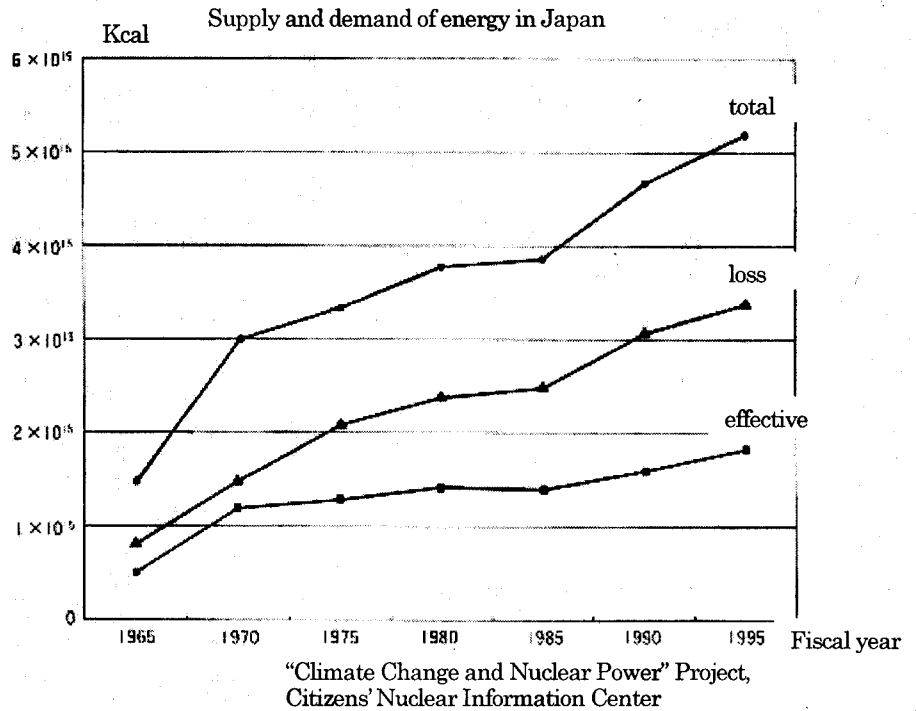
18 May, 2003
Yu Tanaka
Board member of Renewable Energy Promoting People's Forum (REPP)

<Problems of the present energy consumption in Japan>

For the past 30 years, the efficiency of energy use has been dropping. It was loss which increased the energy demand, but the final effective demand has had a little increase.

Supply and demand of energy in Japan

"Climate Change and Nuclear Power" Project,
Citizens' Nuclear Information Center

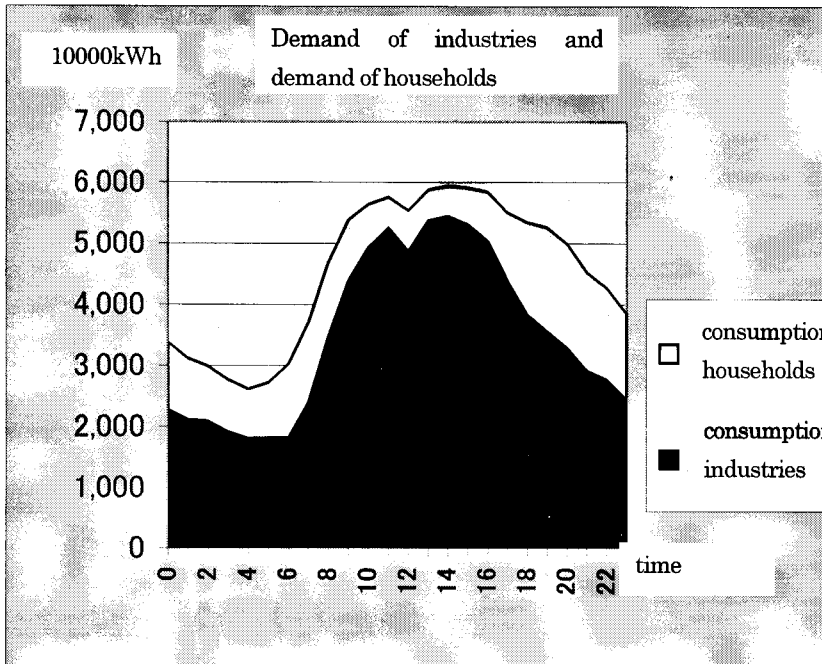<The problem of power is the low load factor>

The graph shows the peak of the total demand with the load factor same level as Scandinavia and the total demand same as present one.
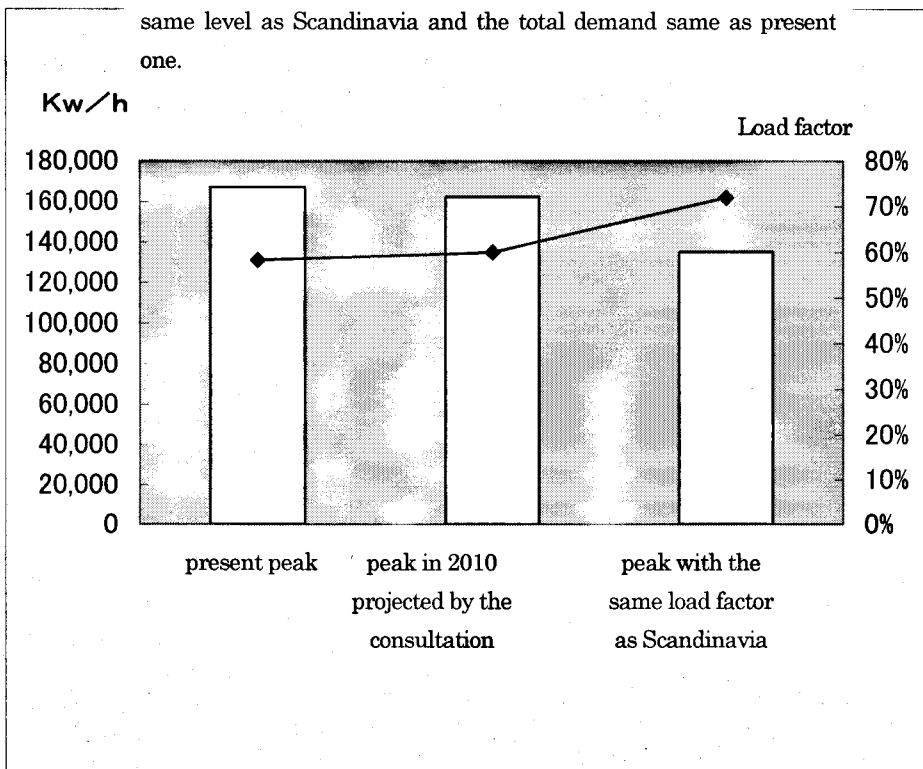
If the load factor of Japan would become the same level as the one of Germany, 1/4 of the present power stations would become unnecessary with the present level of consumption, which means that all the nuclear power stations could be stopped.

<The problem of the load factor is a problem of peak of demand, which is created by the industries>

Demand of industries and demand of households

10000kWh

7,000	
6,000	
5,000	
4,000	
3,000	
2,000	
1,000	
0	

time: 0 2 4 6 8 10 12 14 16 18 20 22

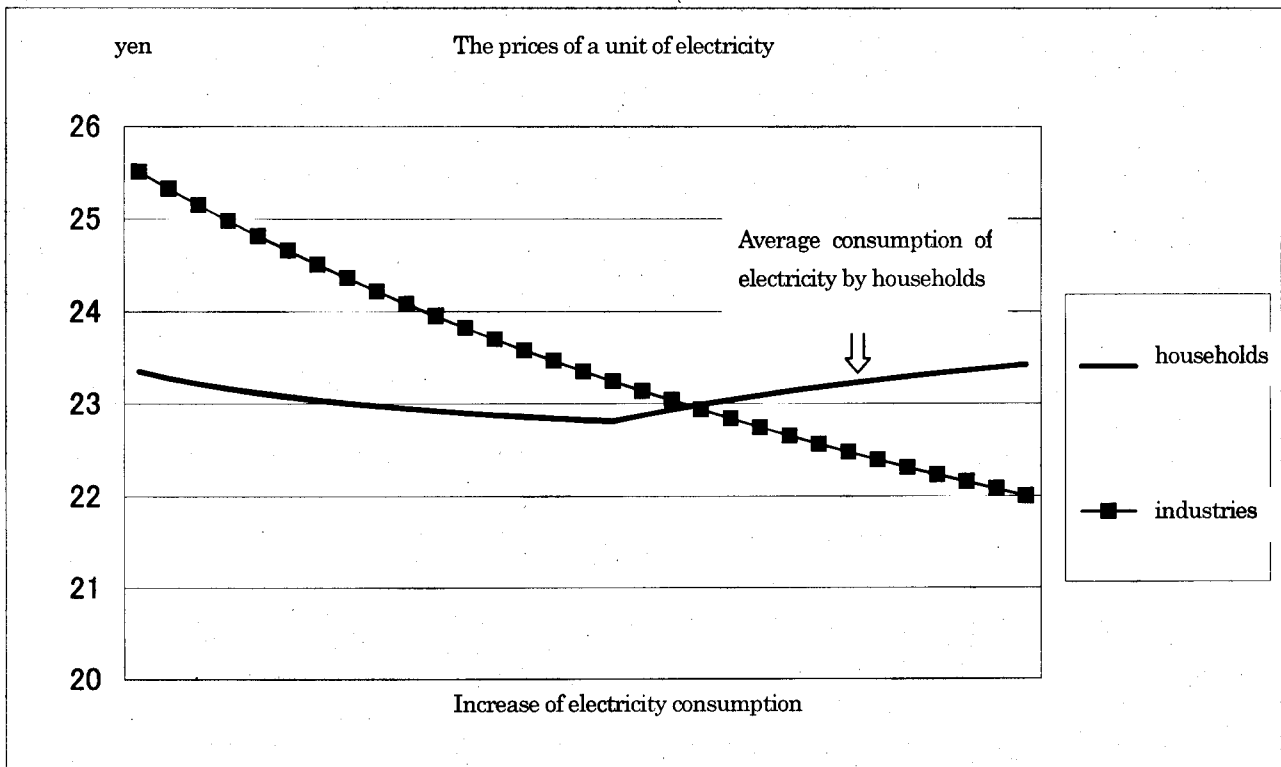□ consumption by households

■ consumption by industries

The peaks of demand of households are from 6 am to 9 am and from 6 pm to 9 pm. At the peak of total electricity demand, i.e. from 2 pm to 3 pm of weekdays in summers, the demand of households is very low.

<The high peak of demand is caused by how the electricity prices are set up>
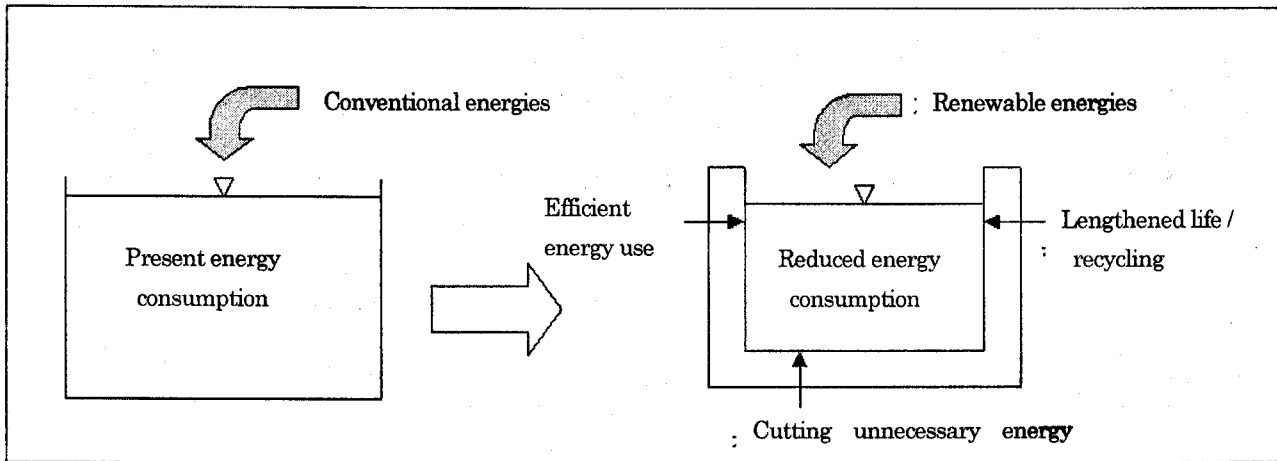
The electricity prices of households are set up so that the more you use electricity in a certain month, the higher the cost per unit of electricity become. On the other hand, the conversed system is applied for industries.

This caused the continuous increase in the peak of electricity demand.

yen

The prices of a unit of electricity

26	
25	
24	
23	
22	
21	
20	

Average consumption of electricity by households
⇓

—— households

—■— industries

Increase of electricity consumption

<It is possible to provide the whole electricity demand of households with renewable energies>

Conventional energies

: Renewable energies

Efficient energy use

Present energy consumption

Reduced energy consumption

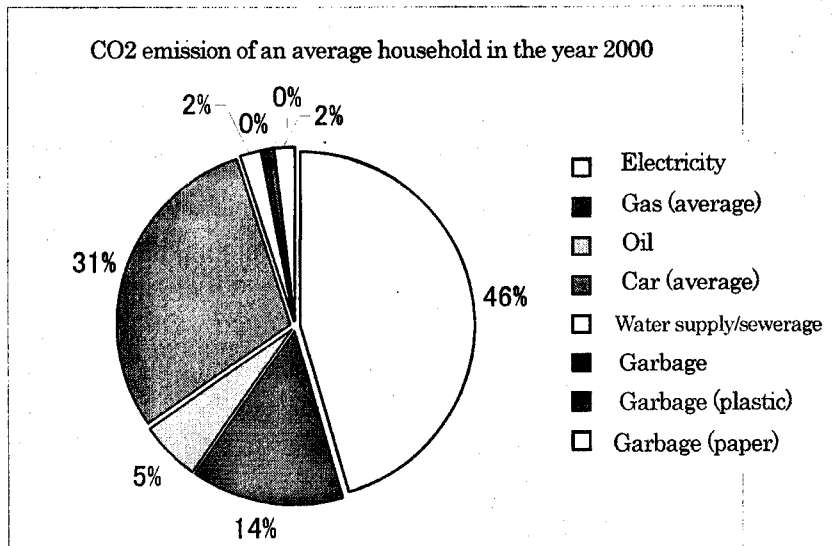Lengthened life / recycling

. Cutting unnecessary energy

It is possible to provide the whole electricity demand of households. To do so, it is necessary to reduce the energy consumption first by implementing efficient use of energy, energy conservation, and lengthening product life.
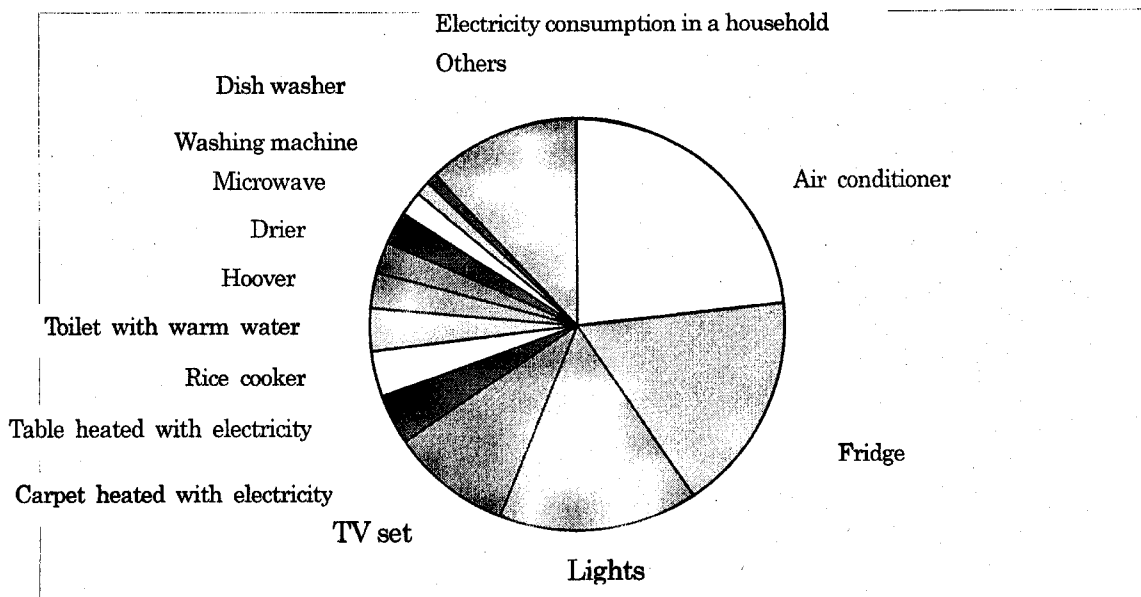
<The largest source of CO_2 emission of household is electricity>

This is the amount of CO_2 emission from households, calculated with the assumption that whole electricity is generated with thermal power stations (i.e. not with nuclear power stations or dams).

Under this assumption, a half of the amount of CO_2 emission is created by electricity. If we wish to prevent Global Warming, the most effective way is to reduce the use of electricity.

CO_2 emission of an average household in the year 2000

2%   0%   0%   2%
0%

31%

46%

5%

14%

☐ Electricity
■ Gas (average)
▨ Oil
▨ Car (average)
☐ Water supply/sewerage
■ Garbage
■ Garbage (plastic)
☐ Garbage (paper)

<Energy conservation is not difficult>

Energy conservation is not so difficult because there are only a few factors which consume large amount of electricity in a household.

Electricity consumption in a household

Others

Dish washer

Washing machine

Microwave

Drier

Hoover

Toilet with warm water

Rice cooker

Table heated with electricity

Carpet heated with electricity

TV set

Lights

Air conditioner

Fridge

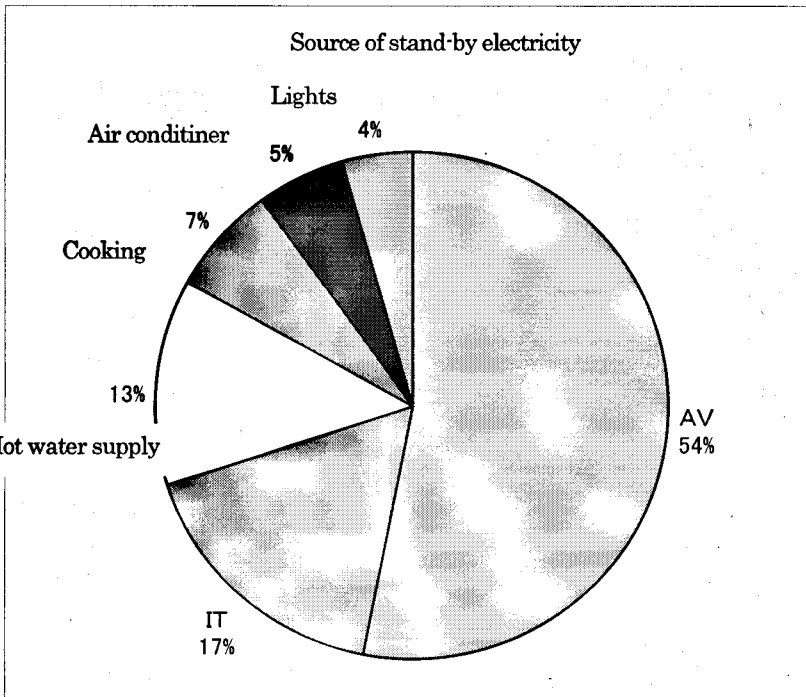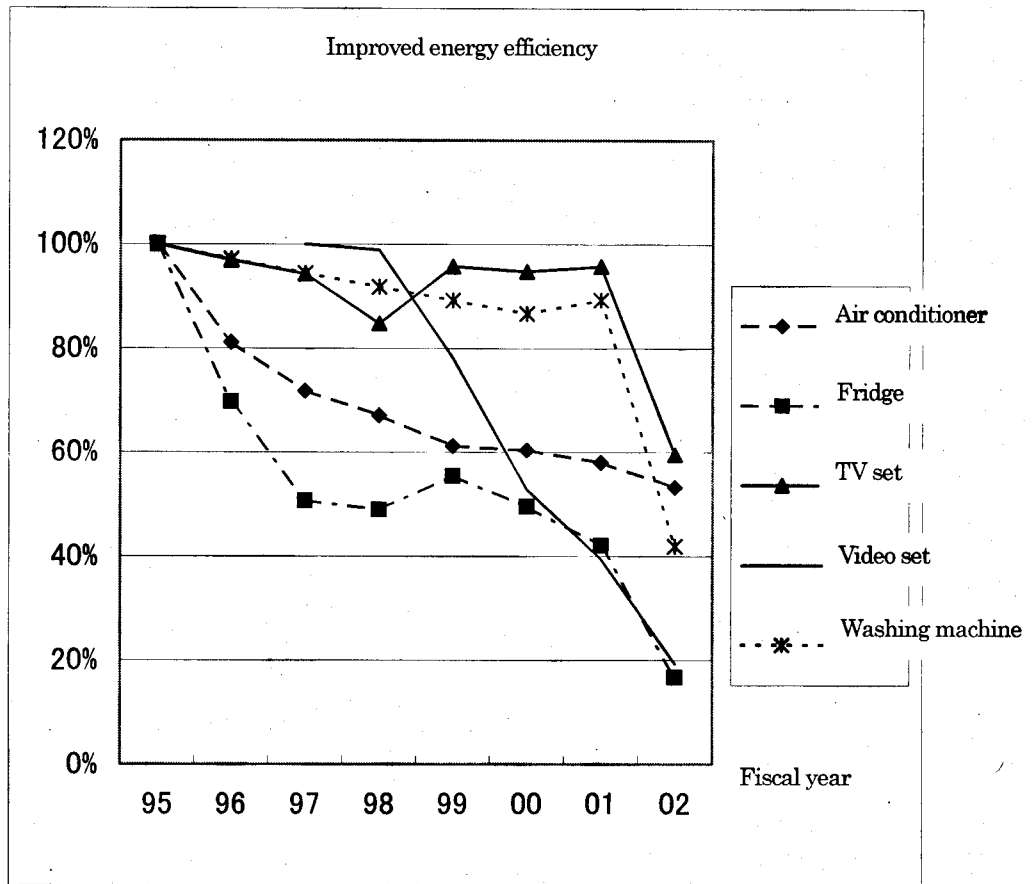# <Electric home appliance with advanced energy efficiency>

Energy efficiency of electric home appliance is improving dramatically for the past few years, so it is possible to reduce the energy consumption by changing the old appliance to new ones.

In that case, it is possible to recover the cost of the new appliance within 5 years because of reduced electricity bill, and to recover the energy spent for the production of the new appliance within a year.

<Limited stand-by electricity>

Stand-by electricity, which is said to account for 10% of consumption, belongs to AV and IT. If these are improved, stand-by electricity can be reduced by 70%.

Improved energy efficiency

Fiscal year: 95 96 97 98 99 00 01 02

Legend:
- Air conditioner
- Fridge
- TV set
- Video set
- Washing machine

Source of stand-by electricity

- Lights 4%
- Air conditiner 5%
- Cooking 7%
- Hot water supply 13%
- IT 17%
- AV 54%

For more information: "The reason for the high electricity bills in Japan".(Hokuto Publication 2000), "Eco-Eco Energy Conservation Game" (Godo Publication 2003) (Japanese only)Author: Yu Tanaka