



# Behavior Change and Driving Forces to Save Electricity in the Electricity Crisis in Japan

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# Electricity shortages in East Japan in 2011

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## ◆ Spring

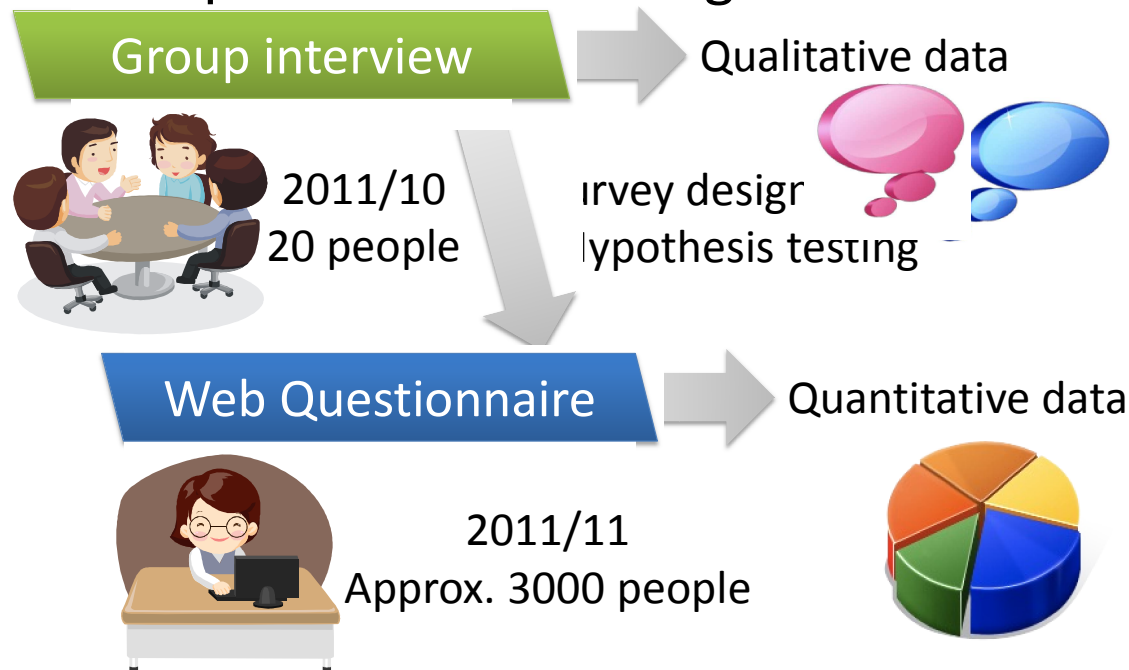
- Earthquake and tsunami on 11/Mar, triggering nuclear power shutdown.
- Rolling blackout from 14 to 28/Mar.

## ◆ Summer

- Set peak demand (kW) reduction targets of 15% from Jul through Sep from the previous year level.
- Resulted in no blackout with outstanding efforts and socio-economic burden.

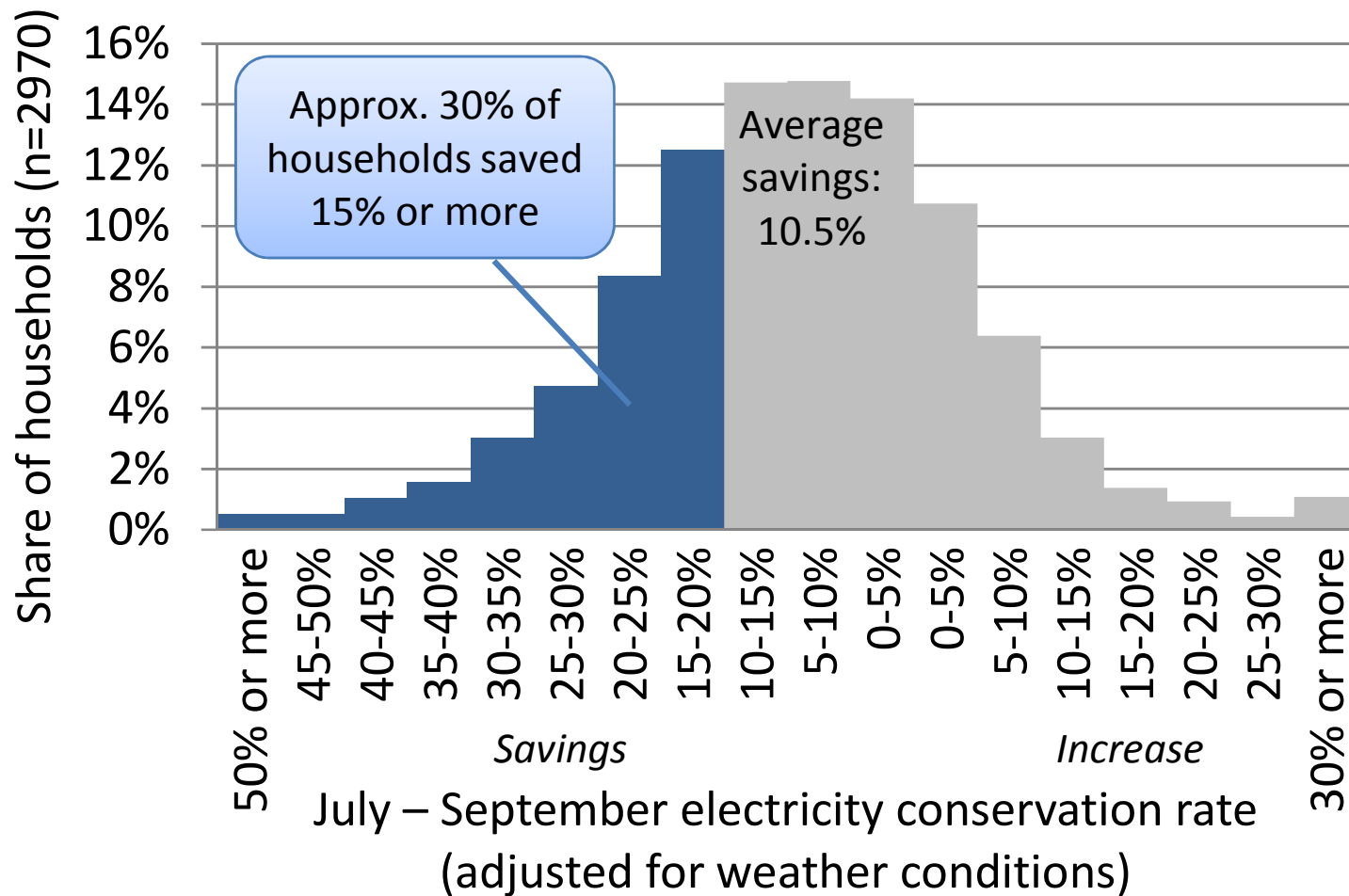
# Overview of research

- ◆ Ex-post analysis of electricity saving during summer 2011 in households served by Tokyo Electric Power Co. (TEPCO):
  - 1. Conservation rates and measures
  - 2. Motives and continuation
  - 3. Toward peak demand saving



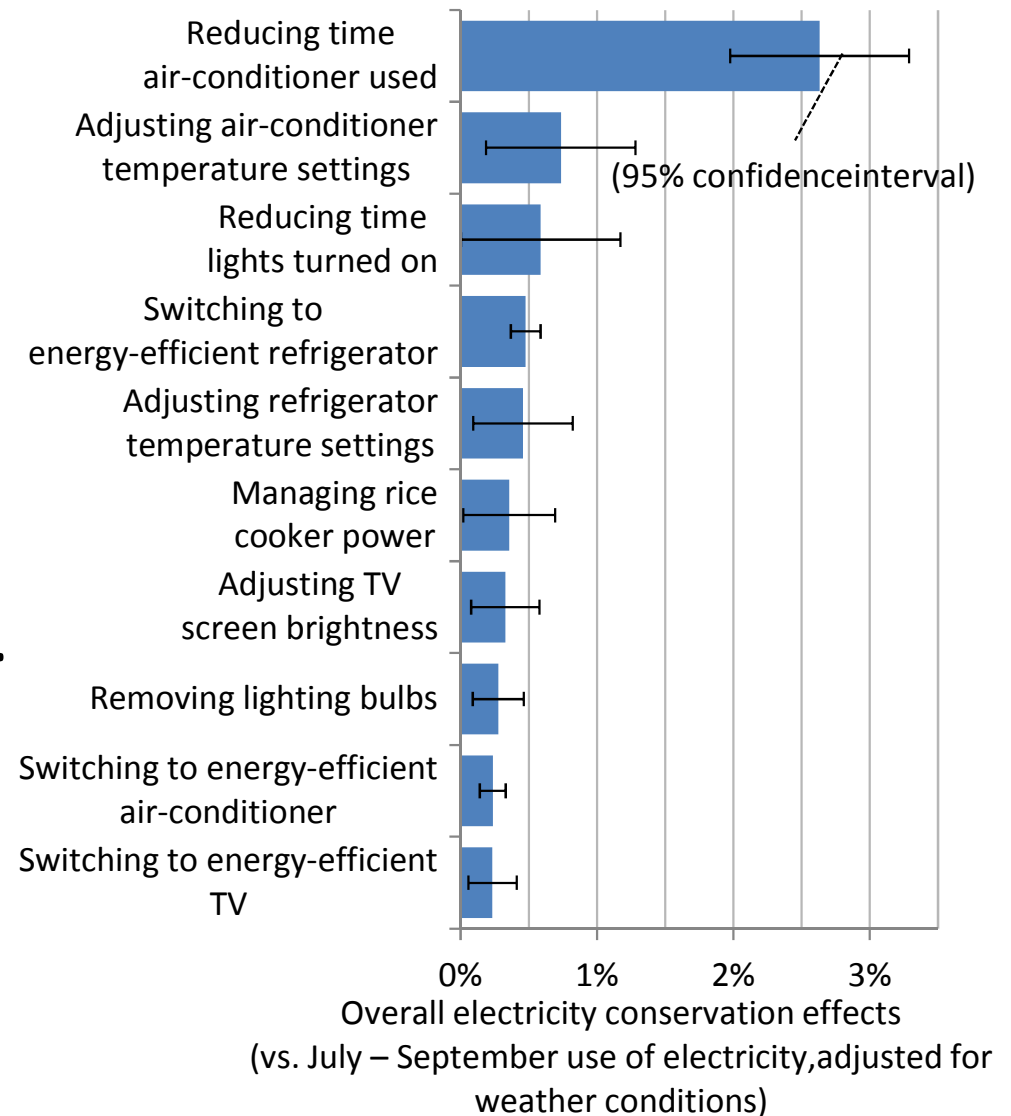
# Electricity Conservation Rate

- ◆ Consumption (kWh) was reduced by 10% on average.

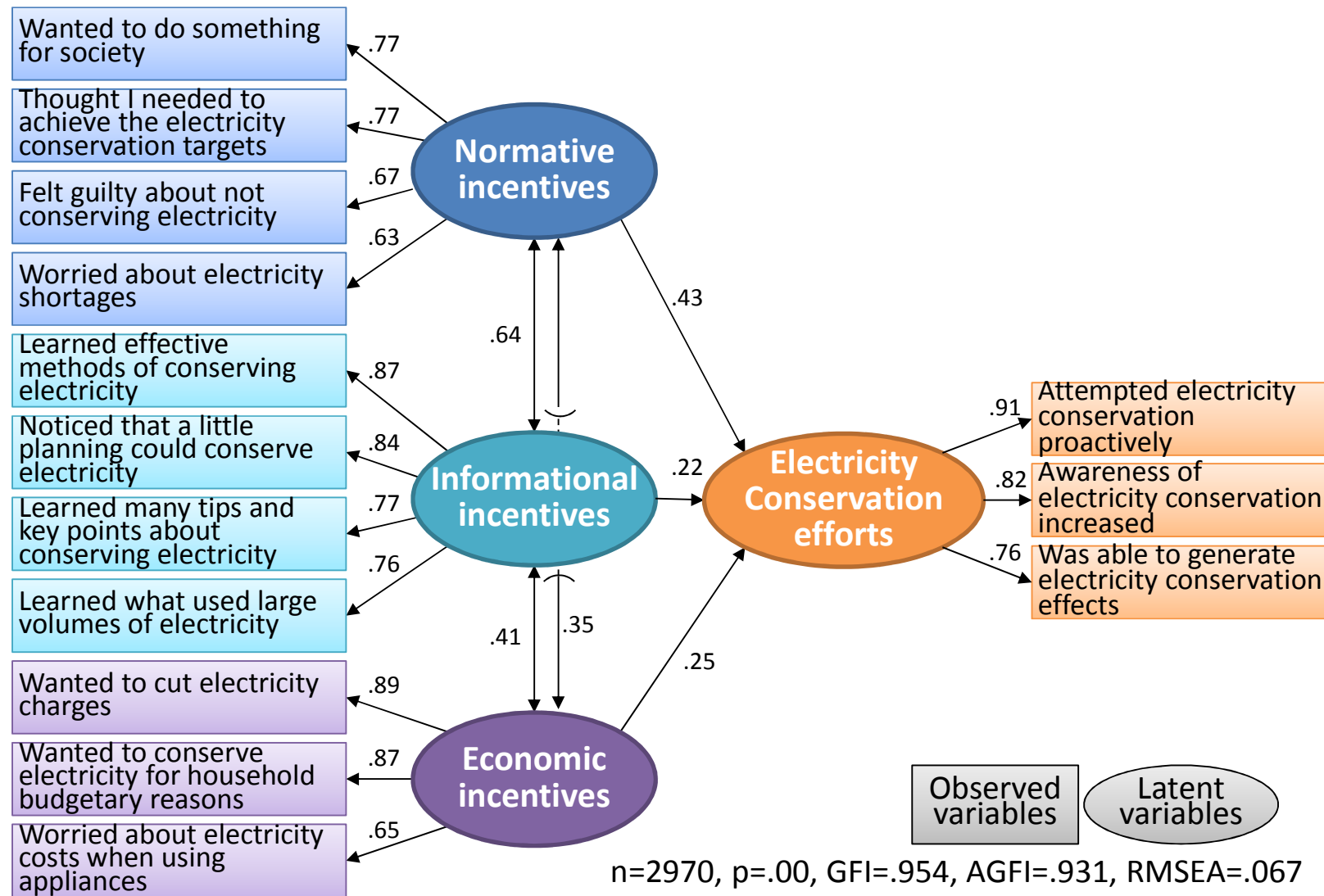


# Main electricity conservation measures

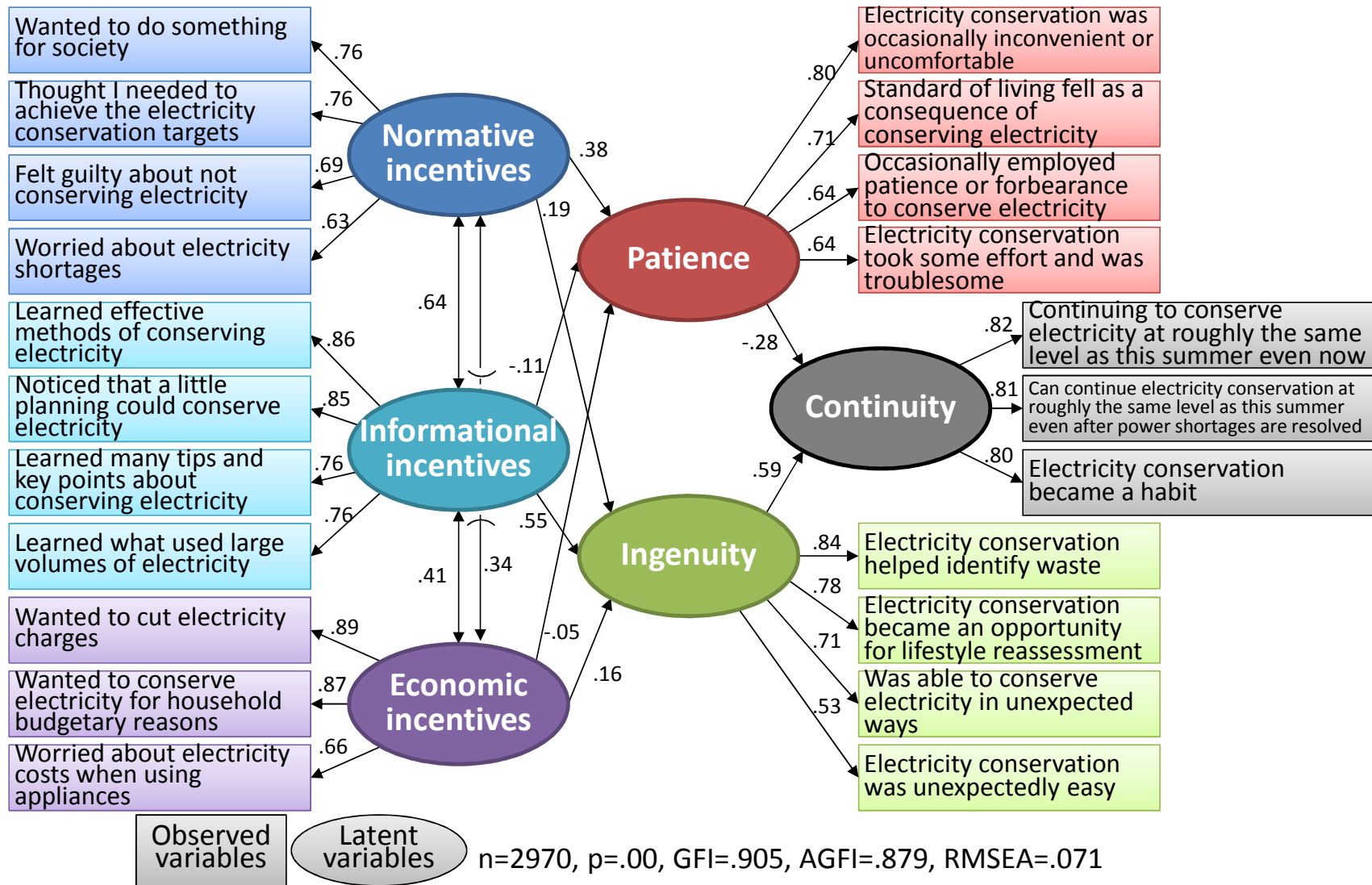
- ◆ Effects of electricity conservation related to air-conditioning use accounted for roughly 40% of overall results.
- ◆ Most of saving came from behavior changes.



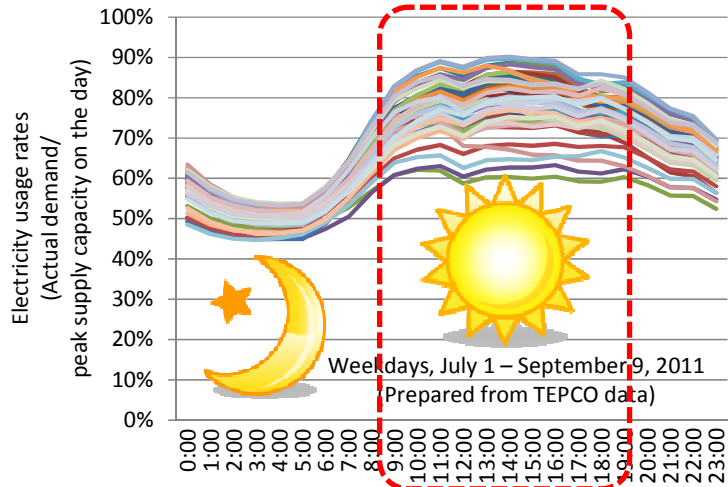
# Driving forces and conservation efforts



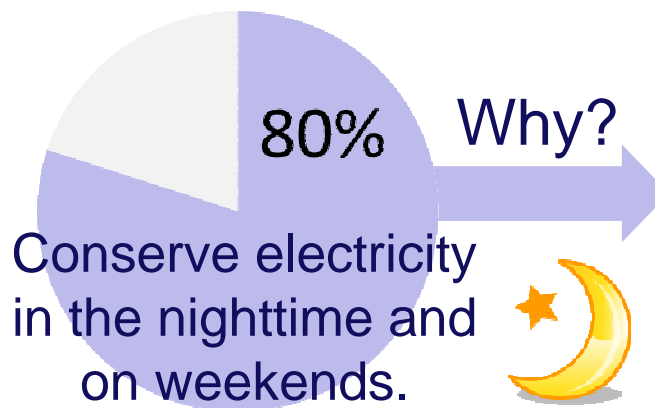
# Consistency



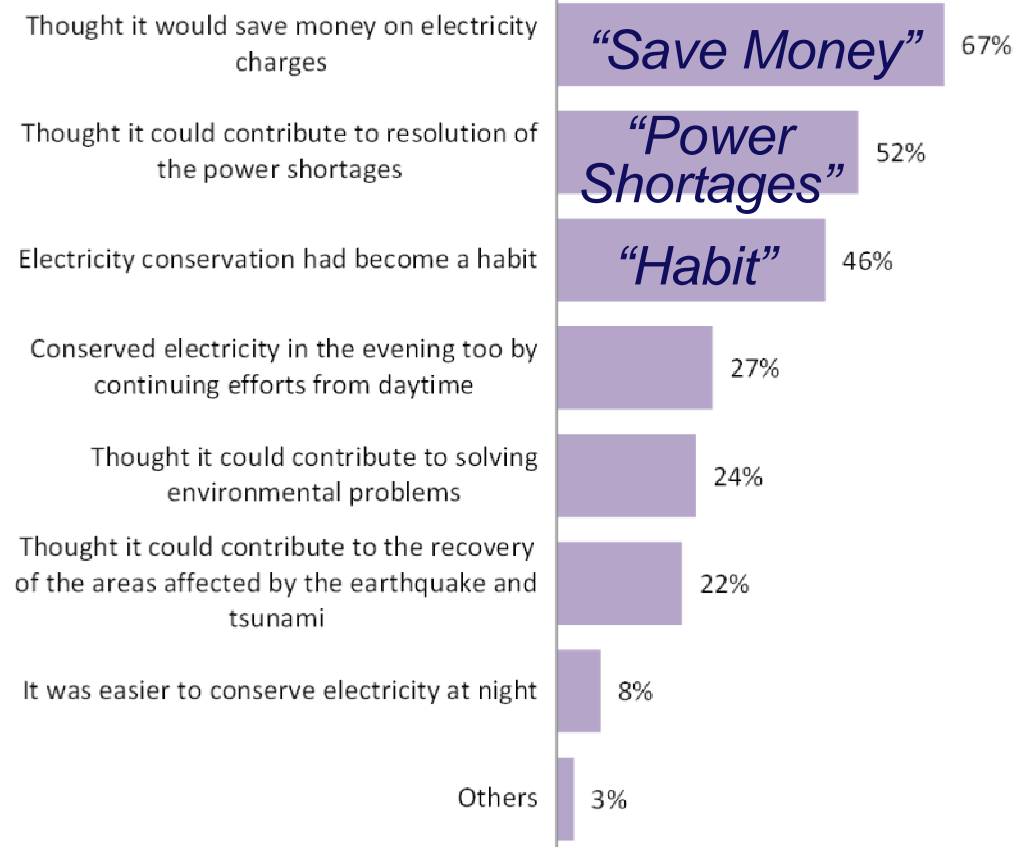
# How people were conscious of electricity conservation at peak & off-peak hours



**Demand control targets set for 9am - 8pm weekdays**

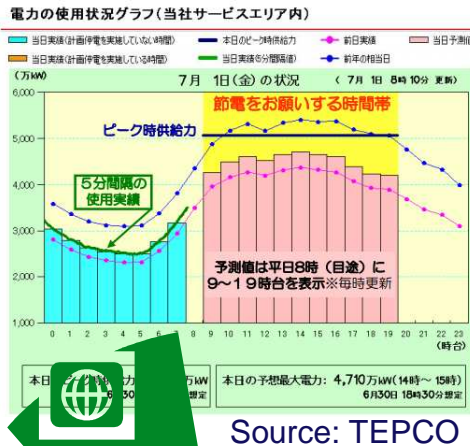


Choose all of the answers below that correctly describe your reasons for consciously conserving electricity at night as well. Subjects: Respondents who answered that they were conscious of electricity conservation at night too (n = 2417)





# Electricity forecasts



Highly recognized.

Did you view such info?

Sometimes  
29%

Often  
65%

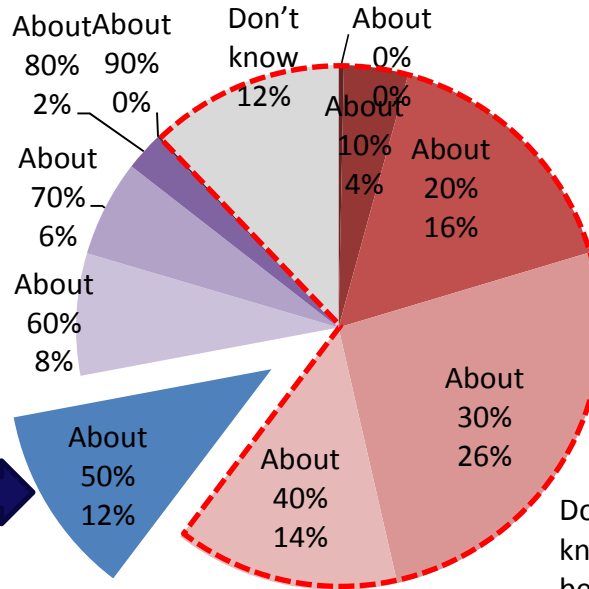
How did people responded?

*While I viewed that information, my response was something like, 'Is that so?' I was not much affected by the information, neither feeling relieved when the figures were low nor feeling I had to try harder when they were high.*

*Watching the electricity forecasts each day, I got a sense that the peak hours were the hot hours in the afternoon ... so I was conscious of those hours. At nighttime and on weekends I used electricity as usual without being very conscious of conservation.*

# Air-conditioners as a dominant peak load

What share do you think air-conditioning accounts for in electric power consumption by households in the entire Kanto region during peak power usage in the summer?  
Subjects: all households (n=2970)



But 70% of people underestimate or don't know

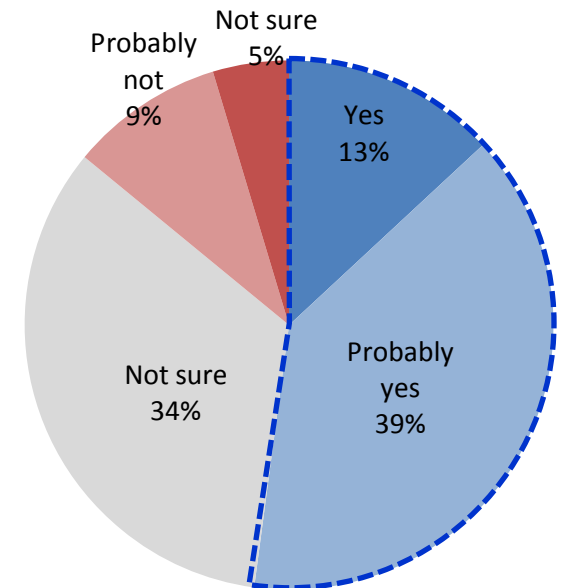
What if they knew correctly?

ACs account for 50% of residential peak loads

50% of them would have been more conscious

Do you think that if you knew this you would have been more conscious of conserving electricity used in air-conditioning on weekday afternoons?

Subjects: Users of air-conditioning who gave an answer of about 40% or less and those who answered "don't know" regarding air-conditioning's share of peak power use in summer (n = 2063)



## Flex Alert in California, US

- ◆ Urgent call when immediate conservation is needed.
- ◆ Convey simple messages on three measures to be followed when issued.



Source: Summit Blue Consulting, 2008

# Key findings

- ◆ 1. Conservation rates and measures
  - The amount of electricity used in July through September 2011 decreased by 10% on average from the previous year.
  - About 40% of the reduction in electricity use resulted from conservation of electricity used for air-conditioning.
- ◆ 2. Motives and continuation
  - Norms played important roles in raising consciousness, while they tended to self-control in some aspects.
  - Provision of information is effective to promote planned and continuable electricity conservation.
- ◆ 3. Toward peak demand saving
  - Worth studying ways of providing easily understandable information emphasizing peak hours and peak load.