Changing behaviours - the Japanese Setsuden experience post-Fukushima:

LOW CARBON SOCIETY RESEARCH NETWORK 4TH MEETING:

17-18 September 2012

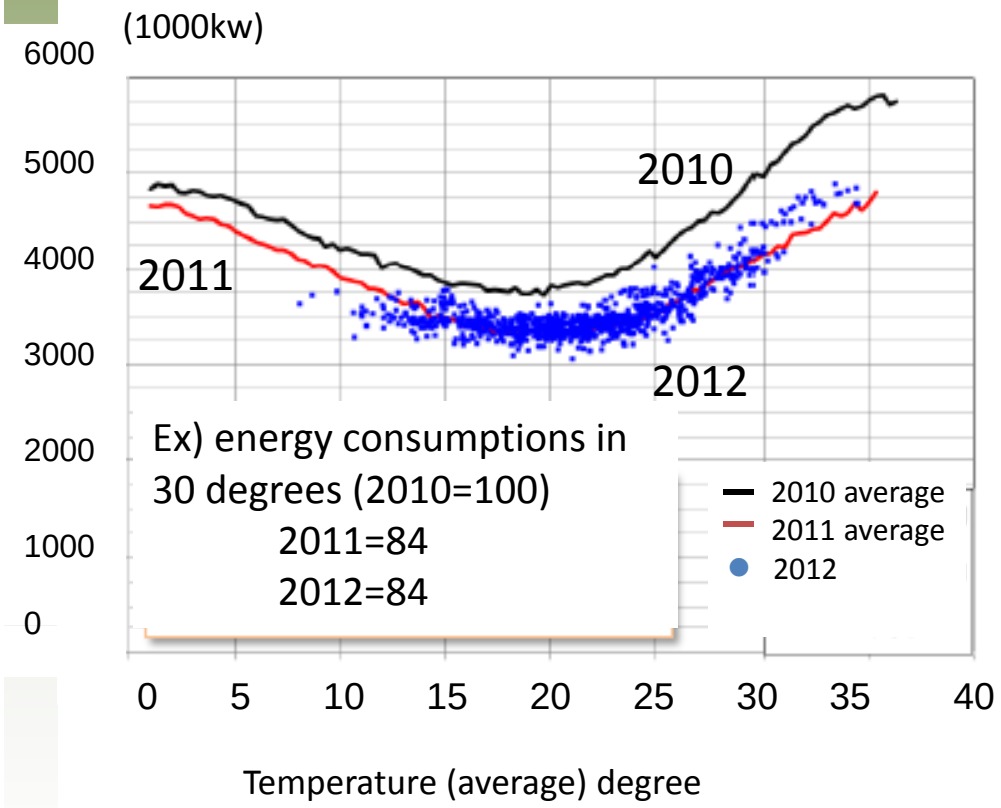
Oxford, United Kingdom

Hideyuki Mori/ Takako Wakiyama

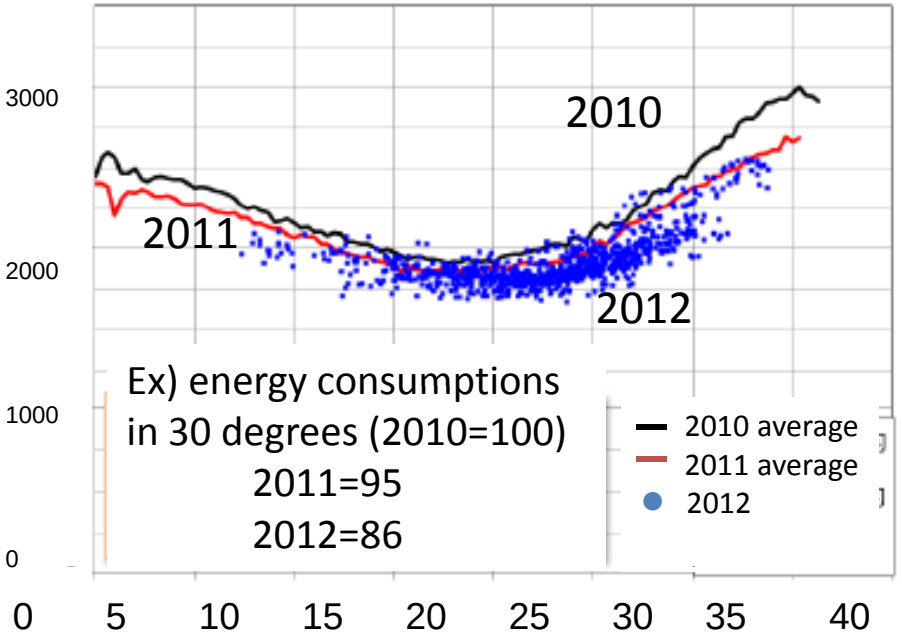
IGES

Post-Fukushima Japan: Response to power deficiency

Energy consumption in **Tokyo electric power company** (9am-21pm)



Energy consumption in **Kansai electric power company** (9am-21pm)



Presentation by the Center for Low Carbon Society Strategy, the Japan Science and Technology Agency (JST), July 2012

Energy reductions in maximum peak demand in 2011 compared to 2010

Maximum peak demand (kW) - week days from 9:00-20:00

	Tokyo electricity Company *(w/o regard to temp.)*	Tokyo electricity Company *(with regard to temp.)*	Tohoku electricity company *(w/o regard to temp.)*	Kansai electricity company *(w/o regard to temp.)*
Reduction target of peak demand	-15% (2011)	-	-15% (2011)	-10% (2011&2012)
Large electricity customers	-29% (▲600)	-27%	-18%	-9%
Small electricity customers	-19% (▲400)	-19%	-20%	-10%
Household	-6% (▲100)	-11%	-22%	-14%
2011 Total (July-Sept)	-18%	-	-15.8%	-10%
2012 Total (July-Aug)	**Under calculation** (Jul: -6.4% from 2011)	-	**Under calculation** (Jul: +0.1% from 2011)	-11.1% (Jul: -10.6% from 2011)

(10,000kW)

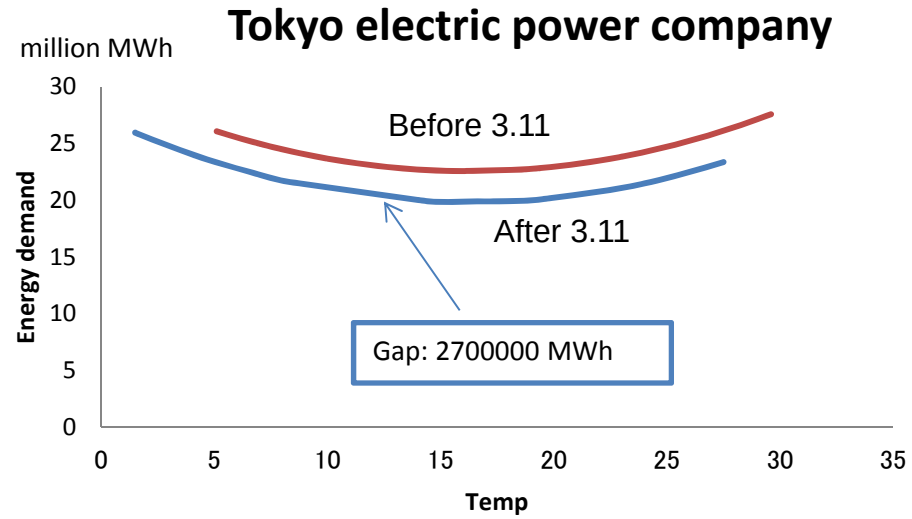
Supply-Demand gaps
Expected shortage of supply was 6.2GW

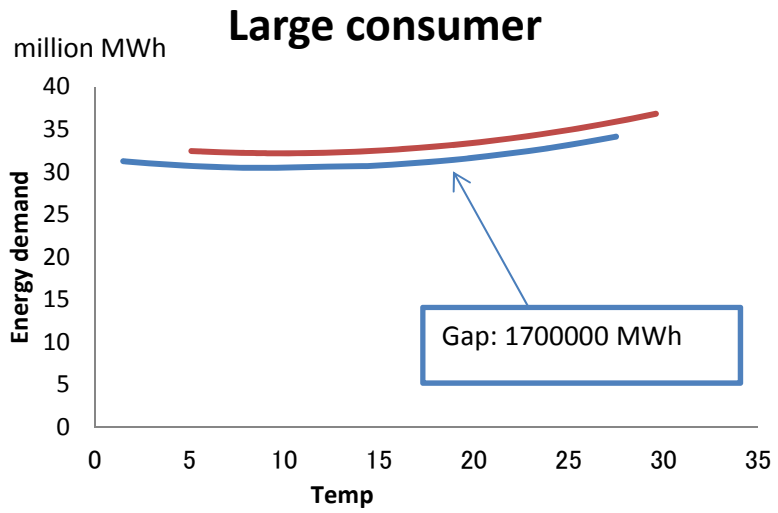
Set up **15% reduction target** in **peak demand**

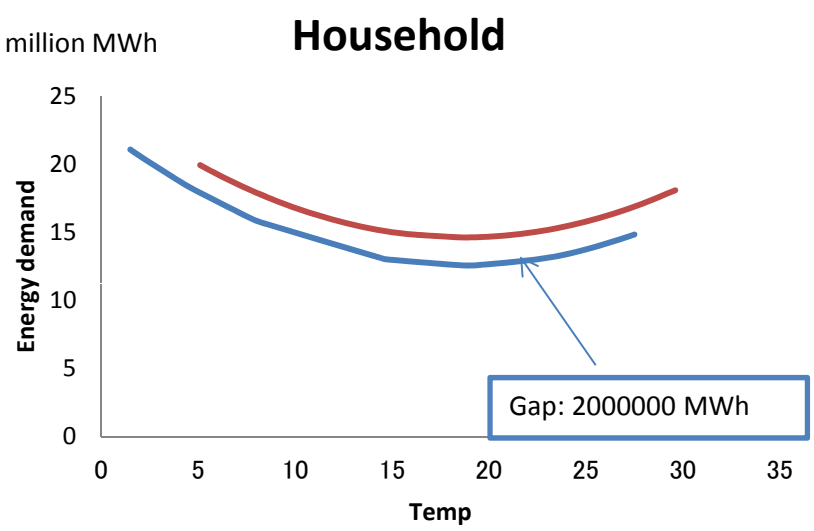
As a result,
Achieved totally **18% (10.77GW)** reductions compared to 2010 summer

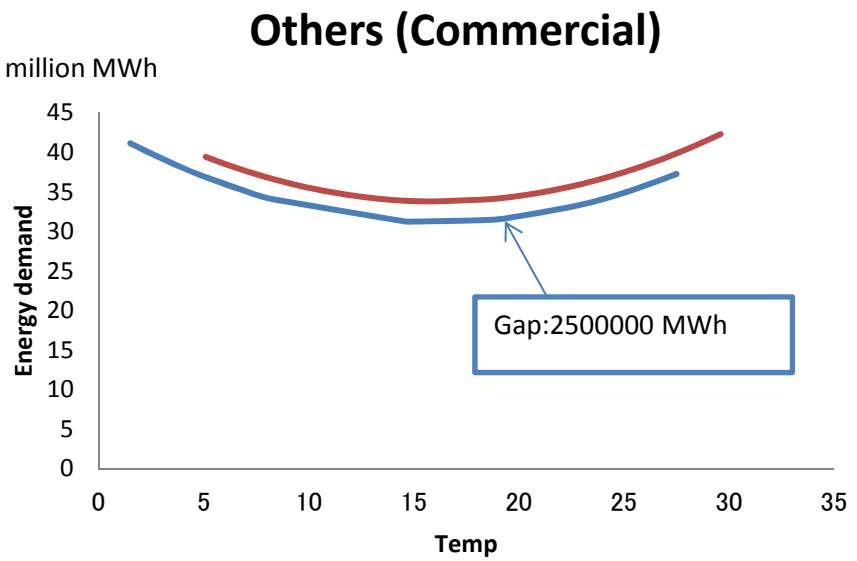
Source: IGES 2012 using data from METI etc

Response to power deficiency by sector









Source: IGES 2012 using data from METI

Demand measures of summer in 2011

Large consumer

- L/c voluntarily develop and implement a plan to reduce energy use during a peak demand (Such as shift adjustment of operation and business)
- Gov. invoked Article 27 of the Electricity Business Act (Limit electricity use)

Small consumer

- Gov. provided a list of energy-saving measures as examples (energy-saving of lighting, air conditioning, OA (office automation))
- Gov. promoted s/c to develop and announce voluntary energy conservation action plan (Provided a format)
- Gov. operated door-to-door visits and briefings

Household

- Gov. provided the list of energy-saving measures for households
- Gov. called for the implementation of energy saving through media etc
- Gov. distributed education materials about “energy-saving“ to elementary and junior high schools

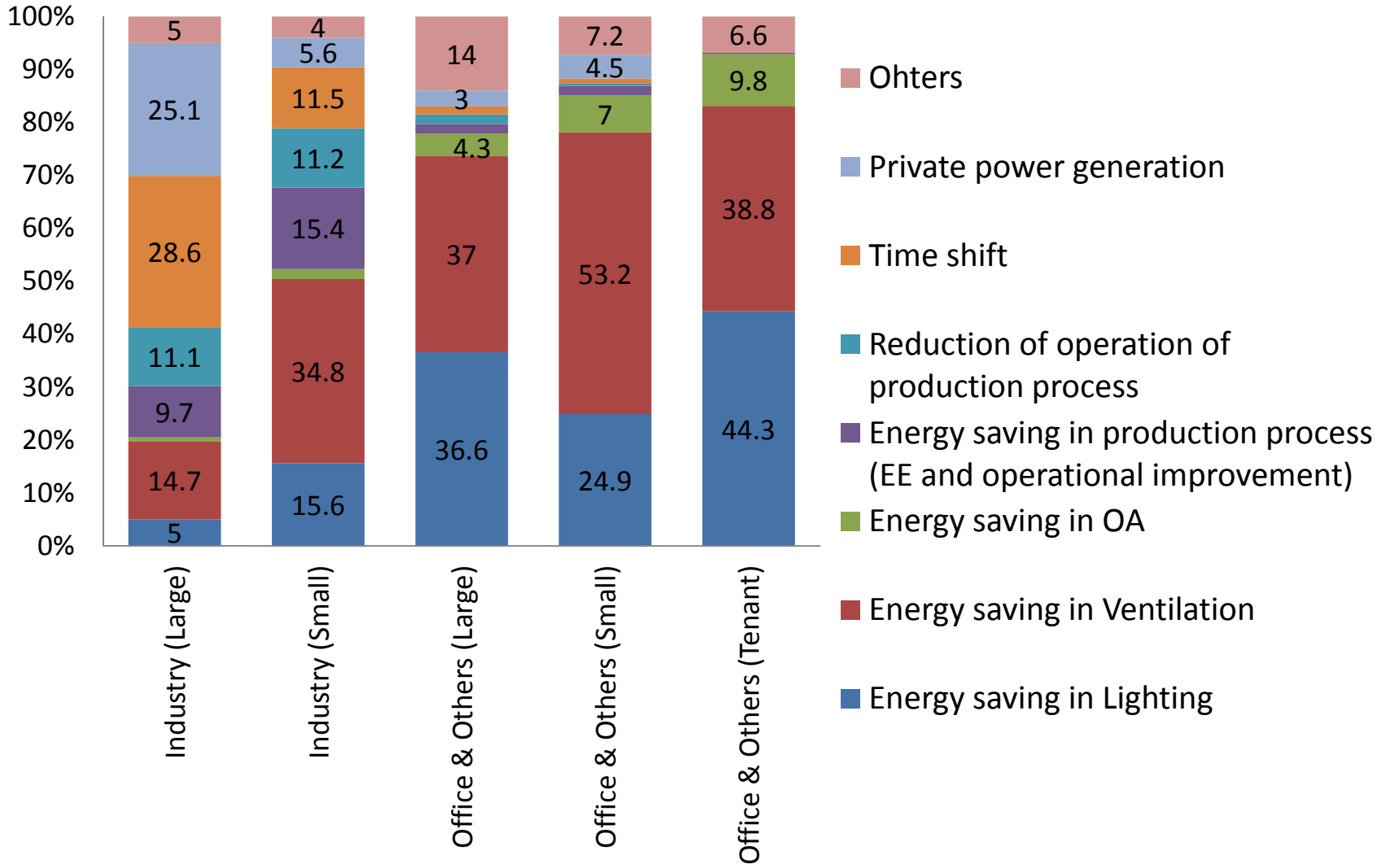
Cross-cutting

- Gov. conducted energy-saving public campaign through various media
- Visualization of electric power supply and demand data (Electricity Forecast)
- Gov. announced the info of the tight power supply and demand

Source: METI 2012

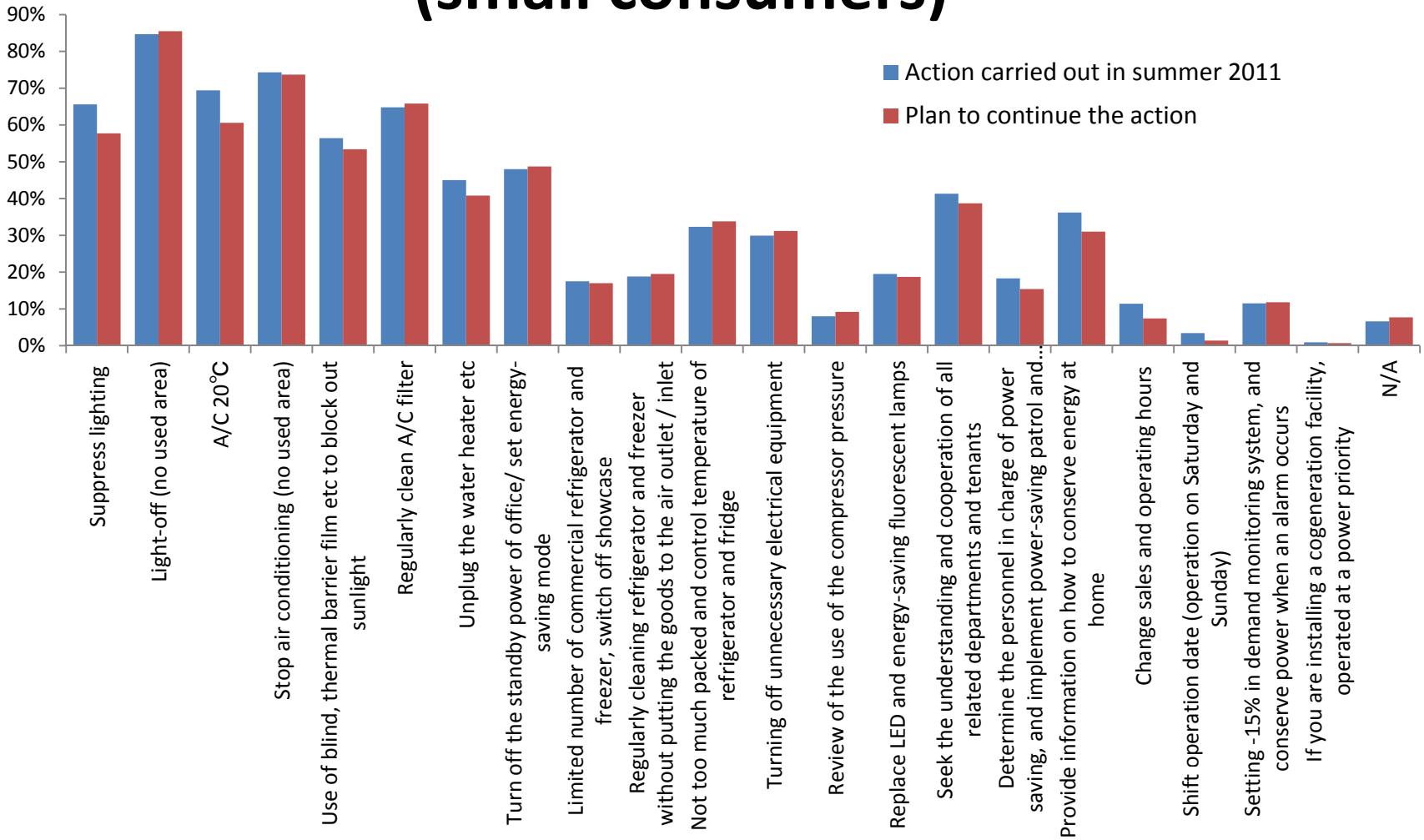
LARGE AND SMALL CONSUMERS

Electricity reduction measures in peak demand during summer



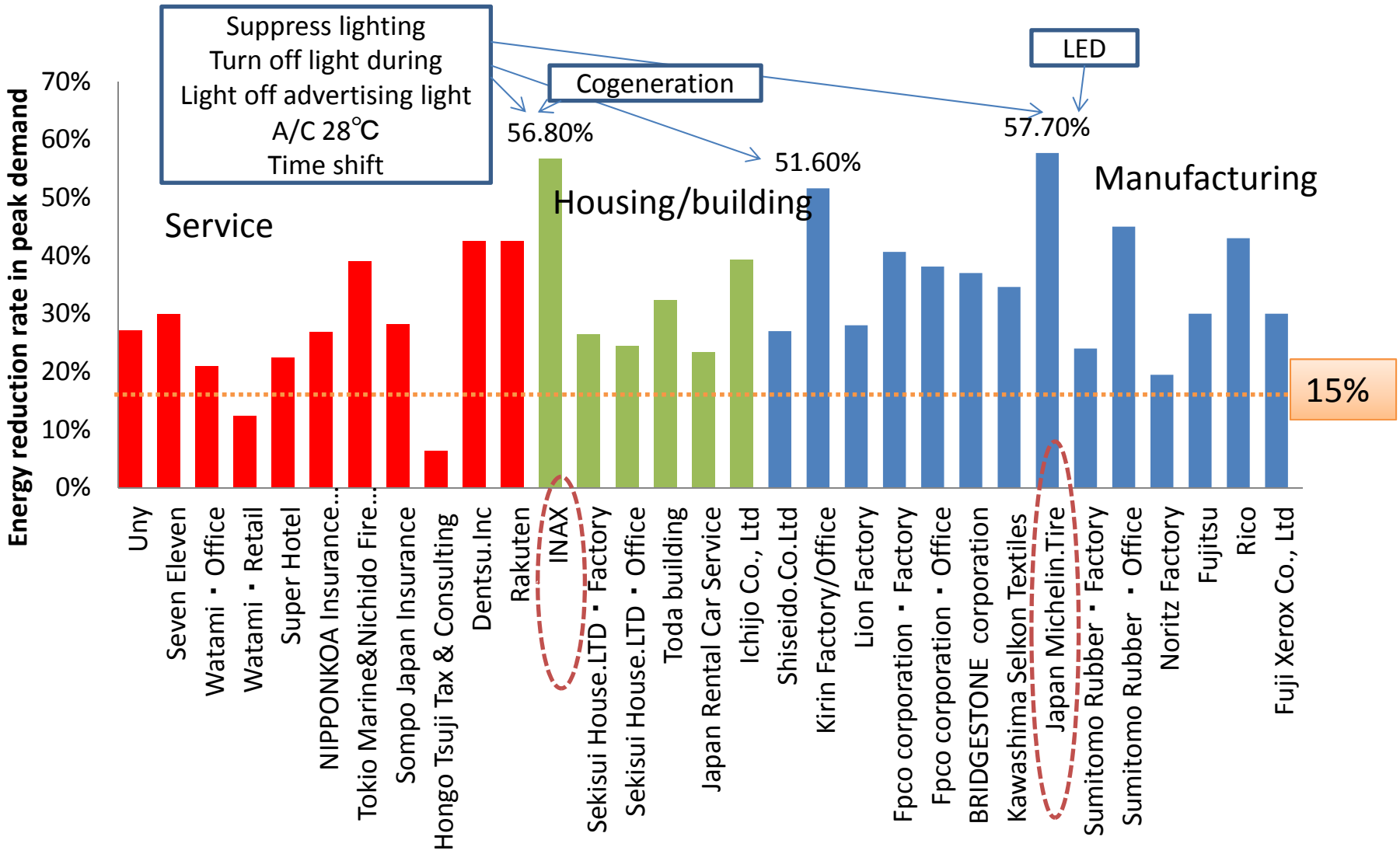
Source: Central Research Institute of Electric Power Industry, May 2012

Implemented energy-saving measures in summer 2011/plan to continue the actions (small consumers)



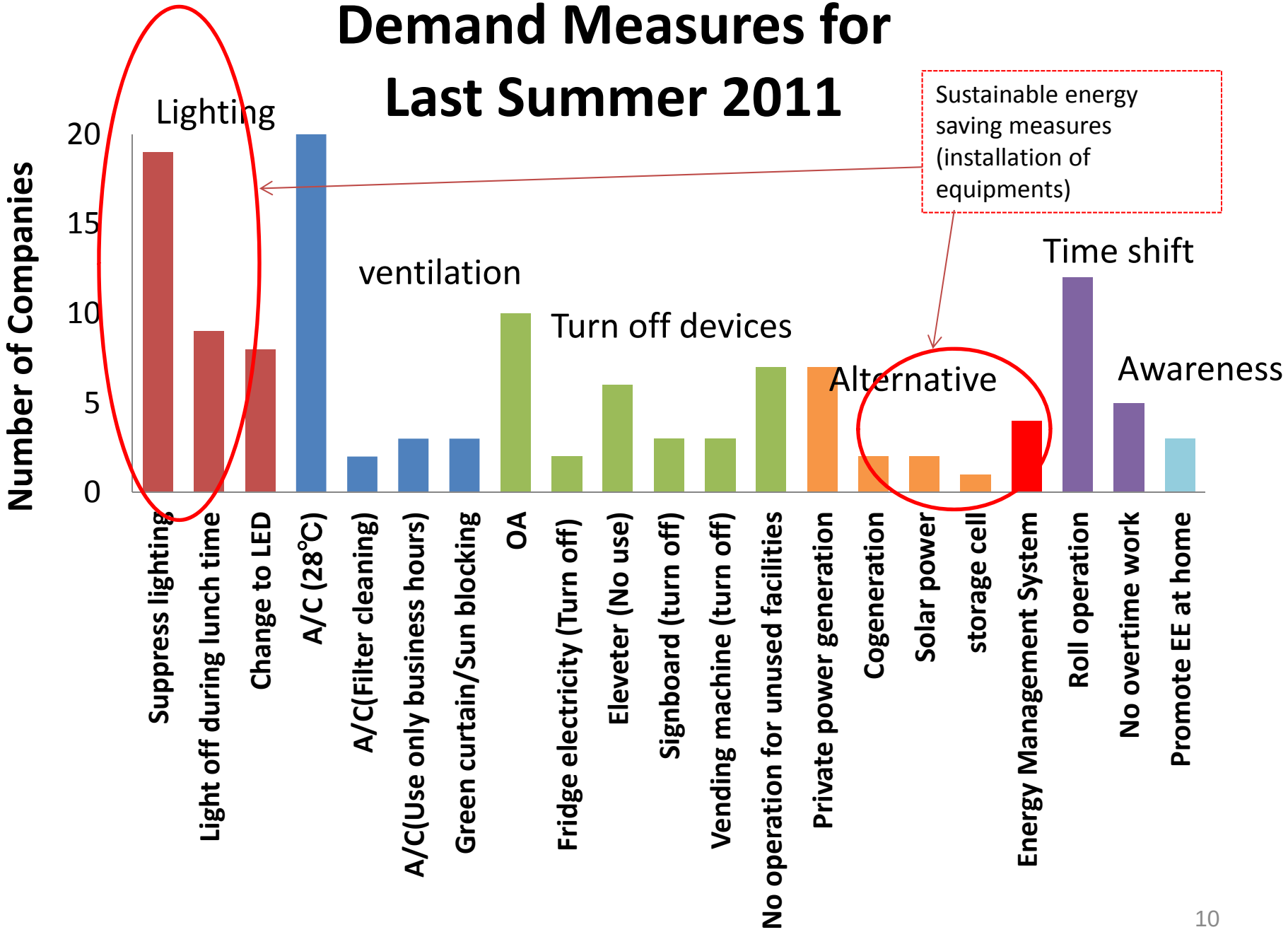
Source: METI 2012

Achievement of energy saving of large consumers in Summer 2011



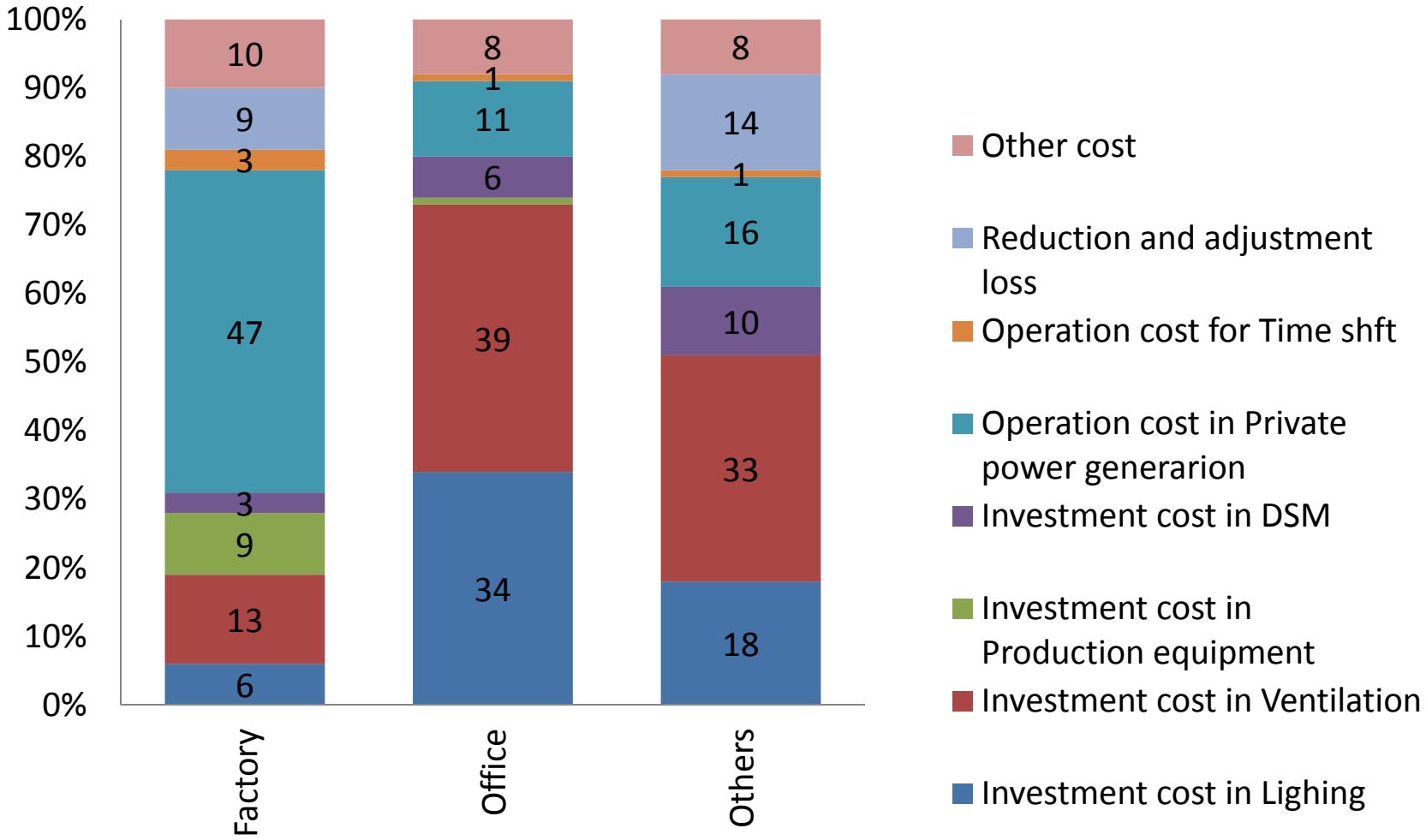
Source: 30 submission reports by company who are the member of eco first system

Demand Measures for Last Summer 2011



Source: 30 submission reports by company who are the member of eco first system

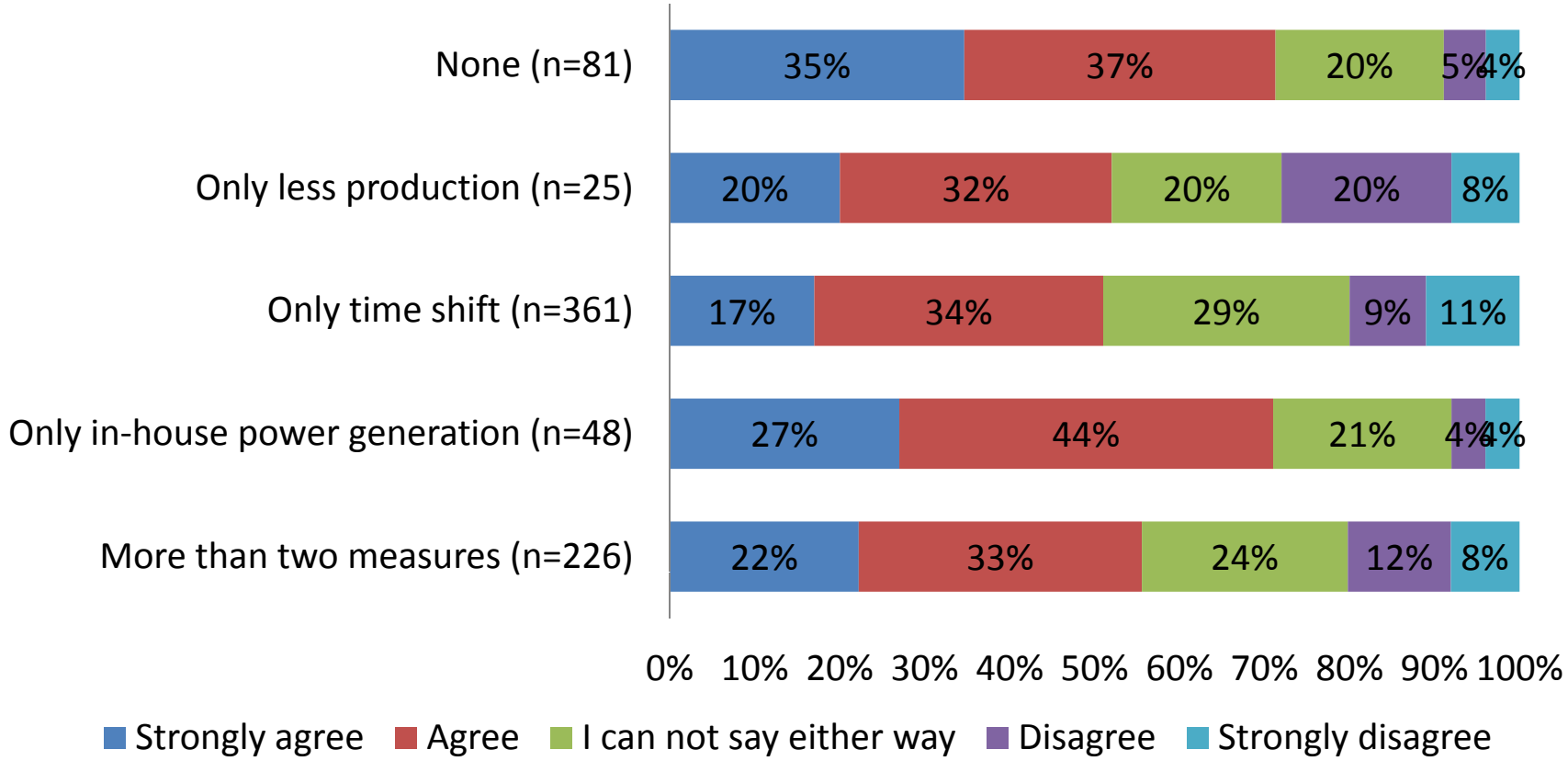
Energy saving cost during summer in 2011



Source: Central Research Institute of Electric Power Industry, May 2012

Result of questionnaire survey: continuity of energy saving (large consumers)

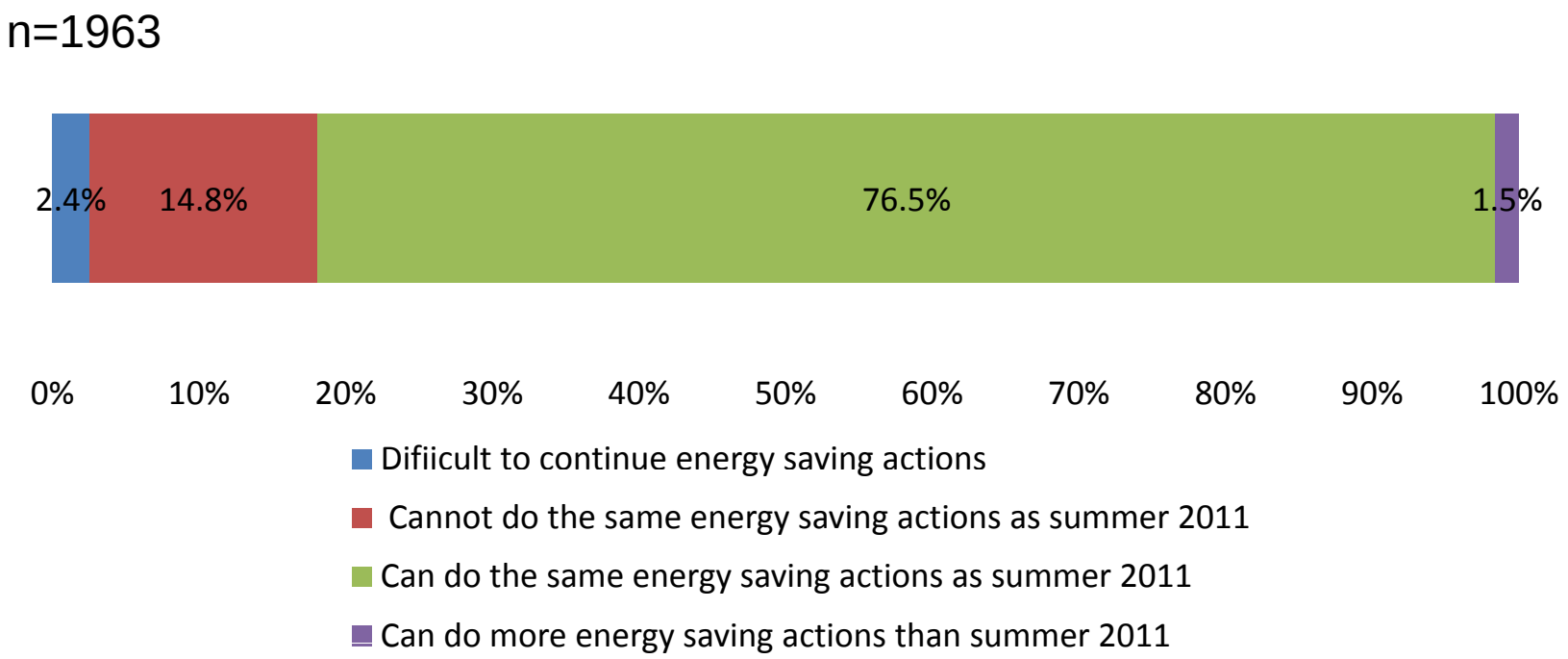
Preference of continuity of energy saving measures: the largest burdensome for large electricity consumers (less production, time shift, in-house power generation)



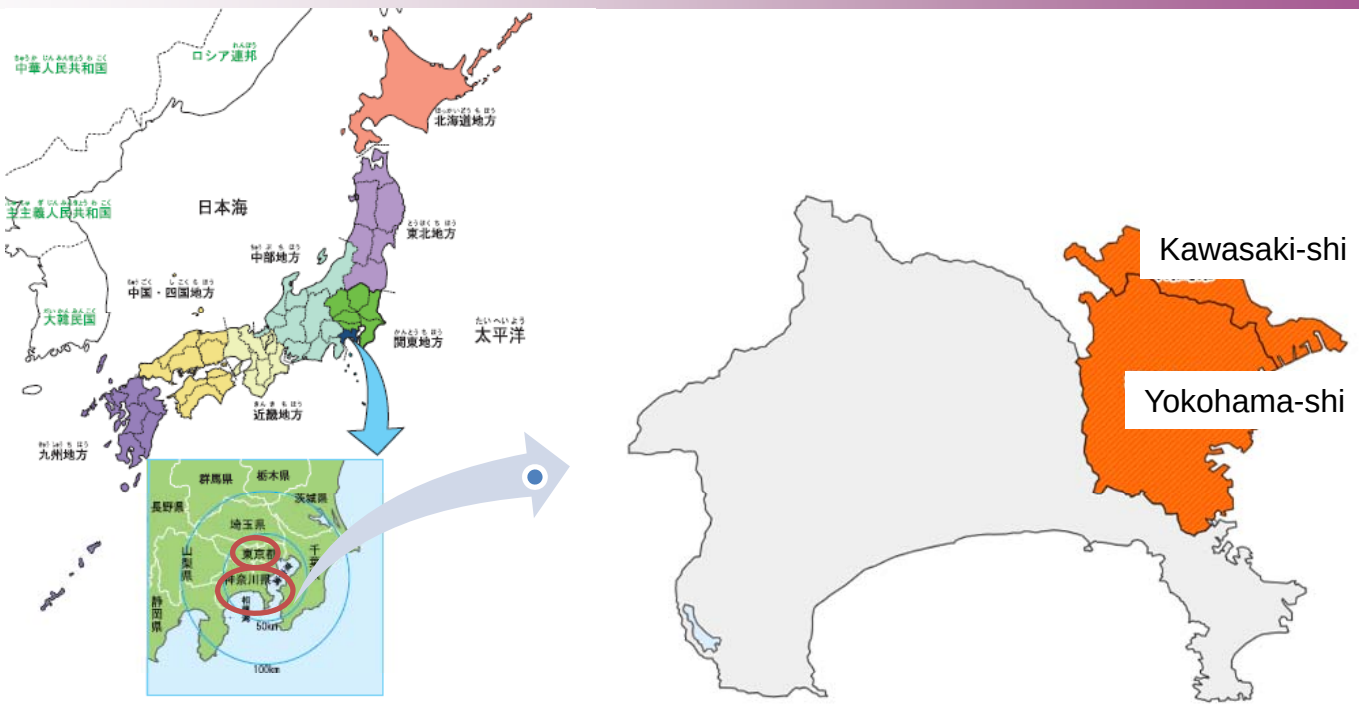
Source: questionnaire survey to the registrants of action plan of energy saving by METI 2011

Result of questionnaire survey: continuity of energy saving (small consumers)

Energy consumers who answered to be able to do more energy saving than summer 2011 or as the same as summer 2011 reached 78%.



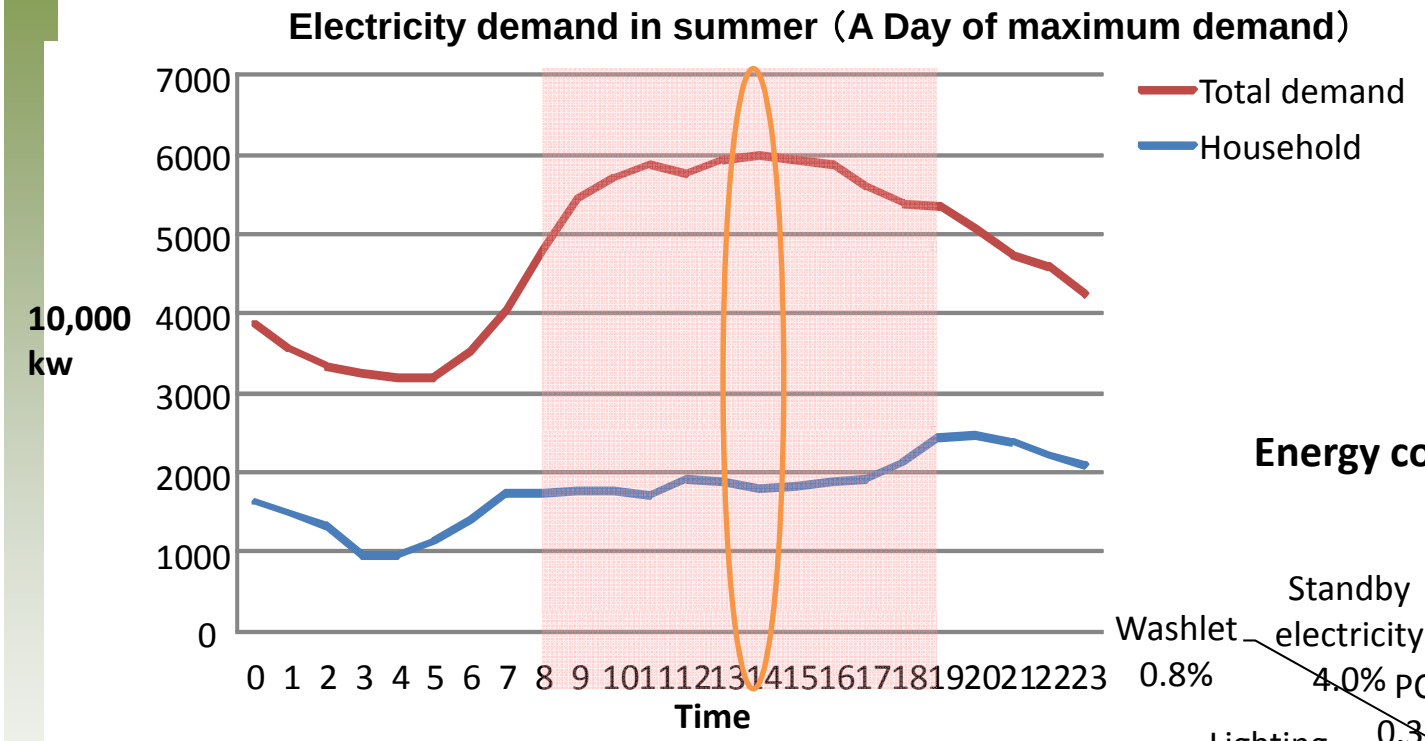
Source: questionnaire survey to the registrants of action plan of energy saving by METI 2011

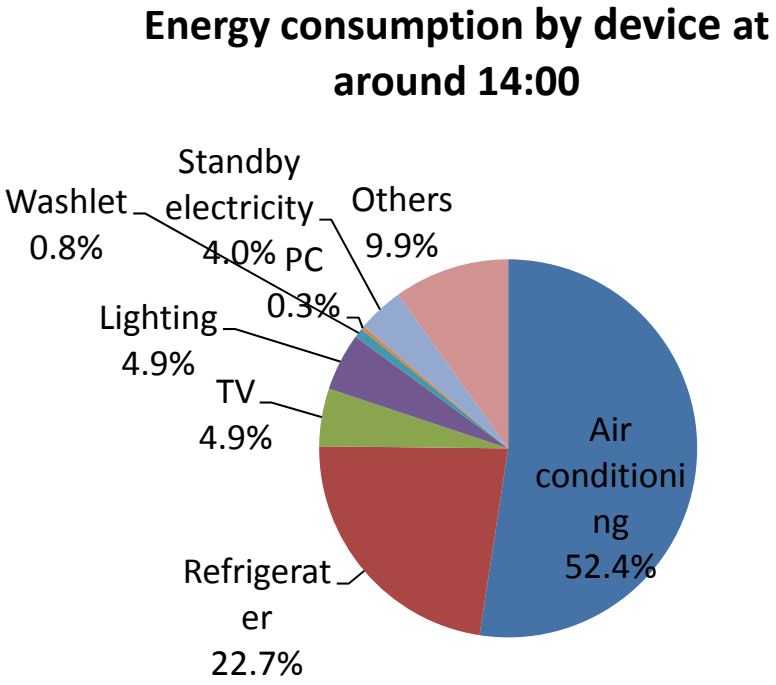


Case study of Yokohama and Kawasaki-city in Kanagawa prefecture

HOUSEHOLD

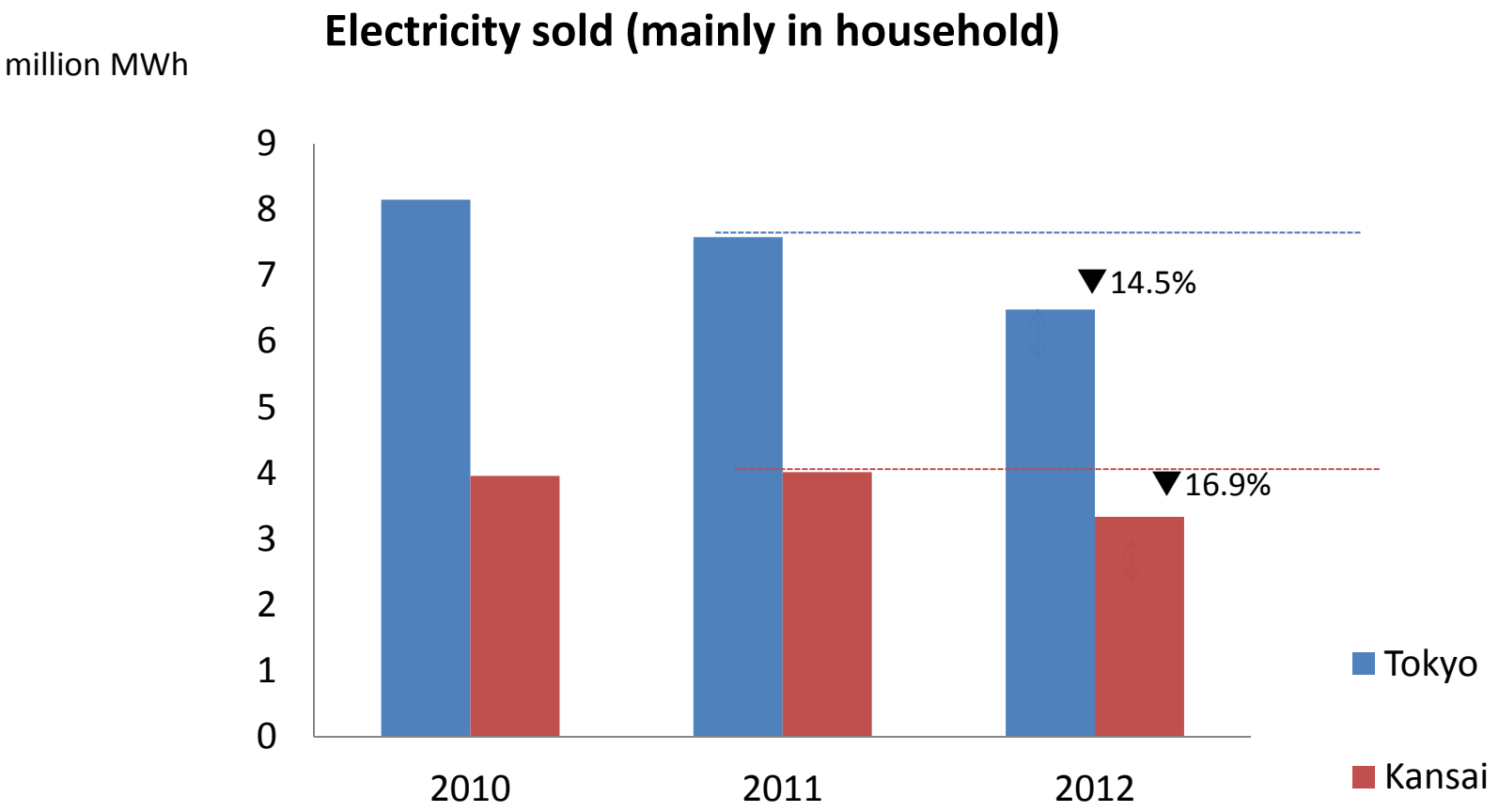
Household :
Power consumption in Summer





Source: METI 2011

Yearly power-saving: no rebound

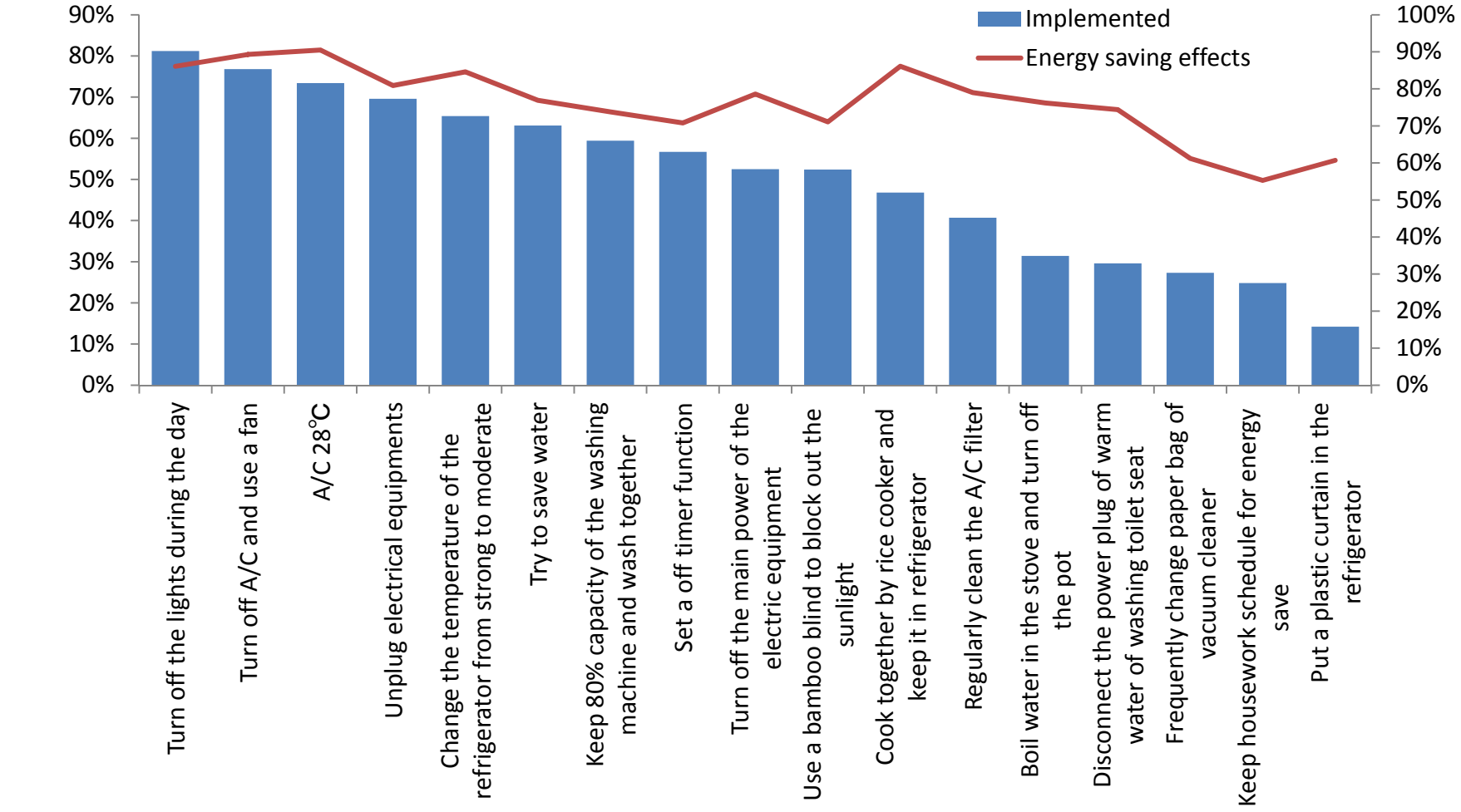


Source: IGES 2012 using data from METI and Federation of electric power companies of Japan

Practice of power-saving in household sector

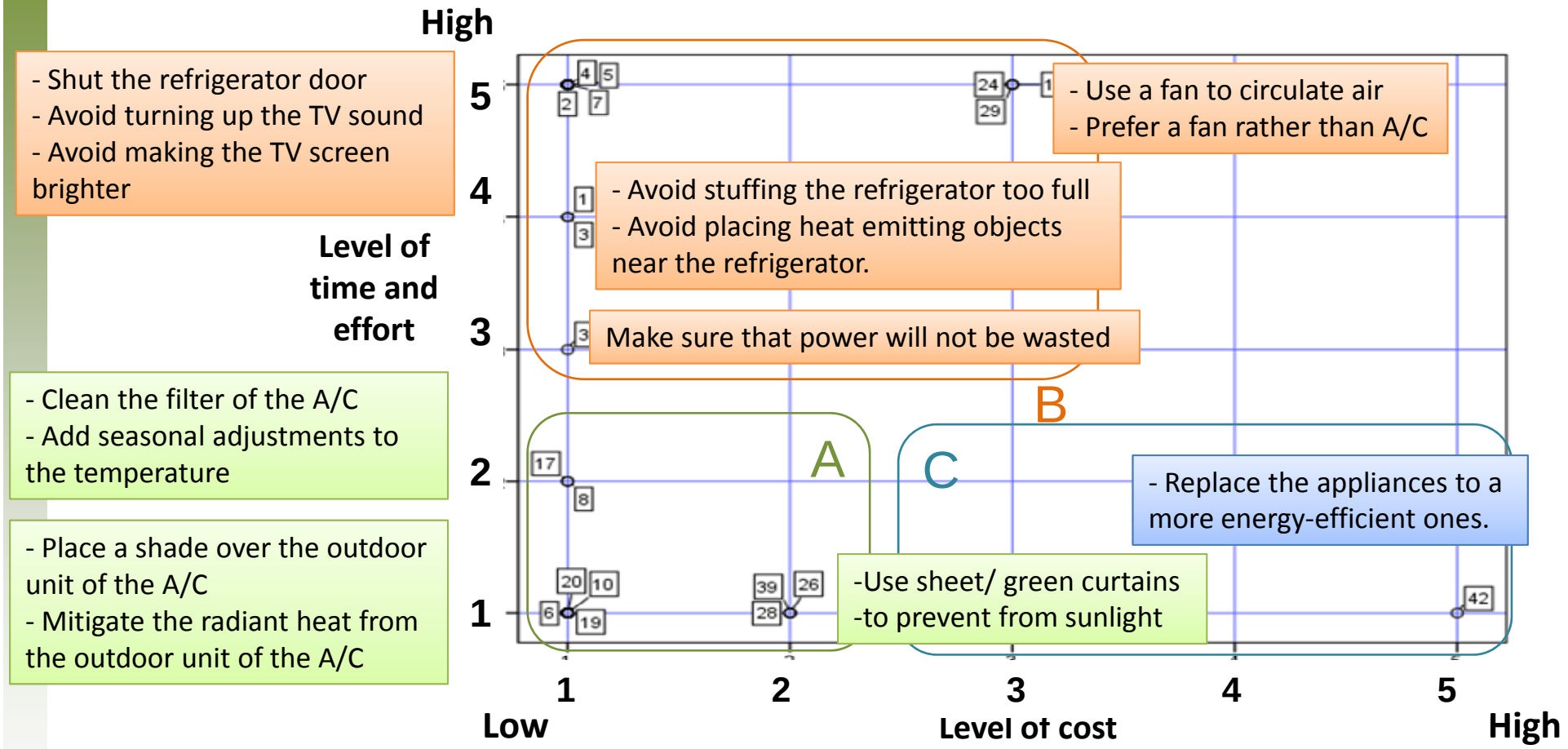
Q. Do you think is there any impact of energy saving?

n=1200



Source: questionnaire survey to the registrants of action plan of energy saving by METI 2011

Relationship between cost and time/effort associated with power-saving actions



Level	1	2	3	4	5
Cost (yen)	0-1000	1001-5000	5001-10000	10001-99999	100000-
Time and effort	Actions that can be taken by one household member once and for all	Actions that need to be taken twice a month and can be taken by one household member	Actions that need to be taken as necessary by all household members	Actions that need to be taken daily and can be taken by one household member	Actions that need to be taken daily by all household members

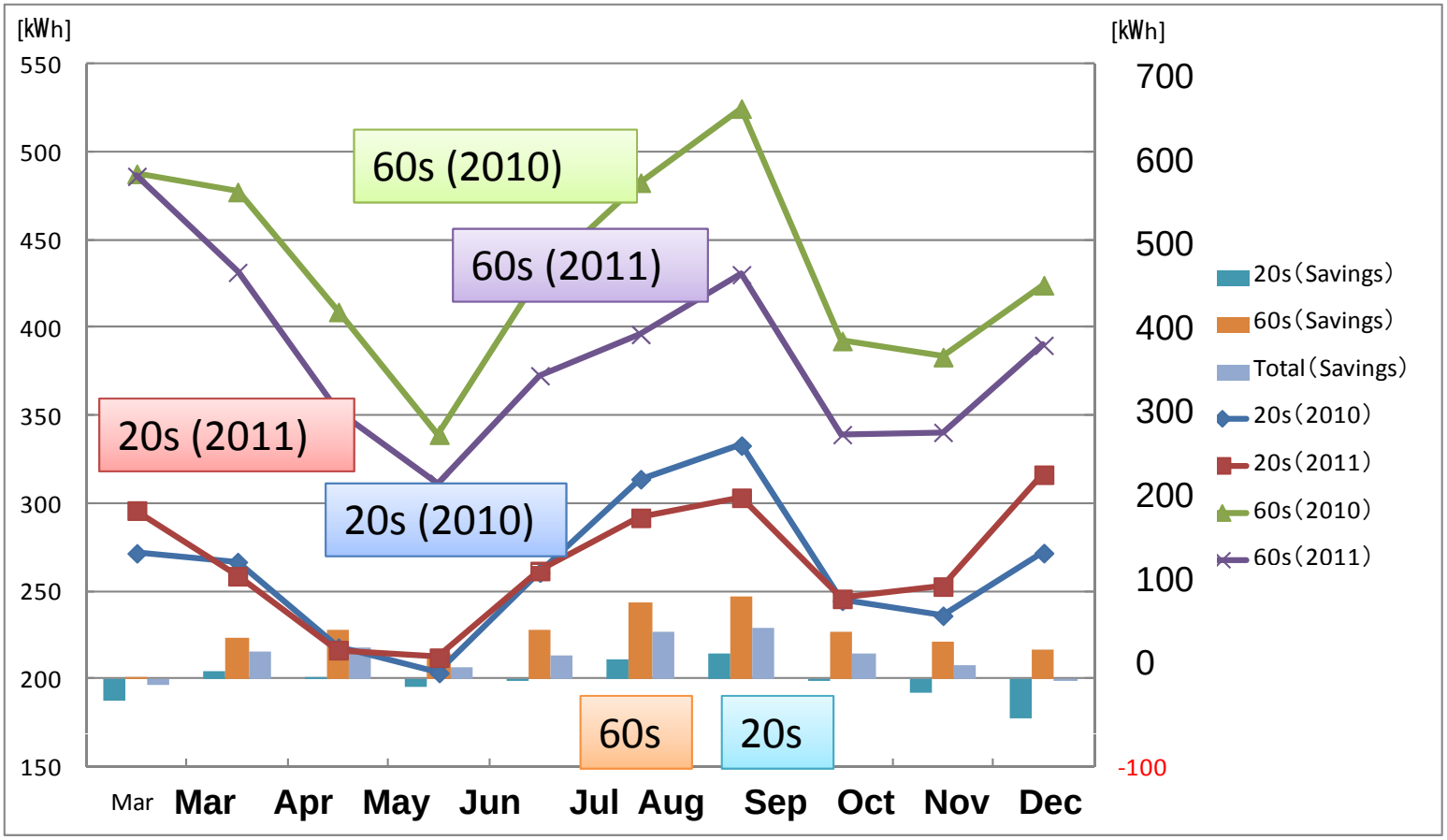
Source: IGES survey 2012

Four factors affecting electricity use in the household sector

1. Climate conditions
2. Characteristics of individual house
3. Features of electric appliance
4. Family factors

Power consumption and the power-saving amount in monthly transition

Monthly total electric power consumption and the reduction amount of monthly total electric power consumption from the previous year of 2010 for the households (20s and 60s)



Source: IGES survey 2012

Thank you very much!!

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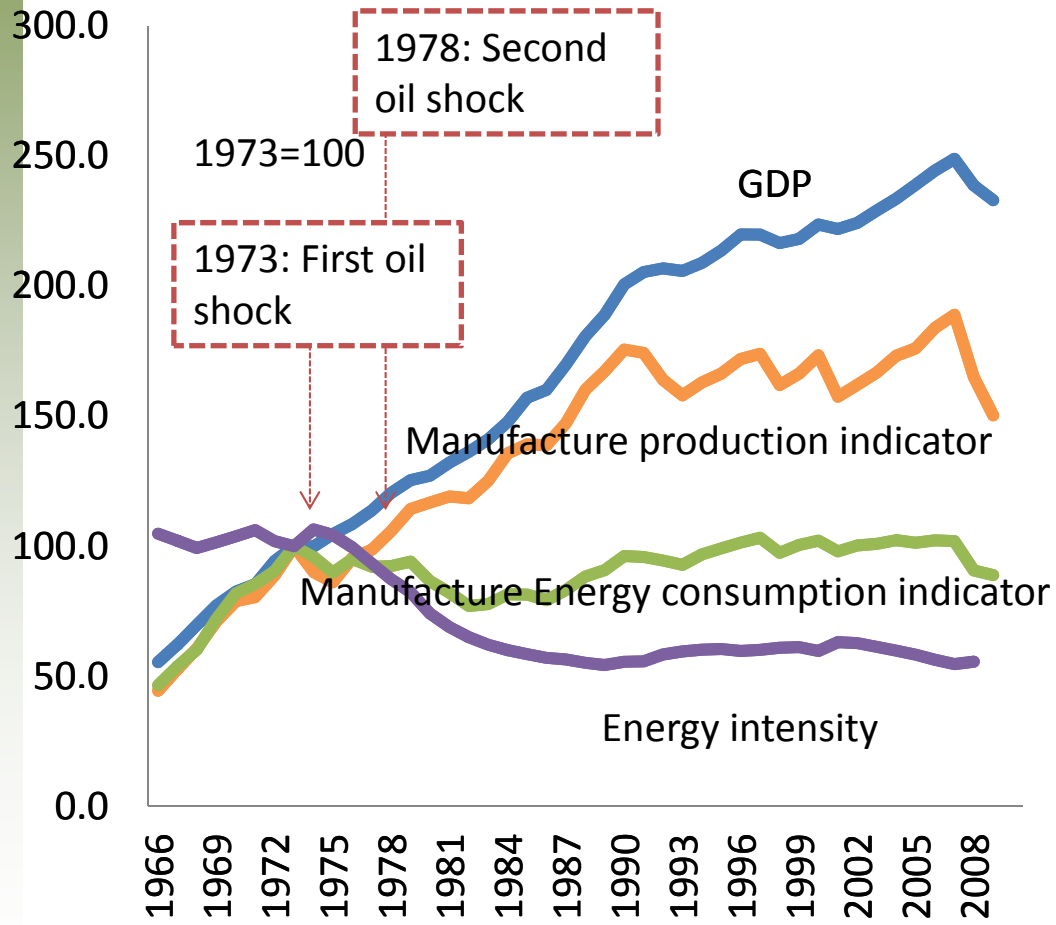
APPENDIX

Energy efficiency transition in industrial sector



Technology and regulation changes

Economic, social environmental condition

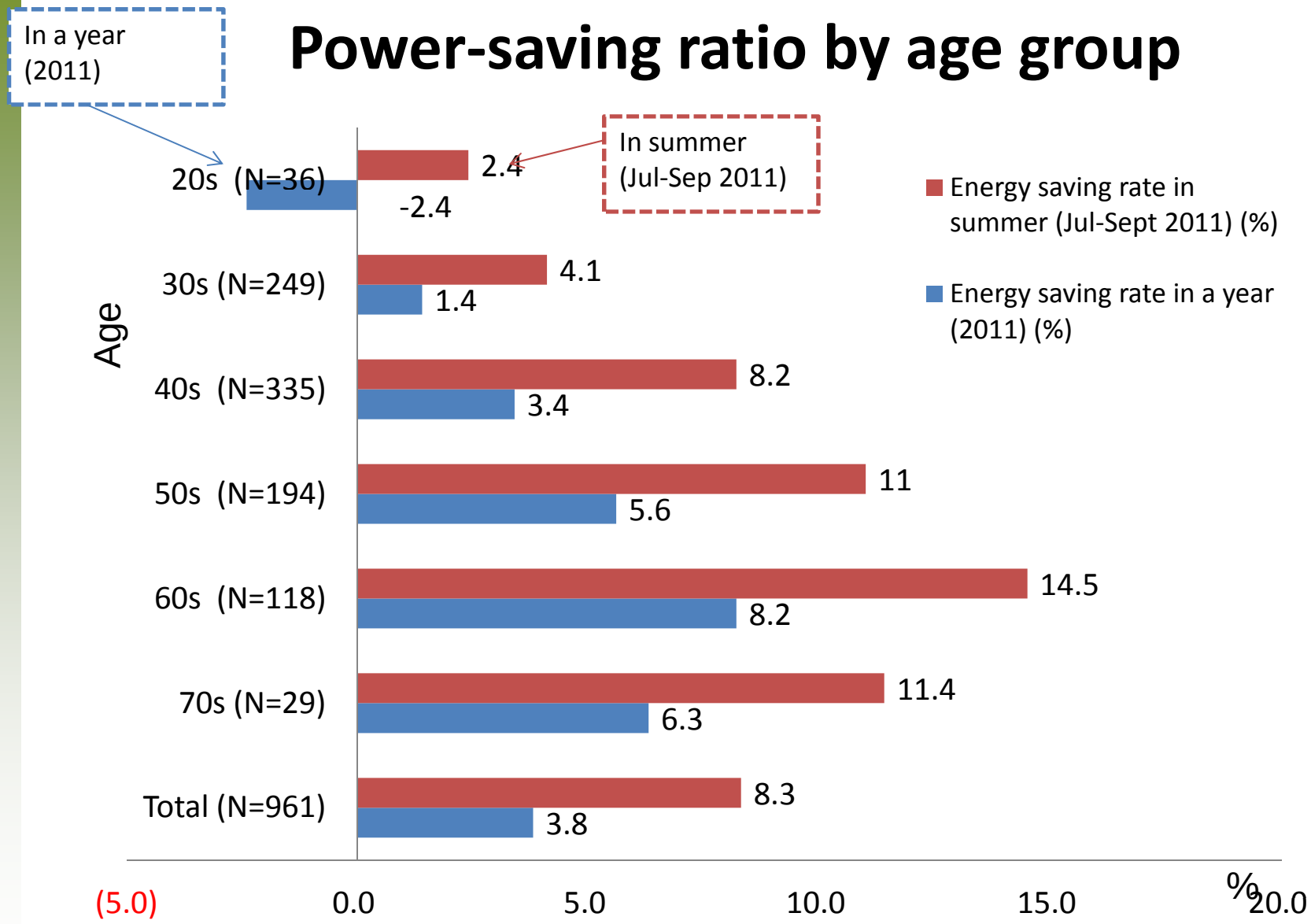
- High economic growth
- Primary industry
- High investment in power generation facilities
- Environment pollution

Chronicles of Energy Conservation Laws and Policies

Energy	Industry	Residential/ Building	Transportation	Machinery & Appliances
1979 Establishment	**1979** Designated energy management factories	**1979** Guidance for buildings and appliances **1980** Energy Efficiency Standards (Voluntary)		
1983 Amendment	**1983 Licensed energy manager system** (factories)			
1993 Amendment	**1993 Periodical reporting** (factories)			
1998 Amendment	**1998** Expand coverage of factories	**1998 Top Runner Program** **1999** Next-generation Energy Efficiency Standards		**1998 Top Runner Program**
2002 Amendment		**2002** Energy management of office buildings		
2005 Amendment	**2005** Integration of heat and power control (factories)		**2005 Reporting system** on energy by carriers	
2008 Amendment	**2008 Company based** rather than plant based regulation, cooperative energy conservation, introduction of bench making	**2008** Data sharing with tenants by building owners, coverage broaden to include franchised chains, introduction of bench making		
2010	**2010** Cap and trade (Tokyo)	**2010** Cap and trade in offices (Tokyo)/ Eco-pint		**2010 Eco-point**

Automobile fuel improvement measures

Power-saving ratio by age group



Source: IGES survey 2012