Energy Management Action Network
The Third Workshop, Guilin China

Energy Management and Practices in Small and Medium Sized Enterprises in Japan

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1. Policy in Japan for SMEs to Promote Energy Conservation and Energy Management

Definition of Japanese SME in Industry

- Capital: ***Less than or equal to 300 million yen or,***
- Number of Employees :
  Less than or equal to 300 Employees

Source: The Small and Medium Enterprise Agency

1) Governmental Financial Supportive Measures

- ***Tax Incentive***
- ***Low Interest Loan***
- ***Subsidies***

2) Technical Support

- ***Free Energy Audit***
- ***Education and Training on Energy Conservation***

1. Policy in Japan for SMEs to Promote Energy Conservation and Energy Management

1)Governmental Financial Supportive Measures

<by Energy Conservation Law, E-C and Recycling Assistance Law >

Tax Incentives:

Income Tax Exemption equivalent to 7% of the equipment acquisition cost or Special Depreciation of up to 30% of the equipment acquisition cost

Low Interest Loan:

Applied for: Regenerative burner furnace, Inverter system facility, Co-generation system, Retro-fitting of building by ESCO, High energy efficiency building construction, High energy efficiency electric furnace & boiler & hot-water server, etc.

Through: Development Bank of Japan, Japan Finance Corporation for Small and Medium Enterprise, National Life Finance Corporation, etc.

Subsidies:

Applied for: project for installation of advanced energy efficiency facilities, introduction of Co-generation system, introduction of HEMS/BEMS, purchasing High energy efficiency hot-water server and low CO2 emission auto mobile and high heat insulation house, ESCO project, R&D project for high energy efficiency technology and system, etc.

Through: NEDO and other organizations

1. Policy in Japan for SMEs to Promote Energy Conservation and Energy Management

2) Technical Support

Free Energy Audit by ECCJ

"Walk-through" type energy audit funded by METI

Summary of Free Energy Audit by ECCJ (Assistance for Factories / Buildings)

Clients — Application for E. Audit

(contacting through web)

ECCJ — Acceptance / Notification / Preparation

<Type> : Walk-through Audit focused on **Management & Utilities**

<Auditing Items>

- **Management (organization, target, standard, operation-manual, maintenance, measurement, record, etc.)**
- **Loss (heat, steam, electricity—compressed air etc., idling time, shut-down time, etc.)**
- **Efficiency (Energy unit consumption, Energy consumption, etc)**

<Auditor> **1 Thermal Expert and 1 Electrical Expert**

<How to Audit> **Preliminary Survey (Document Review) and On-site Survey :**

Document Review / Walk-through Check / Basic Inspection (with thermometer and illuminometer etc.) and Discussion,

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<Proposal for improvement>

Advice / Recommendation of counter measures, Estimation of E-C Effect : Potential / Cost Saving,

<Follow-up> **Questionnaire Survey for Top Management**

--- Implementation of the Recommendation, Energy / Cost saving, etc.

Summary of Audit Results (for Factories)

1) Total Number of factories audited : 1,742

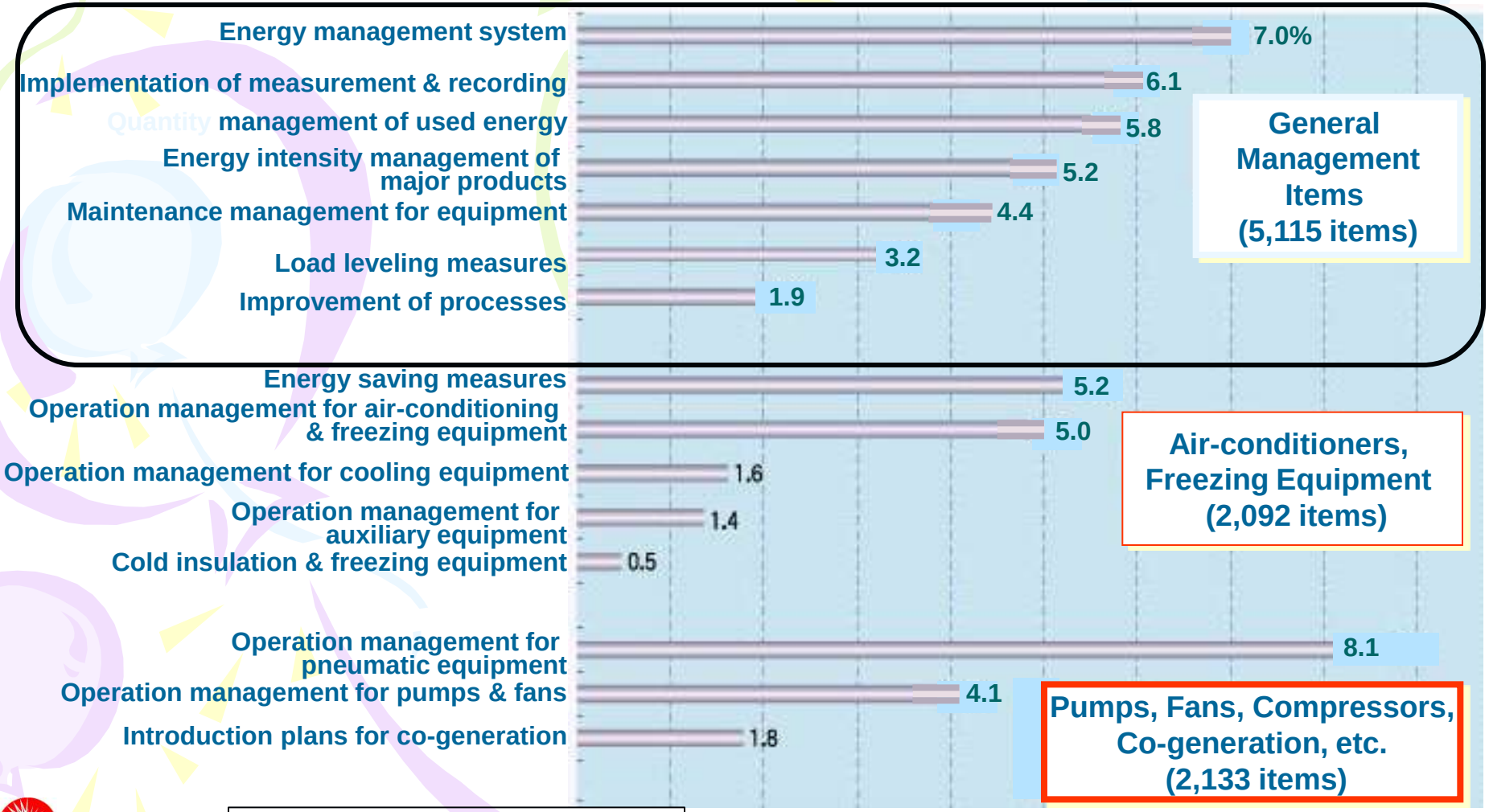
(Fiscal years 1997 – 2003)

Electromechanical apparatus manufacturing	300 (17.2%)
Food manufacturing	157 (9.0%)
Chemical industry	145
Transport equipment manufacturing	140
Plastic products manufacturing	135
Metal product manufacturing	130
Water treatment & supply works	104
General machinery and apparatus manufacturing	92
Ceramic/Cement product manufacturing	73
Precision machinery and apparatus manufacturing	57
Nonferrous metal manufacturing	50
Textile industry	50
(Others)	

Summary of Audit Results

2) Recommended Measures

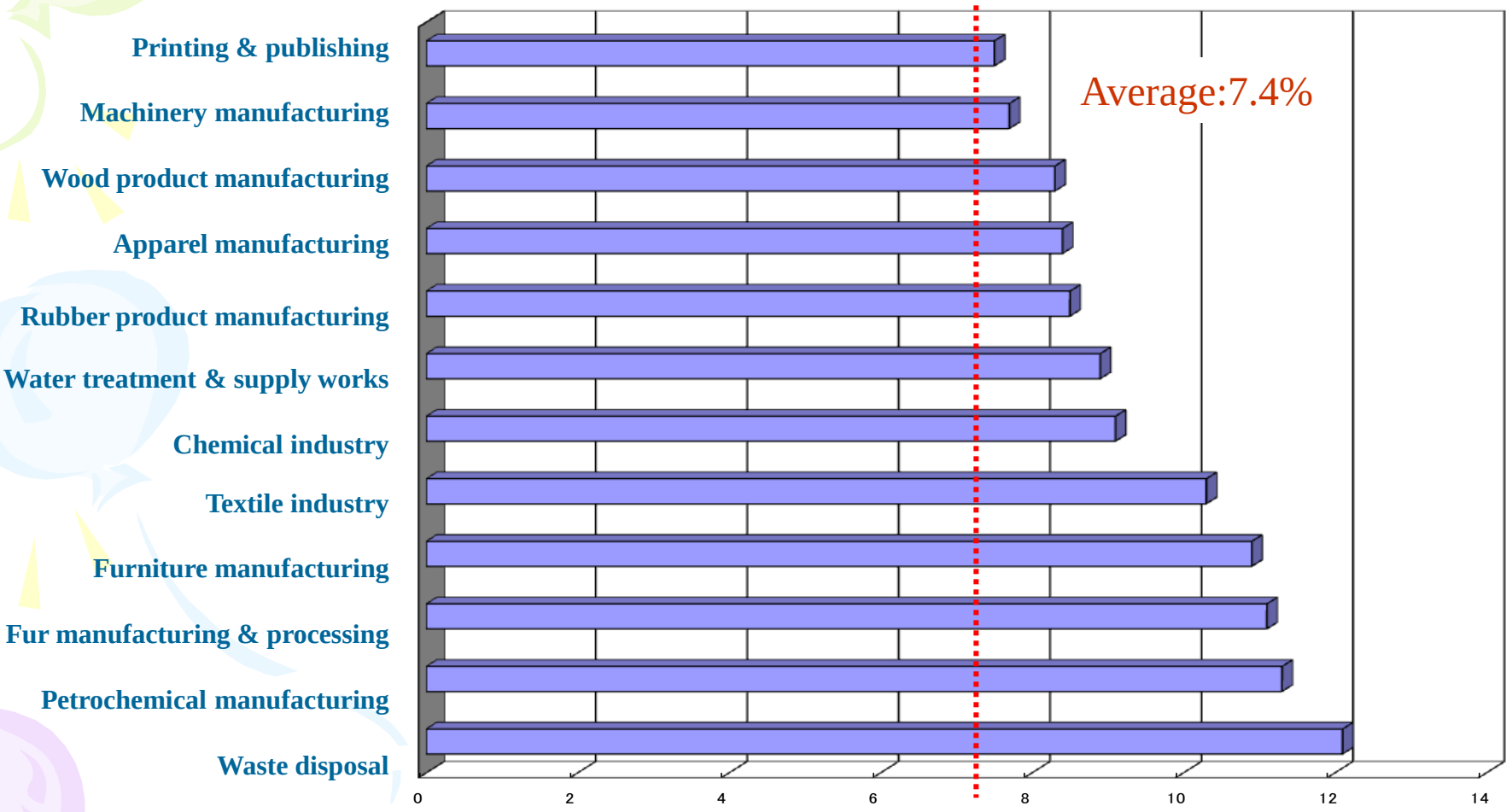
Total proposed items= 15,235



Data Source: ECCJ Homepage

Summary of Audit Results

3) Average Energy-Saving Rate by Industry



Sample No.: 1,455

Audit Effect
Energy-saving Rate (%)

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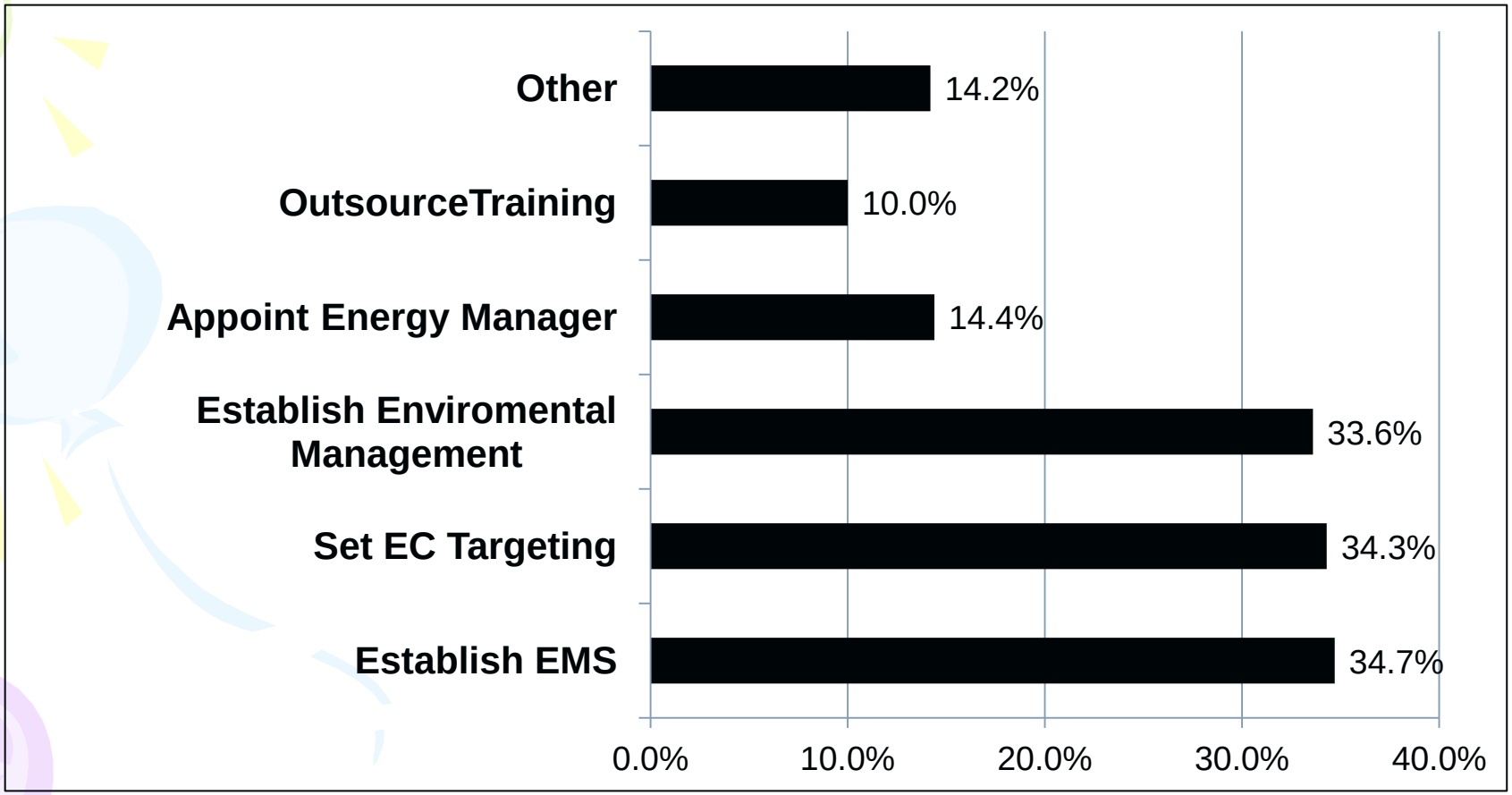
Data Source: ECCJ Homepage

2. Energy Management Situation in Japan

Situation of EC Promotion System in SMEs Factories

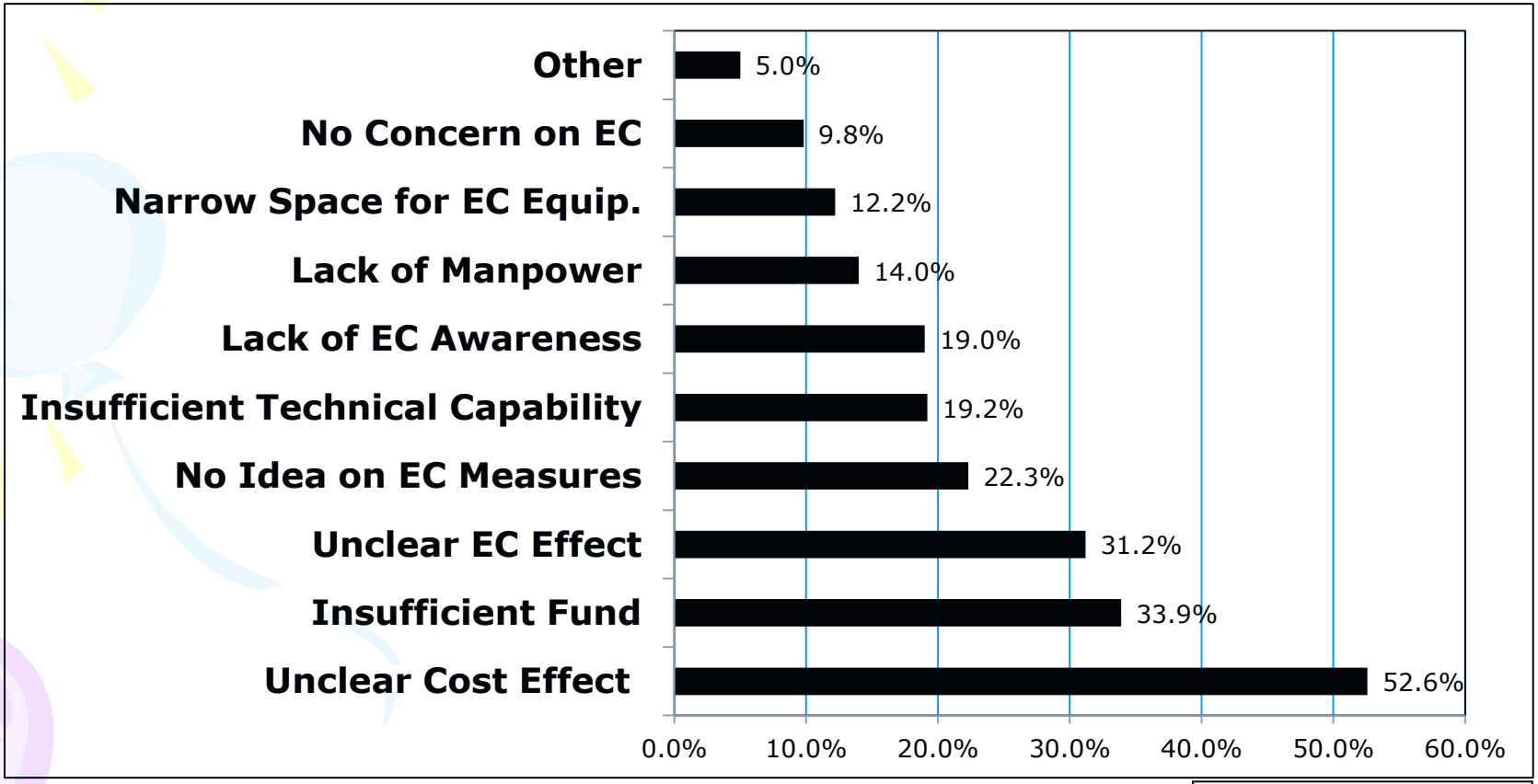


Data Source :Kanto Regional Bureau, METI

Multiple Answer

2. Energy Management Situation in Japan

Barrier of EC

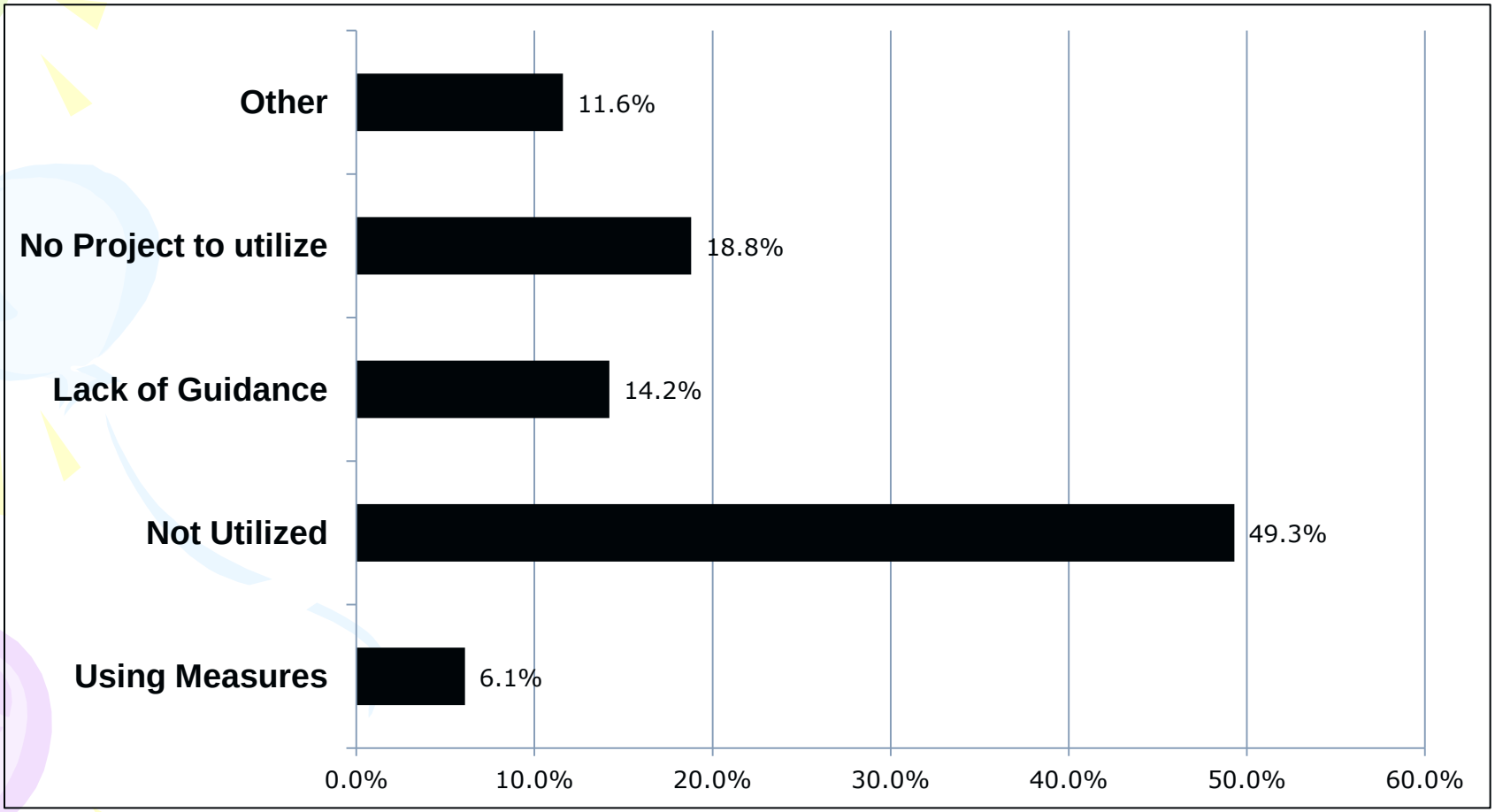


Data Source : Kanto Regional Bureau, METI

Multiple Answer

2. Energy Management Situation in Japan

Utilization of Supporting Measures in SMEs



Data Source ：Kanto Regional Bureau, METI

3. Case Studies
(From National Convention of Excellent Examples)

Case-1

"Save Electrical Energy Consumption ! "

(Single Company Case)

Case-2

"Save Our Energy in Our Industrial Estate!!" (Joint Project)

Data Source: ECCJ Home Page

3. Case Studies

Case-1
"Save Electrical Energy Consumption ! "

1) Company Information:

- Products*: Car Air Conditioner Parts*
- Number of Employees*: 88*
- Annual Energy Usage*: 5,762MWh (electricity)*

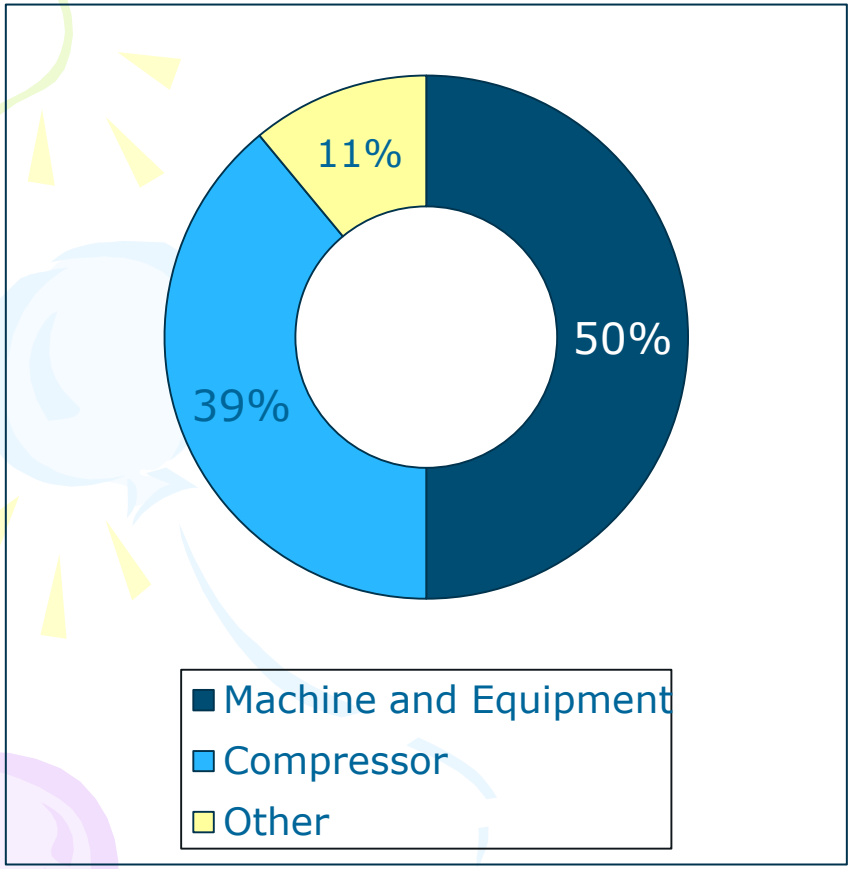
2) Top Policy and Target:

15% Reduction of Electric Consumption

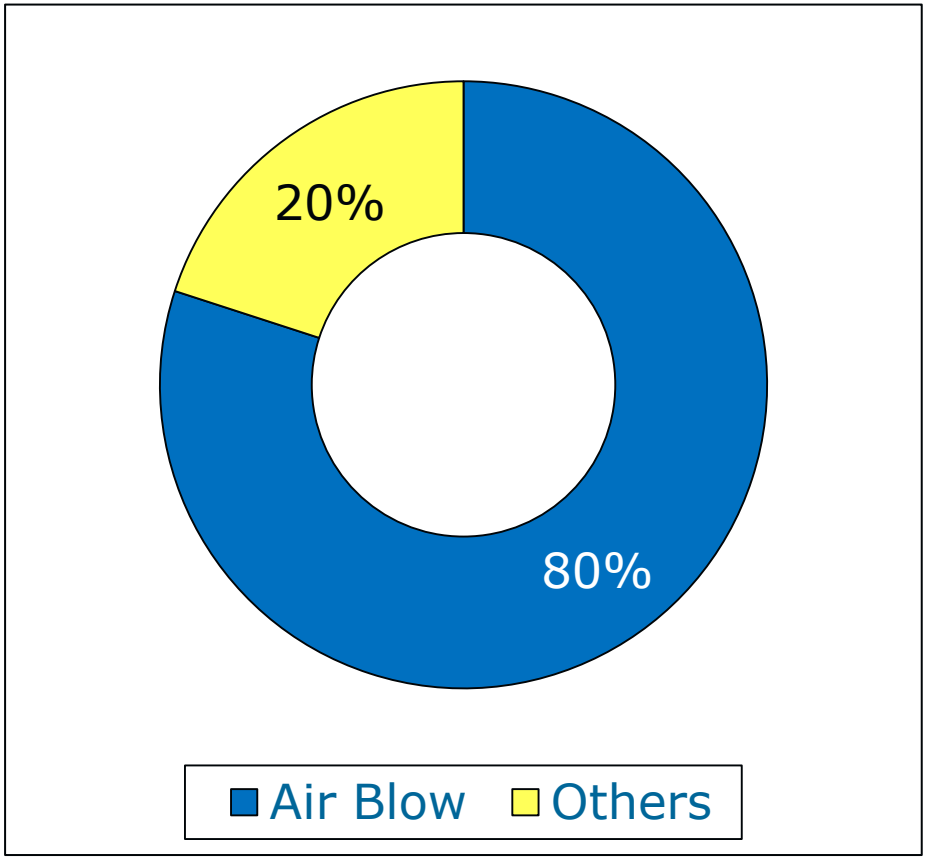
Data Source: ECCJ Home Page

Case-1 "Save Electrical Energy Consumption ! "

3) Current Energy Situation



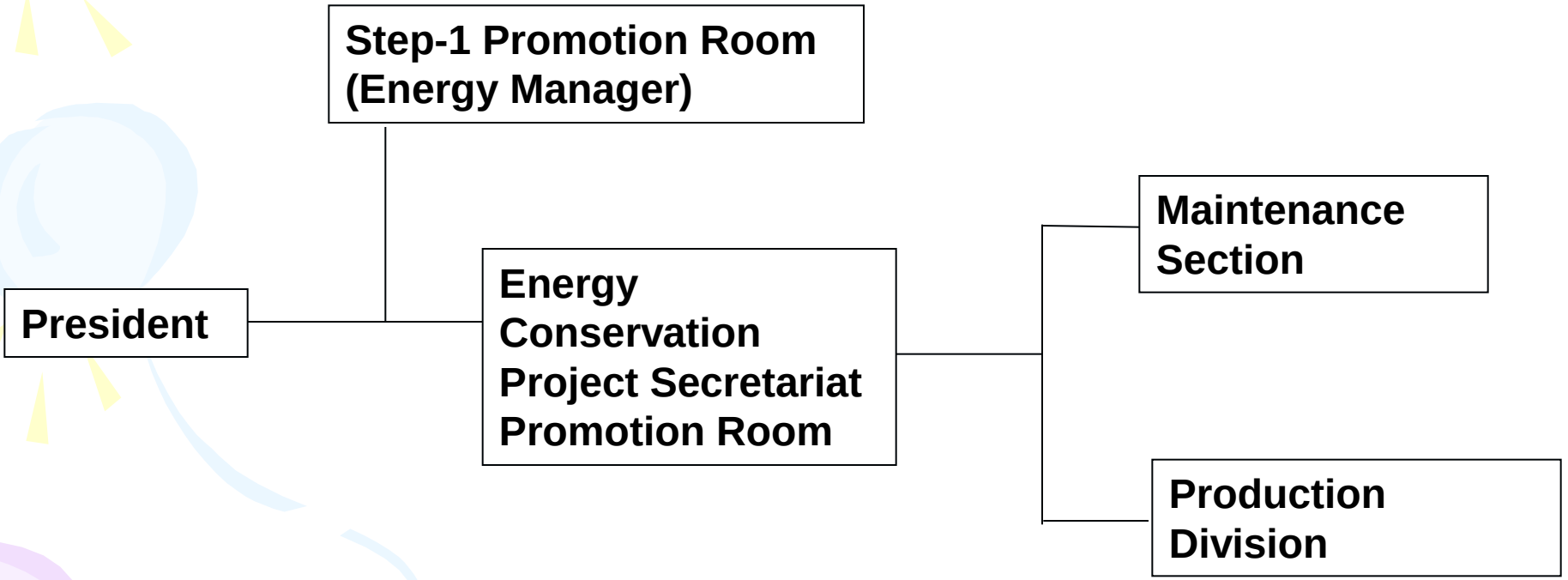
Electric Energy Use



Purpose of Air Used

Data Source: ECCJ Home Page

4) Promotion Organization



Data Source: ECCJ Home Page

5) Identification of Problem Areas and Countermeasures

Problem Areas	Countermeasures
Big air consumption in air blow operation	Adoption of high-efficiency nozzle, air pressure optimization, adjustment of nozzle position
Big Pressure drop in Air Supply Line	Adoption of larger size pipe, Adjustment of pipe route(As results:0.10MPa down)
Waste air supply by mal Compressor operation	Installation of compressors in 3 factories separately and Shut-off Valves in each line
Motor Driven type (On-Off spindle motor Operation)	Adoption of inverter in rolling machine(reduction of 13% energy)

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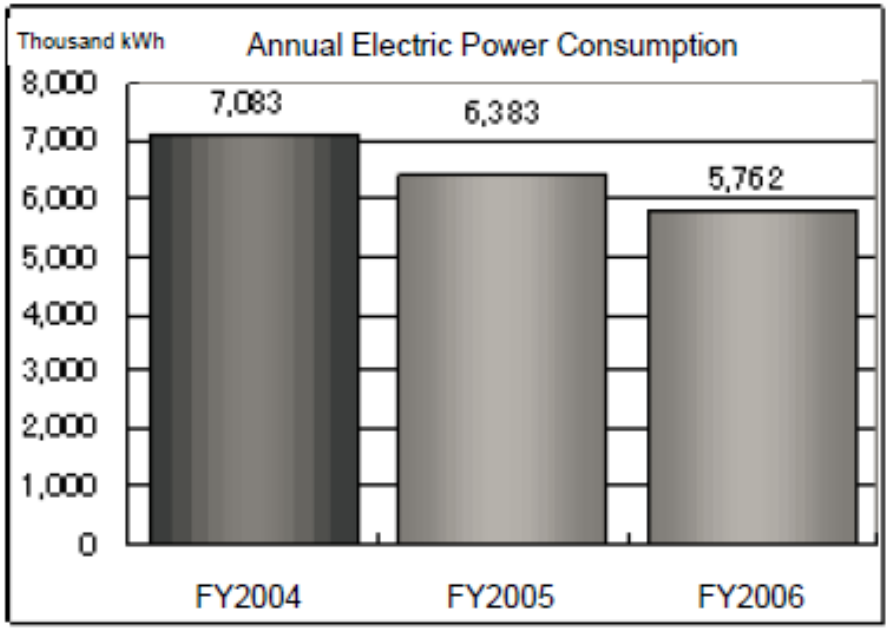
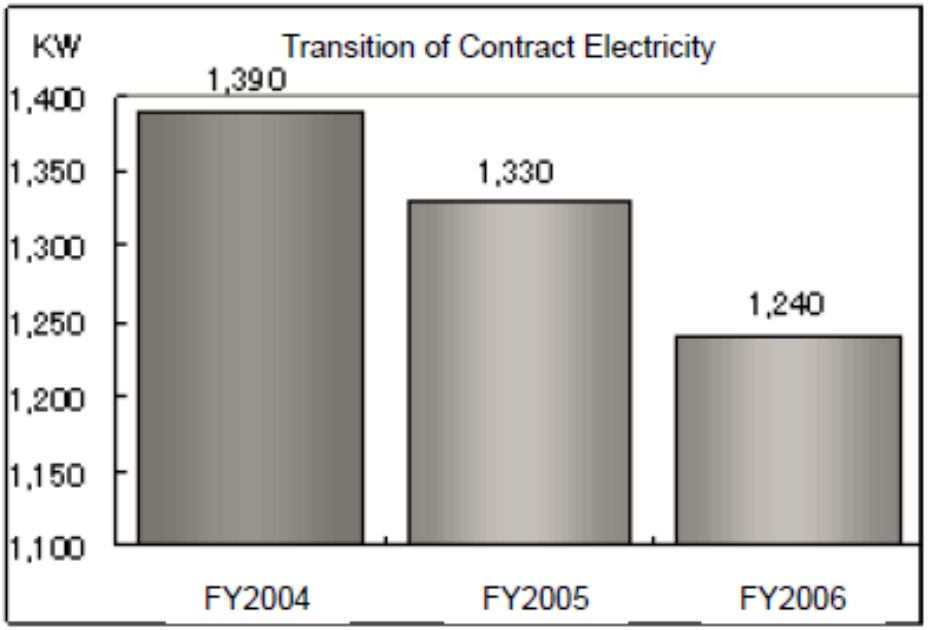
Data Source: ECCJ Home Page

Effects of Energy Saving

Reduction of Power Consumption and Contract Electricity



Transition of Annual Electric Power Consumption



Transition of Contract Electricity and Maximum Electricity

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Data Source: ECCJ Home Page

Economical Effects

Effects of Energy Saving

No.	Items Improved	Monetary Amount of Effect(10 thousand yen/y)	Investment Amount(10 thousand yen/y)	Recovery years
①	Reduction of Air Blow & Pressure	470	30	0.8
②	Air Supply Line		350	
③	Compressor Operation			
④	Conveyor	3	120	-
⑤	Motor Driving	70	120	1.7
⑥	Reduction of Contract Electricity	265	0	0
	Total	808	620	0.8

Data Source: ECCJ Home Page

Case-2
"Save Our Energy in Our Industrial Estate!!"
(Joint Project)

1) Information of Industry Estate

- Industrial Complex for Food, Steel products and Electric machineries
- Number of Member: *673*
- Annual Energy Usage : *Electricity 5,656MWh* (Lighting, Air Conditioners, Vending Machine, Refrigerators, Machine) Fuel 227 Kl Crude oil Eq.

ECCJ

Data Source: ECCJ Home Page

Case-2 "Save Our Energy in Our Industrial Estate!!" (Joint Project)

2) Background of This Project

- To Reduce Energy Cost in the Circumstance of Stagnation in Economy
- To Contribute to Slowing Global Warming

3) Policy and Target

- Reduction of Contract Electricity Demand to reduce energy cost (1815kW—1600kW)
- Lowering Electricity Energy Intensity (10% Down on Energy Intensity)

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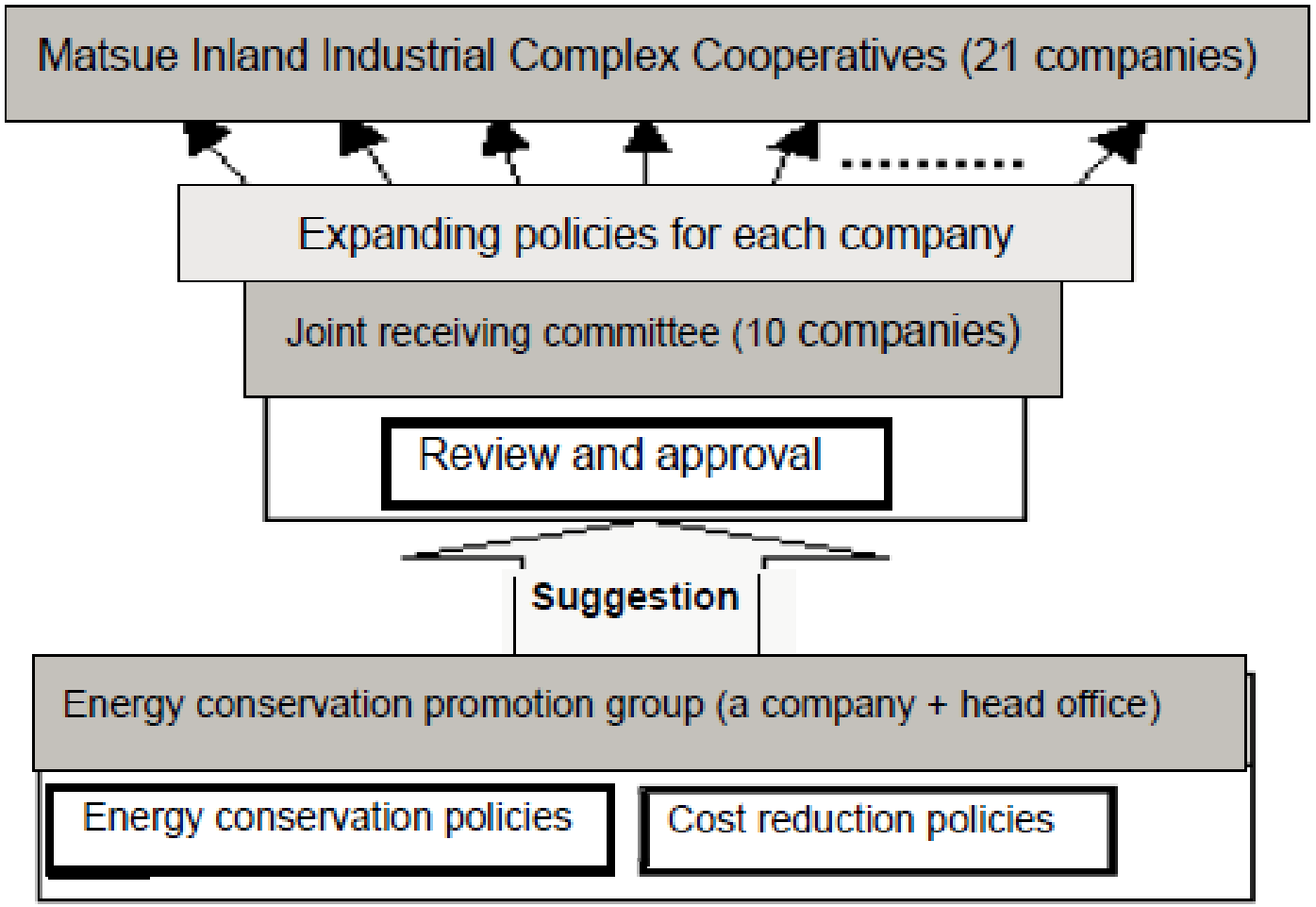
Data Source: ECCJ Home Page

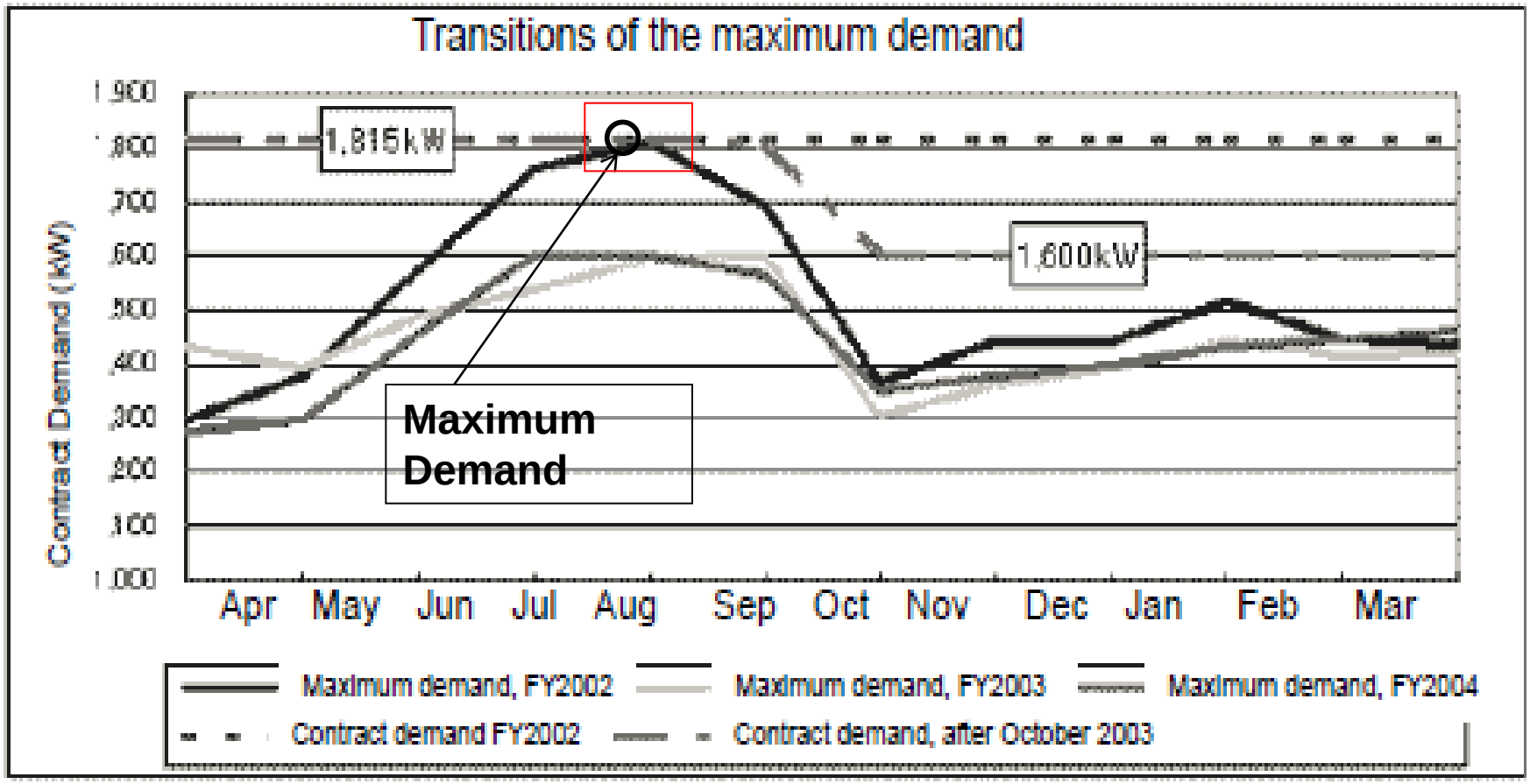
4) Promoting Organization



Data Source: ECCJ Home Page

Case-2 “Save Our Energy in Our Industrial Estate!!” (Joint Project)

5) Current Energy Situation



Transitions of the maximum demand

Data Source: ECCJ Home Page

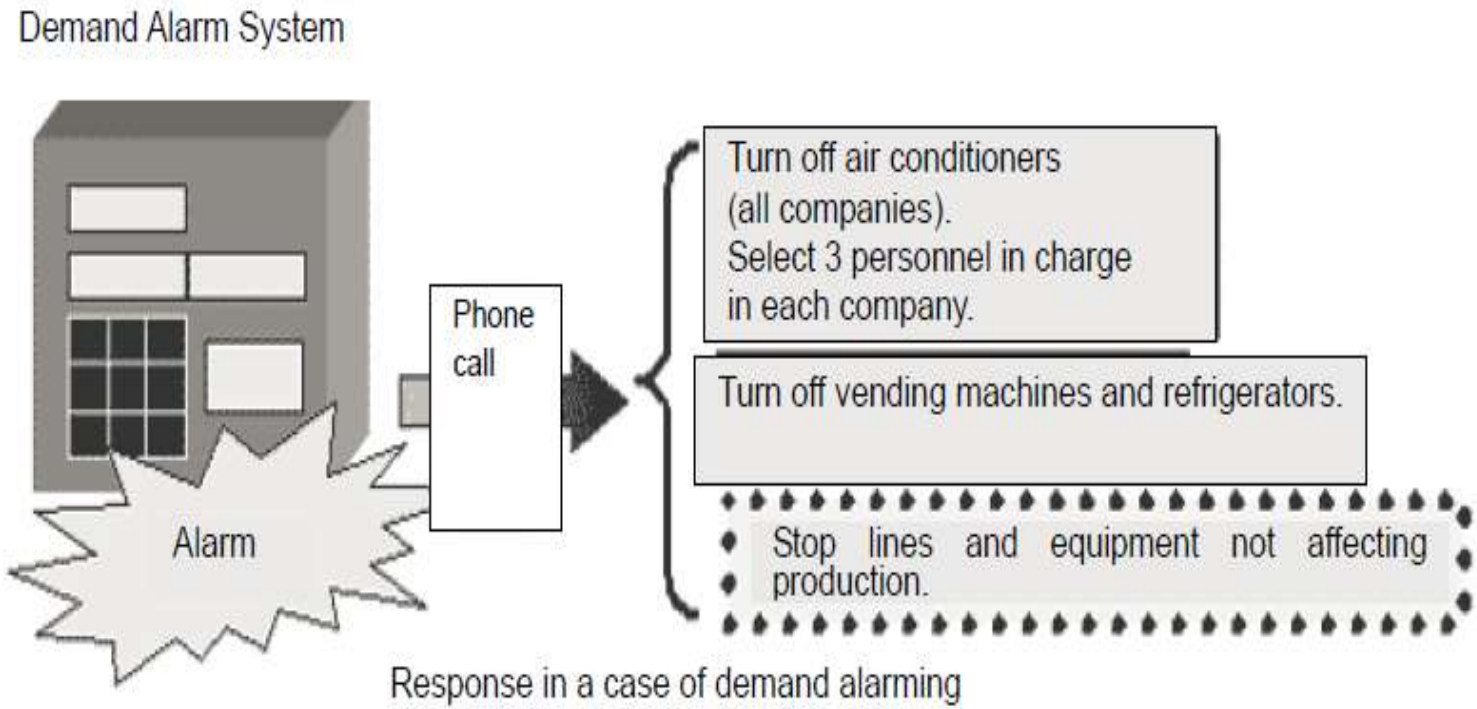
6) Identification of Problem areas and Countermeasures

Problem areas	Countermeasures
Lack of Knowledge and know-how on EC	Collection of Materials, Learning methods, Seminars, EC products introduction by makers
Lack of EC Awareness	Education activities at General meeting and Joint committee
Different views among 21 companies	Common measures, request cooperation
Taking a time for implementation	Transmission and Collection information with head office and contact point

Data Source: ECCJ Home Page

System to Reduce Peak Demand

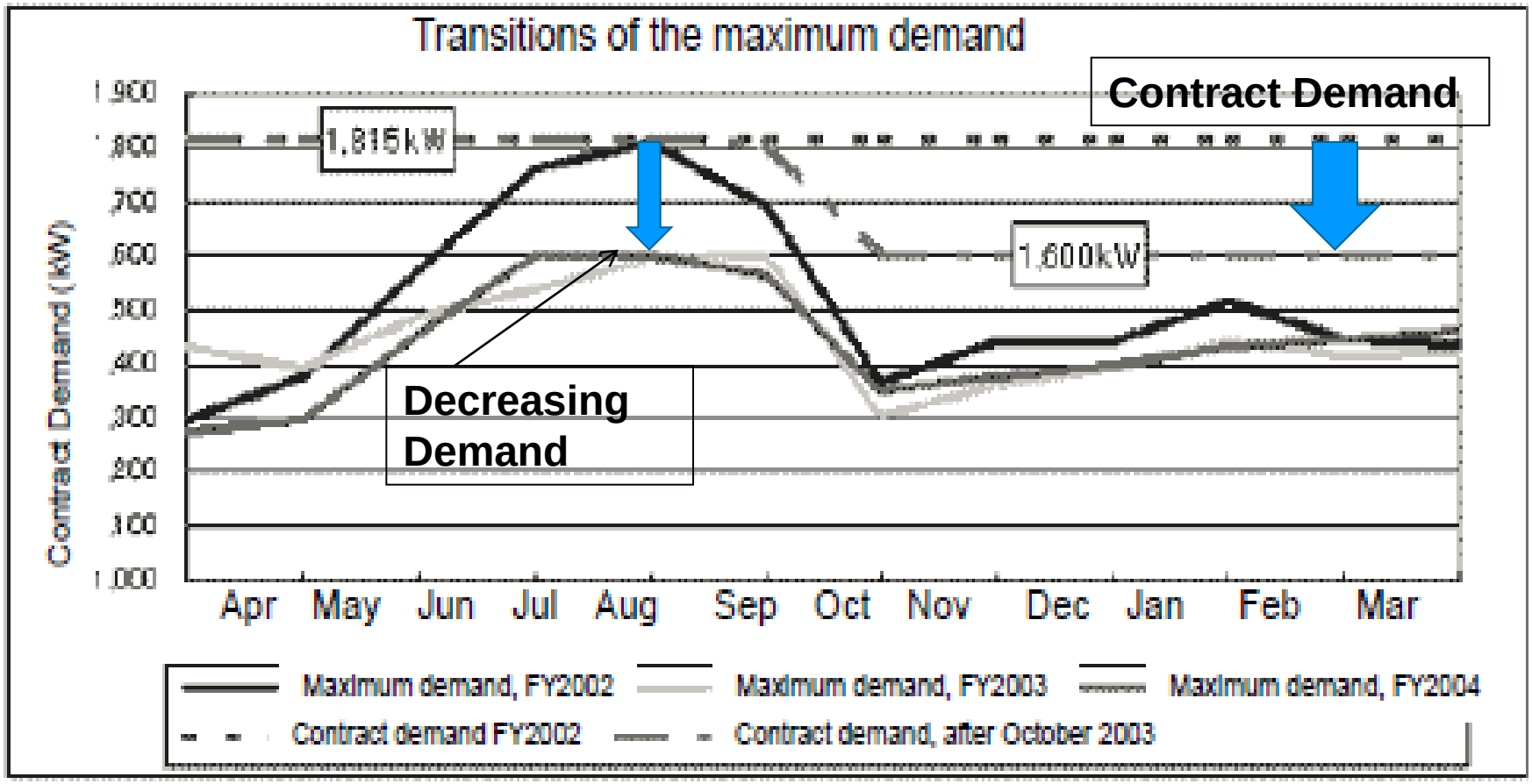
Response in a case of demand alarming



Response in a case of demand alarming

Data Source: ECCJ Home Page

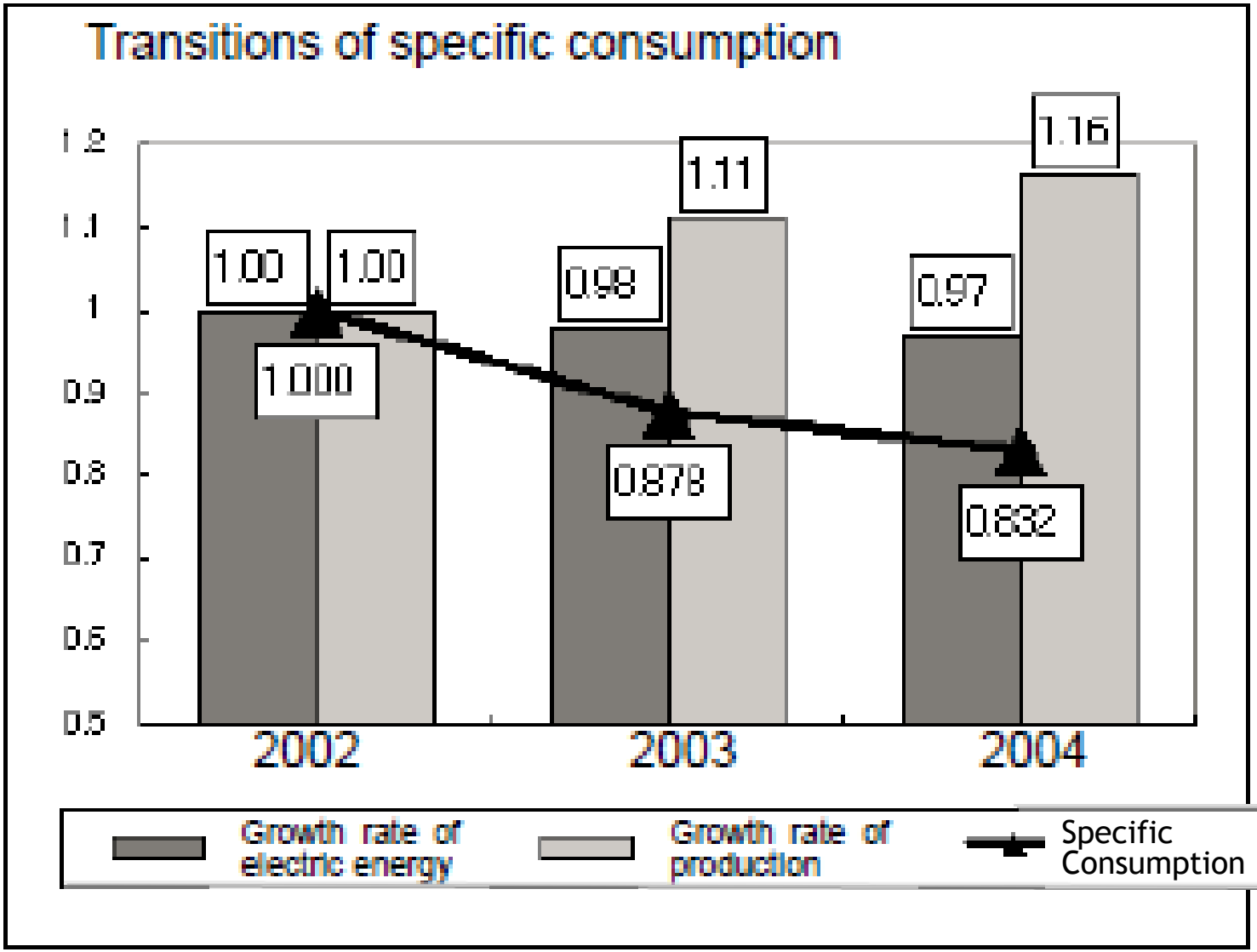
Effect of Energy Saving



Transitions of the maximum demand

Data Source: ECCJ Home Page

Effect of Energy Saving



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Data Source:
ECCJ Home Page

Transitions of specific consumption

Conclusion

1. EMS is important and effective in SMEs.

2. Effective No or Low Cost Measures for SMEs and Training
   - Start with conventional technologies e.g. improvement in insulation, prevention of leakage, etc.
   - Training staff of SMEs concerning fundamentals of energy conservation principle

3. Provision of Supporting System (Policy matter)
   - Support Energy Audit & Technical Advice
   - Financial Support

Thank You

Very Much

For More Information
The Energy Conservation Center, Japan
http://www.eccj.or.jp
Asia Energy Efficiency and Conservation Collaboration Center
(Newly Established in April 2007)
http://www.asiaeec-col.eccj.or.jp

The Energy Conservation Center, Japan

DIRECTION OF EMAK

1. **Networking of policymakers and relevant EM related network will be established.**

2. **Supportive measure to be prepared by policy makers is a key to promote SMEs Energy Management.**

3. **Through EMAK, International EM information exchange is made possible.**