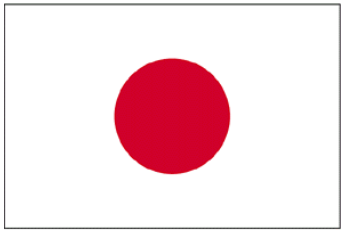
(Dialogue – 1)
Overview of New Japan – Brazil Cooperation on Energy Efficiency and Conservation (EE&C)"

- "Top Runner Program" and Energy Efficiency for Building under Policy and Law in Japan -



January 26th, 2021

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Main Contents

1. Brief Introduction of ECCJ
2. Points of the “New Project” for Japan – Brazil Cooperation on EE&C
3. Japanese Experience
   “Top Runner Program” and Energy Efficiency for Building under Policy and Law in Japan
4. Discussion : Direction of the “New Project”

1. Brief Introduction of ECCJ : Role of ECCJ to Promote EC in Japan

The Energy Conservation Center, Japan (ECCJ)

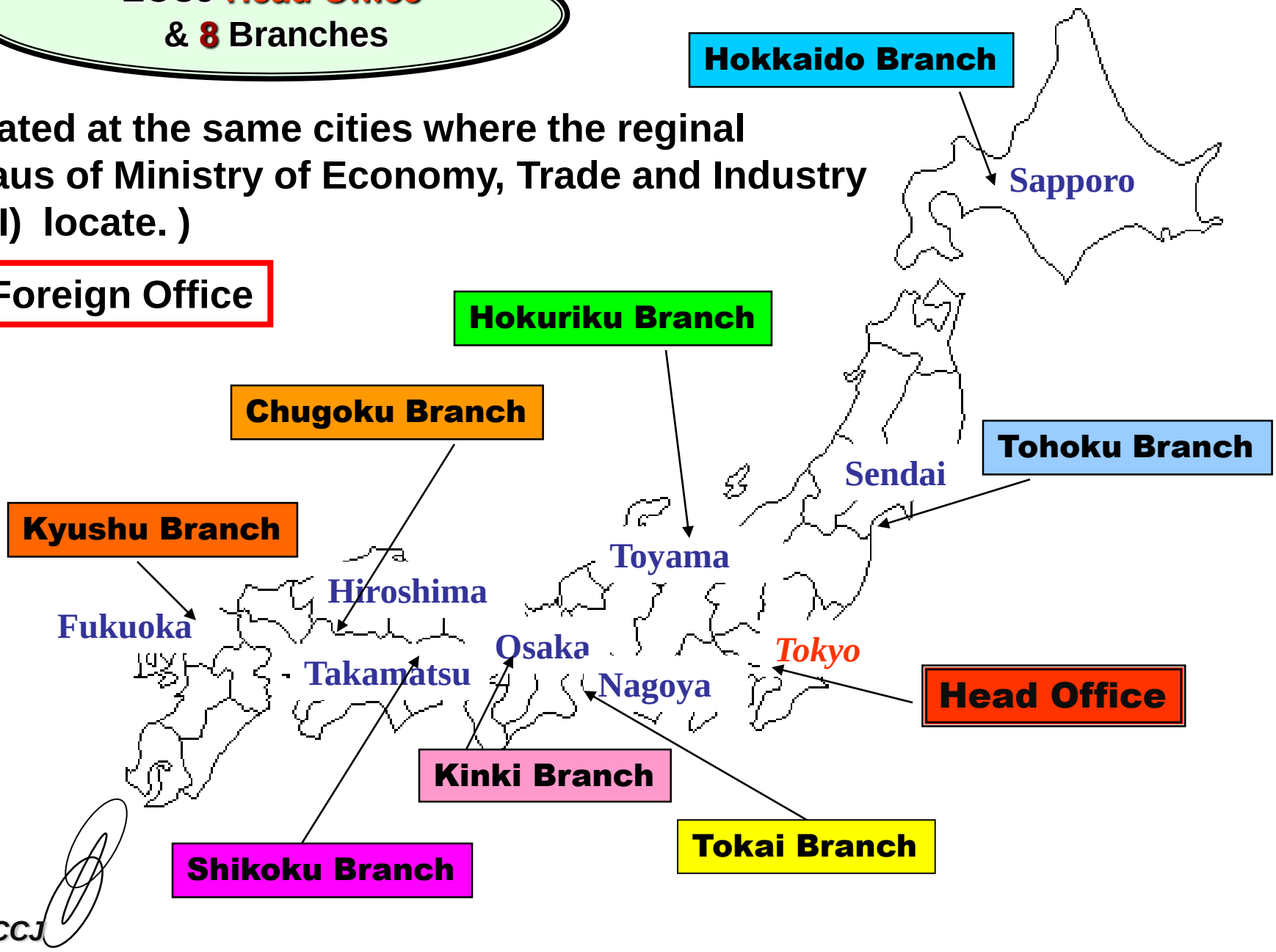
ECCJ is the core organization responsible for promotion of energy efficiency & conservation in Japan.

Legal status	**:**	**General Incorporated Foundation / Private**
Establishment	**:**	**1978**
Office location	**:**	**Tokyo Head Office & 8 Branches**
Supporting member	**:**	**Approx. 2,100 Business Establishments**
Staff	**:**	**81 persons (As of July 2020)**
		(+ Over 500 Registered Experts)
Business scale	**:**	**2.341 billion yen in FY2019 (21 million U$)**

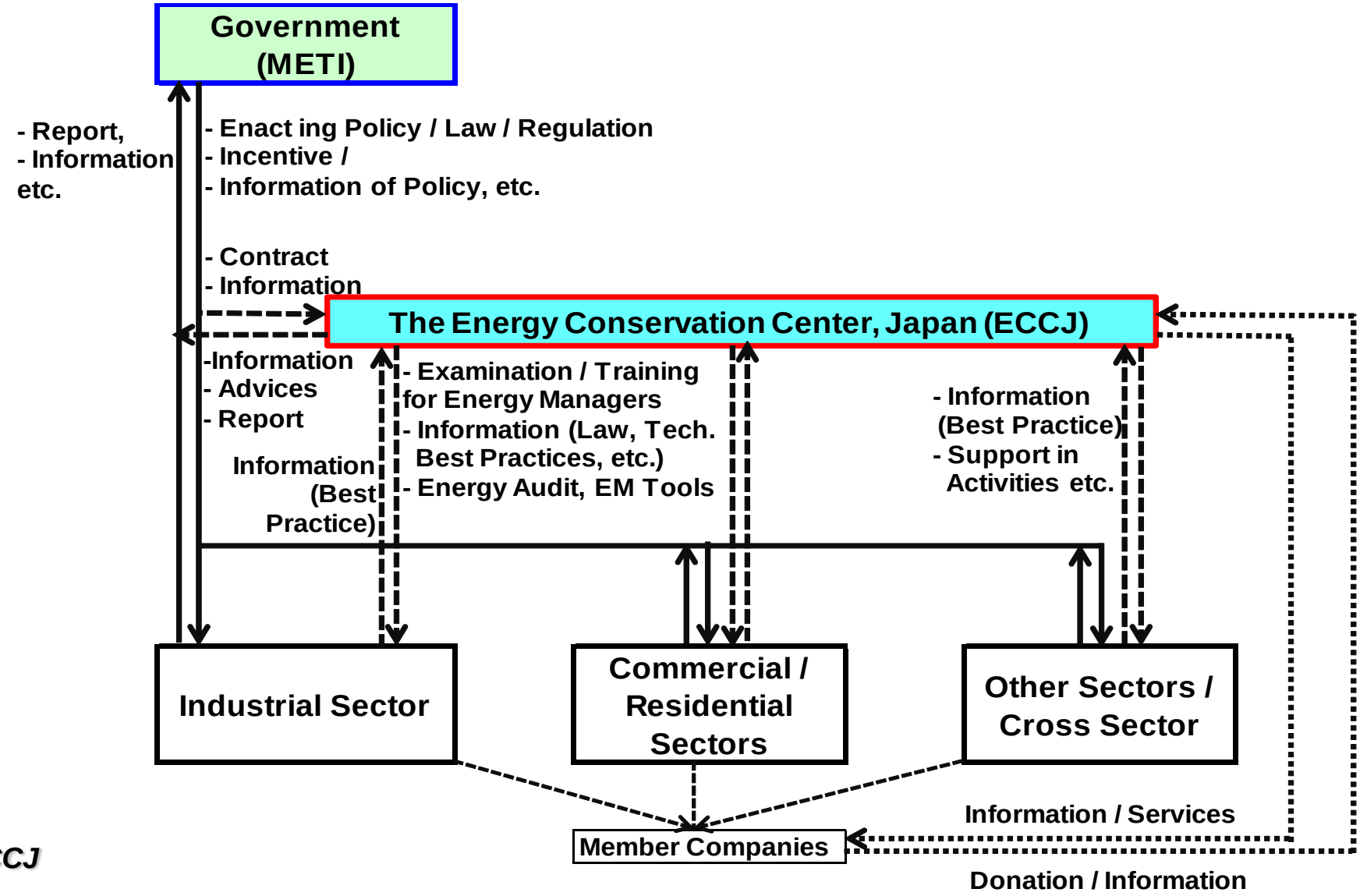
ECCJ Head Office & 8 Branches

(Located at the same cities where the reginal bureaus of Ministry of Economy, Trade and Industry (METI) locate.)

No Foreign Office



Role of ECCJ to Bridge Between Government and Private Sectors for EC Promotion in Japan



Overview : 6 Major Functions of ECCJ

Support in Activities for Enhanced EE&C

- Energy Audit & Diagnosis for EC and Electricity Saving
- Dissemination of Outcome of Energy Audit for EC
- Capacity Building of Regional Platform (EC Consultant)
- Survey & Analysis on EC Promotion for Factories etc.
- Evaluation of Technologies for EE&C

Service to Provide Information on EC and Support for EC

- Implementation of “EC Grand Prize”
- Implementation of Exhibition for Energy & Global Env.
- Provision of Useful Information by Website / Publishing
- Activities to Enhance EC Awareness (EC Goods etc.)
- Services for Member Companies

Capacity Building for EC of Human Resources

- Conduct Training Courses and Education
- Accreditation for Expertise for EC

Provision of EC Solution

- Consultation for EC in Factories / Buildings
- Develop & Utilize Tools to Support EC
- Support to Acquire Accreditation
- Support to Develop EC Business
- Support EC Tied with EC Service Providers

International Cooperation in EE&C

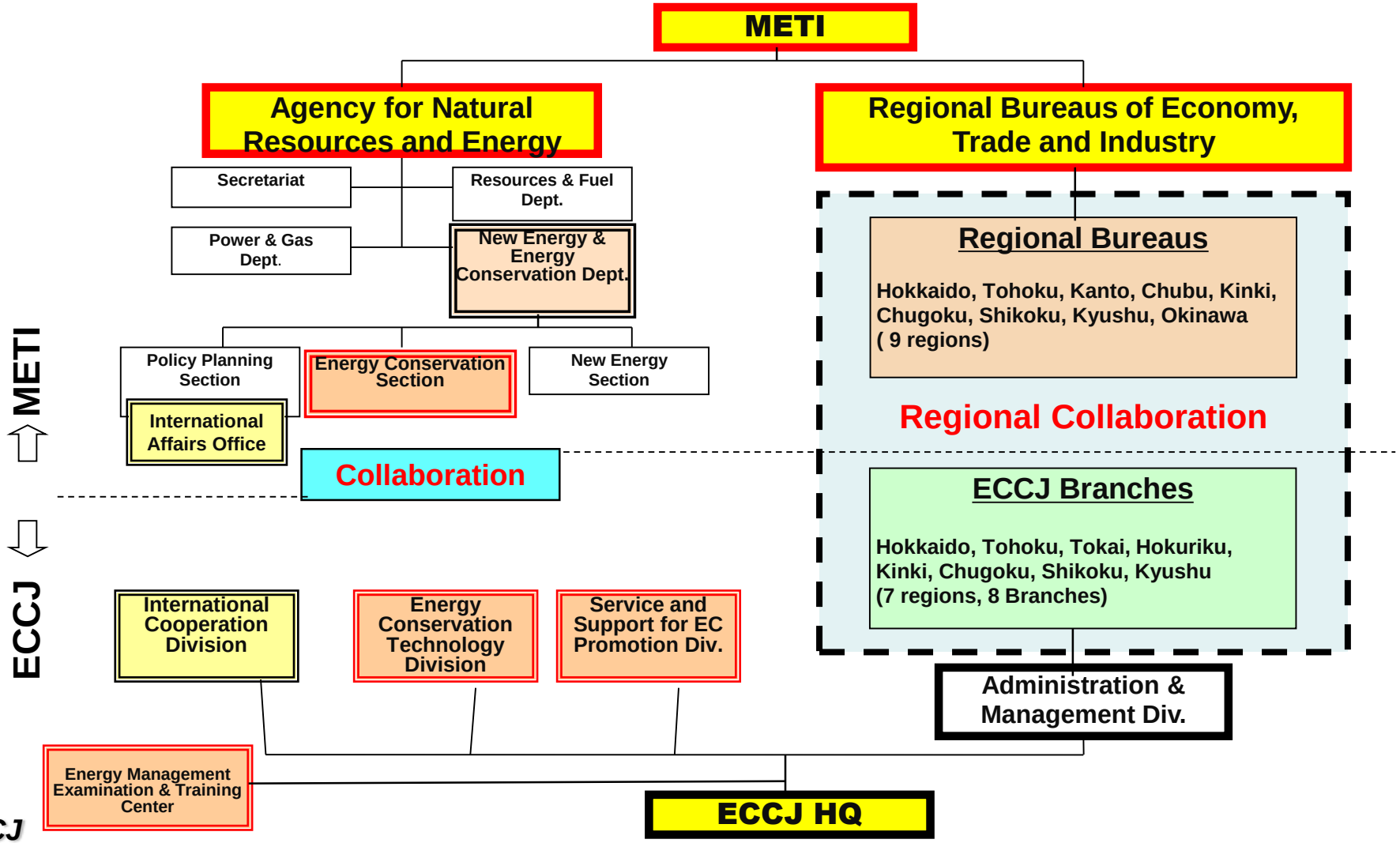
- Implement International EC Cooperation for Foreign Countries
- Support International Organizations for EC
- Support for Globalization of EC Business
- Evaluate/Register ISO50001 Assessor

National Examination / Training for Certification

- Examination etc. to Qualify Energy Mangers

EE&C : Energy Efficiency and Conservation
EC : Energy Conservation
Env. : Environment / K/H : Know-how

Main Role of ECCJ
Collaboration for METI to Enforce Policy / EC Act (Organizational Framework)



2. Points of the “New Project” for Japan – Brazil Cooperation on EE&C

1. Points Shared with MME on Nov. 24th, 2020 (1)

The New Project Proposed by Japan

1. Purpose

(1) Sharing Knowledge of the Japan's "Top Runner Program" to Support the Brazil's Energy Efficiency Policy on the Standard and Labelling (S&L) System

(2) Finding Possible Cooperation of Energy Efficient Building Policy in Brazil toward ZEB

2. Duration :

For Approx. 3 Years (FY 2020 – FY 2022)

Start in Nov. 2020 / Finish in March 2023

1. Points Shared with MME on Nov. 24th, 2020 (2)

3. Counterpart

3-1. Japan Side

Ministry of Economy, Trade and Industry (METI)
(Implementation)
The Association for Overseas Technical Cooperation and Sustainable Partnerships (AOTS)
(Technical Support)
The Energy Conservation Center, Japan (ECCJ)
Daikin Industries Ltd.

3-2. Brazil Side

Ministry of Mines and Energy (MME)
(Implementation) To Be Decided

1. Points Shared with MME on Nov. 24th, 2020 (3)

4. Project Schedule (Draft)

2020FY (-March 2021)

1. Conduct training and consultation of top runner program (online)
2. Discuss to find a possible cooperation of policy on energy efficient building toward ZEB

2021FY

1. Continue training program of top runner program to discuss improvement in the S&L policy
2. Support a policy making of energy efficient building toward ZEB

2022FY

Continue supporting program of the top runner program for improving the S&L system and a policy making of energy efficient building toward ZEB

5. Tie-up with the Ongoing Another Project by METI-ECCJ to Maximize Synergy (Explained Later)

2. New Project under Japan-Brazil EE&C Cooperation

Two(2) Projects under Japan – Brazil Cooperation on EE&C Established between METI and MME

1. **“New Project – This Project” (Started in Nov. 2020)**
2. **“Preceding Project” (Started in December 2019)**
   Consisted of the 2 Programs as Follows ;

(Program-1)

Improvement in Standard and Labeling (S&L) of Electrical Appliances (Such as Air Conditioners and Refrigerators etc.)

(Program-2)

EE&C Promotion in the Energy Intensive Industry by the “Benchmark Approach” under EnMS

2. New Project under Japan-Brazil EE&C Cooperation

Two(2) Projects under Japan – Brazil Cooperation on EE&C Established between METI and MME

Important Points to Confirm

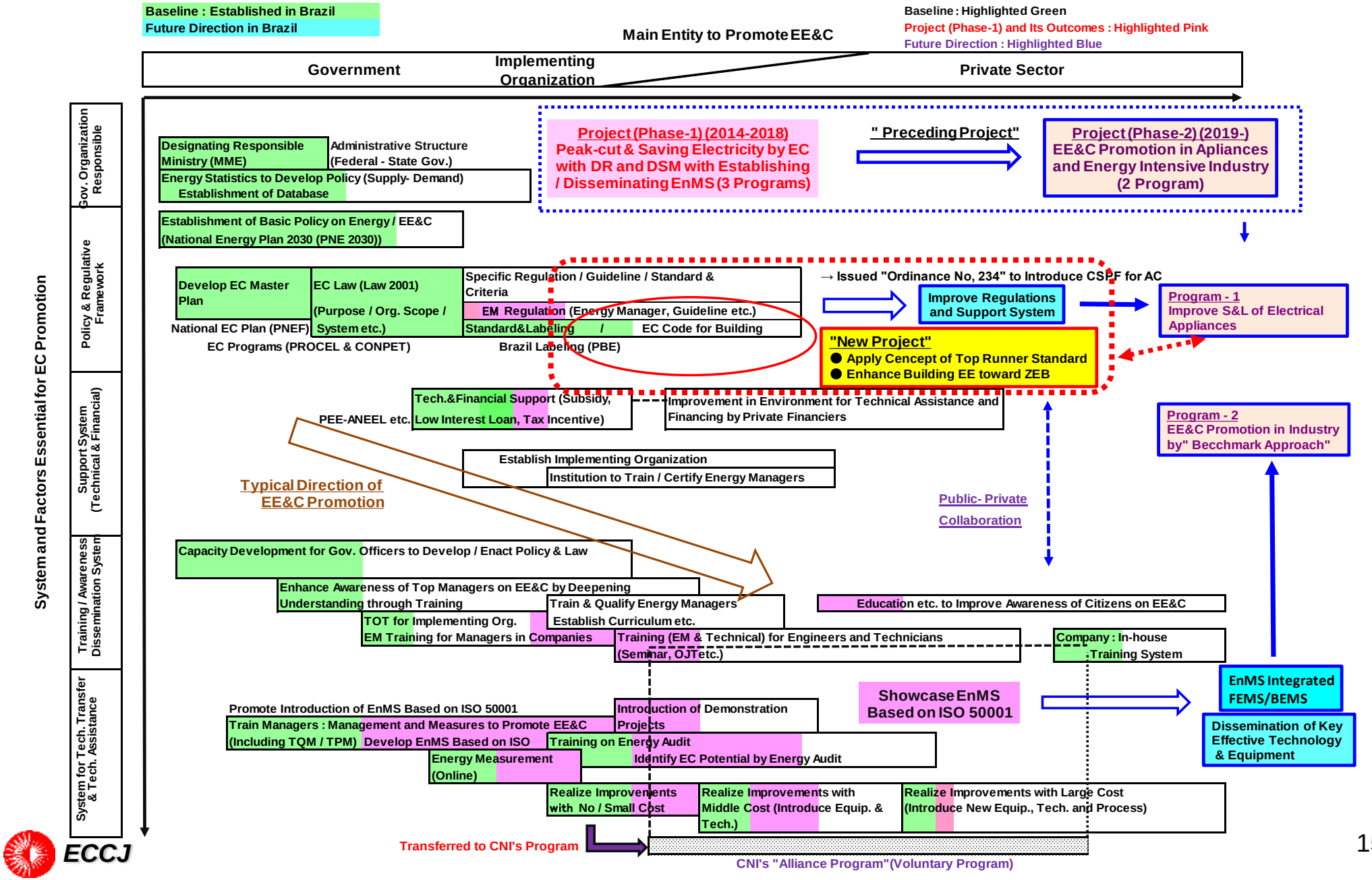
(1) To Maximize Synergy (Effects and Outcomes) of the 2 Projects

(2) To Meet the Needs, Policy and Strategy for EE&C Promotion in Brazil

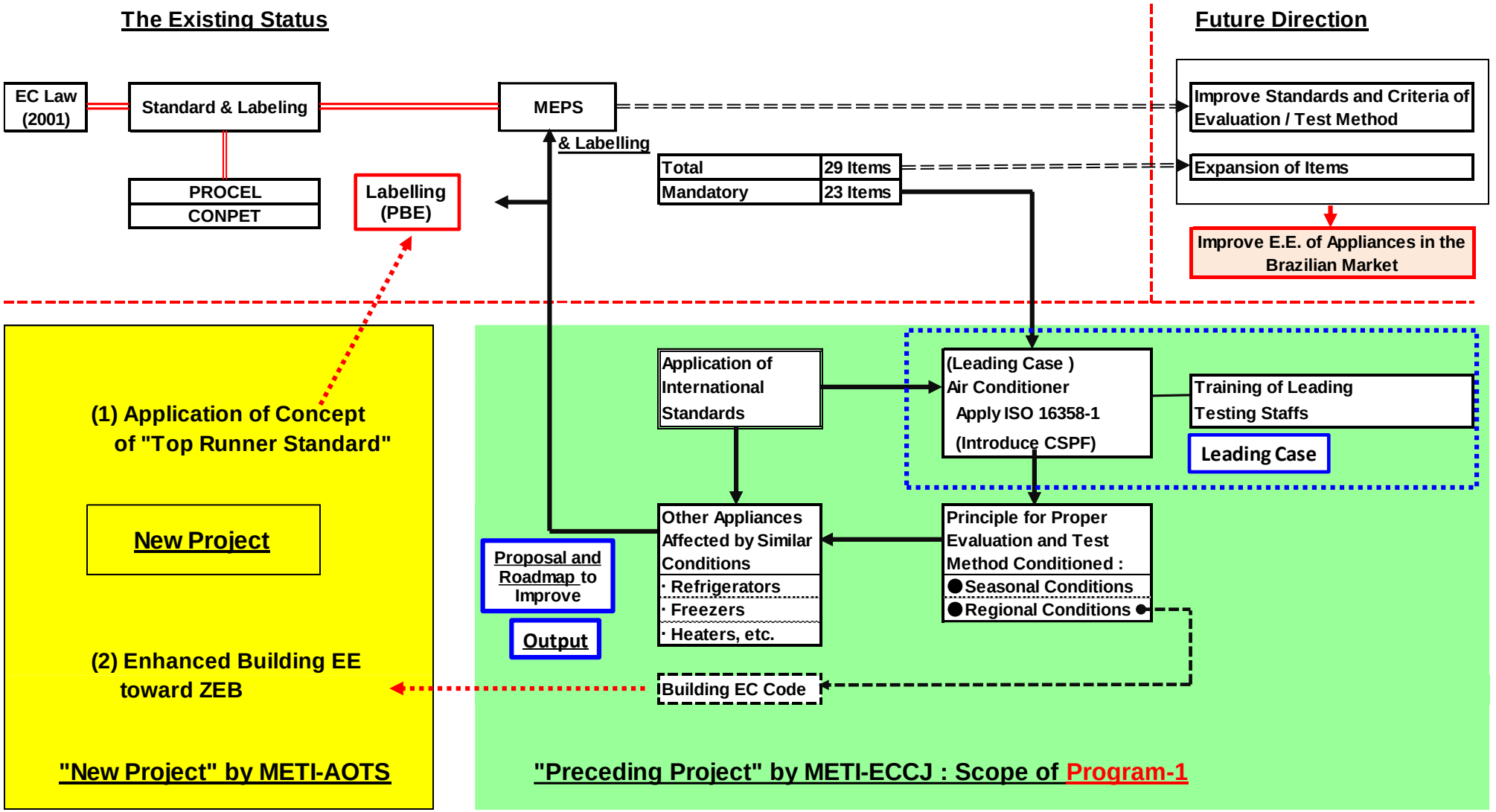
↓

To Discuss Appropriate and Effective Scope and Specifics of the "New Project"

Situation of "New Project" in Systematic Approach for EE&C



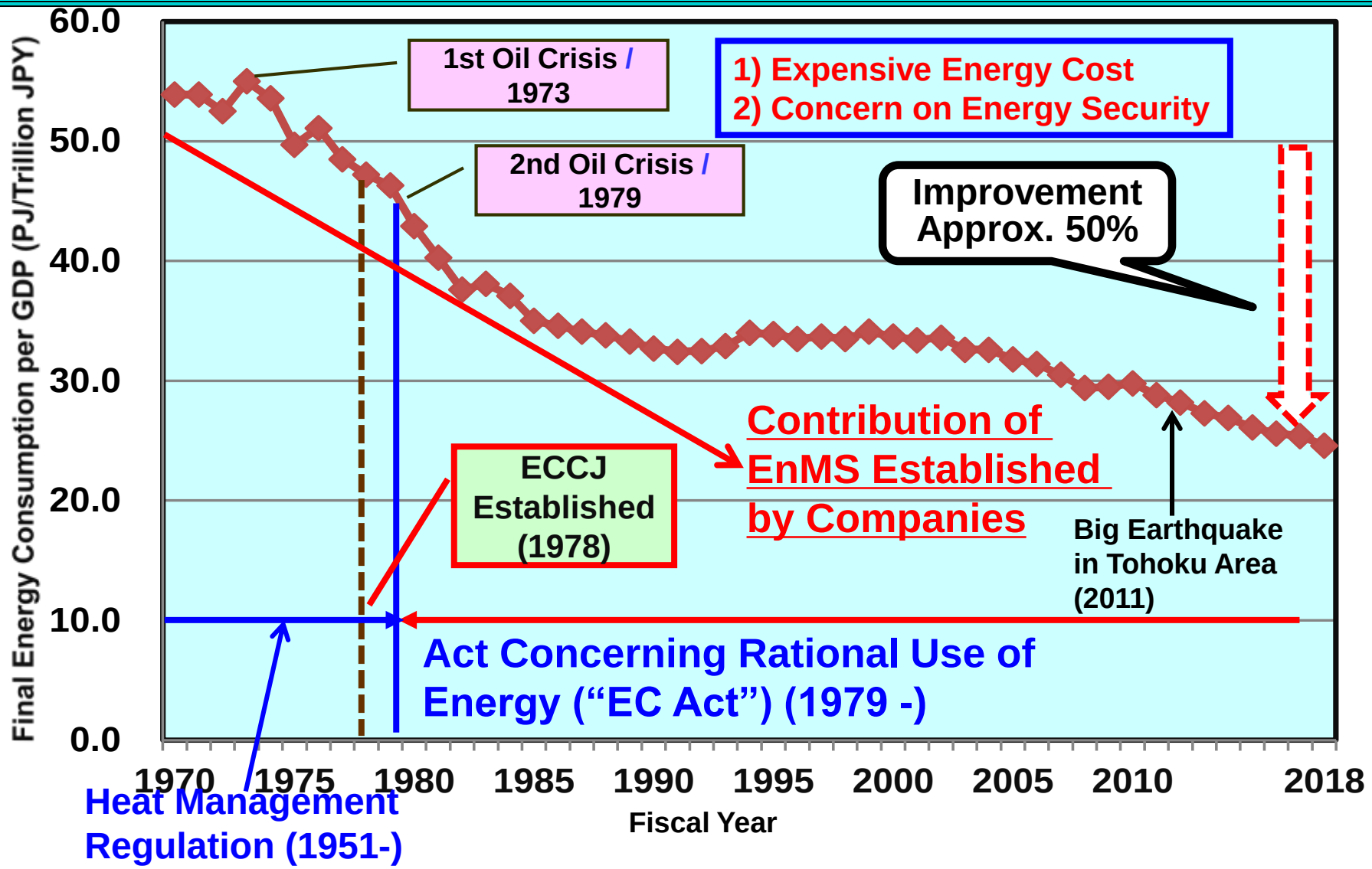
Scope of “New Project” : Relation with “Preceding Project”



3. Japanese Experience

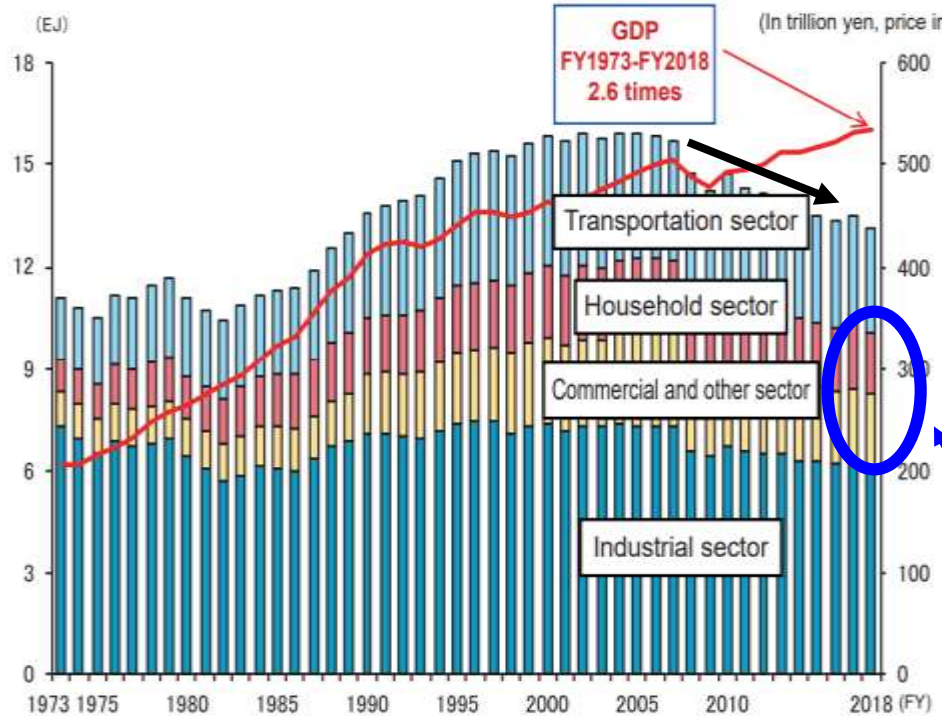
“Top Runner Program” and Energy Efficiency for Building under the Policy and Law in Japan -

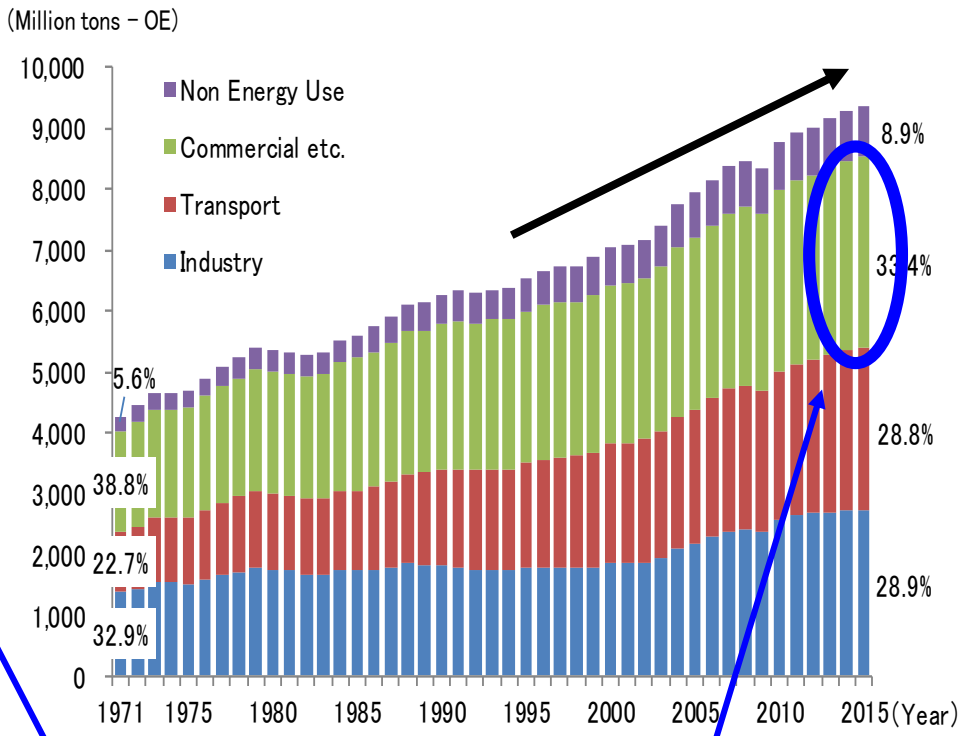
3. Progress in EC : Final Energy Consumption per GDP



Source: "Energy White Paper (FY 2020) by ANRE (Agency for Natural Resources and Energy) / METI (Ministry of Economy, Trade and Industry

Final Energy Consumption by Sector (Japan and World)





JAPAN (1973 (1st Oil Crisis) – 2018)
(Recent Situations)
GDP : Increasing
Total Consumption : Decreasing
(Comparison between 1973 and 2018)
GDP – x2.6
Industry - x 0.8 / Commercial - x 2.1 / Residential - x 1.9 / Transport - x 1.7

Commercial & Residential Sector

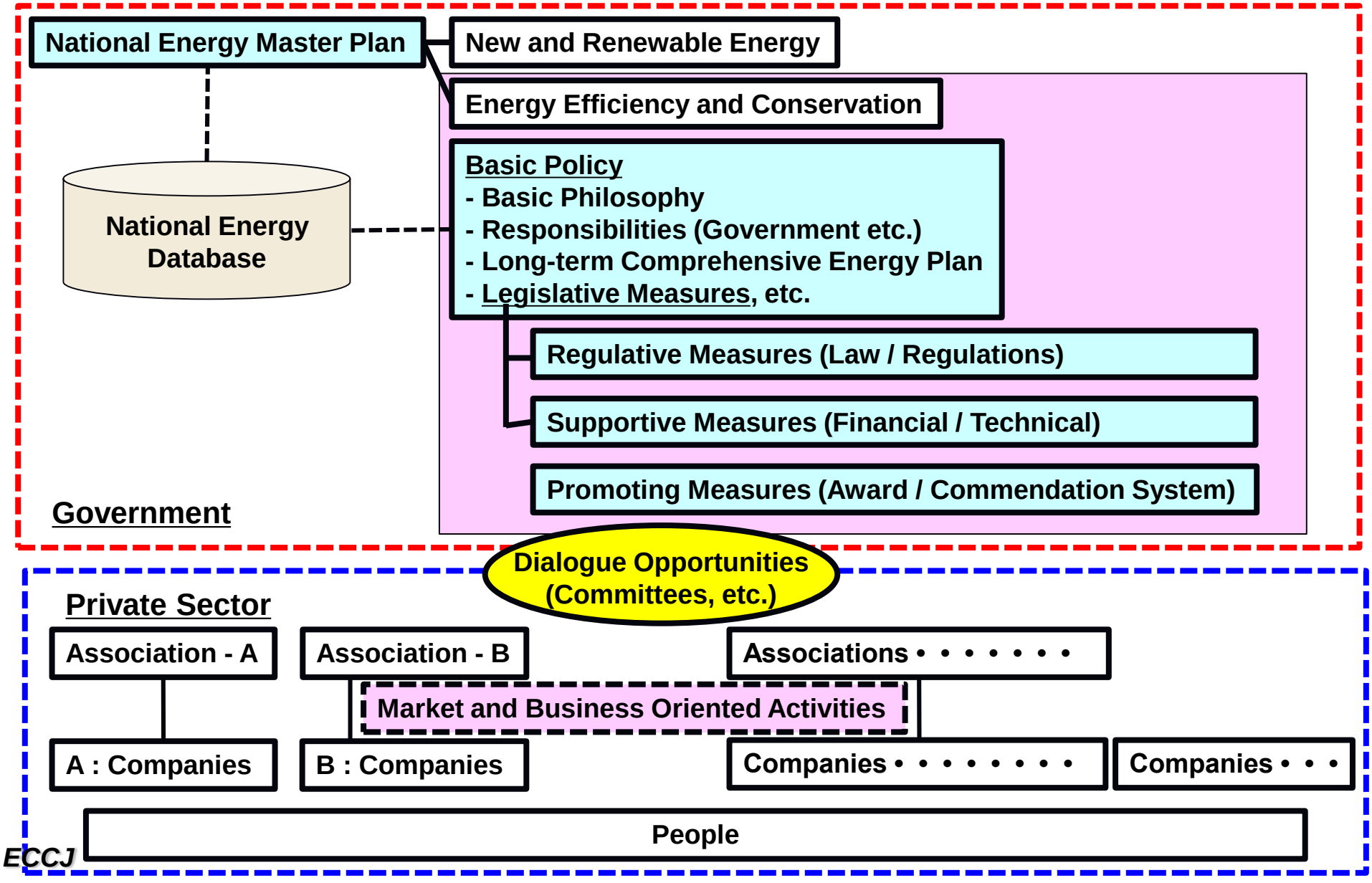
WORLD (1971 – 2016)
(Recent Situations)
Total Consumption : Increasing

Source : "Energy White Paper (FY 2018) by ANRE/METI
(IEA - World Energy Balances 2017)

ECCJ

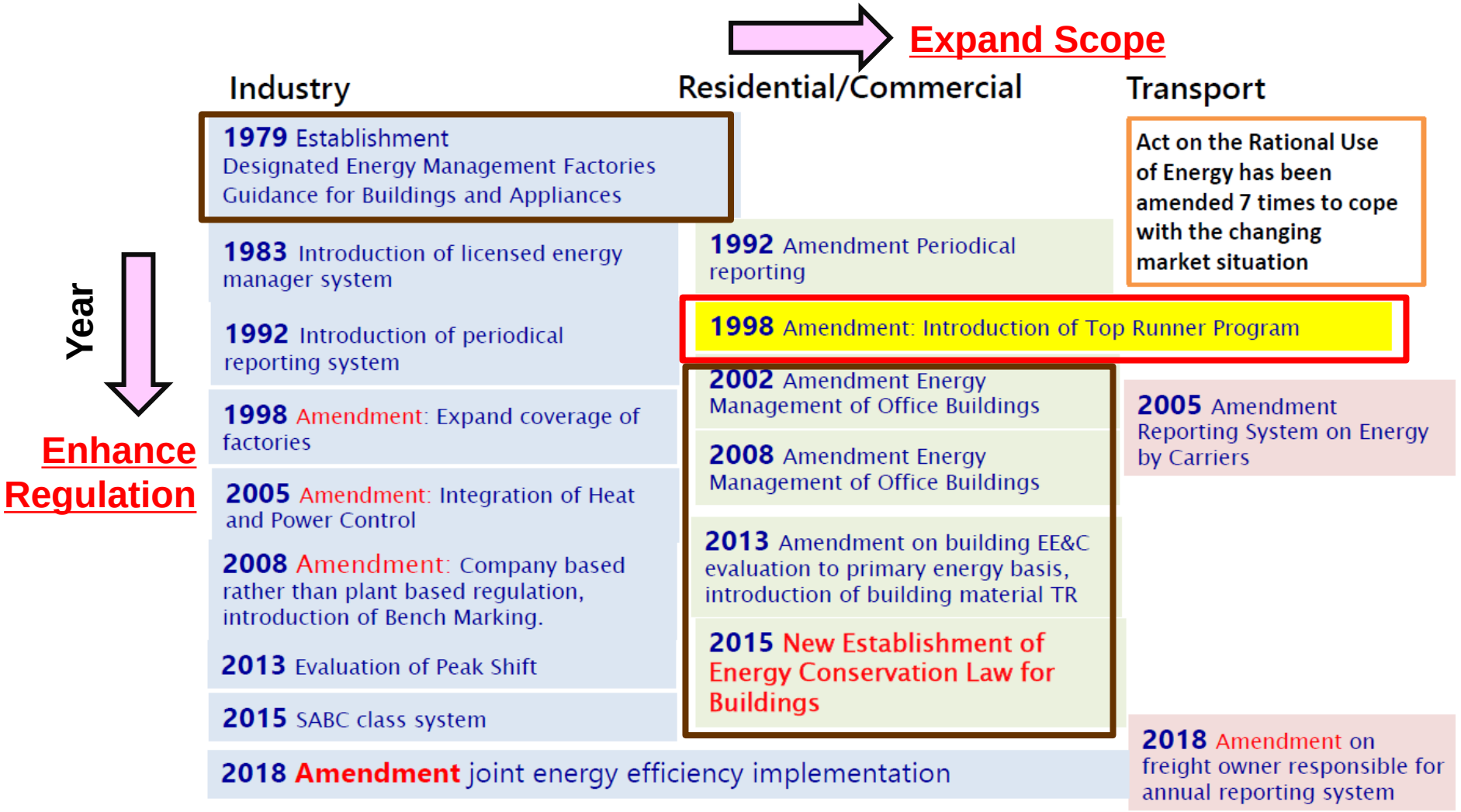
Source : "Energy White Paper (FY 2018) by ANRE/METI

3. Structure of Policy and Measures for EE&C in Japan



3. Energy Conservation (EC) Act in Japan : History

The "Act on Rational Use of Energy" (EC Act) Enacted in 1979



Source : Materials by ANRE/METI

3. Legal Framework : EC Act and Support Measures

	Industry Sector	Consumer Sector		Transportation sector
		Commercial Sector	Residential Sector	
Basic Structure of Energy Conservation Act (Japan)	✓Energy Management System ✓• Energy Manager / • Periodical Reports / • EC Guideline / • EM Standard by BusinessOperators (about 15,000) with 1,500 or more kl-oe/y of Energy Consumption ✓Target Reduce Energy Unit Consumption by 1% / year / Achieve Benchmarks			✓Periodical Reports by Freight Carriers and Consigners ✓ Efforts to Reduce 1% /y of Energy Unit Consumption

✓E. E. Standard for Building – EC Law for Building (Floor Area of 300m^2 or more)

Combination – Regulation and Support

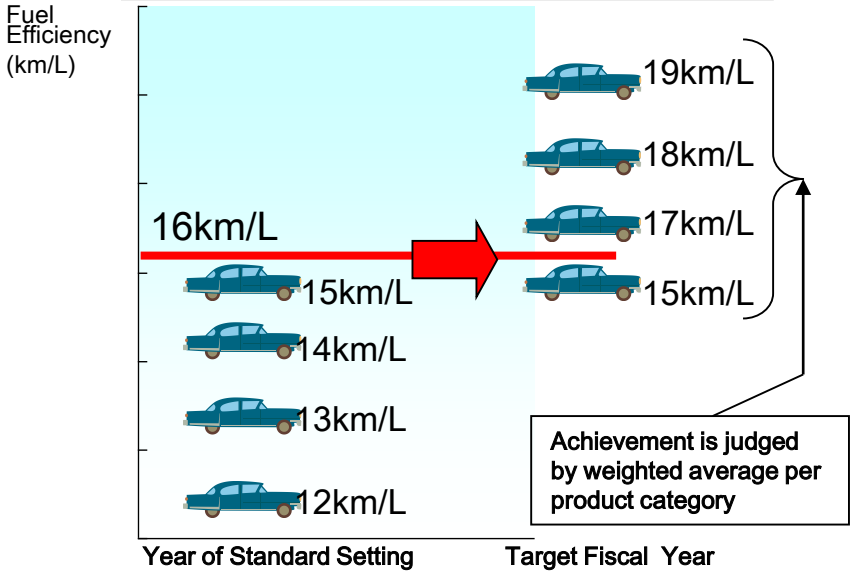
✓Top Runner Standard (Standard and Labeling)
For Home Appliances, Equipment, Automobiles etc., 32 Items in Total (Managing 70% of Household Energy Consumption)

Supporting System Subsidy / Low Interest Loan / Tax Incentive & Tech. Support

3. EC Act : Top Runner Program – Standard & Labelling

1. Energy Efficiency Standard

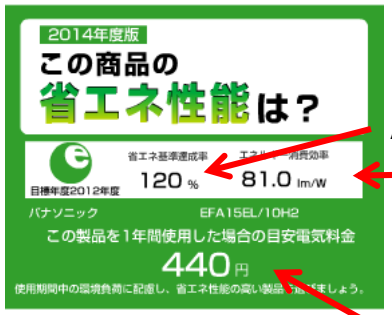
Concept of Criteria Setting



Target Products (32 Products)

1. Passenger vehicles
2. Freight vehicles
3. Air-conditioners
4. TV sets
5. Video-cassette recorders
6. Fluorescent lights
7. Copiers
8. Computers
9. Magnetic disc units
10. Electric refrigerators
11. Electric freezers
12. Space heaters
13. Gas cooking appliances
14. Gas water heaters
15. Oil water heaters
16. Electric toilet seats
17. Vending machines
18. Transformers
19. Electric rice cookers
20. Microwave ovens
21. DVD recorders
22. Residential router
23. Layer 2 switch
24. Complex Machine
25. Printer
26. Heat Pump Water Heater
27. 3-Phase Electric Motors
28. LED Lamps
29. Insulation Materials
30. Sashes
31. Double-Glazed Glass
32. Showcase to Cool / Freeze Food

2. Labelling



Rating by 5 Stars

Achievement Ratio (%)

Efficiency

Power Consumption

Annual Electricity Bill

3. Dissemination

Ranking Catalogue

"Top Runner Program" (Standard & Labeling for Appliances etc.) → List of The Regulated Equipment (32 Items)

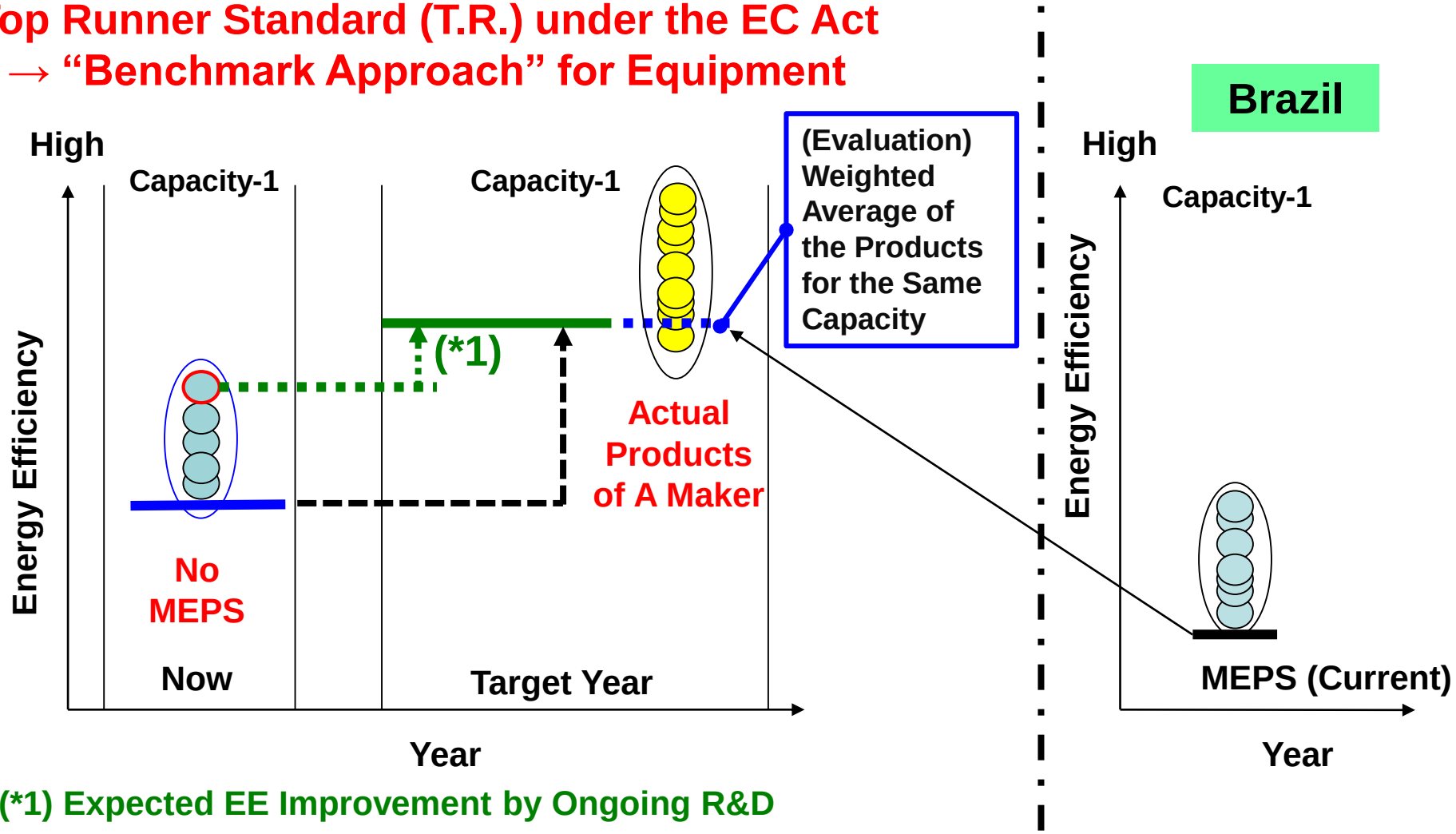
1. Passenger vehicles
2. Air conditioners
3. Lighting equipment (Using only fluorescent lamps as main light source)
4. TV sets
5. Photocopy machines
6. Computers
7. Magnetic disk units
8. Freight Vehicles
9. Video cassette recorders
10. Electrical refrigerators
11. Electrical freezers
12. Space heaters
13. Gas cooking appliances
14. Gas water heaters
15. Oil water heaters
16. Electric toilet seats
17. Vending machines
18. Transformers
19. Electric rice cookers
20. Microwave ovens
21. DVD recorders
22. Routers
23. Switching units
24. Multifunction devices
25. Printers
26. Electric water heaters
27. AC motors
28. Self-ballasted LED lamps
29. Showcase
30. Insulation materials
31. Sashes
32. Multi-paned glazing

*(Year Specified) 1.-9.:Apr. 1999, 10.-11.: Dec. 1999, 12.-18.: Dec. 2002, 19.-21.: Apr. 2006, 22.-23.: Jul. 2009, 24.-26.: Mar. 2012, 27.-28.: Nov. 2013, 29.: Feb.2016, 31.-32.: Nov. 2014

Source : Materials by ANRE/METI

"Top Runner Program" for Appliances, Equipment and Vehicles - Concept to Setup Criteria of Energy Efficiency -

Top Runner Standard (T.R.) under the EC Act
→ "Benchmark Approach" for Equipment



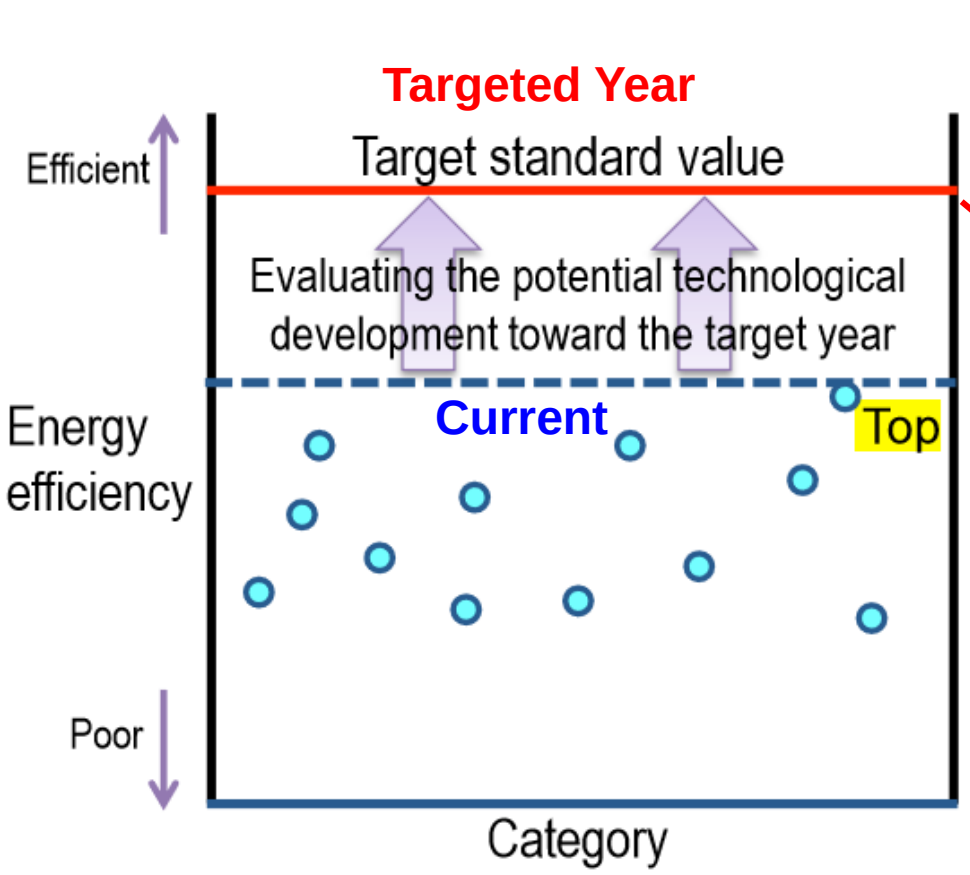
(*1) Expected EE Improvement by Ongoing R&D

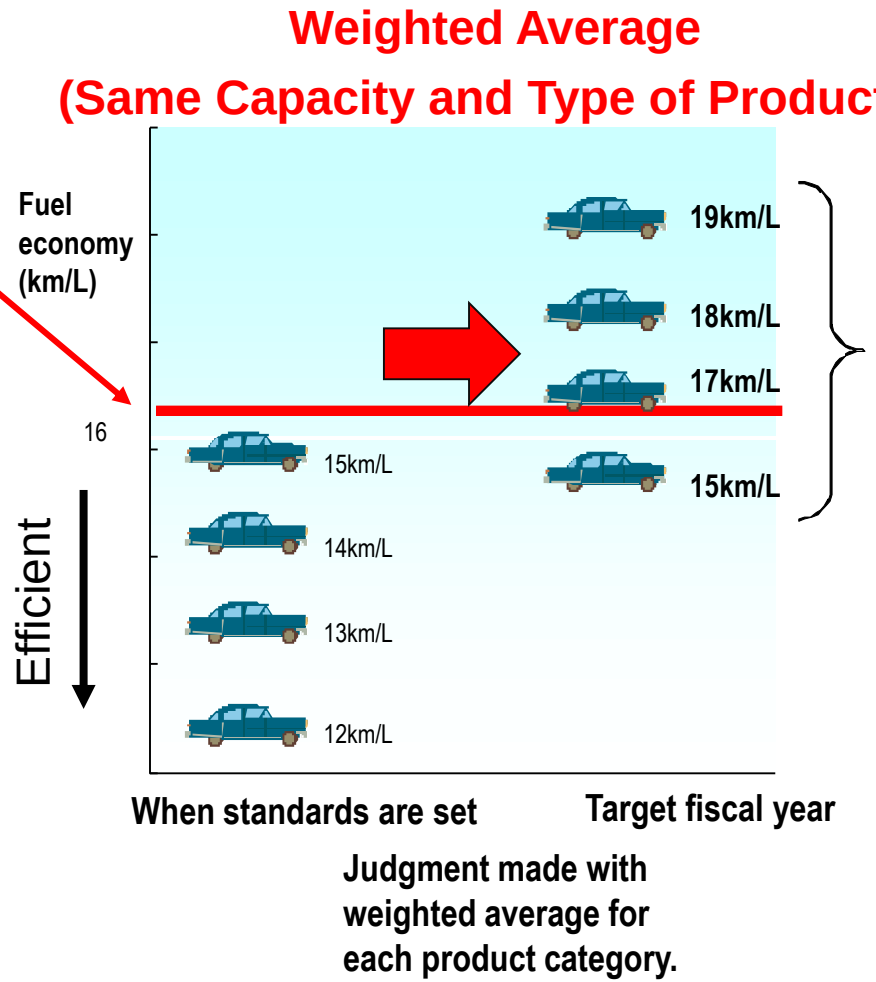
The Existing T.R. Criteria

New / Improved T.R. Criteria

ECCJ

"Top Runner Program" (Standard and Labeling)
- Criteria and Evaluation of Energy Efficiency -





Source : Materials by ANRE/METI

"Top Runner Program" (Standard and Labeling)
- Labeling to Let Consumers Know Efficiency & Merits -
(22 Items among 32 Items)

(e Mark by Manufacturers : 22 Items)
Green : Achievement Ratio ≥ 100% (Achieved)
Orange : Achievement Ratio < 100% (Not Achieved)

Simplified Label
(19 Items among 22)

Unified Label (6 Items among 22)
(by Retailers)

5 Items
(AC, TV Set etc.)

Rating by 5 Stars (5-Star Product)

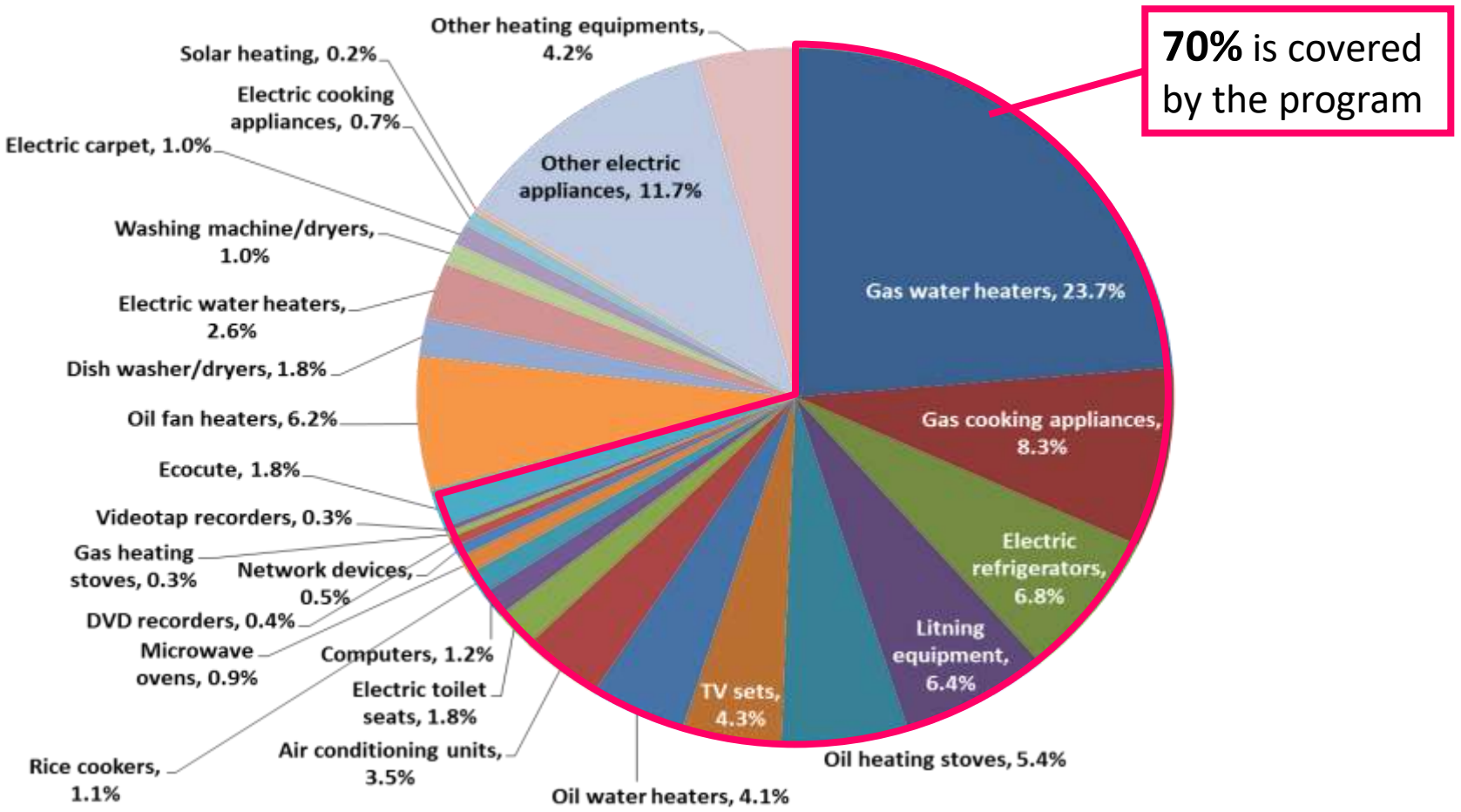
Achievement Ratio (%) : 198% and
Annual Electricity Consumption : 77 kWh/Y

Name of Manufacturer / Code of Product

Estimated Annual Electricity Bill : 1690 JPY

“Top Runner Program” (Standard and Labeling)
→ Impacts to Affect Energy Efficiency in Household

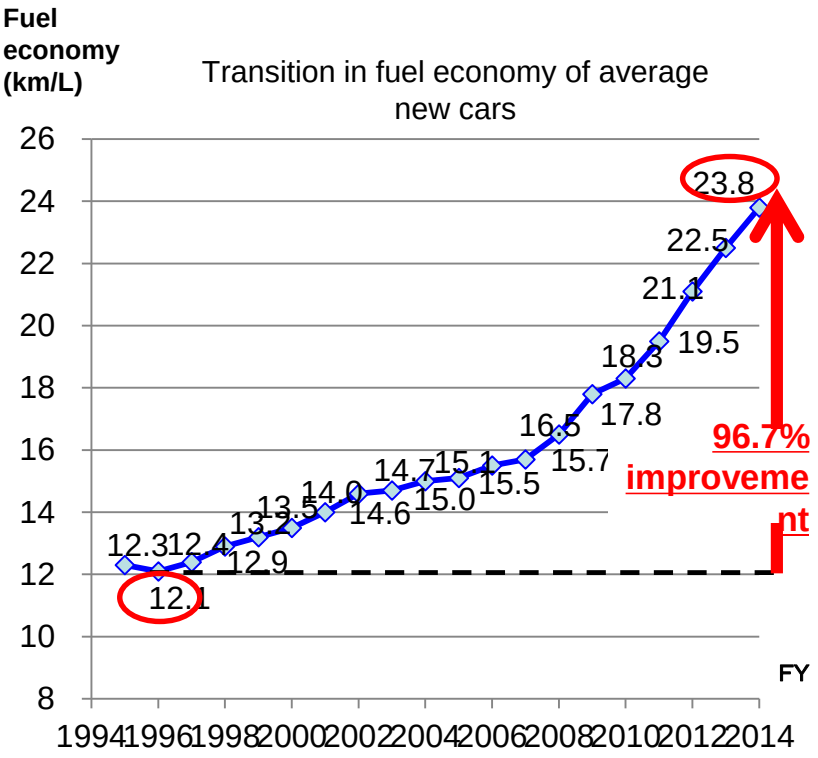
○ Coverage : Approx. 70% of Final Energy Consumption in Household



Source : Materials by ANRE/METI

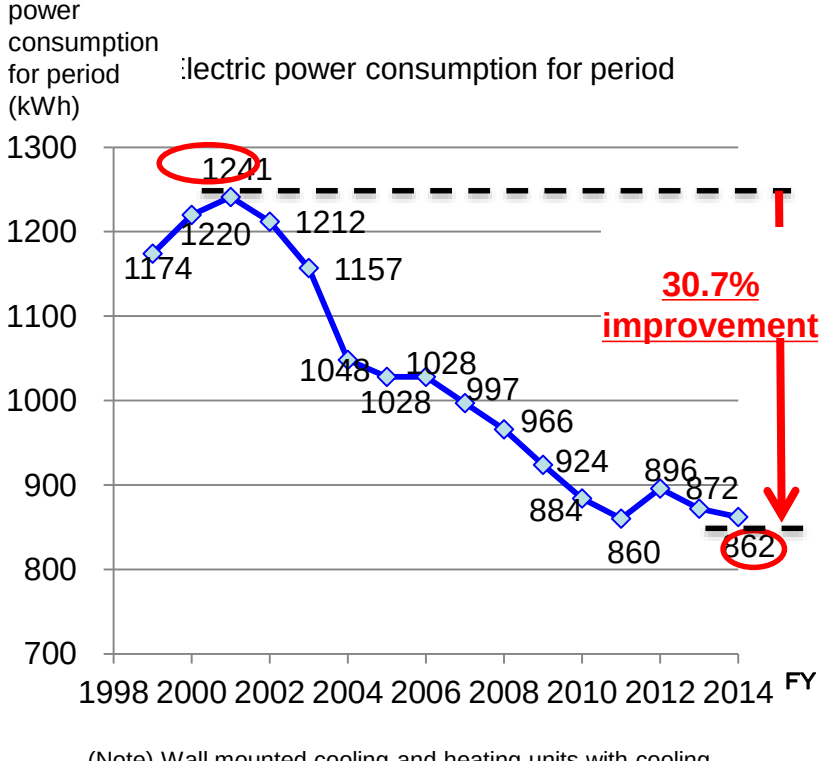
“Top Runner Program” (Standard and Labeling)
- Actual Improvements in Energy Efficiency (Examples) -

[Passenger vehicles]



(Note) Fuel economy values for the 10-15 mode.

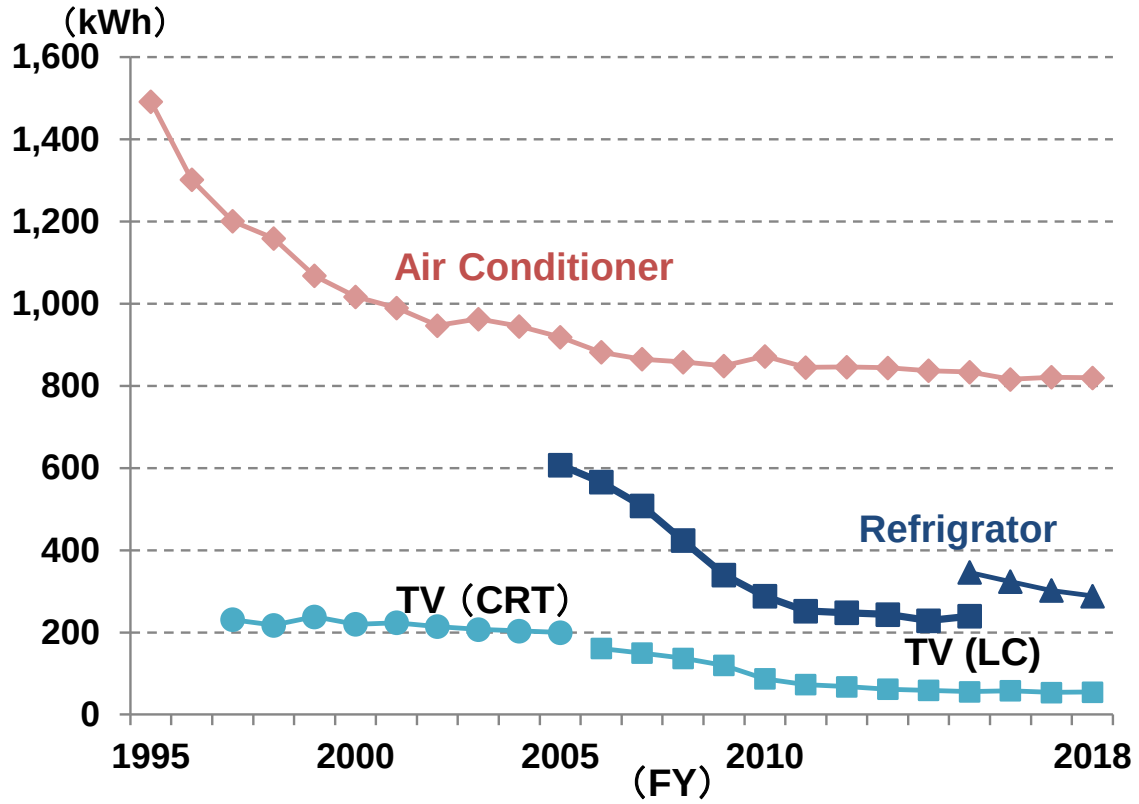
[Air conditioners]



(Note) Wall mounted cooling and heating units with cooling capacity of 2.8kW-class model; simple average values for a representative model of energy conserving-type products.

Source : Materials by ANRE/METI

“Top Runner Program” (Standard and Labeling)
- Actual Improvements in EE of Major Electrical Appliances -



1. Air Conditioner
   - Capacity : 2.8 kW
   - Power Consumption during for Cooling and Heating
2. Refrigerator
   - Rated Internal Volume : 400 L
   - Annual Power Consumption
3. Television Set (TV) – CRT and LC
   - Size : 32 Type
   - Annual Power Consumption (Average of Catalogue Values)

Source : White Paper 2020 by ANRE/METI

"Top Runner Program" (Standard and Labeling)
- Improvements in EE during Target Years for Appliances -

Name of Appliances		(*) Ratio Improved	Duration etc.
Air Conditioner (For Household)	Smaller than 4kW	16.3%	FY 2005 → FY 2010 (Wall Installation Type)
	Larger than 4kW	15.6%	FY 2006 → FY 2012 (Wall Installation Type)
Lighting Equipment	Fluorescent Lamp	14.5%	FY 2006 → FY 2012
Television Set (LC and Plasma)		60.6%	FY 2008 → FY 2012
Computer		85.0%	FY 2007 → FY 2011
Magnetic Disk		75.9%	FY 2007 → FY 2011
Refrigerator (For Household)		43.0%	FY 2005 → FY 2010
Freezer (For Household)		24.9%	FY 2005 → FY 2010
Electrical Toilet Seat		18.8%	FY 2006 → FY 2012

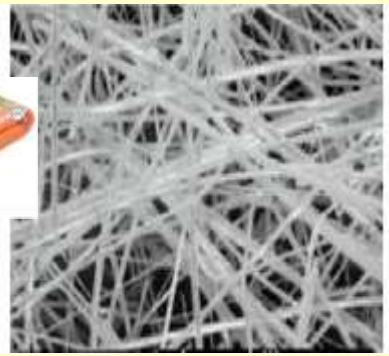
(*) Ratio of Improvement : (1) Weighted Average Based on Shipped Products
(2) Actual Values to the Standard Values

Source : Catalogue of Energy Efficiency Performance (2020) by ANRE/METI

“Top Runner Program” : Recent Additional Items
- Insulation Materials and Window for Buildings -

Insulation

Ordinary glass wool
Avg. fiber diameter: 7-8 μm

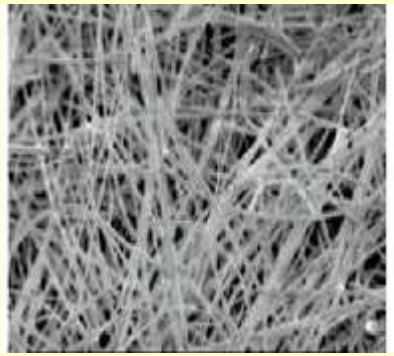


Thermal Resistance: 2.0 (m^2K/W)

- Market share: approx. 3%
- Approx. 40% better insulating performance than ordinary glass wool

Thermal Resistance 2.7 (m^2K/W)

High-performance glass wool (fine fibers)
Avg. fiber diameter: 4-5 μm

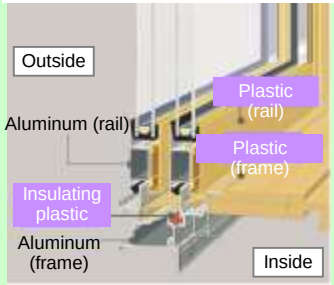


Window

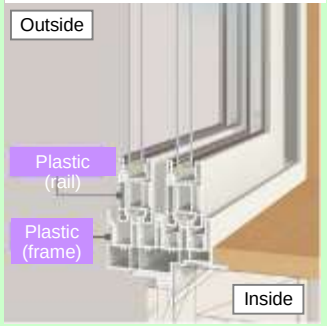
Aluminum sash + single-pane glazing

- Market share: approx. 3% to under 10%
- Approx. 100% better insulating performance than aluminum single-pane windows

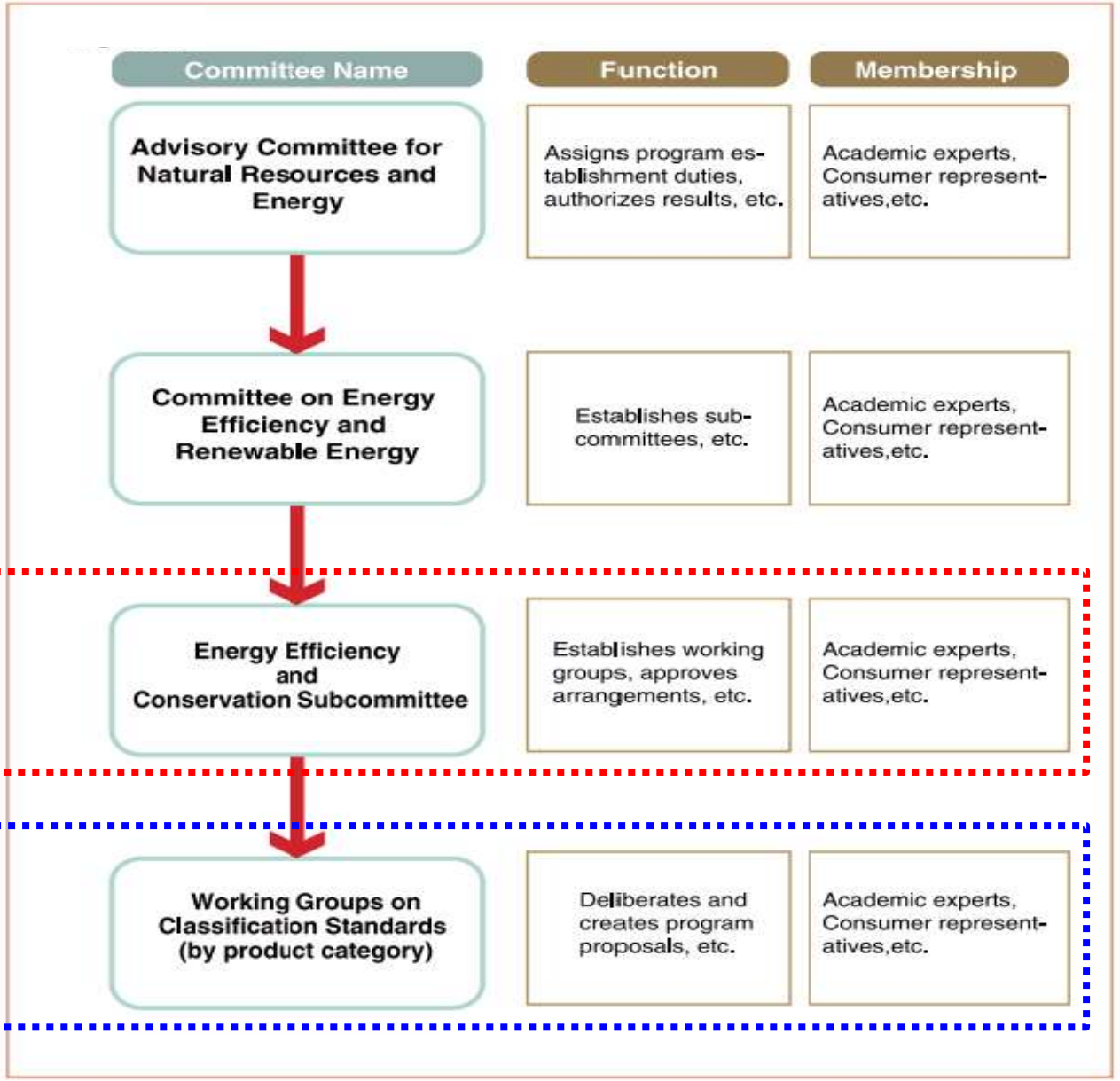
Al-plastic composite sash + low-E multilayer glazing



Plastic sash + low-E multilayer glazing



“Top Runner Program” : Committees and Functions to Develop Standards and Criteria



- Establish Working Group
- Approve Standards and Criteria of Products
- Draft “Proposal”

Study / Develop and Propose Standards and Criteria of Products

“Top Runner Program” : Dissemination of E.E. Appliances

Catalogue (pdf) for Downloading : https://seihinjoho.go.jp/frontguide/catdl.html

Cover of Brochure

Explanation of Labelling

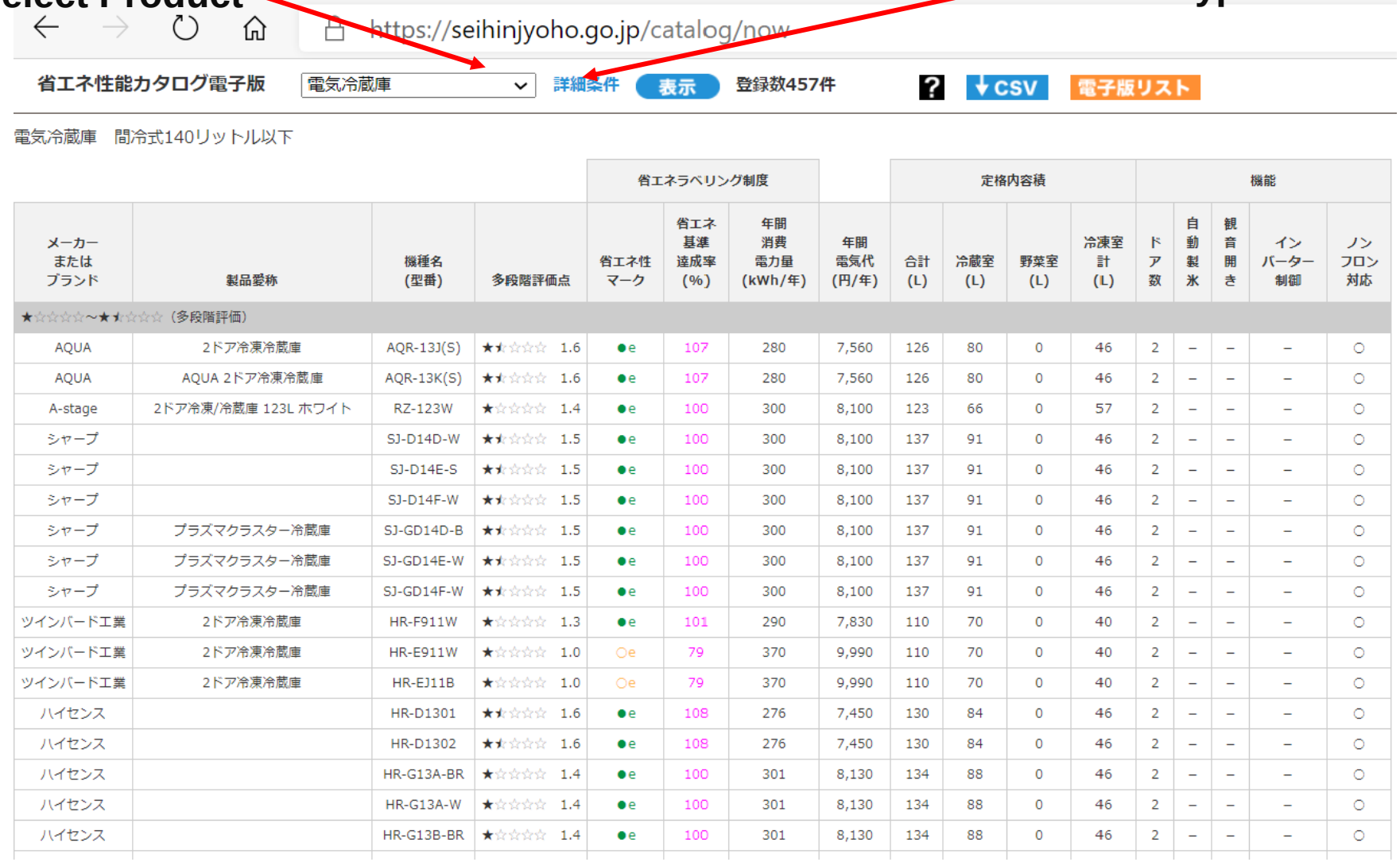
Raking of Energy Efficiency
(Example : Air Conditioners)

“Top Runner Program” : Dissemination of E.E. Appliances

Electronic Catalogue : https://seihinjoho.go.jp/catalog/now

1. Select Product

2. Choose Capacity, Type



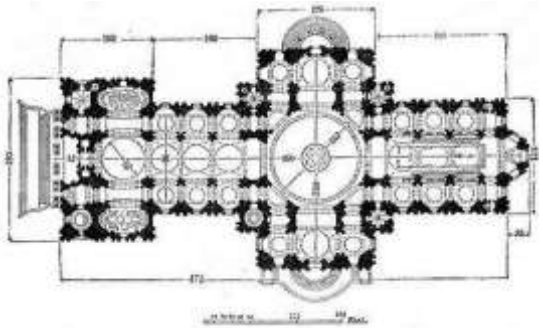
https://seihinjyoho.go.jp/catalog/now

省エネ性能カタログ電子版　電気冷蔵庫　詳細条件　表示　登録数457件　CSV　電子版リスト

電気冷蔵庫　間冷式140リットル以下

				省エネラベリング制度				定格内容積				機能				
メーカーまたはブランド	製品愛称	機種名(型番)	多段階評価点	省エネ性マーク	省エネ基準達成率(%)	年間消費電力量(kWh/年)	年間電気代(円/年)	合計(L)	冷蔵室(L)	野菜室(L)	冷凍室計(L)	ドア数	自動製氷	観音開き	インバーター制御	ノンフロン対応
★☆☆☆☆～★★☆☆☆（多段階評価）																
AQUA	2ドア冷凍冷蔵庫	AQR-13J(S)	★★☆☆☆ 1.6	●e	107	280	7,560	126	80	0	46	2	–	–	–	○
AQUA	AQUA 2ドア冷凍冷蔵庫	AQR-13K(S)	★★☆☆☆ 1.6	●e	107	280	7,560	126	80	0	46	2	–	–	–	○
A-stage	2ドア冷凍/冷蔵庫 123L ホワイト	RZ-123W	★☆☆☆☆ 1.4	●e	100	300	8,100	123	66	0	57	2	–	–	–	○
シャープ		SJ-D14D-W	★★☆☆☆ 1.5	●e	100	300	8,100	137	91	0	46	2	–	–	–	○
シャープ		SJ-D14E-S	★★☆☆☆ 1.5	●e	100	300	8,100	137	91	0	46	2	–	–	–	○
シャープ		SJ-D14F-W	★★☆☆☆ 1.5	●e	100	300	8,100	137	91	0	46	2	–	–	–	○
シャープ	プラズマクラスター冷蔵庫	SJ-GD14D-B	★★☆☆☆ 1.5	●e	100	300	8,100	137	91	0	46	2	–	–	–	○
シャープ	プラズマクラスター冷蔵庫	SJ-GD14E-W	★★☆☆☆ 1.5	●e	100	300	8,100	137	91	0	46	2	–	–	–	○
シャープ	プラズマクラスター冷蔵庫	SJ-GD14F-W	★★☆☆☆ 1.5	●e	100	300	8,100	137	91	0	46	2	–	–	–	○
ツインバード工業	2ドア冷凍冷蔵庫	HR-F911W	★☆☆☆☆ 1.3	●e	101	290	7,830	110	70	0	40	2	–	–	–	○
ツインバード工業	2ドア冷凍冷蔵庫	HR-E911W	★☆☆☆☆ 1.0	○e	79	370	9,990	110	70	0	40	2	–	–	–	○
ツインバード工業	2ドア冷凍冷蔵庫	HR-EJ11B	★☆☆☆☆ 1.0	○e	79	370	9,990	110	70	0	40	2	–	–	–	○
ハイセンス		HR-D1301	★★☆☆☆ 1.6	●e	108	276	7,450	130	84	0	46	2	–	–	–	○
ハイセンス		HR-D1302	★★☆☆☆ 1.6	●e	108	276	7,450	130	84	0	46	2	–	–	–	○
ハイセンス		HR-G13A-BR	★☆☆☆☆ 1.4	●e	100	301	8,130	134	88	0	46	2	–	–	–	○
ハイセンス		HR-G13A-W	★☆☆☆☆ 1.4	●e	100	301	8,130	134	88	0	46	2	–	–	–	○
ハイセンス		HR-G13B-BR	★☆☆☆☆ 1.4	●e	100	301	8,130	134	88	0	46	2	–	–	–	○

3. EC Act : Energy Efficiency for Building



Design

Construction

Completion and Operation

- **Compliance with Building E.E. Code**
- **Submission of "Report"**

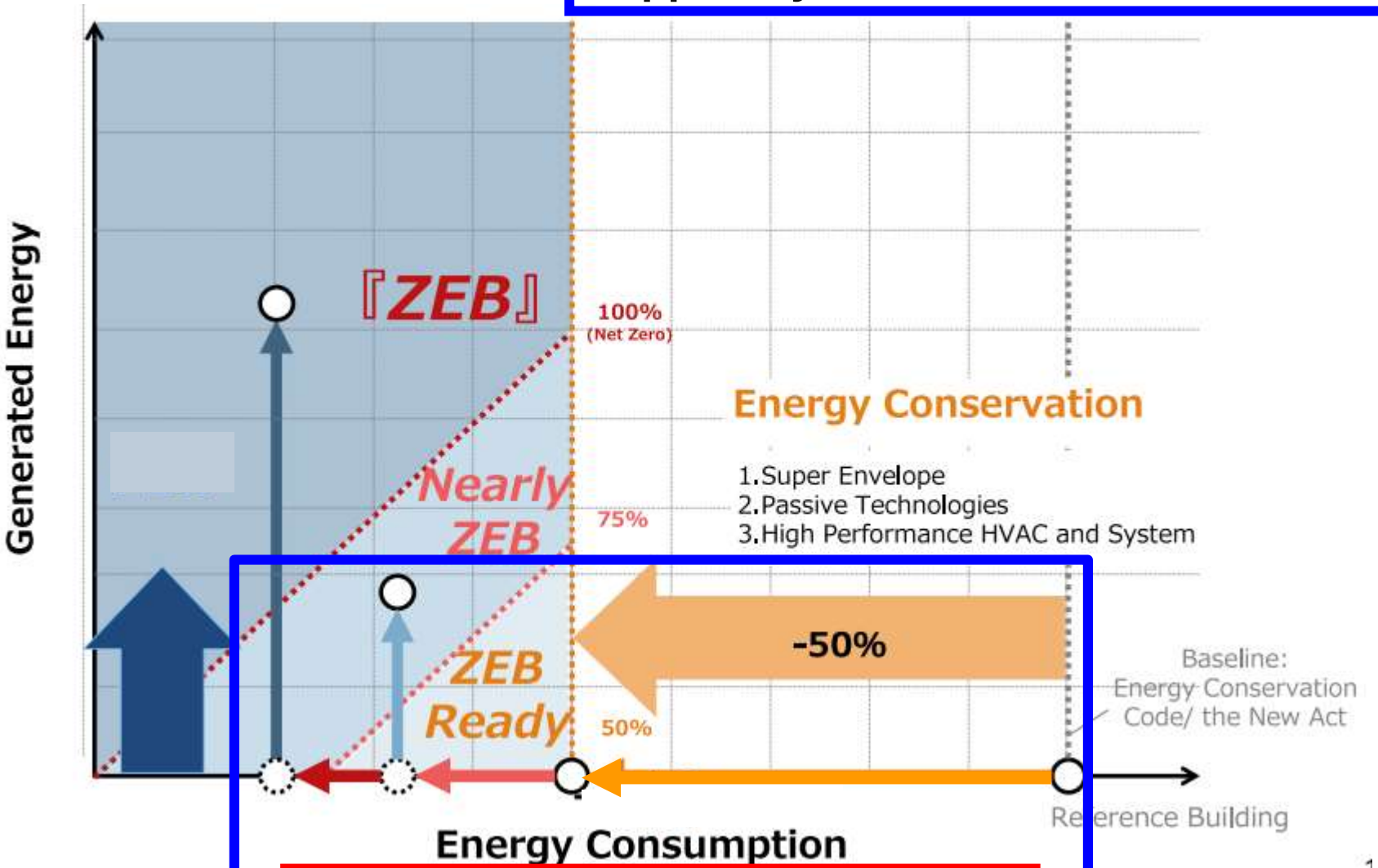
("Building E.E. Act" by Ministry of Land, Infrastructure, Transport and Tourism (MLIT)

- **Compliance with EM Regulation**
- **Submission of "Periodical Report"**

("EC Act" by Ministry of Economy, Trade and Industry (METI))

Policy Approach toward ZEB

Support by Government to Promote ZEB



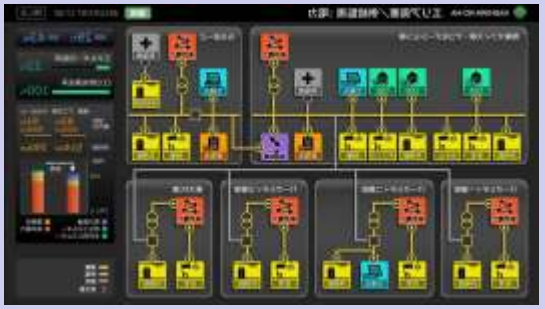
Energy Efficiency & Conservation

Key Point

ZEB : Major Elements and Roadmap

Energy Generation and Supply

Energy Management System



Demand Management
Demand Response

Operation Control for Equipment

Basis

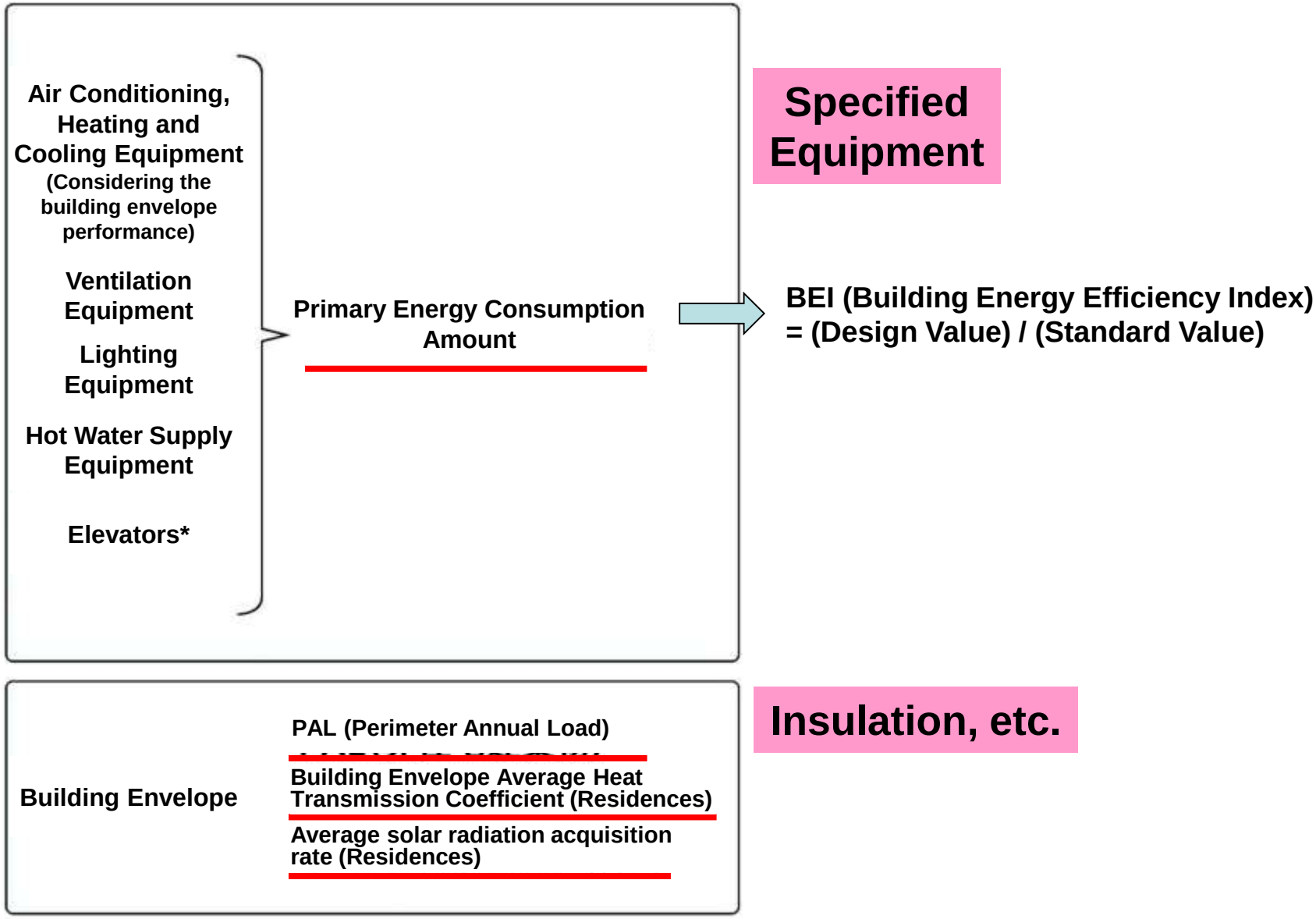
- Minimized Energy Consumption
- Minimized / Stable Energy Demand

Energy Efficiency and Conservation

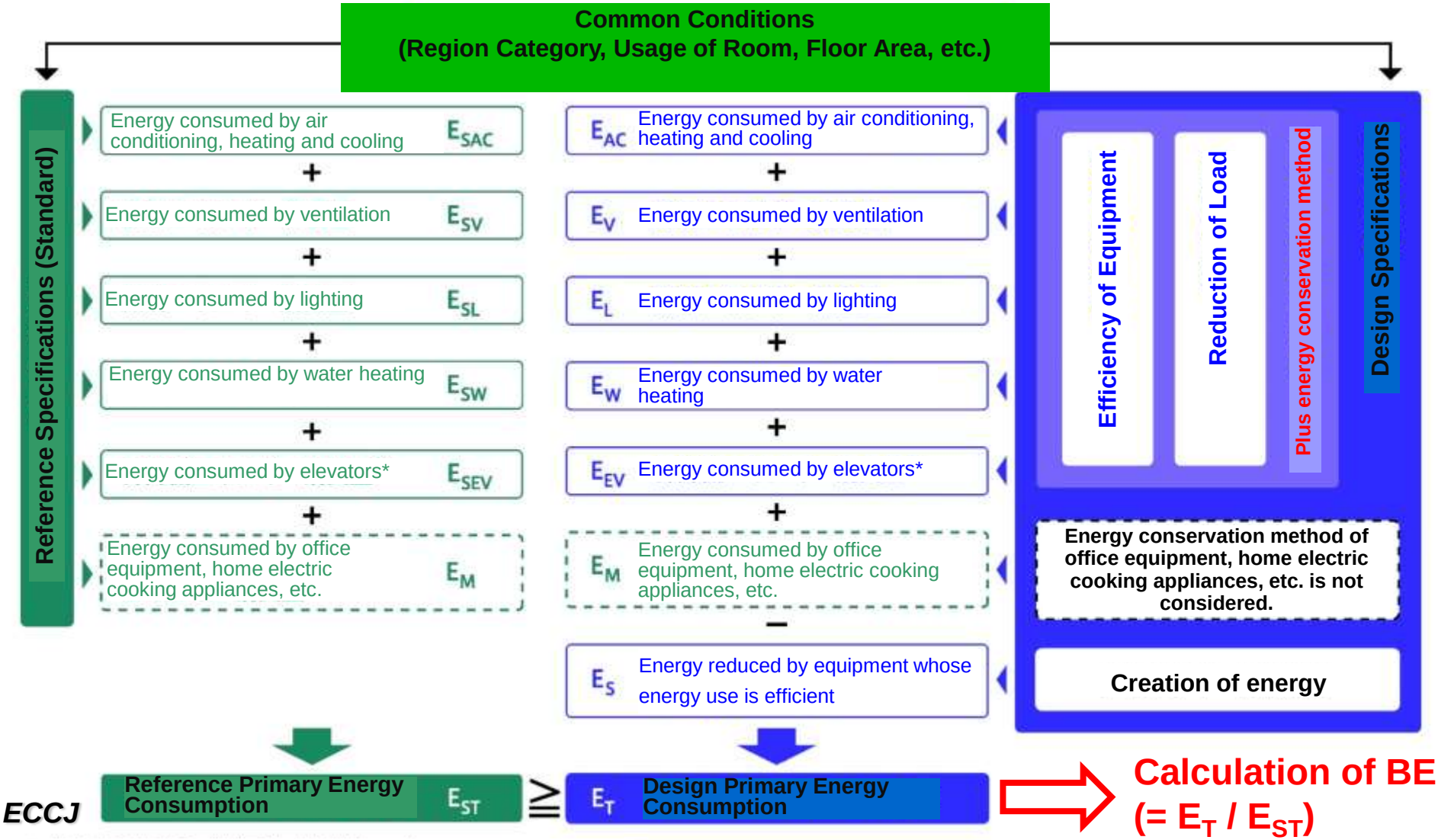
EC Act – Building Energy Efficiency Act
- Outline Specified Building and Obligation -

Item / Category	Specified Building	Non-Specified Building
Floor Area (FA)	300 m^2 or Wider	300 m^2 > (FA)
Application	(1) New Construction (2) Expansion (3) Reconstruction	(1) New Construction (2) Expansion (3) Reconstruction
	Renovation / Remodeling of Roofs, Walls or Floors	
	New Installation or Repair of Specified Equipment Such as Air Conditioning System	
Obligations	To Comply Specified Design Criteria	Required Efforts To Comply Specified Design Criteria
	(1) Report before Starting Construction	Application of Top Runner Standard (Building - Housing Energy Efficiency Labelling System)
Standards and Criteria to Apply	(1) PAL* (Perimeter Annual Load) - Related to Insulation etc. of Building Envelope and Roof (2) BEI (Building Energy Efficiency Index) Based on Primary Energy Consumption (Used by Specified Equipment)	(1) PAL* (Perimeter Annual Load) - Related to Insulation etc. of Building Envelope and Roof (2) BEI (Building Energy Efficiency Index) Based on Primary Energy Consumption (Used by Specified Equipment)

EC Act – Building Energy Efficiency Act
Standards and Criteria to Apply

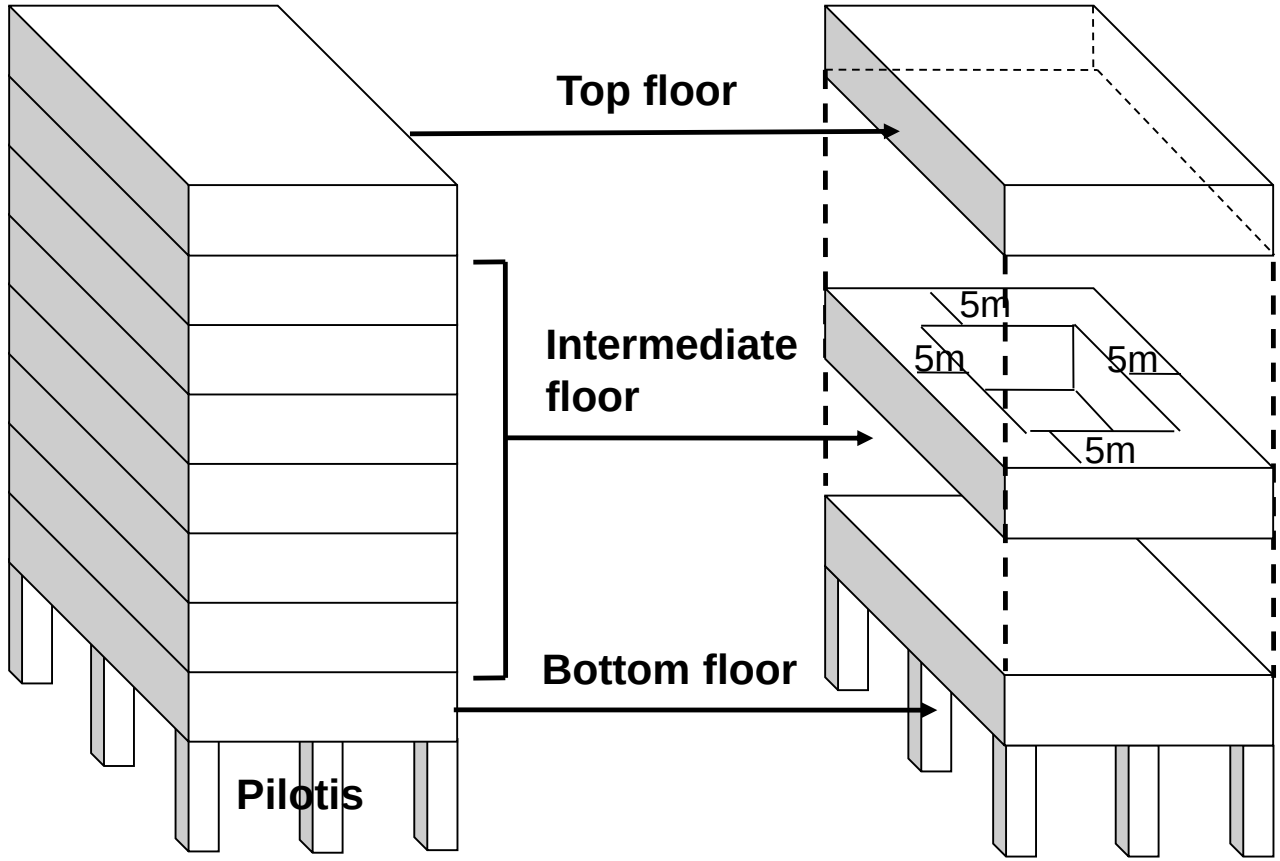


EC Act – Building Energy Efficiency Act
- Calculation of "Primary Energy Consumption" -



* The target is non-residential buildings and apartment residences.

EC Act – Building Energy Efficiency Act
- PAL and Perimeter Zone (Indoor Perimeter Zone) -



$$PAL = \frac{\text{Annual Thermal Load of the Indoor Perimeter Zones (MJ/year)}}{\text{Floor Area of Indoor Perimeter Zones (m}^2\text{)}}$$

EC Act – Building Energy Efficiency Act
- PAL* (Perimeter Annual Load) : Standard Values -

Standard Values of PAL (MJ/m^2) for Regions in Japan

Bulding Category		Regions							
Category-1	Category-2	1	2	3	4	5	6	7	8
A. Office		480	480	480	470	470	470	450	570
B. Hotels	Guest Room	650	650	650	500	500	500	510	670
	Banquet Hall	990	990	990	1,260	1,260	1,260	1,470	1,470
C. Hospital	Patient Room	900	900	900	830	830	830	800	980
	Other Areas	460	460	460	450	450	450	440	650
D. Department Store etc.		640	640	640	720	720	720	810	1,290
E. School etc.		420	420	420	470	470	470	500	630
F. Restaurant etc.		710	710	710	820	820	820	900	1,430
G. Gathering Places	Library etc.	590	590	590	580	580	580	550	650
	Gymnasium etc.	790	790	790	910	910	910	910	1,000
	Movie Theater etc.	1,490	1,490	1,490	1,510	1,510	1,510	1,510	2,090
		(North - Cold) ←						→ (South - Warm)	
		Hokkaido					Tokyo		Okinawa

(Point)

Values depends on the climatic conditions, design features and internal thermal load .

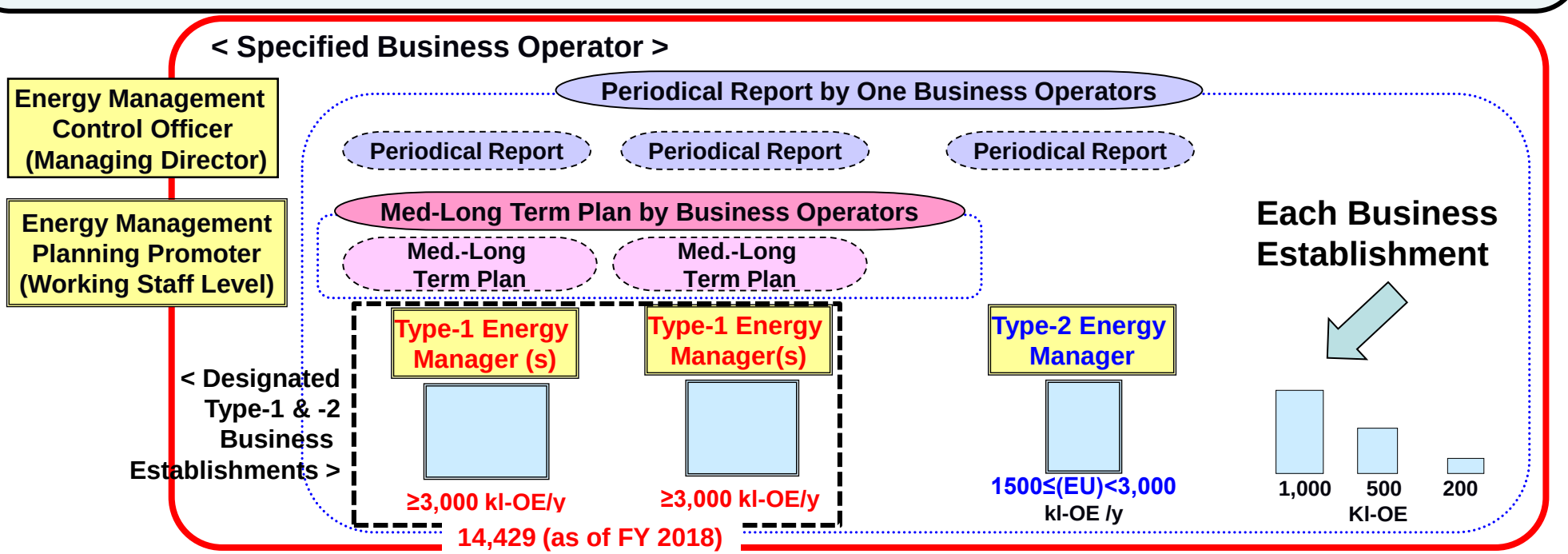
EC Act : Requirements for Energy Management for EE&C

Enhanced Regulatory System to Promote Comprehensive Energy Management by Individual Business Operators (14,429 (as of FY 2018))

- Scope 1 : Business Operators (Enterprises) Who Consume Energy Stipulated by the EC Act (≥ 1,500 kl-OE/y)
- Scope 2 : Franchise Chains to Be Equivalent to Business Operators (Regulation of Head Quarters)

Obligation : (1) Submission of the med.-long term plan and the periodical report by one business operator (enterprise)
(2) Assignment of the Energy Management Control Officer among of Managing Directors

- Continued Regulation on Energy Management for Designated Type-1 and Type-2 Factories / Business Establishments



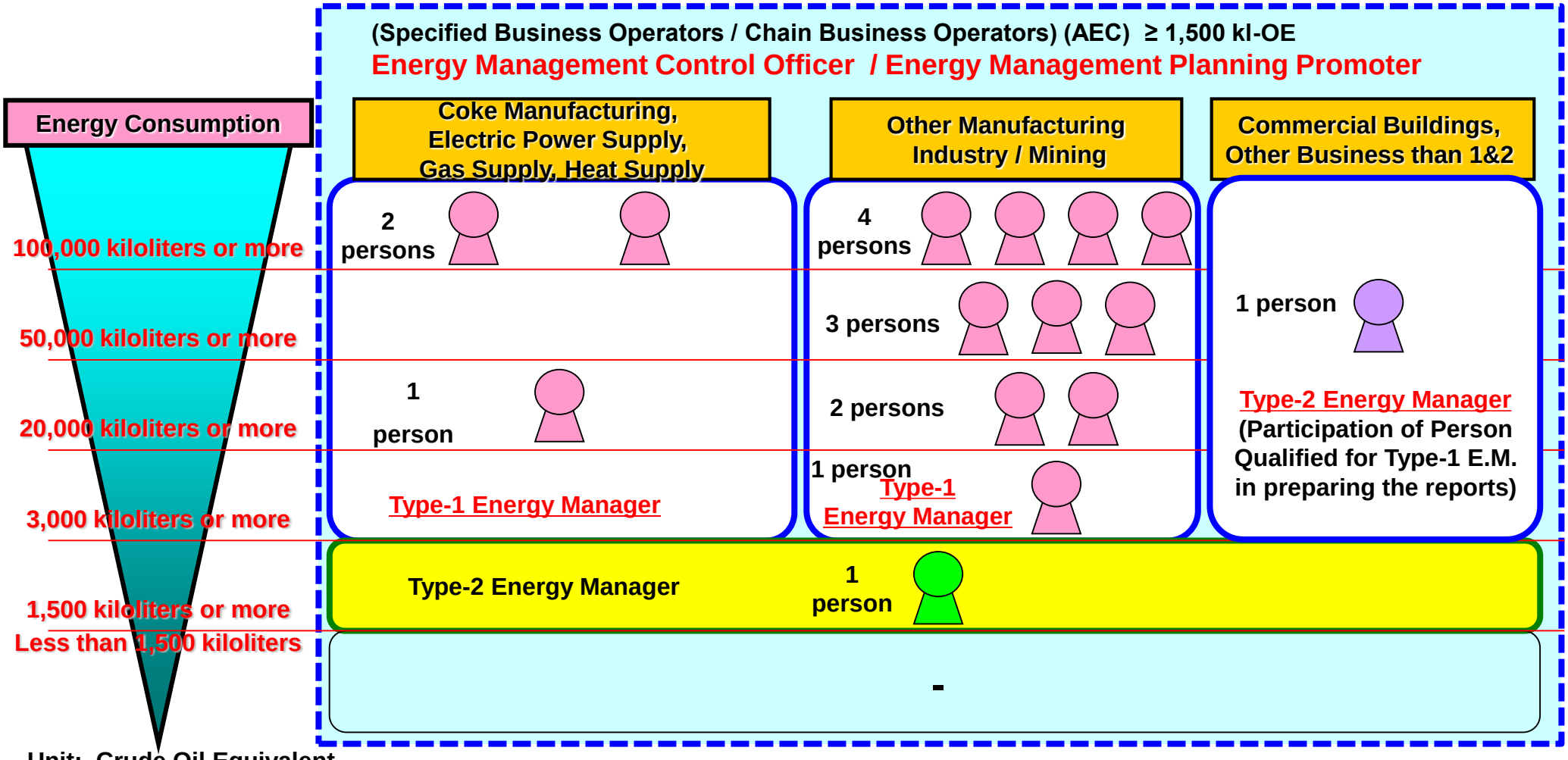
[Organization for Energy Management]

- Appointment of Energy Management Control Officer among Managing Directors by Each Business Operator
- Appointment of Type-1 / Type-2 Energy Managers by Each Designated Factory / Business Establishment

[Periodical Report / Medium-Long Term Plan] → To Be Submitted by Each Business Operator

Source : Materials by ANRE/METI

EC Act : Energy Management – Qualified Energy Managers → Required Number of Responsible Energy Managers To Assign



ECCJ

EC Act : Energy Management – Qualified Energy Managers
→ Qualification of Type-1 and Type-2 Energy Managers

For Type-1 Energy Managers

1. National Examination

- Once a year
- 1 day, 4 subjects

Examinees: 11,905 persons/year (2018)
Successful Applicants: 2,770 persons/year
(Passing rate: 23%)

2. National Training Course

- Once a year
- 6 day training & 1 day qualifying examination
- Pre-qualification : 3 years experience

Applicants: 1,208 persons/year (2018)
Successful Applicants: 676 persons/year
(Passing rate: 56%)

Exam. Subjects

General Knowledge - Common
(Basics of energy management , Global warming, Energy policy, Energy Conservation Act)

<Thermal Subjects>
Basics of thermal energy & fluid
Fuel & combustion
Thermal facilities & management

<Electrical Subjects>
Basics of electricity
Electric facilities & instruments
Application of electric power

For Type-2 Energy Managers

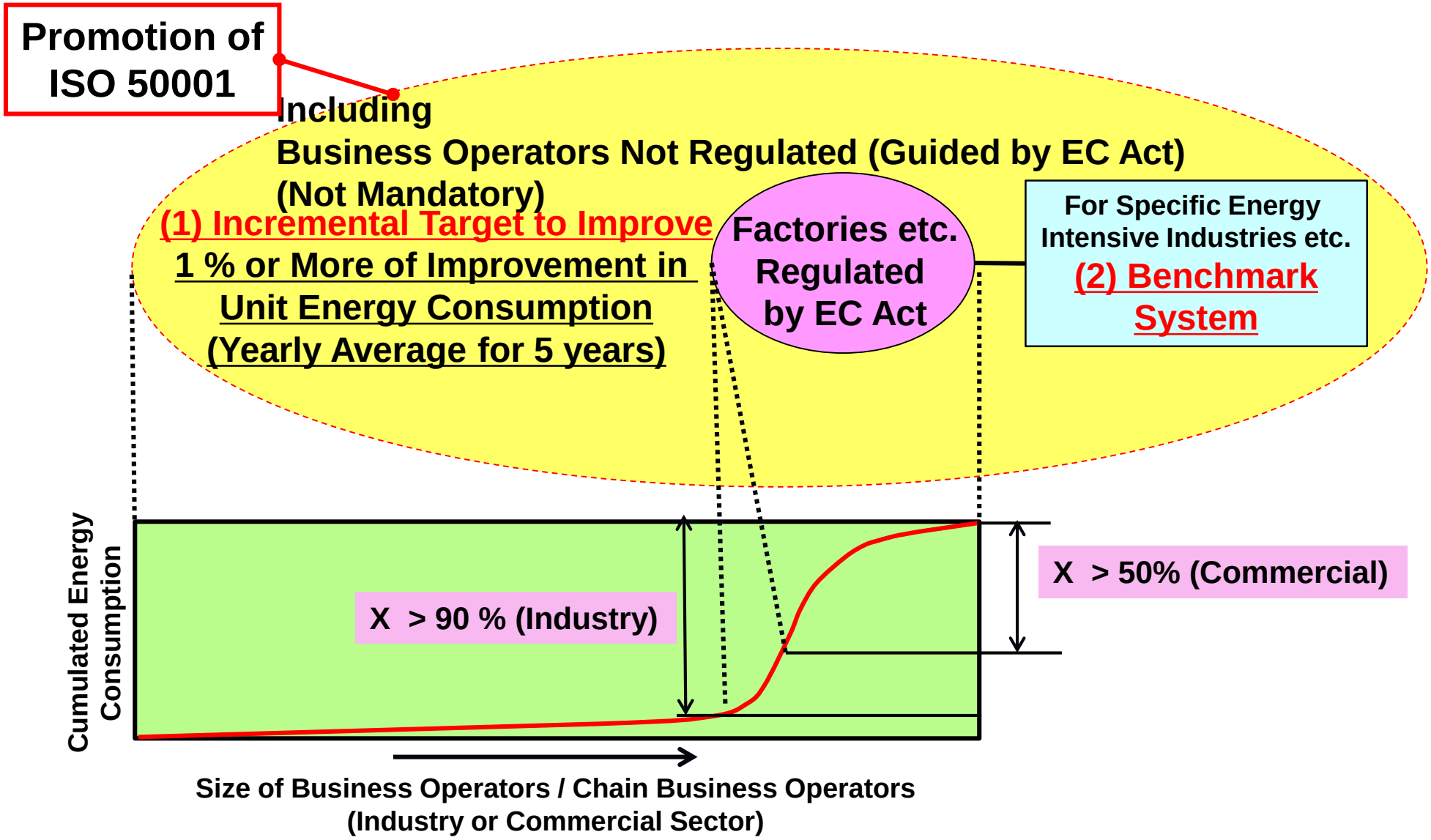
1. National Training Course

- Twice / year - 1 day training

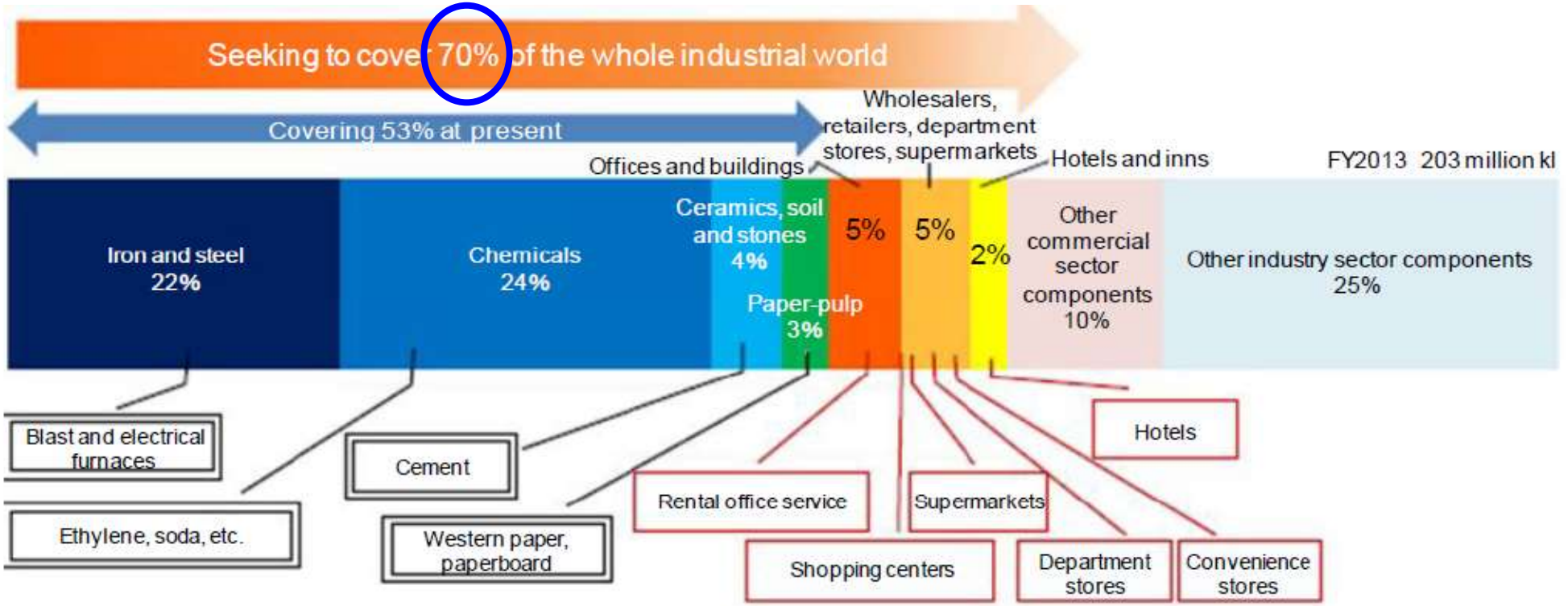
Trainees/qualified persons: Approx. 5,000 persons/year

*** ECCJ is assigned to be the embody to carry out the state examination and the training course to qualify persons to be energy managers by the government.**

EC Act : Energy Management – Energy Efficiency Targets



EC Act : Energy Management – EE Targets
- Benchmarks / Benchmarks for Commercial Sector (Buildings) -



Industry Sector ✚ **Benchmarks for Commercial Sector**

1. Convenience Store
2. Hotel
3. Department Store
4. Food Super Market
5. Shopping Center
6. Rental Office

(As of June 2019)

Source : Materials by ANRE/METI

EC Act : Energy Management – EE Targets
- Benchmarks for Building -

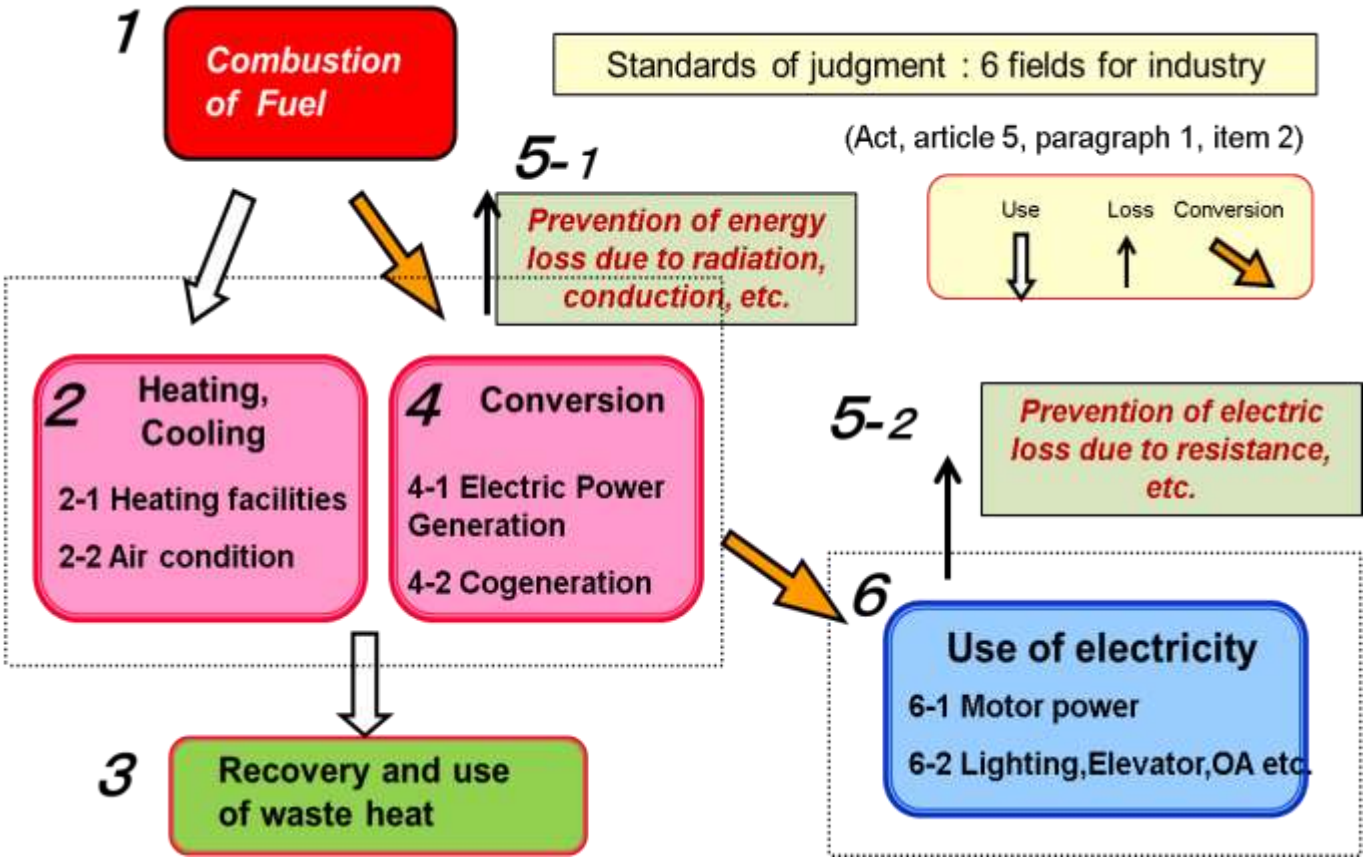
Classification	Business Field	Benchmark Indicator	Numerical Target
7	**Convenience Store**	**The value obtained by A/B** A : Total amount of electricity consumption for the store. (kWh/y) B : Annual sales amount of the store (Million JP Yen)	**845 kWh/mmYen or less**
8	**Hotel** (Facility conditions as follows : ① 0.5 or more of ratio of number of guest rooms summed the number of single rooms over 15 m^2 and double rooms over 22 m^2 vs total number of guest rooms ② there are restaurants to serve beakfast and dinner)	**The value obtained by A/B** **Average of A/B weighted by each hotel's energy consumption vs energy consumption for whole hotels** A : Total amount of energy consumption (GJ/y). B : Summation of (1) through (7) (1) 2.238 X (area of guest rooms and public area) (m^2) (2) 6.060 X (area of restaurants and pary rooms) (m^2) (3) 0.831 X (area of inhouse parking lots) (m^2) (4) 48.241 X (number of guests (capacity to stay)) (5) 32.745 X (number of employees) (6) 0.152 X (anual number of guests stayed) (7) 0.030 X (anual number of customers of restaurants and party rooms)	**0.723 or less**
9	**Department Store**	**The value obtained by A/B** A : Total amount of energy consumption (kl-OE/y). B : Summation of (1) and (2) (1) 0.0531 X (total floor area) (m^2) (2) 0.0256 X (total sales ammount) (Million JP Yen)	**0.792 or less**
10	**Super Market (Food Products)**	**The value obtained by A/B** A : Total amount of energy consumption (GJ/y). B : Summation of (1) and (2) (1) 2.543 X (total floor area) (m^2) (2) 0.684 X (annual operating hours) (hrs) (3) 5.133 X (total width (outer size) of cooling or freezing showcases) (Japanese unit - syaku)	**0.792 or less**
11	**Shopping Center**	**The average weighted by energy consumption of each facility for the values obtained by A/B for individual facilities** A : Total amount of energy consumption (kl-OE/y). B : Total floor area (m^2)	**0.0305 kl-OE/m^2**
12	**Rental Office**	**The average weighted by energy consumption of each business establishment for the potential energy saving by applying EC measures at the individual business establishments which are calculated by the evaluation tool**	**16.3% or less**

Source :
EC ACT (Japan)

ECCJ

EC Act : Energy Management
- Basic Guideline for Energy Conservation -

6 Key EC Guidelines Based on Basic Energy Flow
(Applied in Japan under the "Energy Conservation Act" – Reference)



- **Viewpoints for EC**
- **To Include in "EM "Standards" too**

Rationalization of

1. Fuel and Combustion
2. Heating, Cooling and Heat Transfer
4. Conversion of Heat to Driving
6. Conversion of Electric Power to Driving Force and Heat, etc.
3. **Recovery and Utilization** of Waste Heat
5. **Prevention** of Energy Loss by Radiation, Conduction and Resistance etc.

EC Act : Energy Management
- Specific EC Guideline for Building : Items -

EC Act : Energy Management
- EC Guideline for Building : Specific Sample (Lighting etc.) -

3. Items related to Lighting Systems, Elevators and Motive Power Facilities		
Standard Components	(1) Management & Control	A. Lighting systems shall be managed according to the instructions based on JIS Z9110 (General rules of recommended lighting levels), JIS Z9125 (Lighting of indoor work places), or their equivalent standards, which shall be described in the **EM Manual**. Dimming or turning-off the light shall be managed in a way that eliminates excessive or unnecessary lighting, which shall be described in the **EM Manual**. B. Elevators shall be operated efficiently according to the instructions concerning efficient elevator operation, which shall be described in the **EM Manual**. The efficient operation includes limiting the floors to stop in certain time slots or in certain days of the week and limiting the number of elevators in operation (if there is more than one).
	(2) Measurement & Recording	A. Illuminance of lighting systems shall be periodically measured and the results shall be recorded according to the instructions concerning measurements and records of illuminance in workplaces to be lit, which shall be described in the **EM Manual**.
	(3) Maintenance & Inspection	A. Lighting systems shall be periodically maintained and inspected according to the instructions concerning maintenance and inspection, which shall be described in the **EM Manual**. The instructions include cleaning and replacement of lighting fixtures and lamps. B. Elevators shall be periodically maintained and inspected in a way that reduces mechanical losses of their electric motors, power transmission units and machines that apply loads to the motors, which shall be described in the **EM Manual** concerning maintenance and inspection. C. Motive Power facilities of plumbing facilities and mechanical parking facilities shall be periodically maintained and inspected in a way that reduces mechanical losses of their electric motors, power transmission units and machines that apply loads to the motors, which shall be described in the **EM Manual** concerning maintenance and inspection. If a fluid machine (e.g. a pump or fan) is used as the machine that apply a load, the machine shall be periodically maintained and inspected in a way that prevents leaks of the fluid and reduces resistance of pipes and ducts, which shall be described in the **EM Manual** concerning maintenance and inspection.
Target Components		A. For lighting systems, when natural lighting can be used, selecting lighting fixtures with a dimming function and introduction of automatic control devices for lighting shall be considered. Introduction of lighting systems that is capable of properly offsetting high illuminance of a new light source (e.g. at the initial installation of the lighting system, immediately after the replacement of a light source) for power saving shall also be considered. B. Introducing light-emitting diode (LED) lighting fixtures shall be considered. C. For elevator and escalator facilities, efficient operation based on their usage shall be studied. The efficient operation includes use of a motion sensor to stop the facilities while no passenger is around.

Standard Components

Target Components

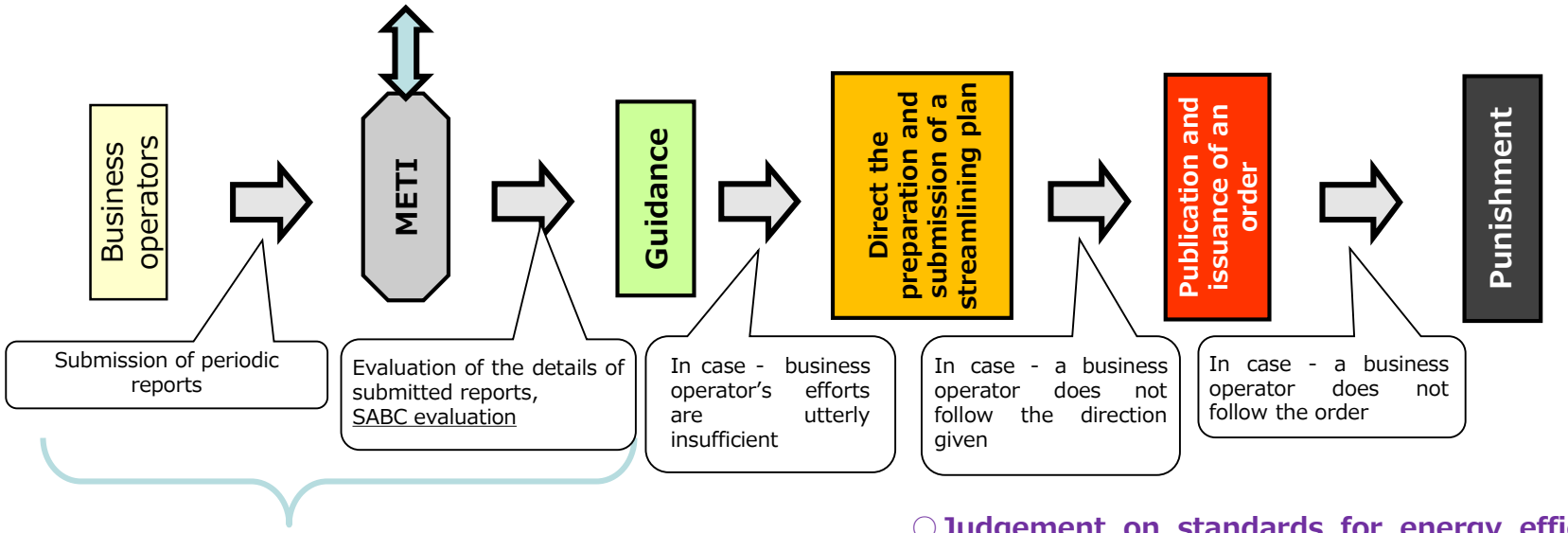
Standard Components	(4) Necessary Measures when Installing New Facilities	A. When installing a new lighting facility, elevator, etc., a proper type of the equipment shall be selected in accordance with necessary illuminance or a required transportation capacity. B. When installing a new lighting system, actions including the following shall be taken to improve efficient use of energy. (a) To consider introducing energy-conserving lighting facilities such as inverter fluorescent lamps. (b) To consider introducing energy-conserving lighting facilities such as lighting fixtures with high efficiency lamps (e.g. HID lamps). (c) To select lighting fixtures that can be easily maintained, allowing easy cleaning and light source replacement. Ease of maintenance shall also be taken into consideration for the place and method of installation. (d) To select lighting fixtures, considering factors for total lighting efficiency. The factors include illuminance efficiency of the light sources, efficiency of lighting circuits and lighting fixtures, and light radiation efficiency. (e) To consider separating lighting system circuits for places with natural lighting from others. (f) To consider measures to prevent unnecessary lighting in some places and time slots by turning the lights off or dimming. The measures include installing a motion sensor, use of timers, and interlocking with security systems. C. When installing new equipment for lighting systems that is regarded as the **Specified Energy Consuming Equipment**, a proper type of the equipment shall be selected with due consideration to the applicable performance regulation with regard to the equipment in question. D. When installing a new elevator, such actions to improve efficient use of energy shall be taken like adopting higher energy efficiency control system and/or driving system. E. When installing a new AC motor that is regarded as the Specified Energy Consuming Equipment or a new motive power facility equipped with such an AC motor, a proper type of the equipment shall be selected with due consideration to the applicable performance regulation (see table(7) for Top-Runner Standards*see footnote) with regard to the equipment in question. When installing a new AC motor that is not regarded as the Specified Energy Consuming Equipment (limited to a three-phase squirrel-cage induction motor) or a new motive power facility equipped with such an AC motor, a proper type of the equipment shall be selected with due consideration to the JIS C4212 (Low-voltage three-phase squirrel-cage high-efficiency induction motors)*see footnote.

Reference :
“Act Concerning Rational Use of Energy” in Japan

*Top-Runner Standard for high efficiency motors specifies motors in accordance with IE3, while JIS C4212 specifies motors in accordance with IE2.

EC Act : Energy Management
- Inspection System -

Check and Analyze the "Periodical Report"
- **Results of Energy Conservation**
- **Mid-Long Term Plans for Improvement**



< Matters to be stated in periodic reports >
- **Implementation status of energy efficiency measures**
- **Changes in specific energy consumption**
- **Status of the benchmark indices (for only applicable types of business)**

○ **Judgement on standards for energy efficiency measures (Matters to be observed concerning business operators' management systems and management methods of individual devices**

○ **Non-binding target (Reduction by 1% or more on an annual average basis)**

○ **Benchmark index/target levels (for several business sectors (e.g. manufacture of steel, power supply, manufacture of cement, manufacture of paper, petroleum refinery, manufacture of chemicals, and buildings)**

4. Discussion :
Direction of the “New Project”

4. Discussion : Direction of the "New Project"

4-1 Possible Application of the Concept of "Top Runner Program"

(1) Purpose

To Visualize and Disseminate the Highest Energy Efficiency (EE) of Products (Benchmarking)

(2) Possibility

- Addition of the Criterion of the Highest Energy Efficiency (EE) Level to the Existing 5 EE Levels

or

- Revision of the Criterion of Energy Efficiency for the Existing "Level A"

(3) Issue ?

The Existing S&L / Measures to Promote Sales

4. Discussion : Direction of the "New Project"

4-2 Possible Measures to Enhance Building Energy Efficiency toward ZEB

(1) Purpose : Maximization of E.E. of Buildings

Main Element of ZEB

1) Measures for EE&C (Most Important)
   - Design of Building and Facilities Equipped with Building for EE (← Energy Efficient Appliances and Equipment)
   - Energy Management and Measures for EE in Operation and Maintenance

2) Individual Generation and Supply of Energy

3) Energy Management System with Control System

4. Discussion : Direction of the "New Project"

4-2. Enhance Building Energy Efficiency toward ZEB (Continued)

(2) Possibility

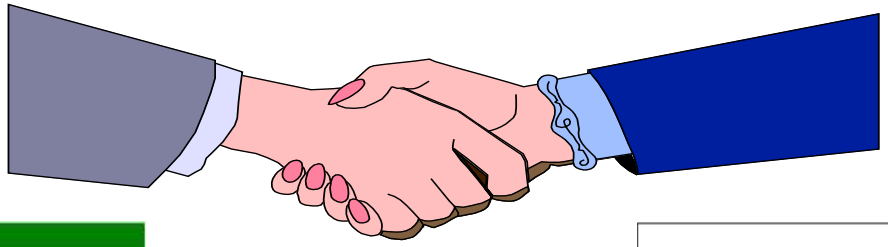
Add or Improve Policy and/or Legal Framework under the Existing EC Law to Promote EE for Buildings

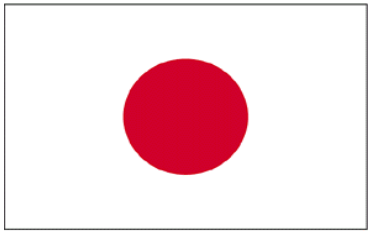
- **E.E. Codes in Designing Buildings**
- **Regulation on Energy Management in Operation and Maintenance of Buildings**

(3) Issue ?

Clarification of the Baseline (E.E. Code for Design, Guideline for Operation and Actual Situations) / Actual EE&C Promotion in Brazil

Thank you very much





For More Information

The Energy Conservation Center, Japan (ECCJ)

https://www.eccj.or.jp

Asia Energy Efficiency and Conservation Collaboration Center (AEEC)

https://www.asiaeec-col.eccj.or.jp/index.html

Japanese Business Alliance for Smart Energy Worldwide

https://www.jase-w.org/english/top/