
Energy Efficiency & Conservation and Shift to Non-fossil Energy

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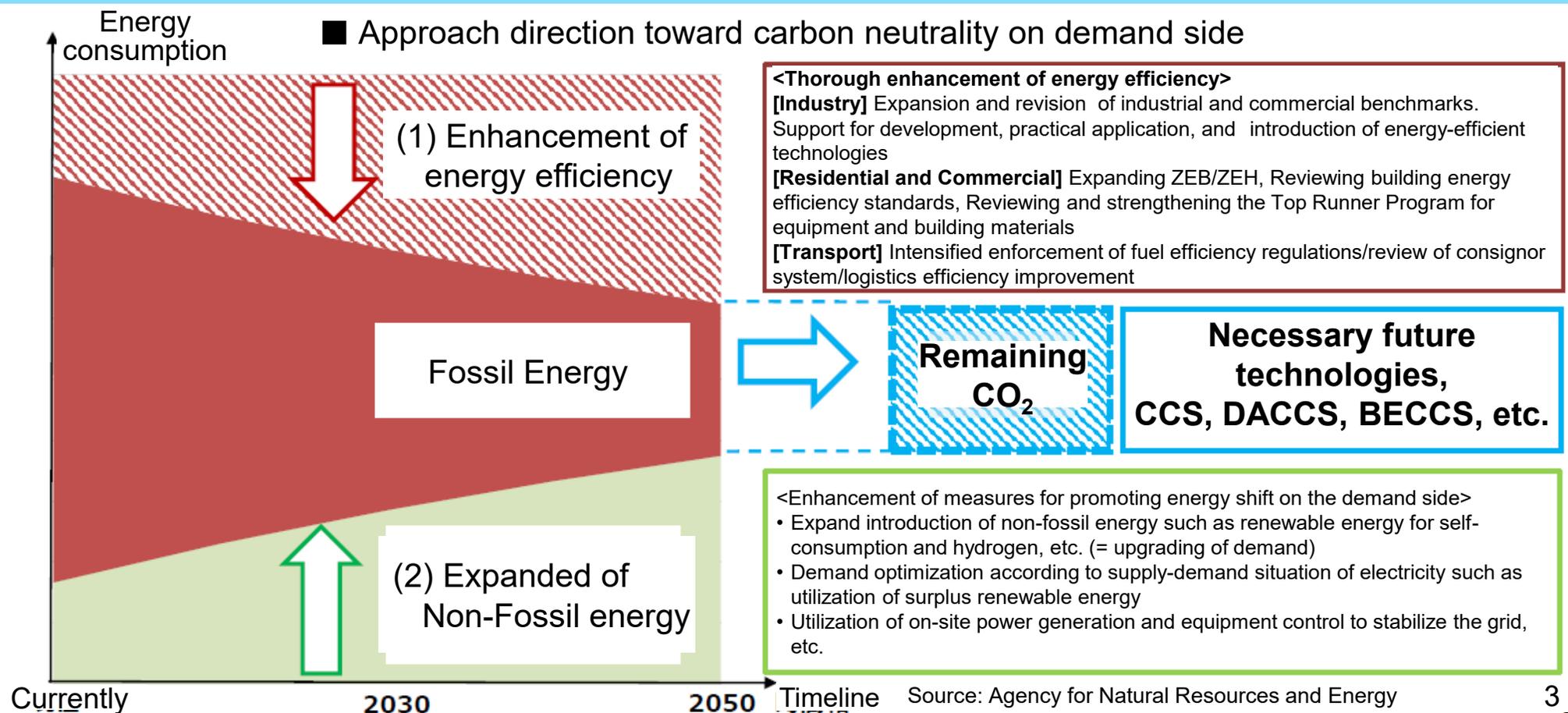
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➤ Main Reasons Why Japan Improves Energy Efficiency

- Our energy self-sufficiency rate is about 15%, having most of our energy resources dependent on import. With our past experience of oil crises, business operators deeply recognize the necessity of energy conservation.
- The EE&C Act was formulated, taking these two oil crises as an opportunity.
- Including submission of a periodical report, etc., promotion of energy efficiency & conservation (EE&C) is a measure leading to cost reduction and directly connected to management improvement for business operators.
It is also associated with requirements for applying for a subsidy.
- EE&C is recognized as a measure to preferentially promote carbon neutrality (CN). CN promotion is highly evaluated by investors, etc.
- The EE&C Act comes with penal provisions. Its intended business operators respond properly from a viewpoint of legal compliance.

[Ref.] Approach Direction toward Carbon Neutrality on Demand Side

- Based on the 2050 carbon neutrality goal, it is also **necessary to not only thoroughly improve energy efficiency (1)**, but also **enhance measures for expanded introduction of non-fossil energy (2)** such as non-fossil electricity and hydrogen toward 2030 on the way.
- To this end, **it is demanded to not only continue to review and enhance regulations based on the EE&C Act and strengthen energy efficiency measures through support measures, etc., but also strengthen measures for promoting an energy shift such as electrification and hydrogenation on the demand side based on expanded introduction of non-fossil energy on the supply side.**



1. Outline of EE&C Act (Overview)

Act on Rationalization of Energy Use and Shift to Non-fossil Energy

Officially announced on May 20, 2022

(1) Purpose of the Act

Article 1

The purpose of this Act is to contribute to securing the effective utilization of energy in accordance with economic and social conditions relating to energy in and outside Japan, such as fossil fuel constituting a substantial portion of the energy used in Japan and the growing need for the use of non-fossil energy, by taking the measures necessary for the [rationalization of energy use](#) and the [shift to non-fossil energy](#) in factories, etc., transportation, buildings, machinery and equipment, etc., and measures required for the [optimization of electricity demand](#), as well as other measures necessary for comprehensively promoting the rationalization of energy use and the shift to non-fossil energy, thereby [contributing to the healthy development of the national economy](#).

(2) Structure of the Act

**Chapter I : General Provisions
(Purpose and Definitions)**

Chapter II : Basic Policy

**Chapter III : Measures Pertaining to
Factories**

Specified business operator

Specified chain business operator

Certified managing and supervising
business operator

Management-related
business operator

- Appointment of energy management and supervision officer
- Appointment of energy management planning promoter
- Appointment of Type1 (Type 2) energy manager
- Submission of mid-long term plan report (EE&C plan, etc.)
- Periodical report (energy consumption, intensity, compliance status of EC Guideline, etc.)

**Chapter IV : Measures Pertaining to
Transportation**

Specified consignor

Certified managing and
supervising consignor

Management-
related consignor

Information on carriers omitted

**Chapter V : Measures Pertaining to
Buildings**

**Chapter VI : Measures Pertaining to
Machinery, Equipment, etc.**

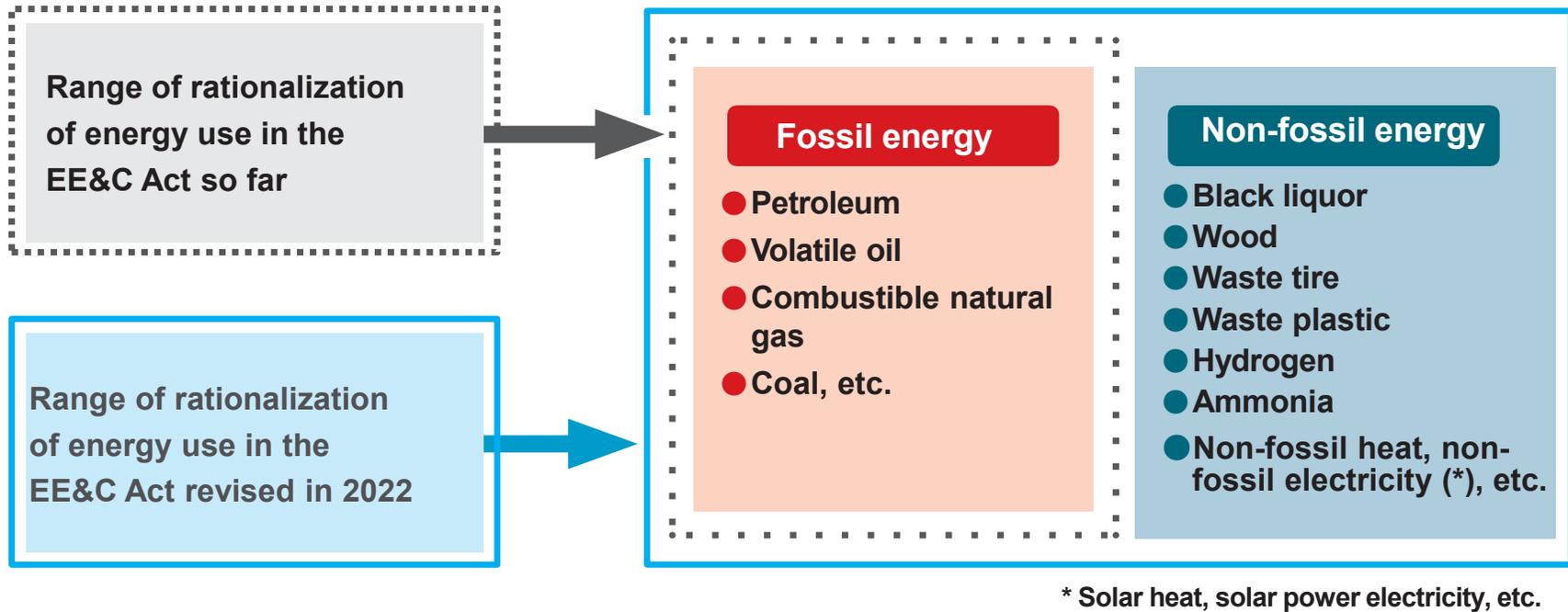
**Chapter VII : Measures Pertaining
to Electricity Providers**

**Chapter VIII : Miscellaneous
Provisions**

Chapter IX : Penal Provisions

Fig.: Structure of “Act on Rationalization of Energy Use and Shift to Non-fossil Energy” (Outline)

(3) Energies covered by the Act

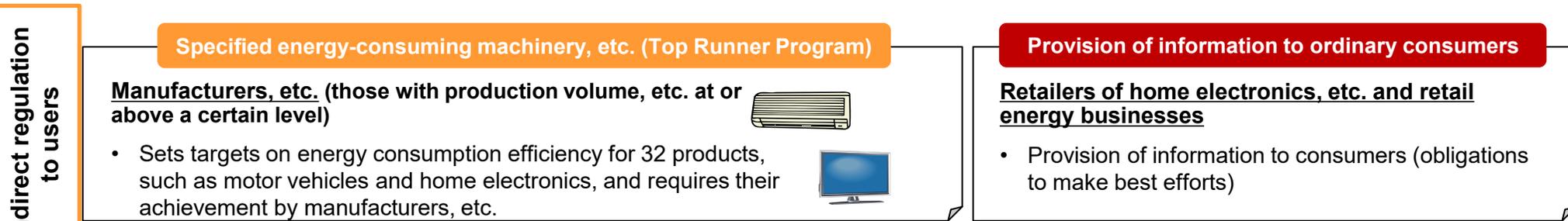
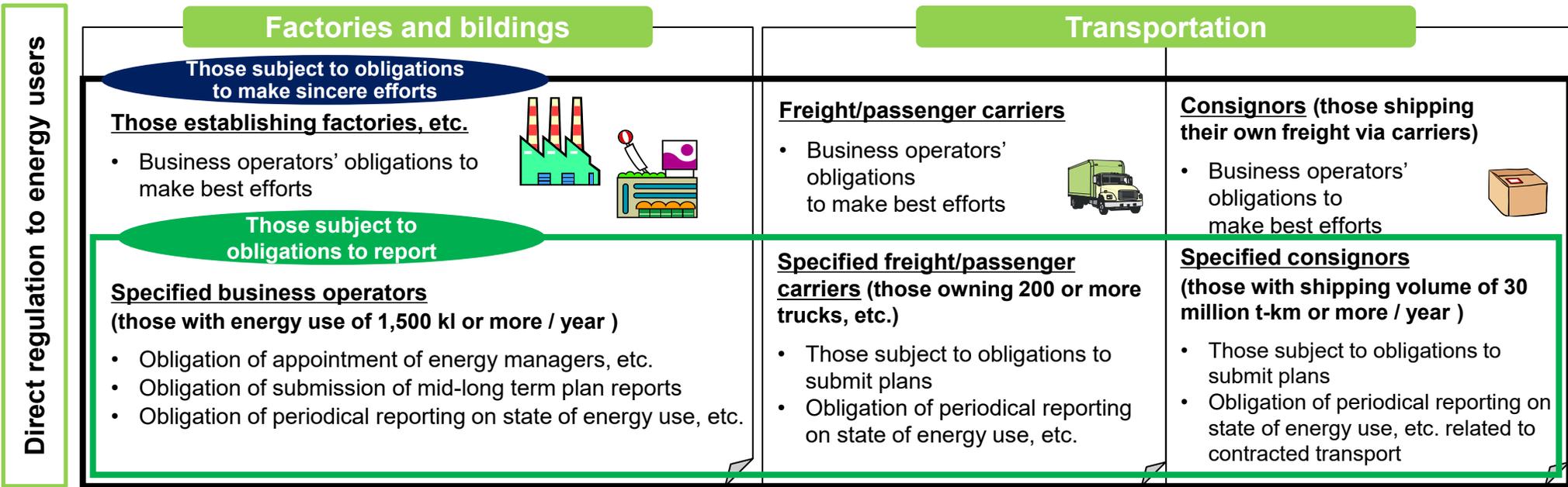


It is demanded to rationalize use of all energies.

Fig.: Energies covered by the Act

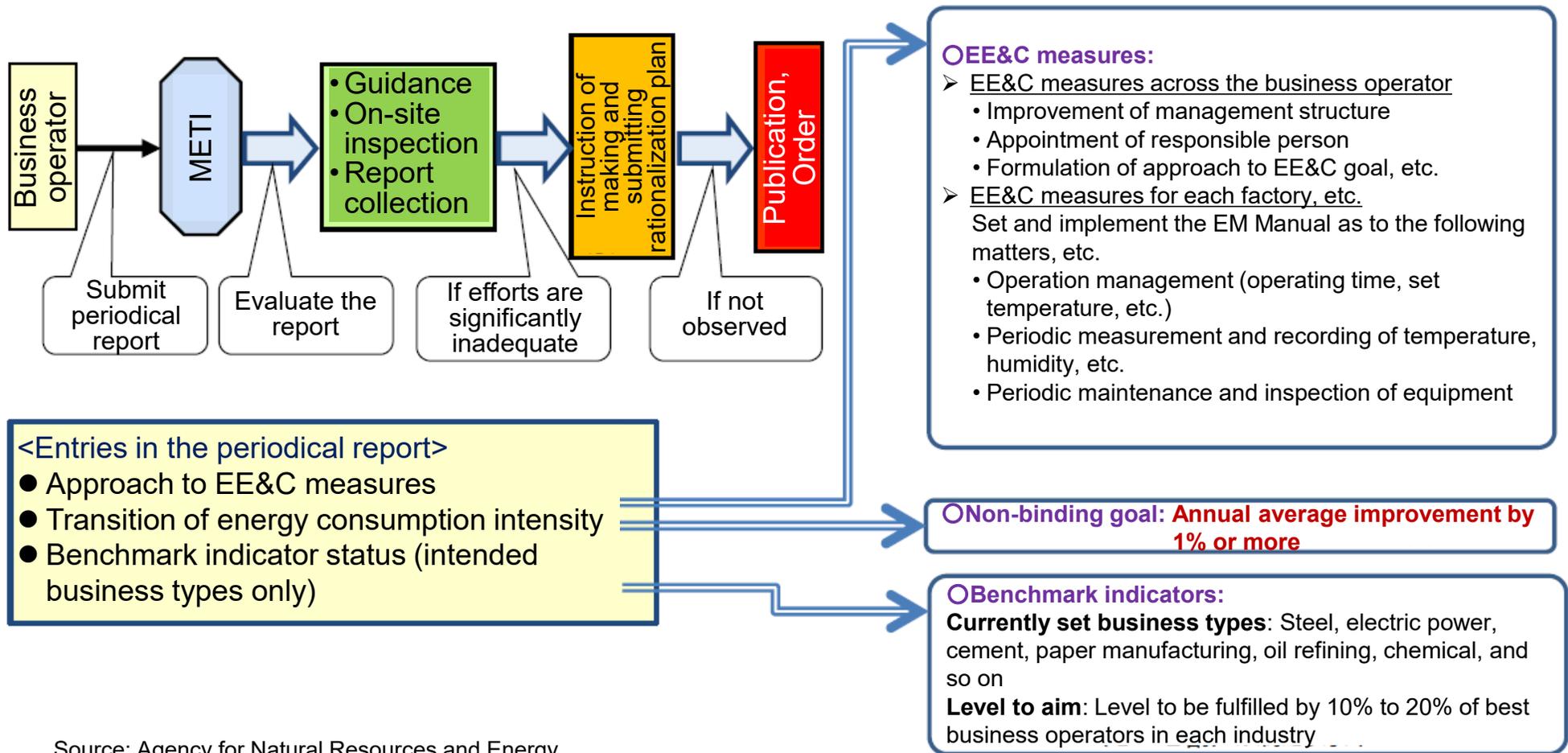
[Ref.] Outline of Act on Rationalizing Energy Use (EE&C Act)

- The EE&C Act **provides factory establishers, carriers and consignors with the EC Guideline (guideline for equipment management, improvement goal of energy consumption efficiency (annually 1%), etc.) for improving energy efficiency.** It obligates business operators above a certain scale to **report energy usage status, etc.** **If their efforts are not enough, it gives a guidance and advice or instructs them to make a rationalization plan.**
- For manufacturers^{Note)} of specified energy-consuming machinery, etc. (such as motor vehicles and home electronics), **it requires achievement of targets on machinery energy consumption efficiency and provides for issue of recommendations, etc. if efficiency improvements are inadequate.** Note) Those whose production volume, etc. is at or above certain levels.



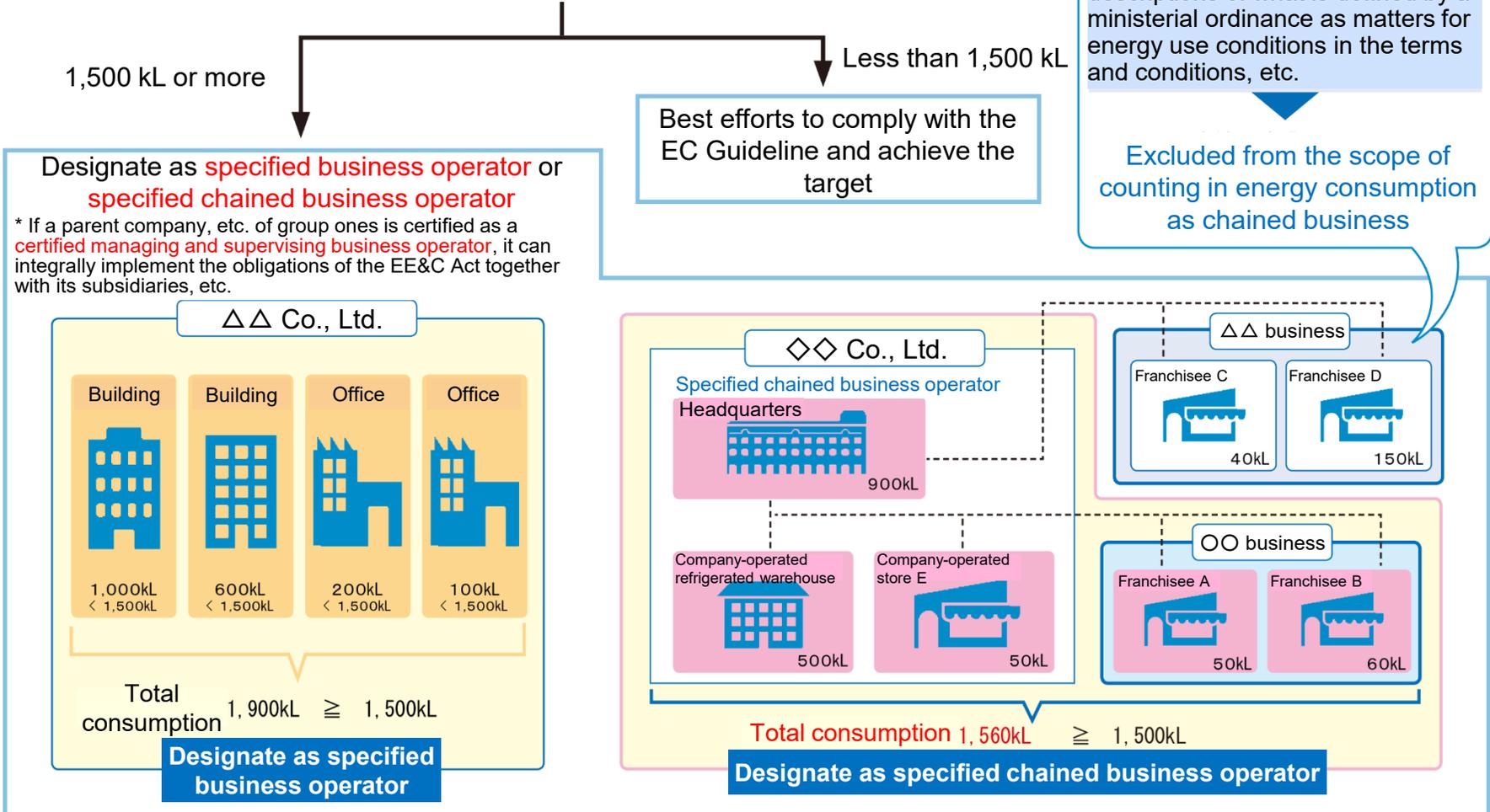
[Ref.] Outline of Regulations for Factories and Buildings

- The EE&C Act obligates **business operators with annual energy consumption of 1,500 kl or more** to **periodically report** their energy usage status, etc. Based on the periodical report, the **government evaluates their efforts**.
- One of criteria is **annual average improvement of energy consumption intensity by 1% or more**. If the **efforts are significantly inadequate in consideration of the EC Guideline for factories** (Notice of Ministry of Economy, Trade and Industry), the government will **give a guidance, conduct an on-site inspection, instruct them to make a rationalization plan, publish their names, give them an order or impose a fine**.



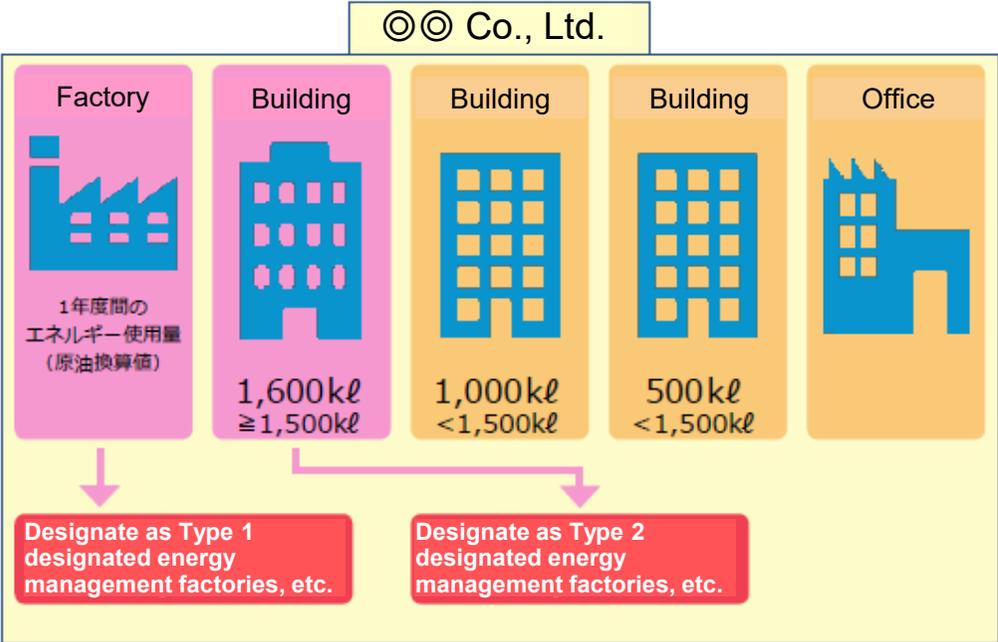
(4) Regulatory system for each business operator

Annual energy consumption (crude oil equivalent value) for each business operator and chained business operator



In case annual energy consumption in each factory or building is 1,500 kl or more in crude oil equivalent

Designate each factory or building as **Type 1 designated energy management factories, etc. (3,000 kl or more)** or **Type 2 designated energy management factories, etc. (1,500 kl to 3,000 kl)**.



(5) Duties of business operators, etc.

Table: Duties across business operator

Annual energy consumption (Crude oil equivalent (kl))		1,500 kl or more/year		Less than 1,500 kl/year
Category of business operator		Specified business operator, specified chained business operator or certified managing and supervising business operator	Management-related business operator	—
Duties of business operator	Personnel to be appointed	Energy management supervision officer and energy management planning promoter	—	—
	Documents to be submitted	Energy usage status report (only when specified) Appointment/dismissal notification of energy management supervision officer, etc. (only when appointed/dismissed) Mid-long term plan report (every year as a rule)	—	—
		Periodical report (every year) ^{Note 1)}		
	Matters to be addressed	Practice of measures defined in EC Guideline to be observed by business operator (Setting of EM Manual, practice of EE&C measures, and so on)		
Practice of measures defined in Guideline ^{Note 2)} (Fuel shift, change of operational hours, and so on)				
Business operator's goal		Energy consumption intensity of annual average of 1% or more from a mid-/long-term viewpoint or reduction of electricity demand optimization evaluation intensity		
Check by administration		Response to guidance, advice, report collection, on-site inspection or instruction to make rationalization plan (publicized or ordered if not observing)		Response to guidance and advice

Note 1) The management-related business operator must submit the certification table and designation table of the periodical report (in the case of having designated energy management factories, etc.) through the certified managing and supervising business operator.

Note 2) Guideline for business operators concerning measures contributive to optimization of electricity demand in factories, etc.

Table: Specified categories and duties for each designated energy management factory, etc.

Annual energy consumption (Crude oil equivalent (kl))	3,000 kl or more/year		1,500 kl or more/year to less than 3,000 kl/year	Less than 1,500 kl/year
Designated category	Type 1 designated energy management factories, etc. ^{Note}		Type 2 designated energy management factories, etc. ^{Note}	Not designated
Business operator category	Type 1 specified business operator		Type 2 specified business operator ^{Note}	-
		Type 1 designated business operator ^{Note}		
Business type	5 business types such as manufacturing industry (Mining, manufacturing, electricity supply, gas supply and heat supply industries) * Except for offices	Offices of left-mentioned business types Other than left-mentioned business types (Hotels, hospitals, schools, etc.)	All business types	All business types
Personnel to be appointed	Type 1 energy manager	Type 2 energy manager	Type 2 energy manager	-
Documents to be submitted	Periodical report (Necessary to fill in the designation table) Appointment/dismissal notification of energy manager, etc. (Only when appointed/dismissed)			-

(6) EC Guideline and EM Manual

(6)-1 EC Guideline

[EC Guideline for business operators relating to rationalization of energy use in factories, etc.]

I
Standard
component

I-1 Matters to be addressed by all business operators

The following 9 items (1) to (9) are provided as the matters to be addressed by the specified business operator, etc., overlooking the entire factory, etc.

- | | |
|--|--|
| (1) Formulation of approach (goal, operation, new installation and renewal of equipment) | (4) Securement of funds and human resources required for energy efficiency & conservation |
| (2) Improvement of management structure | (5) Notification of approach to employees and implementation of their energy-saving education |
| (3) Allocation of responsible persons, etc.
1) Duties of responsible person
2) Duties of responsible person's assistant
3) Duties of on-site supervisor | (6) Confirmation and evaluation of approach compliance status, and instruction to improve
(7) Periodic scrutiny and change of method to evaluate approach and compliance status
(8) Understanding of situation by document management on approach and management structure
(9) Disclosure of approach information contributive to rationalization of energy use |

I-2, 1. Basic action items for each factory and equipment

- | | |
|---|--|
| (1) Rationalization of energy use through productivity improvement | (4) Understanding, analysis, etc. of aging of existing equipment |
| (2) Equipment such as measuring instruments for energy management | (5) Introduction of high-energy efficiency equipment and optimization of allowance |
| (3) Understanding of waste heat, etc. of energy-intensive equipment | (6) Minimization of energy use |

I-2, 2. Items related to the energy-consuming equipment, etc.

2-1 Offices: To standardize the measures for management, measurement, recording, maintenance, inspection, new installation and renewal of main equipment

- | | |
|---|---|
| (1) Air conditioning equipment, ventilation equipment | (5) Exclusive power generation equipment, co-generation equipment, solar power generation equipment, etc. |
| (2) Boiler equipment, water heating equipment, solar heat utilization equipment, etc. | (6) Office equipment, consumer equipment |
| (3) Lighting equipment, elevators, power equipment | (7) Commercial equipment |
| (4) Power receiving/transforming equipment, BEMS | (8) Others |

2-2 Factories, etc.: To standardize the measures for management, measurement, recording, maintenance, inspection, new installation and renewal of each process related to energy use

- | | |
|---|--|
| (1) Rationalization of fuel combustion | (4) Rationalization of heat conversion to power, etc. |
| (2) Rationalization of heating, cooling and heat transfer | (5) Prevention of energy losses due to radiation, conduction, resistance, etc. |
| (3) Waste heat recovery and use | (6) Rationalization of electricity conversion to power, heat, etc. |

➤ Reference for formulating the mid-long term plan report

<First part>

- To provide the matters for the specified business operators, etc. to systematically address by making efforts in the medium to long term.
 - Efforts to annually reduce energy consumption intensity or electricity demand optimization evaluation intensity by 1% or more on the average in the medium and long term as an entire established factory or for each factory, etc.
 - Efforts to achieve the benchmark
 - Consideration to utilize ISO 50001

1-1 Offices: To provide the items for the business operators to consider and implement for main equipment.

- | | |
|--------------------------------|-----------------------------|
| (1) Air conditioning equipment | (5) Lighting equipment |
| (2) Ventilation equipment | (6) Elevators |
| (3) Boiler equipment | (7) BEMS |
| (4) Water heating equipment | (8) Co-generation equipment |
| | (9) Electric equipment |

1-2 Factories, etc.: To Provide the items for the business operators to consider and implement for main equipment

- | | |
|--|---|
| (1) Fuel equipment | (5) Electric equipment |
| (2) Utilization of the natural heat (*) and waste heat | (6) Air conditioning equipment, water heating equipment, ventilation equipment, elevators |
| (3) Waste heat recovery equipment | (7) Lighting equipment |
| (4) Co-generation equipment | (8) FEMS (* Except for solar heat, geothermal heat, hot spring heat and snow and ice heat |

2. Other items related to rationalization of energy use

- | | |
|---|---|
| (1) Consideration for efficient utilization of heat energy | (4) Utilization of energy service providers |
| (2) Utilization of unused energy, renewable energy, etc. | (5) Utilization of IoT, AI, etc. |
| (3) Approach to collaborative energy efficiency improvement | (6) Utilization of tools and means related to rationalization of energy use |

To provide the points to note so that the measures for shift to non-fossil energy will not greatly obstruct the effects of the measures for rationalization of energy use.

II
Target
component

III
Harmonization
provisions

[EC Guideline for business operators relating to shift to non-fossil energy in factories, etc.]

I-1 Matters to be addressed by all business operators

The following 7 items (1) to (7) are provided as the matters to be addressed by the specified business operator, etc., overlooking the entire factory, etc.

(1) Formulation of approach (goals, matters to be addressed)

(2) Improvement of management structure

(3) Securement of funds and human resources required for shift to non-fossil energy

(4) Confirmation and evaluation of approach compliance status, and instruction to improve

(5) Periodic scrutiny and change of method to evaluate approach and compliance status

(6) Understanding of situation by document management on approach and management structure

(7) Disclosure of approach information contributive to rationalization of energy use

I-2 Matters to be addressed in factories, etc.

(1) Offices: Basic action items to be addressed for fuel, heat, electricity, etc.

1-1 Items for fuel: Selection of equipment suitable for use of non-fossil fuel and higher use ratio of non-fossil fuel

1-2 Items for heat: Selection of equipment suitable for use of non-fossil heat, higher use ratio of non-fossil heat, procurement of heat with high non-fossil ratio, and utilization of heat certificate, etc.

1-3 Items for electricity: Selection of equipment suitable for use of non-fossil electricity, procurement of electricity with high non-fossil ratio, and utilization of electric power certificate, etc.

1-4 Other items: Technological development and demonstration experiments contributive to shift to non-fossil energy.

(2) Factories, etc.: Basic action items to be addressed for fuel, heat, electricity, etc.

1-1 Items for fuel: Selection of equipment suitable for use of non-fossil fuel and higher use ratio of non-fossil fuel

1-2 Items for heat: Selection of equipment suitable for use of non-fossil heat, higher use ratio of non-fossil heat, procurement of heat with high non-fossil ratio, and utilization of heat certificate, etc.

1-3 Items for electricity: Selection of equipment suitable for use of non-fossil electricity, procurement of electricity with high non-fossil ratio, and utilization of electric power certificate, etc.

1-4 Other items: Technological development and demonstration experiments contributive to shift to non-fossil energy.

● To provide the matters for the specified business operators, etc. to systematically address by making efforts in the medium to long term.

- Setting of the target for a non-fossil energy ratio of the usage of electricity supplied from others and self-generated electricity

- Setting of the target for the government-defined level indicator as a guide

- Setting of other targets for indicators in consideration of characteristics of business types, peculiar circumstances, etc.

(Remarks) 1. Method to calculate a non-fossil energy amount

2. Types, etc. of available certificates, etc.

To provide the points to note so that the measures for shift to non-fossil energy will not greatly obstruct the effects of the measures for rationalization of energy use.

I
Standard
component

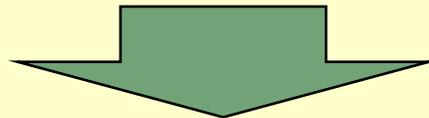
II
Target
component

III
Harmonization
provisions

(6)-2 Legal position of EM Manual

“**Basic Policy** for Rationalization of Energy Use and Shift to Non-fossil Energy”
1-1 (1)-6. **Set the EM Manual** for operation, maintenance, inspection of energy-consuming equipment and other items, and perform management in compliance with the Manual.

“**EC Guideline for Rationalization of Use**”
Concerning management, measurement, recording, maintenance and inspection of energy-consuming equipment, the EC Guideline for Rationalization of Use defines the “items to be implemented by **setting the EM Manual**”.



The “**EM Manual**” is a “manual provided by the business operators themselves as to **management, measurement, recording, maintenance and inspection** of the energy-consuming equipment in order to rationalize energy use”.

(1) Management of fuel combustion

- a. To manage fuel combustion, set the **EM Manual** for **air ratio** according to fuel-combusting equipment (referred to as the “combustion equipment”) and the type of fuel used.
- b. Set the EM Manual so as to lower the air ratio on the **basis of the air ratio values listed in Table 1 (A).**
- c. When using multiple combustion equipment, set the EM Manual so as to increase thermal efficiency across the entire combustion equipment (of input heat quantity, a ratio of heat quantity used for increasing the value added of an intended object; same hereinafter) and adjust combustion loads of respective combustion equipment.
- d. When combusting a fuel, set the EM Manual for operating conditions so as to increase combustion efficiency according to the properties such as fuel granularity, moisture and viscosity, and operate the equipment appropriately.

(2) Measurement and recording on fuel combustion

For each combustion equipment, understand a **fuel supply rate, exhaust gas temperature along with combustion, remaining oxygen amount in exhaust gas and other fuel combustion condition** and set the **EM Manual** for measurement and recording of the items required for improvement. Based on the Manual, measure these items periodically and record their results.

(3) Maintenance and inspection of the combustion equipment

Set the **EM Manual** for maintenance and inspection of the combustion equipment and conduct periodic maintenance and inspection based on the Manual to maintain the equipment in good condition.

(4) Measures for new installation and renewal of the combustion equipment

- a. When newly installing or renewing the combustion equipment, select it according to a required load.
- b. When newly installing or renewing the combustion equipment, use combustion tools such as a burner compatible with the types of the combustion equipment and fuel and capable of **adjusting a fuel supply rate and an air ratio according to fluctuations of the load and combustion condition.**
- c. When newly installing or renewing the combustion equipment, use a ventilator capable of adjusting a ventilation rate and a pressure in a combustion chamber.

System of Regulations for Energy Management

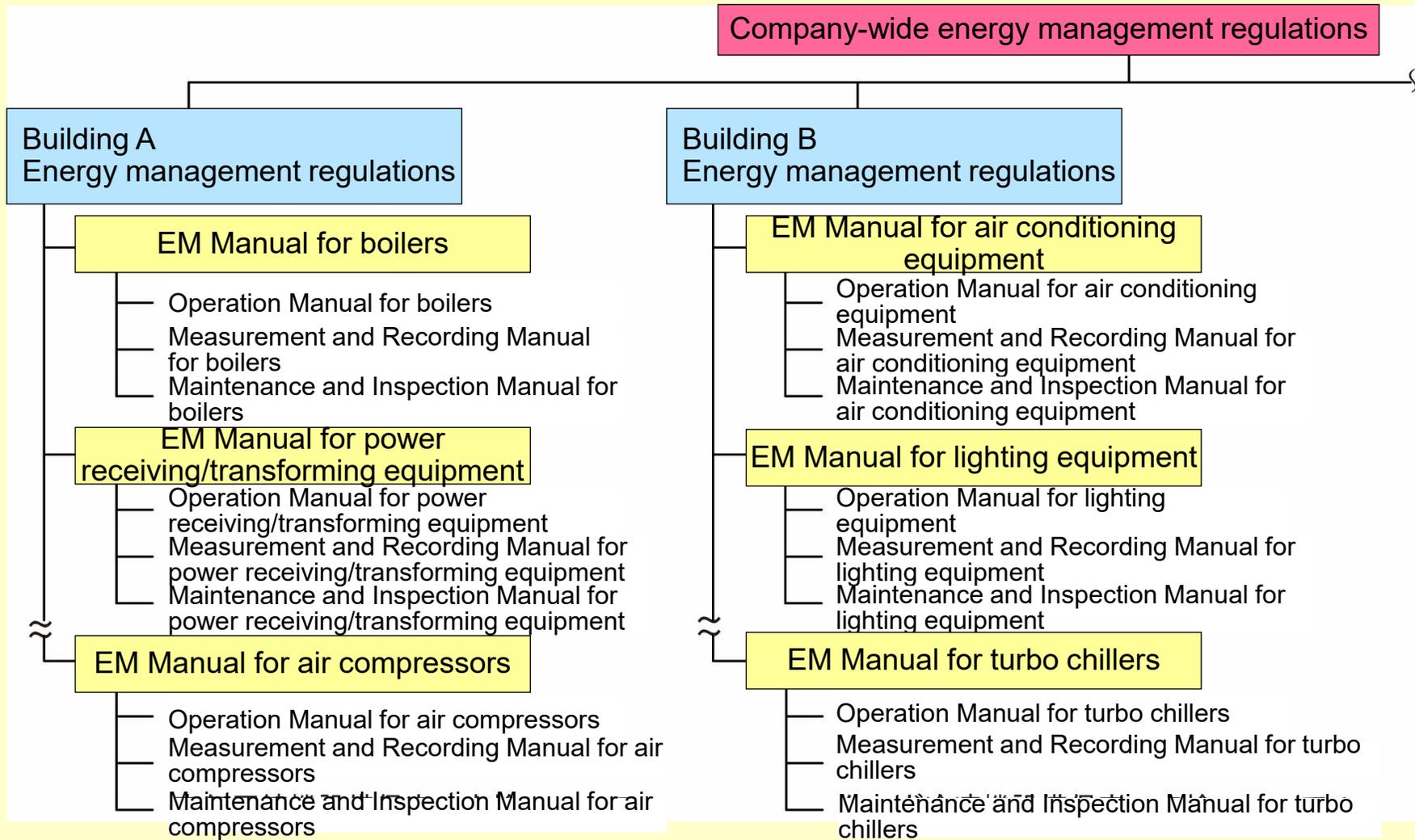


Fig.: Sample system of regulations for EM Manual

Details of EM Manual (Example)

EM Manual based on “EE&C Act”	EM Manual for air conditioning equipment	Ref. No.	5	
		Page	1/2	
<p>1. Purpose This EM Manual provides the measures for management, measurement, recording, maintenance, inspection, new installation and renewal in order to properly manage the air conditioning equipment of Tamachi Building and rationalize energy use.</p> <p>2. Scope The Manual applies to the air conditioning equipment of Tamachi Building.</p>				
Item	Description	EC Guideline No.	Management criterion	Refer to
Operation management	<p>1. For air conditioning of an office, etc., limit a target section, reduce a load by managing blinds, etc., and set equipment operating hours, temperature, ventilation frequency, humidity, etc. according to the usage status to avoid excessive air conditioning.</p> <p>(1) Set a summer cooling temperature and a winter heating temperature to the government-recommended ones.</p> <p>(2) In the interim period, stop air conditioning and mainly perform outside air cooling.</p> <p>(3) Shorter air conditioning time</p> <p>1) When starting daily work: Start operation in consideration of indoor and outdoor temperatures.</p> <p>2) When ending daily work: Stop operation before ending daily work. Air conditioning during overtime work shall be permitted on an application basis.</p> <p>(4) In case an outside air intake function is provided</p> <p>1) Adjust an outside air volume within a range of securing an indoor CO₂ density at 1,000 ppm or lower.</p> <p>2) When starting daily work, shut out the outside air during precooling/preheating.</p> <p>(snip)</p>	(1), 1), a,	<p>Set temperature and humidity for each section. Summer: 28°C Winter: 20°C</p> <p>Air conditioning start time Summer/winter: XX:XX Interim period: XX:XX CO₂ density: 800 ppm to 1,000 ppm</p>	Operation and Management Manual for air conditioning equipment

[Ref.] Entries in the periodical report (Designation – Table 8)

2-1 Compliance status of EC Guideline in factories, etc. (Except for those exclusively for offices and other similar purposes) (Related to Act, Article 5, Paragraph 1, Item 2)

Intended item (Equipment)	Operation management, etc.	Measurement and recording	Maintenance and inspection	Measure for new installation and renewal
(1) Rationalization of fuel combustion	Fuel combustion management	Measurement and recording for fuel combustion	Maintenance and inspection of fuel equipment	Measure for new installation and renewal of combustion equipment
	Setting of EM Manual <input type="checkbox"/> Already set <input type="checkbox"/> Partially set (%) <input type="checkbox"/> Not set	Setting of EM Manual for measurement and recording <input type="checkbox"/> Already set <input type="checkbox"/> Partially set (%) <input type="checkbox"/> Not set	Setting of EM Manual for maintenance and inspection <input type="checkbox"/> Already set <input type="checkbox"/> Partially set (%) <input type="checkbox"/> Not set	<input type="checkbox"/> Measure taken as per EC Guideline at new installation and renewal time <input type="checkbox"/> Measure not taken as per EC Guideline at new installation and renewal time <input type="checkbox"/> Equipment not newly installed or renewed in relevant fiscal year
	Management defined in EM Manual <input type="checkbox"/> Implemented <input type="checkbox"/> Partially implemented <input type="checkbox"/> Not implemented	Implementation of measurement and recording defined in EM Manual <input type="checkbox"/> Implemented <input type="checkbox"/> Partially implemented <input type="checkbox"/> Not implemented	Implementation of maintenance and inspection defined in EM Manual <input type="checkbox"/> Implemented <input type="checkbox"/> Partially implemented <input type="checkbox"/> Not implemented	
(2) Rationalization of heating, cooling and heat transfer				
(2-1) Heating equipment, etc.	Management of heating, cooling and heat transfer	Measurement and recording for heating, etc.	Maintenance and inspection of heating equipment, etc.	Measure for new installation and renewal of heating equipment, etc.
	Setting of EM Manual <input type="checkbox"/> Already set <input type="checkbox"/> Partially set (%) <input type="checkbox"/> Not set	Setting of EM Manual for measurement and recording <input type="checkbox"/> Already set <input type="checkbox"/> Partially set (%) <input type="checkbox"/> Not set	Setting of EM Manual for maintenance and inspection <input type="checkbox"/> Already set <input type="checkbox"/> Partially set (%) <input type="checkbox"/> Not set	<input type="checkbox"/> Measure taken as per EC Guideline at new installation and renewal time <input type="checkbox"/> Measure not taken as per EC Guideline at new installation and renewal time <input type="checkbox"/> Equipment not newly installed or renewed in relevant fiscal year
	Management defined in EM Manual <input type="checkbox"/> Implemented <input type="checkbox"/> Partially implemented <input type="checkbox"/> Not implemented	Implementation of measurement and recording defined in EM Manual <input type="checkbox"/> Implemented <input type="checkbox"/> Partially implemented <input type="checkbox"/> Not implemented	Implementation of maintenance and inspection defined in EM Manual <input type="checkbox"/> Implemented <input type="checkbox"/> Partially implemented <input type="checkbox"/> Not implemented	

(7) Evaluation system for business operators classification

The evaluation system for business operators classification is designed to classify the specified business operators, who submit the periodical reports, into **4 classes of S, A, B and C** and respond to them in a well-balanced manner according to the classes.

The business operators, who have achieved their effort target or benchmark target, are classified into Class S as excellent business operators and published by business type.

<p style="text-align: center;">Class S</p> <p>Business operators with excellent energy efficiency (Those clearing the goals)</p>	<p style="text-align: center;">Class A</p> <p>Business operators expected to make further efforts for energy efficiency (Those not clearing the goals)</p>	<p style="text-align: center;">Class B</p> <p>Business operators with stagnant energy efficiency (Those not clearing the goals)</p>	
<p>[Level]</p> <ol style="list-style-type: none"> <u>Achieving Effort target</u>*1 Or <u>Achieving benchmark target</u>*2 <p>[Response]</p> <p>Publish their names and the number of consecutive years achieved at the website of the Ministry of Economy, Trade and Industry as excellent business operators.</p>	<p>[Level]</p> <p>Business operators whose energy efficiency level is higher than Class B, but not reaching the Class S level.</p> <p>[Response]</p> <p>Deliver information on EE&C support measures, etc. by e-mail to promote achievement of the non-binding goals.</p>	<p>[Level]</p> <ol style="list-style-type: none"> <u>Not achieving the non-binding goals</u>*1 and <u>higher intensity than the previous fiscal year for most recent 2 years running</u> Or <u>5-year average intensity increasing by over 5%</u> <p>[Response]</p> <p><u>Send a warning letter and conduct a field survey, etc. intensively.</u></p>	<p style="text-align: center;">Class C</p> <p>Attention-required business operators (Those not clearing the goals)</p> <p>[Level]</p> <p><u>EC Guideline compliance status particularly poor</u> among Class B business operators</p> <p>[Response]</p> <p>Give a guidance based on the <u>EE&C Act, Article 6.</u></p>

*1: Effort target: To reduce the 5-year average intensity by 1% or more annually.

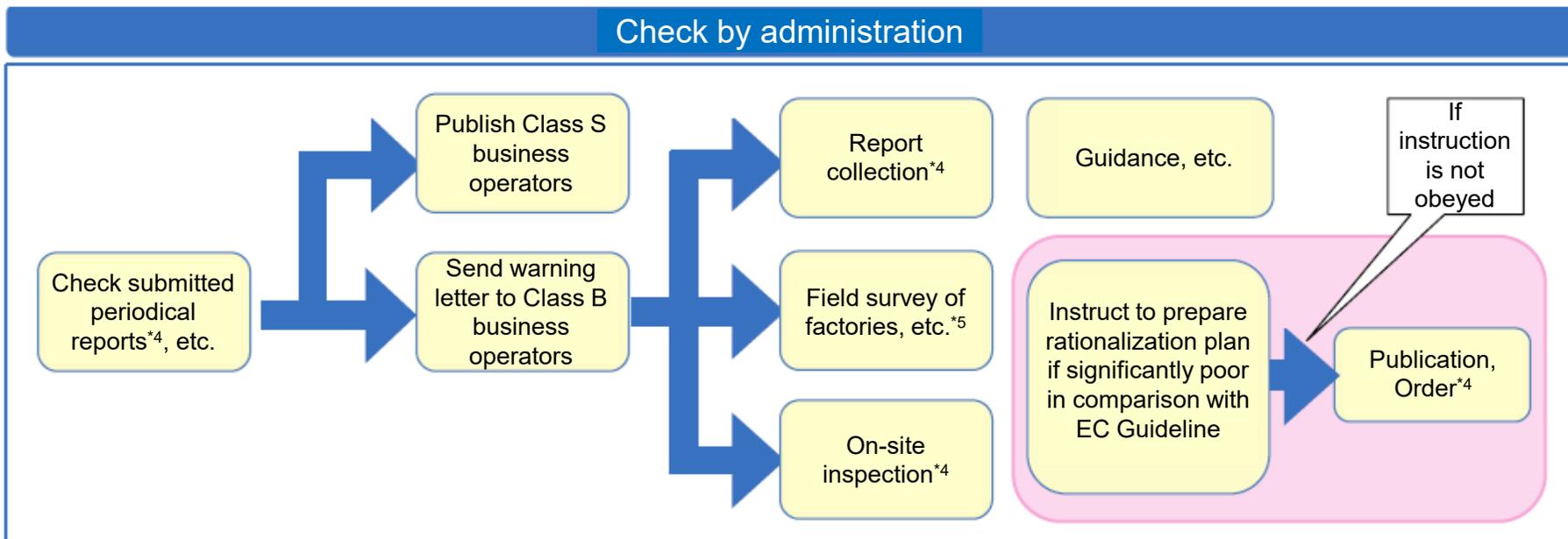
*2: Benchmark target: Mid-long term target level for business operators in the intended business types and fields of the benchmark system.

Levels to be aimed at in the med-long-term in business types and fields covered by the Benchmark System

*3: The business operators with late submission of the periodical reports and mid-long term plan reports may be excluded from Class S business assessments and preferential treatments.

In order to confirm the transitions of the EC Guideline compliance status, energy consumption intensity and electricity demand optimization evaluation intensity as to the Class B business operators, there may be “report collection”, “on-site inspection” and “field survey of factories, etc.” If the EC Guideline compliance status is determined poor as a result of report collection, field survey of factories, etc. or on-site inspection, they will be classified into Class C (attention-required business operators) and subjected to a guidance, etc.

If the rationalization status of energy use is significantly poor in comparison with the EC Guideline, they will be instructed to prepare a “rationalization plan”.



***4: If a business operator fails to submit the periodical report or a report related to report collection, makes a false report or refuses, obstructs or avoids the on-site inspection, it will be fined for ¥500,000 or less. If it fails to obey the order, it will be fined for ¥1,000,000 or less.**

***5: The field survey of factories, etc. is designed to thoroughly rationalize energy use by visiting a specified business operator to survey and confirm the rationalization status of energy use, and so on. The survey is entrusted by the Agency for Natural Resources and Energy.**

(8) Outline of the field survey of factories, etc.

From among the specified business operators, etc. designated based on the EE&C Act, visit the factories, etc. of those classified into the “Class B (those stagnant in energy efficiency improvement)” according to the evaluation system for business operators classification, concerning the following items, thereby deepening their understanding of rationalization of energy use to improve energy efficiency comprehensively.

- Compliance with the “EC Guideline for the business operators on rationalization of energy use in the factories, etc.”
- Factors for deterioration of the energy intensity
- Approach to energy efficiency and conservation, etc.

The field survey has been entrusted to ECCJ as a national project, surveying about 200 business operators annually these several years.

(9) Outline of the benchmark system

The benchmark system is designed to **use a common indicator across the business type to evaluate** the EE&C status of the business operators and aim at achieving the **goal (target level)** of each business operator to promote approach to energy efficiency and conservation.

<Significance of introducing the benchmark system>

- The business operators, whose approach to energy efficiency and conservation has not been adequately evaluated with a conventional indicator (1% or more reduction) alone, **can now receive adequate evaluation of energy efficiency and conservation** by using the benchmark indicator.
- The **business operator's approach to energy efficiency and conservation can be objectively grasped** owing to evaluation based on the common indicator across the business type.

3 factors required for establishing the benchmark system

1. Business

Set an industry/business type consuming energy by the same or very similar method.

2. Benchmark indicator

Evaluation indicator to be commonly set for intended business operators. Set it in consideration of peculiarity of intended business.

3. Target level

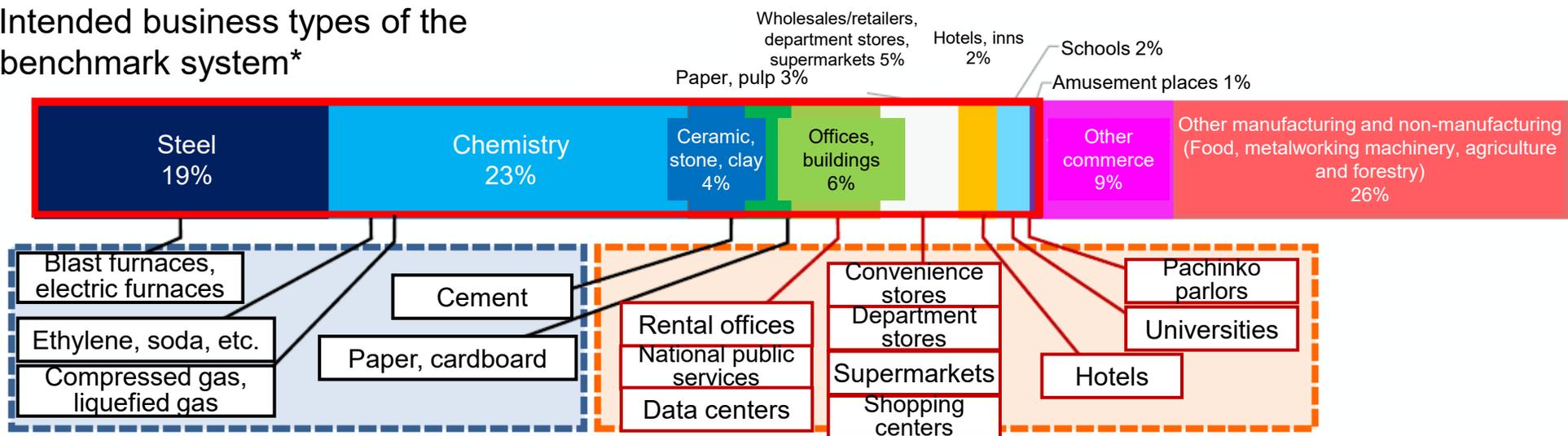
Set a mid-long term high level to be aimed at by intended business operators (upper 10% to 20% of intended business type).

Business	Benchmark indicator	Target level
Steel industry by blast furnace	Energy consumption (kl) / crude steel volume (t)	0.531 kl/t or lower

Intended business types of the benchmark system

- The system has been introduced into the manufacturing industry with high energy consumption since FY2009, gradually expanding its scope; now covering **7 business types in the industry sector (12 categories)** and **10 business types in the commercial sector (11 categories)**.
- The business operators, who have achieved the target level, are published as excellent energy efficiency business operators*.

Intended business types of the benchmark system*



* Report results of the benchmark indicators based on the Act on Rationalization of Energy Use and Shift to Non-fossil Energy (http://www.enecho.meti.go.jp/category/saving_and_new/benchmark/)

Source: Prepared by secretariat from the EDMC 2025 edition

* The total is below 100% due to rounding.

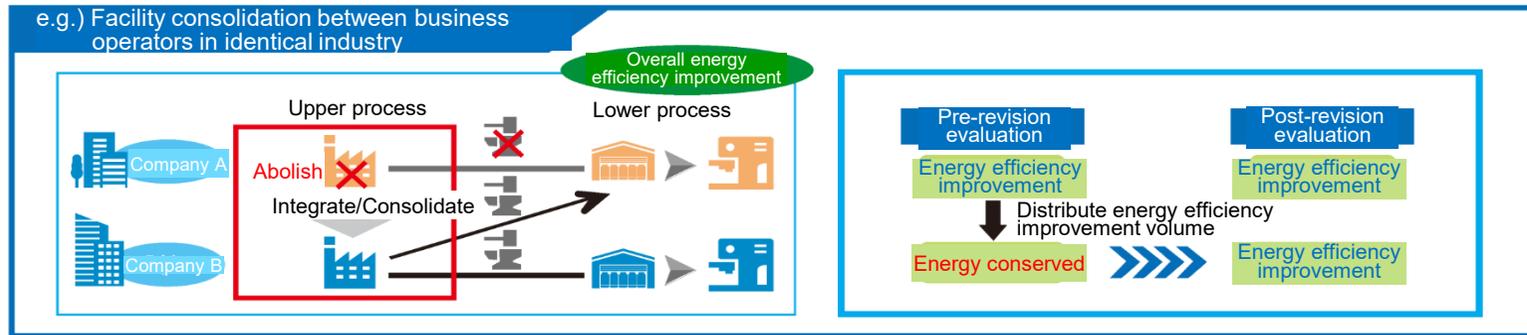
(10) Certification system for collaborative energy-efficiency plan

If the system is not utilized

- As it is required to report the energy usage status, etc. for each company, the effects are not properly evaluated in spite of collaborative approach to energy efficiency improvement.

If the system is utilized

- The collaborative energy efficiency improvement volume may be distributed between companies and reported.



System utilization flow

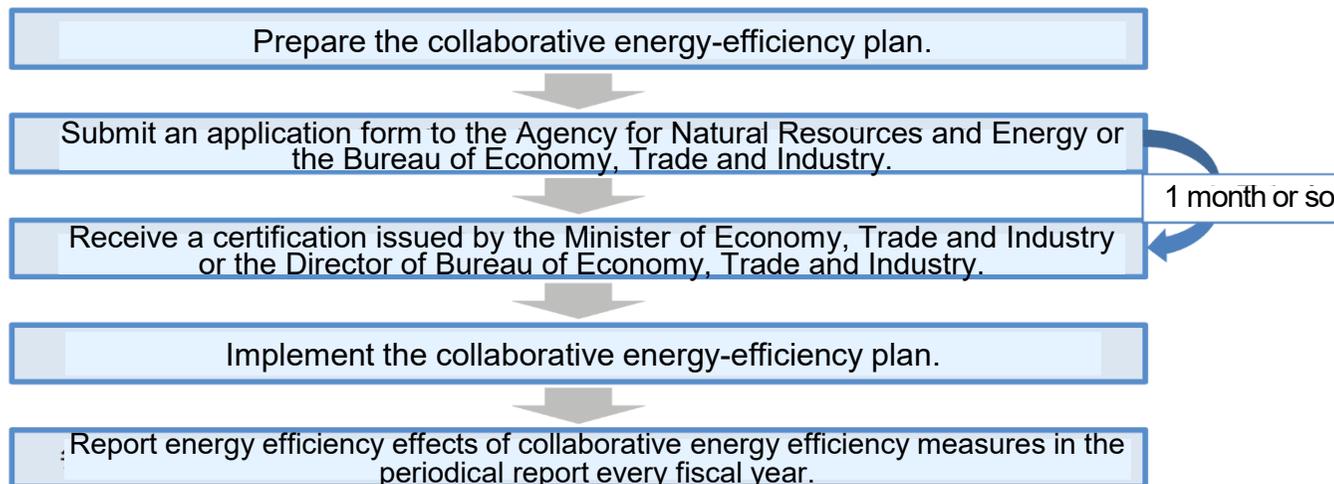


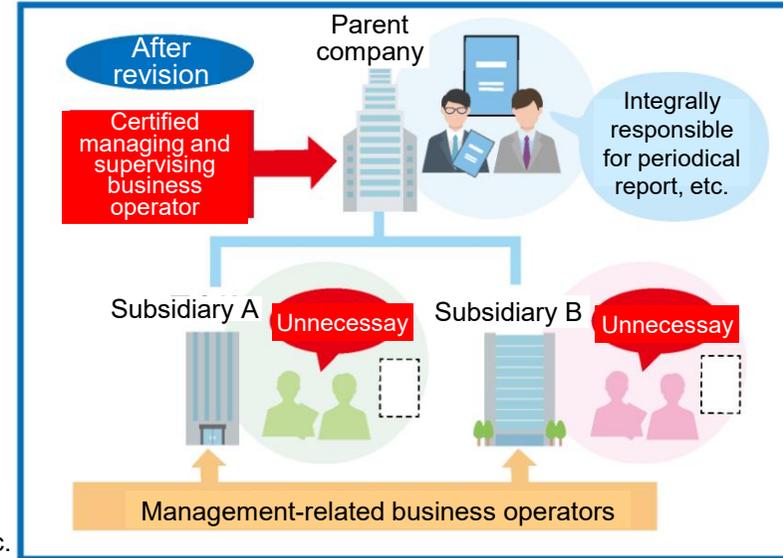
Fig.: Outline of collaborative energy-efficiency plan certification system and system utilization flow

(11) Certification system for certified managing and supervising business operator

If a parent company, etc. of a group company is certified as a body to supervise the group's integral approach to energy efficiency improvement, it is approved to integrally execute the duties such as submission of the periodical report by the said parent company, etc. (certified managing and supervising business operator), including subsidiaries, etc.

<Regulating the factories and buildings>

	Before revision	After revision (Revised in 2018)
Submission of periodical report and mid-long term plan report	Reported and submitted by all specified business operators	Integrally submitted by certified managing and supervising business operator * Business operators classification also to be integrally evaluated
Appointment of energy management supervision officer, etc.	Appointed by all specified business operators, etc.	Appointed only by certified managing and supervising business operator



* It is still necessary to appoint the Type 1 and Type 2 energy managers for each designated energy management factories, etc.



Energy management supervision officer



Energy management planning promoter



Periodical report and mid-long term plan report

● System utilization flow



(12) Energy Efficiency and Global Warming Countermeasures online reporting System (EEGS)

Purpose of this system

- The [business operators' burdens such as preparation and submission of reports are reduced](#) by one-stop integrated service covering preparation to submission of the reports in the EE&C Act, Act on Promotion of Global Warming Countermeasures and Act on Rational Use and Proper Management of Fluorocarbons.

Advantages of this system

No installation required for use

- ✓ Different from a report preparation support tool, this system [does not need to be installed for use](#) and readily available by simply accessing a specified URL.

Easy data collection required for report

- ✓ [Data can be simultaneously input in multiple buildings and collected online, reducing a burden of information collection.](#)

Less burden of report submission

- ✓ The reports can be submitted online, [dispensing with submission of paper reports.](#)
- ✓ [Various reports can be centrally managed](#) in the EE&C Act, Act on Promotion of Global Warming Countermeasures and Act on Rational Use and Proper Management of Fluorocarbons.

Capable of reducing report errors

- ✓ [Input values can be automatically checked online](#), reducing human errors.

Capable of confirming the past fiscal year reports

- ✓ [As the reports submitted in the past can be confirmed of their contents](#), those for this fiscal year can be prepared while referring to the past ones.

Capable of confirming the report processing status

- ✓ It is [possible to confirm online the processing status \(submitted, received, remanded, etc.\)](#) of the submitted reports in the government agencies.

(13) Penal provisions

The following describes main penal provisions of the EE&C Act.

If a business operator's approach to rationalization of energy use is significantly inadequate, the government will make a recommendation, publication or order. If it violates the order, it will be fined for ¥1,000,000 or less.

If the business operator fails to submit the periodical report, etc. or submits a false report, it will be fined for ¥500,000 or less.

Also, if it fails to notify appointment or dismissal of energy management personnel (energy management supervision officer, energy management planning promoter, Type 1 energy manager, Type 2 energy manager), it will be fined for ¥200,000 or less.

2. Outline of EE&C Act Revisions

- Based on the importance of (1) Further enhancement of energy efficiency, (2) Shift to non-fossil energy on the demand side and (3) Optimization of demand in view of supply structure changes such as increased variable renewable energy including solar power toward 2050 CN (carbon neutrality), the EE&C Act was revised in May 2022 to take the following measures.

(1) Expansion of the scope of rationalization of energy use [Review of energy definition]

- Expand the definition of “energy” in the EE&C Act and demand rational use of all energies including non-fossil energy.
- A primary energy conversion factor for electricity uses a nationwide uniform average emission factor of all power sources as a basis.

(2) Measures for shift to non-fossil energy [Newly installed]

- Demand the specified business operator, etc. to periodically submit the mid-long term plan report on the goal of shift to non-fossil energy and the usage status of non-fossil energy.
- To evaluate the electricity procured from an electric power supplier, reflect a non-fossil power ratio by retail electric power supplier (menu).

(3) Measures for optimization of electricity demand [Review of leveling of electricity demand]

- Build a framework to promote demand shift to renewable energy output suppression time (Up DR) and demand decrease at supply-demand tight time (Down DR).
- Demand the electric power supplier to prepare a plan for development of a fee structure, etc. contributive to optimization of electricity demand.
- Effort duties to improve performance for optimization of electricity demand for electric equipment (top runner equipment).

2-1. Review of Energy Definition

Review of Energy Definition

[Conventional system]

- The purpose of the **EE&C Act** is to **rationalize use of fossil energy** in order to secure effective utilization of fuel resources.
- For this reason, **solar power-based electricity and non-fossil energy such as biomass, hydrogen and ammonia are not included in the definition of “energy” in the EE&C Act, being excluded from the scope of rationalization of use.**

[Challenges]

- Recently, **utilization of non-fossil energy has been increasing on the supply side** such as dissemination and expansion of renewable energy like solar power generation and expanded utilization of hydrogen and ammonia as energy. With high environmental compatibility, utilization of non-fossil energy should be promoted on the demand side. However, as **hydrogen and ammonia need to be procured from resource-rich overseas countries**, for instance, **there are certain supply constraints. Efficient utilization is essential on the demand side.**
- Accordingly, **it is necessary to rationalize use of non-fossil energy as well as fossil energy to secure effective utilization of fuel resources, thereby maintaining stable energy supply.**

[Future direction]

- **Review the definition of “energy” in the previous EE&C Act and expand the scope of rationalization of use to all energies including non-fossil energy.**

Definition of Energy

- In the revised EE&C Act, **any fuel not falling in the category of “fossil fuels” (“Fuels” in the current Act) is defined as “non-fossil fuel”. The heat and electricity using the non-fossil fuels and other than fossil fuels as heat sources are defined as “non-fossil energy”.**

■ Act on Rationalization of Energy Use and Shift to Non-fossil Energy (Definition)

Article 2. In the Act, **“energy”** refers to the **fossil fuels, non-fossil fuels, heat** (except for what is provided by cabinet order, same hereinafter) and **electricity**.

2. In the Act, the **“fossil fuels”** refer to **crude oil, volatile oil, heavy oil, petroleum products provided by the Ordinance of METI, combustible natural gas, coal, coke** and **other coal products specified by order of METI**, which are **used for combustion and other purposes provided by the Ordinance of METI**.

3. In the Act, the **“non-fossil fuels”** refer to **hydrogen and other non-fossil fuels** which are used for the aforementioned purposes provided by the Ordinance of the Ministry of Economy, Trade and Industry.

4. In the Act, the **“non-fossil energy”** refers to the heat used instead of the heat using the **non-fossil fuel** and fossil fuel as the heat sources (referred to as the **“non-fossil heat”** in Article 5, Paragraph 2, Item 2, b and c) and the electricity used instead of the electricity obtained by converting power obtained by converting the heat using the fossil fuels as the heat source (referred to as the **“non-fossil electricity”** in Article 5, Paragraph 2, Item 2, d).

- Concerning **hydrogen, ammonia and e-fuels**, their **future evaluation will be continuously reviewed**, considering that some of them are derived from the fossil fuels.

■ Fossil fuels

- Crude oil, volatile oil (gasoline), heavy oil, other petroleum products (naphtha, kerosine, diesel fuel, petroleum asphalt, petroleum coke, petroleum gas)
- Combustible natural gas
- Coal, coke, other coal products (coal tar, coke oven gas, blast furnace gas, converter gas)

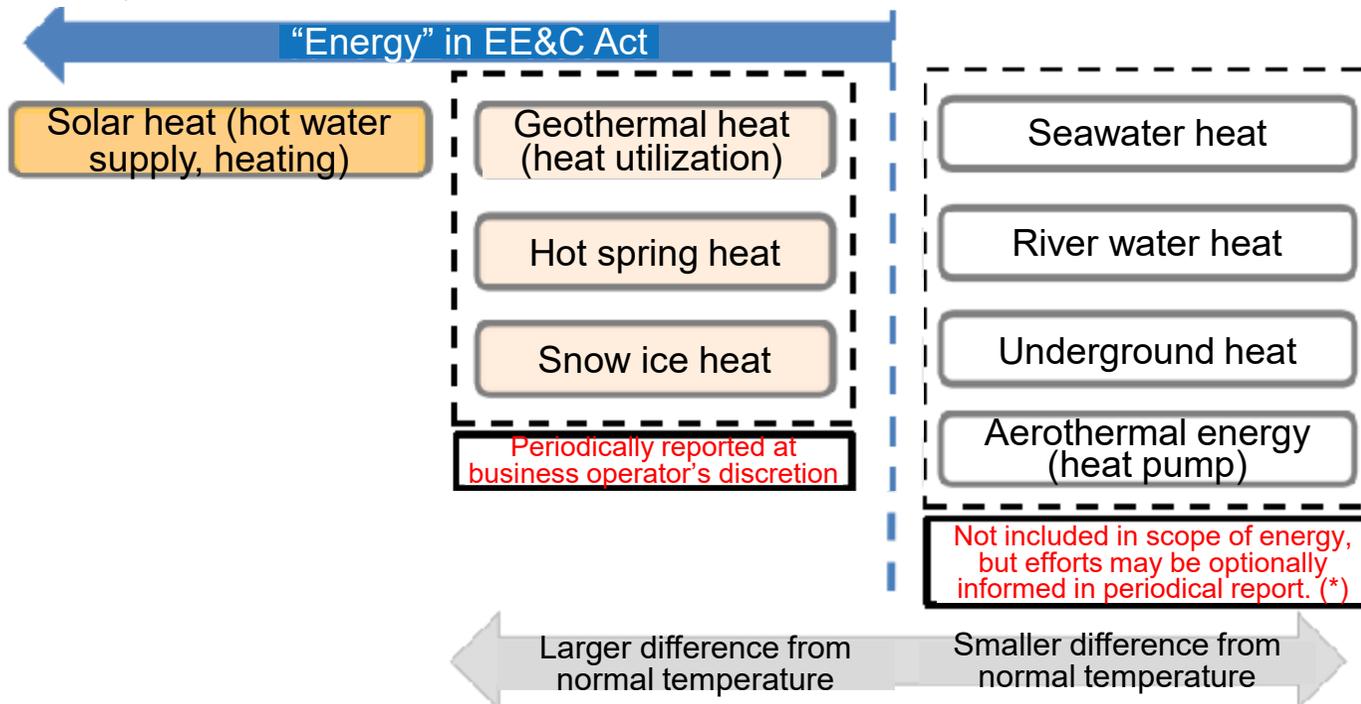
■ Examples of non-fossil fuels (other than fossil fuels)

By-product gas, by-product oil (except for those derived from raw materials), black liquor, waste tire, waste plastics, impure alcohol, tar pitch, grease pitch, animal and vegetable oils, fatty acid pitch, waste oil (including reclaimed oil), waste materials, wooden chips, coffee grounds, waste alcohol, hydrogen, RDF (Refuse Derived Fuel), biofuel, ammonia, e-fuels, and so on

Handling of Natural Heat

- Concerning the natural heat, as with the non-fossil fuels and non-fossil electricity, it is necessary to include the **heat with certain supply constraints** in the scope of calculations under the revised EE&C Act, from a viewpoint of rationalization of energy use.
- The supply constraints on the natural heat are **focused on the temperature difference from the normal temperature** (solar heat, geothermal heat, hot spring heat and snow ice heat have the large temperature difference).
- Natural heat in the EE&C Act: **Solar heat, geothermal heat (heat utilization), hot spring heat, snow ice heat**

■ Sample types of natural heat



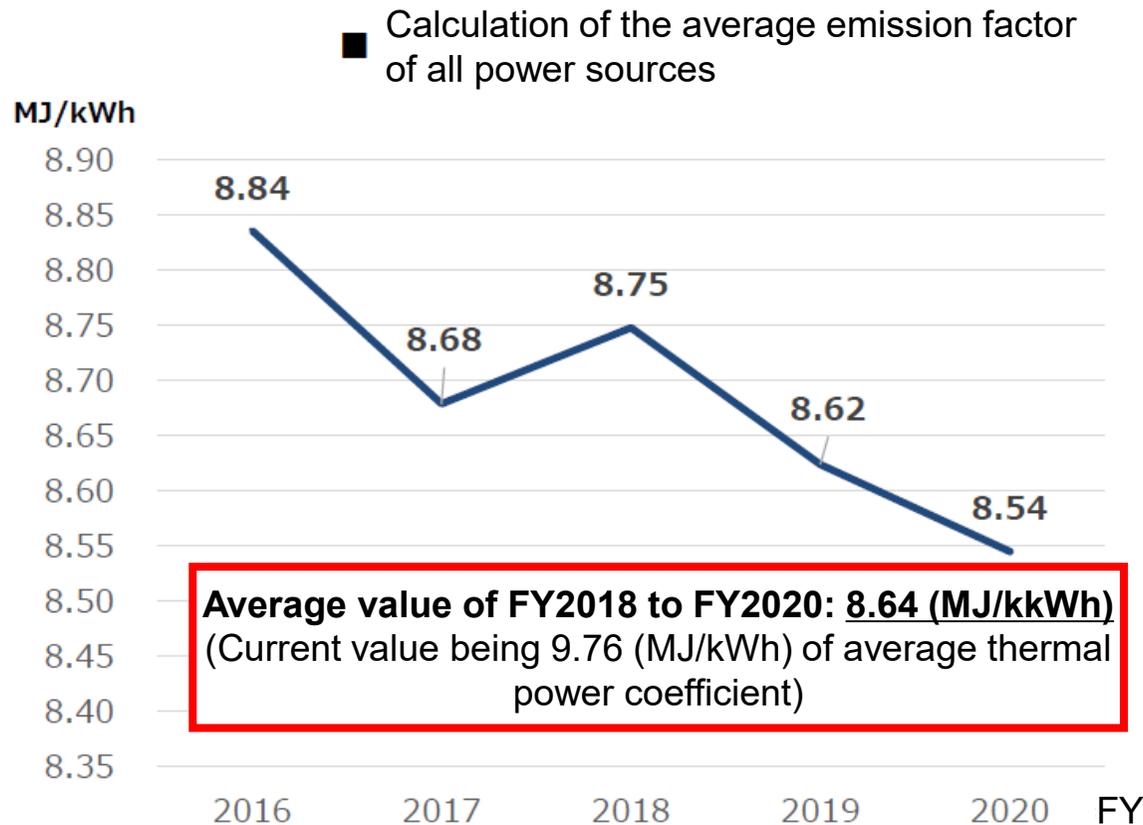
Source: Agency for Natural Resources and Energy

(Ref.) Definition of Energy in **Pre-revision EE&C Act** vs. **Post-revision EE&C Act**

	Pre-revision EE&C Act	Post-revision EE&C Act (Current)
Fuels	<ul style="list-style-type: none"> ● Crude oil, volatile oil (gasoline), heavy oil, other petroleum products ● Combustible natural gas ● Coal, coke, other coal products ● Those used for combustion and other purposes <p>* Charcoal and firewood excluded</p>	<ul style="list-style-type: none"> ➤ Fossil fuels <ul style="list-style-type: none"> • Crude oil, volatile oil (gasoline), heavy oil, other petroleum products • Combustible natural gas • Coal, coke, other coal products
	(Non-fossil fuels excluded)	<ul style="list-style-type: none"> ➤ Non-fossil fuels <ul style="list-style-type: none"> • Wood, black liquor • Biomass • Waste plastics • Other than fossil fuels
Heat	<ul style="list-style-type: none"> ● Heat using fuels above as heat sources (steam, hot water, cold water, etc.) <p>* Solar heat, geothermal heat, etc. excluded</p> <p>* Energy recovered from waste excluded</p>	<ul style="list-style-type: none"> ➤ Heat using fuels above as heat sources (steam, hot water, cold water, etc.)
	(Heat and natural heat using non-fossil fuels as heat sources excluded)	<ul style="list-style-type: none"> ➤ Natural heat <ul style="list-style-type: none"> • Solar heat, geothermal heat, hot spring heat • Snow ice heat
Electricity	<ul style="list-style-type: none"> ● Electricity derived from fuels above <p>* Solar power generation, wind power generation, waste power generation, etc. excluded</p>	<ul style="list-style-type: none"> ➤ Electricity derived from fuels above (fossil and non-fossil) (Oil-fired power, coal-fired power, LNG-fired power, biomass-fired power, etc.)
	(Electricity and renewable electricity derived from non-fossil fuels excluded)	<ul style="list-style-type: none"> ➤ Electricity derived from renewable energy <ul style="list-style-type: none"> • Solar power, wind power, geothermal power, hydraulic power, etc.

Primary Energy Conversion Factor for Electricity

- A primary energy conversion factor for electricity is calculated with an **average emission factor of all power sources of the recent 3 years (FY2018 to FY2020)**.
- As presented at the EE&C Subcommittee on Jun. 30, 2021, a **review cycle is appropriately considered based on the progress of energy mix** in view of an impact of the fluctuating electricity conversion factor on the business operators.



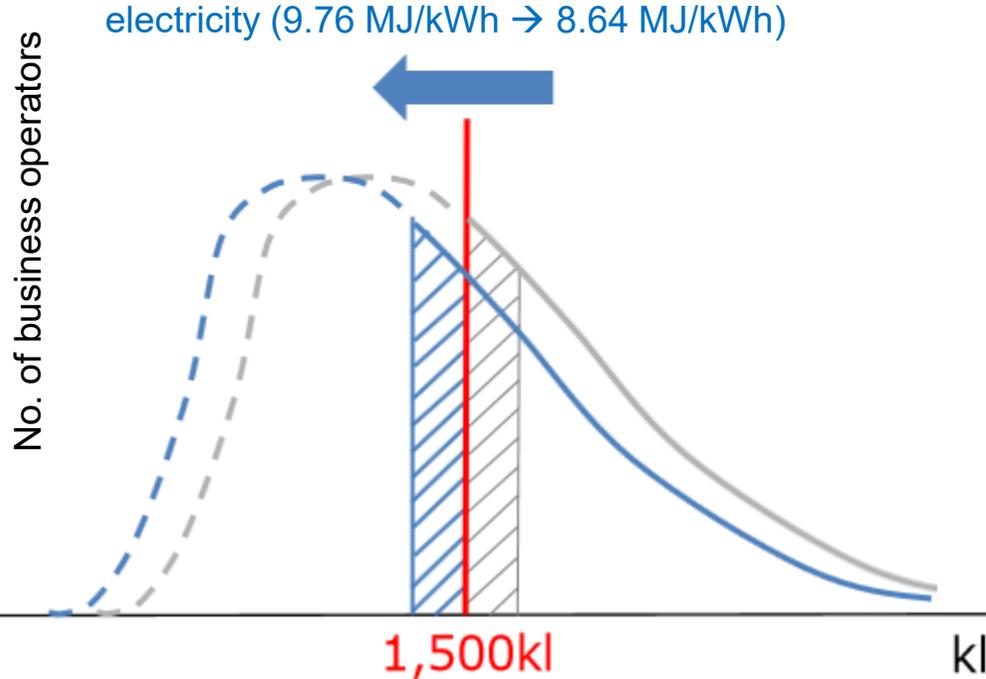
Source: Agency for Natural Resources and Energy

[Ref.] Fluctuations of Energy Consumption Resulting from Revised Act (Impact on Number of Reporting Business Operators)

- Along with the revisions of the EE&C Act, the number of specified business operators, etc. may increase or decrease.

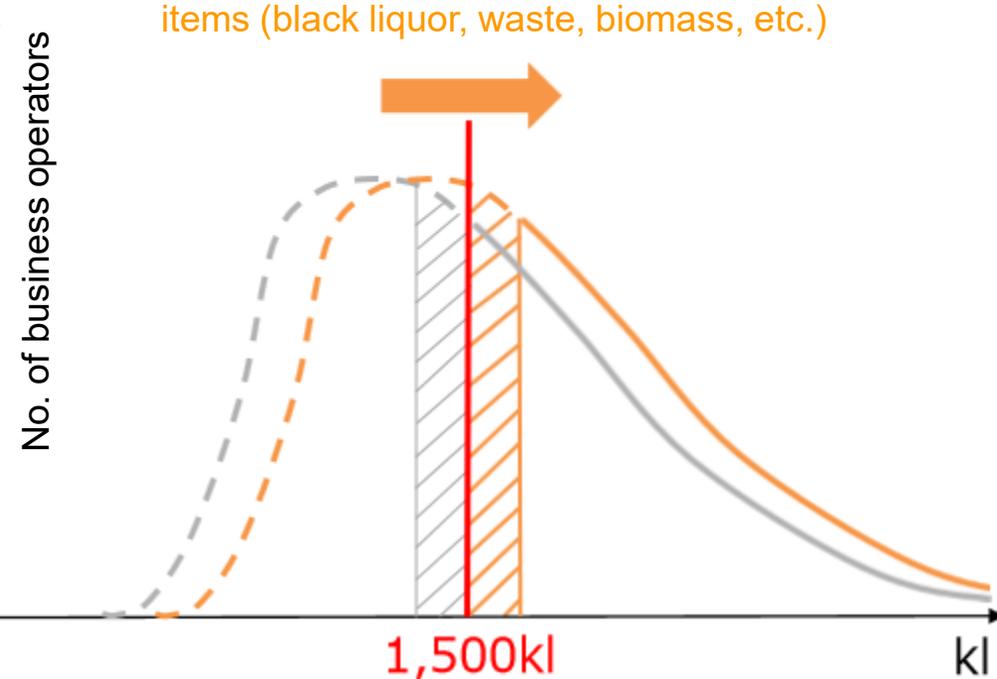
Industries with high electric power usage ratio
(commercial sector, etc.)

Review primary energy conversion factor for electricity (9.76 MJ/kWh → 8.64 MJ/kWh)



Industries with high usage of non-fossil energy
(paper manufacturing industry, cement industry, etc.)

Add non-fossil energy to intended report items (black liquor, waste, biomass, etc.)



Source: Agency for Natural Resources and Energy

[Ref.] Energy Calculation in Revised EE&C Act

[Crude oil equivalent]

Energy (**fossil, non-fossil**)
Consumption of electricity, fuels
(gas, petroleum), etc.

Electricity : kWh (electric energy)
City gas : m³ (volume)
LPG : kg (weight)
Heavy oil : L (volume)

Heat quantity equivalent
Unit: GJ (gigajoule)

Crude oil equivalent
Unit: kl (kiloliter)

EE&C Act applies regulations when annual consumption is 1,500 kl or more.

[Heating values of major energies: Energy conversion factors]

Type of energy		Unit	Heating value [Unit: GJ]	
Fuels Fossil Non-fossil	Kerosine		1 kl	36.5
	Diesel oil		1 kl	38.0
	Heavy oil A		1 kl	38.9
	Petroleum gas	Liquefied petroleum gas (LPG)	1 t	50.1
	Combustible natural gas	Liquefied natural gas (LNG)	1 t	54.7
	City gas 13A (Tokyo Gas)		1,000 m ³	45.0
	Coal (Coking coal)		1 t	28.9
	Waste plastics (Non-fossil)		1 t	29.3
	RDF (Non-fossil)		1 t	18.0
	Waste oil (Non-fossil)		1 kl	40.2
Electricity	Electricity utility system	Identical value during day and night	1,000 kWh	8.64
	Self-consumption solar power generation (Non-fossil)		1,000 kWh	3.6

[Crude oil conversion examples of each energy]

Multiply the heat quantity used “GJ” by 0.0258 (crude oil conversion factor [kl/GJ]) to obtain energy consumption (crude oil conversion value).

<Calculation example from the heat quantity>

$$10,000 \text{ [GJ]} \times 0.0258 \text{ [kl/GJ]} = 258 \text{ [kl]}$$

<Calculation example from energy usage>

City gas: 1,000 [1,000 m³]

$$1,000 \text{ [1,000 m}^3\text{]} \times 45.0 \text{ [GJ/1,000 m}^3\text{]} \times 0.0258 \text{ [kl/GJ]} = 1161 \text{ [kl]}$$

Electric power (purchased from the system): 1,000 [1,000 kWh]

$$1,000 \text{ [1,000 kWh]} \times 8.64 \text{ [GJ/1,000 kWh]} \times 0.0258 \text{ [kl/GJ]} = 223 \text{ [kl]}$$

2-2. Measures for Rationalization of Energy Use

[Ref.] Energy Efficiency vs. Shift to Non-fossil Energy

- In the previous EE&C Act, non-fossil energy does not fall into the category of “energy” and deducted from energy input in calculations of energy consumption intensity, etc. However, the revised EE&C Act demands the consumers to rationalize use of all energies (non-fossil energy included) and shift to non-fossil energy.
- The same as before, the revised EE&C Act evaluates all energies in terms of the crude oil equivalent. However, as non-fossil energy may have lower combustion efficiency than fossil energy, energy input may increase by shifting energy used from fossil energy to non-fossil energy. Accordingly, depending on the business operator, fossil energy may have higher combustion efficiency and economic rationality than non-fossil energy.
- Based on such characteristics of non-fossil energy, as the measures for further encouraging the shift from fossil energy to non-fossil energy, how about partially deducting non-fossil energy from energy input in calculating the energy consumption intensity and the benchmarks?

Energy consumption
intensity or benchmark by
business type

=

Energy consumption
Production volume,
etc.

- Electricity (grid electricity, self-generated solar power)
- Heat
- Coal
- Petroleum
- LNG
- Black liquor
- Waste
- Biomass, etc.



Partially deducted in
calculation

Evaluation of Non-fossil Energy

- To calculate the energy consumption intensity, etc., how about **multiplying by a correction factor (a < 1) when converting the heat quantity of non-fossil fuels (black liquor, waste, hydrogen, ammonia, etc.)?**

Current correction factor = 0.8

- For **self-generated solar power electricity**, how about **converting with an amount of energy of electricity itself (3.6 MJ/kWh)?**

$$\text{Energy consumption intensity} = \text{Energy consumption}^* / \text{Production volume, etc.}$$

* Calculation of energy consumption

Type of energy		Energy consumption [Measured in increment of]	Heat qty. conversion		Energy consumption in crude oil equivalent [kl]	Energy consumption intensity		Use ratio of non-fossil energy		
			Conversion factor	Heat qty. conversion value [GJ]		Correction factor (Draft)	Energy consumption in crude oil equivalent [kl]	Correction factor (Draft)	Energy consumption in crude oil equivalent [kl]	Non-fossil energy amount [kl]
Fossil fuels	Crude oil [kl]	20.00	38.20	764.00	19.71	—	19.71	—	19.71	0.00
	Gasoline [kl]	20.00	34.60	692.00	17.85	—	17.85	—	17.85	0.00
	Kerosine [kl]	20.00	36.70	734.00	18.94	—	18.94	—	18.94	0.00
	Heavy oil [kl]	20.00	39.10	782.00	20.18	—	20.18	—	20.18	0.00
	Coal (coking coal) [t]	20.00	29.00	580.00	14.96	—	14.96	—	14.96	0.00
(Omitted)										
Non-fossil fuels	Black liquor [t]	10.00	13.60	136.00	3.51	0.80	2.81	—	3.51	3.51
	Waste [t]	10.00	17.00	170.00	4.39	0.80	3.51	—	4.39	4.39
(Omitted)										
Electricity	Grid electricity [kWh]	1000.00	8.64	8.64	0.22	—	0.22	Weighting to self-generated electricity	0.22	0.1052
	Grid electricity equivalent to non-fossil energy [%]	40.00								
	Self-generated solar power electricity [kWh]	1000.00	3.60	3.60	0.09	—	0.09	(2.4) × (1.2)	0.27	0.27
Heat	Industrial steam [GJ]	20.00	1.02	20.40	0.53	—	0.53	Convert to average emission factor of all power sources at 8.64/3.6	0.53	0.00
	Self-consumption solar heat [GJ]	5.00	1.00	5.00	0.13	—	0.13		0.13	0.13
Total [Crude oil equivalent (kl)]					100.51		98.93		100.68	8.40
Additional amount of renewable energy certificate, etc.		100.00								0.02
Non-fossil energy consumption										8.42
Crude oil conversion factor [kl/GJ] * Fixed value		0.0258								
Use ratio of non-fossil energy [%]		8.3618								

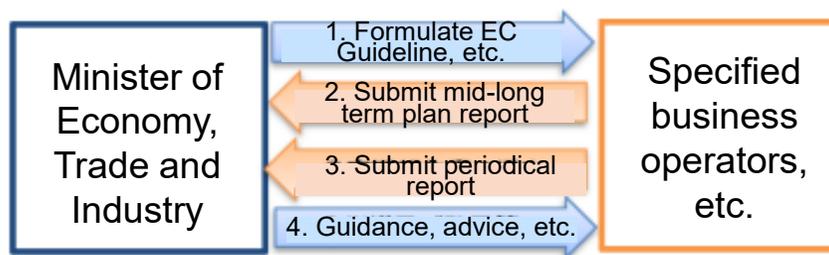
Source: Agency for Natural Resources and Energy

2-3. Measures for Shifting to Non-fossil Energy

Mid-Long Term Plan for Shifting to Non-fossil Energy

<Guideline goals of shifting to non-fossil energy vs. mid-long term plan report>

- The EC Guideline for the business operators relating to shifting to non-fossil energy in the factories, etc. (hereinafter referred to as the EC Guideline) provides the guideline goals of shifting to non-fossil energy for each of 5 business types.
- The specified business operators, etc. prepare and submit the mid-long term plan reports and periodical reports for achieving the goals of shifting to non-fossil energy according to EC Guideline, etc.



<Target fiscal year in the mid-long term plan report>

- How about **aiming at FY2030 as a target fiscal year** in the mid-long term plan report and **setting numerical goals for FY2030**?

<Guidance, advice, etc.>

- Based on the efforts of the specified business operators, etc. toward the goals, the government provides guidance and advice as required. If the shift to non-fossil energy is “significantly inadequate” in light of the EC Guideline, the government will consider the levels of related technologies and the supply status of non-fossil energy to give recommendations or publish their names.
- Furthermore, from a viewpoint of promoting the shift to non-fossil energy, the government will evaluate excellent business operators and consider support by budgetary measures, etc. in the future.

Quantitative Guideline Goals of Shift to Non-fossil Energy: Across Industrial and Commercial Sectors

- As for a **“ratio of non-fossil electricity”** to be reported by all specified business operators, how about setting a goal for a **non-fossil ratio to overall electricity usage including self-generated power**, formulating a plan to achieve it and reporting the results in order to evaluate more widely the consumers’ own efforts such as installation of solar panels on their own premises?
- All specified business operators set the goals, formulate the plans to achieve them and report the results as to (1) **Ratio of non-fossil electricity to electricity usage across the business operator (including self-generated power)**, (2) **Guideline indicators provided by the government (only business types provided with them)**, and (3) **Indicators particularly effective for improving the non-fossil ratio across the business operator (optional)**.

[Sample indicators of business types with guideline indicators (*)]

- **Automobile manufacturing industry:**
Electricity usage across business operator
Overall non-fossil ratio
- **Cement manufacturing industry:**
Non-fossil fuel ratio in kilns, etc.
- **Blast furnace steel industry:**
Coal usage for every ton of crude steel
Intensity reduction rate
- **Chemical industry (petrochemical industry, alkali industry):**
Coal usage reduction rate

① **Set a goal for a non-fossil electricity ratio to electricity usage across business operator (including self-generated power), formulate a plan to achieve it and report the results.**

② **Set a goal for the indicator, formulate a plan to achieve it and report the results.**

③ **As for other indicators, set additional goals across the business operator or for each business type, formulate the plans to achieve them and report the results. (Optional)**

[Optionally set sample indicators]

- Non-fossil ratio to energy usage across the business operator
 - Non-fossil ratio to externally procured electricity
 - Non-fossil ratio to energy in the XX manufacturing process
 - Non-fossil ratio to thermal energy usage for hot water supply
- (Set the indicators particularly effective for improving the non-fossil ratio across the business operator.)

(1) Quantitative Guideline Goals of Shift to Non-fossil Energy in Major 5 Business Types

- Based on working group discussions so far, what do you say to the following ideas about the standard non-fossil goals in major 5 business types*?

* Steel industry (blast furnaces, electric furnace ordinary steel, electric furnace special steel), chemical industry (petrochemical industry, alkali industry), cement manufacturing industry, paper manufacturing industry (paper, cardboard), automobile manufacturing industry. The same hereinafter in this document.

Cement manufacturing industry

Set a non-fossil fuel ratio in the calcination process (kilns, etc.) in FY2030 to 28%.

Automobile manufacturing industry

Set a non-fossil electricity ratio to overall electricity usage in FY2030 to 59%. (Number combining externally procured electricity and self-generated power)

Chemical industry (Petrochemical and alkali industries)*1

Paper manufacturing industry (Paper and cardboard manufacturing industries)*1

As for the business operators having boilers using coal as a main fuel, **reduce coal consumption in FY2030 by 30% from FY2013.** As for other business operators, set a non-fossil ratio of externally procured electricity to 59%.

Steel industry (Blast furnaces)*1

Reduce the coal consumption intensity for every ton of crude steel in FY2030 by 2% from FY2013 through the efforts for the shift to non-fossil energy such as introduction of hydrogen, waste plastics and biomass.

Steel industry (Electric furnace ordinary steel, electric furnace special steel)*1

Set a non-fossil electricity ratio to overall electricity usage in FY2030 to 59%. (Number combining externally procured electricity and self-generated power)

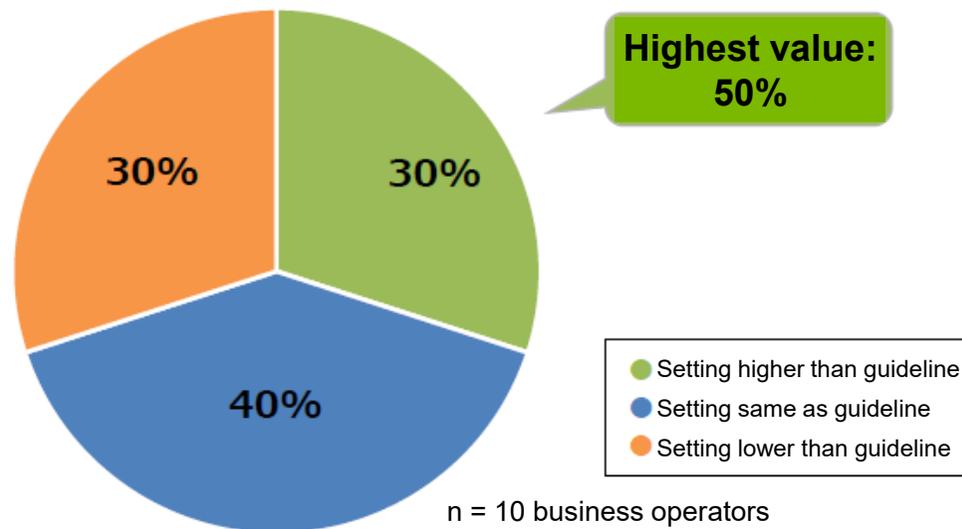
(Ref.) Goals of Shift to Non-fossil Energy in Mid-Long Term Plan (1): Cement Manufacturing Industry (FY2024 submission version)

Each business operator's quantitative goals of shifting to non-fossil energy in the cement manufacturing industry

Quantitative Guideline goals:

Set a non-fossil fuel ratio in the calcination process (kilns, etc.) in FY2030 to 28%.

Business operator ratios (Business operators' goal settings vs. guidelines)



Each business operator's major efforts for shifting to non-fossil energy in the cement manufacturing industry

- Expanded utilization of waste such as waste plastics, waste oil
- Enhancement of waste treatment and combustion equipment, and so on

(*) Of the mid-long term plan reports submitted by the end of August 2023, the secretariat aggregated those confirmed of goal settings.

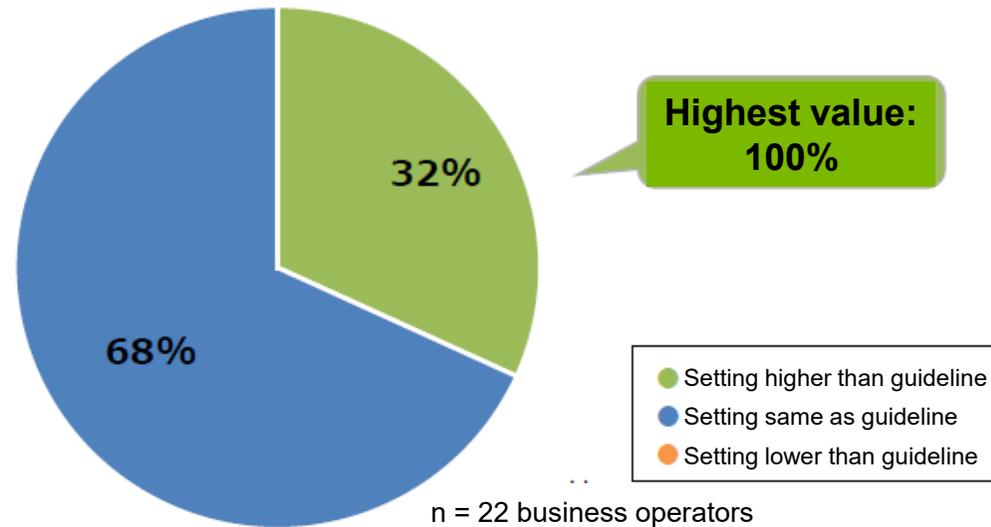
(Ref.) Goals of Shift to Non-fossil Energy in Mid-Long Term Plan (2): Automobile Manufacturing Industry (FY2024 submission version)

Quantitative goals of shifting to non-fossil energy in the automobile manufacturing industry

Quantitative guideline goals:

Set a non-fossil electricity ratio to overall electricity usage in FY2030 to 59%.

Business operator ratios (Business operators' goal settings vs. guidelines)



Each company's major efforts for shifting to non-fossil energy in the automobile manufacturing industry

- Procurement of non-fossil electric power
- Installation of facilities for solar power generation, wind power generation, hydroelectric power generation, hydrogen demonstration reactor and ammonia-fired power generation
- Electrification (kitchens, air conditioning, painting, pre-processing heating heat pumps, casting and holding furnace heaters), and so on

(*) Of the mid-long term plan reports submitted by the end of August 2023, the secretariat aggregated those confirmed of goal settings.

Source: Agency for Natural Resources and Energy

2-4. Measures for Optimization of Electricity Demand: DR Report System

- **From a viewpoint of promoting Up and Down DRs** by large-scale consumers, the **following evaluations and incentives have been prepared for the periodical report system.**
 1. Evaluation of **actual DR results**: Let them enter a DR practice count and an amount of DR (kWh) in the periodical report, and publish excellent business operators and give a preferential subsidy treatment as incentives.
 - ✓ As for a “**report (duty) on the DR practice count (days)**”, **start its operation from the FY2023 report.**
 - ✓ As for a “**report on the advanced evaluation of DR (optional)**”, various DRs will be classified to report their respective amounts (in kWh, etc.). For the time being, the consumers, aggregators, etc. are invited, who will cooperate to provide electric energy data, etc. required for verification, **advancing an analysis over FY2023.** Based on their verification results, etc., corrections will be made during FY2023 as required, **starting its operation from FY2024.**
 2. Evaluation by energy efficiency **intensity**: When evaluating by the energy efficiency intensity (for instance, energy consumption for every ton of crude steel), set an energy coefficient (MJ/kWh) lower when suppressing renewable energy output, and higher at the time of tight supply-demand, thereby giving incentives for addressing the DRs.

Entering the DR practice count (days) in the periodical report (Picture)

1-3 Days of Measures Taken for Optimization of Electricity Demand

Days of Measures Taken for Optimization of Electricity Demand	days
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[Ref.] Types of DRs

- Demand response (DR) is largely classified into 3 types; “Up DR” to increase a power demand when there is surplus renewable energy, “Down DR” to decrease the power demand when power supply-demand is tight, and “DR in the supply-demand adjustment market” to secure a power supply-demand balance in an actual supply-demand situation.

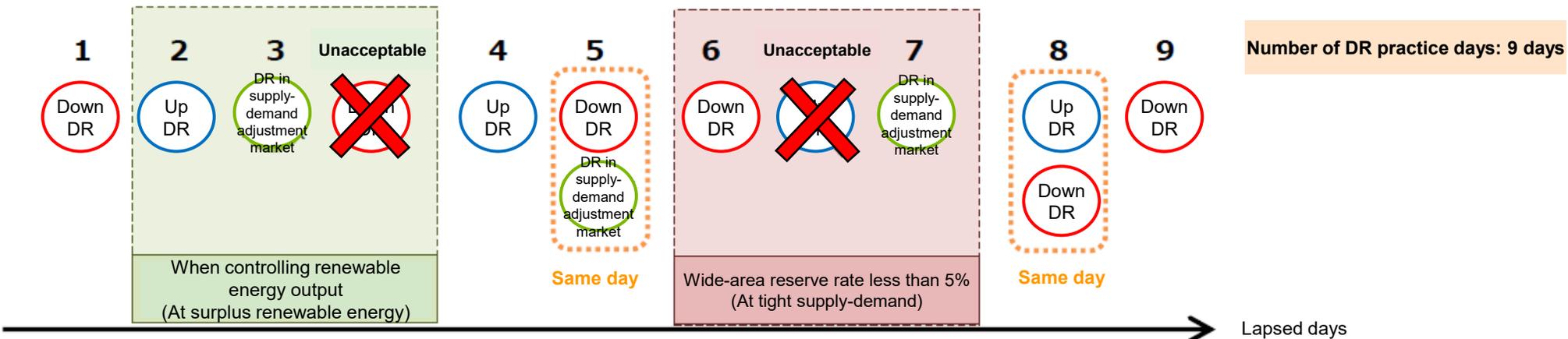
Item	Up DR	Down DR	DR in supply-demand adjustment market
Outline	DR to increase the power demand when there is surplus renewable energy. * Contract between a retail electric company and a customer, and so on.	DR to suppress the power demand when power supply-demand is tight. * Contract between a general power transmission and distribution company or retail electric company and a customer, and so on.	(In spite of surplus or tightness) DR for securing a power supply-demand balance in an actual supply-demand situation. * Procure in the supply-demand adjustment market.
Major DR instruction method	The retail electric company instructs the customer to increase a demand (via an aggregator, etc.).	The retail electric company or general power transmission and distribution company instructs the customer to suppress the demand (via the aggregator, etc.).	The general power transmission and distribution company instructs the customer to respond to a required amount (via the aggregator, etc.).
Conceptual diagram			

Specific Method to Evaluate Actual DR Results in “Optimization of Electricity Demand”

- As for **reporting the DR practice count (duty)**, it is desirable to **simplify the reporting items** as much as possible from a viewpoint of **making approx. 12,000 specified business operators, etc. have as much interest as possible in DR**.
- There are “Up DR”, “Down DR” and “DR in the supply-demand adjustment market”. Considering that **any appropriate DR contributes to “optimization of electricity demand”** and is easy to report, it is desirable to **report the number of DR practice days without distinguishing their types**.
- As for oppositely directed DRs such as **Up DR at tight supply-demand** (demand increase) and **Down DR at surplus renewable energy** (demand suppression), however, it is not acceptable to count them because they **may obstruct stable power supply**, going against “optimization of electricity demand”.

<Concept>

- Count the **“number of days” of carrying out DRs** (in spite of different DRs and without distinguishing their types).
- Do not count Up DR at tight supply-demand (demand increase) and Down DR at surplus renewable energy (demand suppression).

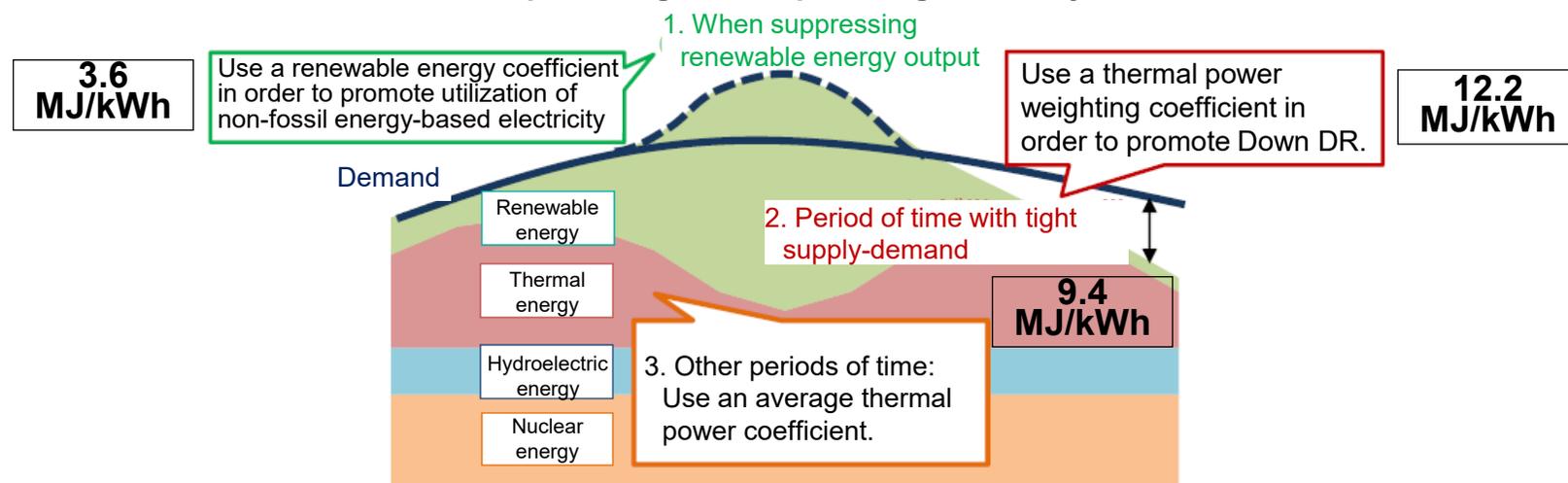


➤ Electricity Demand Optimization Evaluation Intensity

Outline of Measures for Optimizing Electricity Demand

- In optimizing electricity demand, fluctuate a primary energy conversion factor for electricity according to the fluctuations of an electricity supply-demand situation in order to promote a demand shift to the time when there is generation of surplus renewable energy electricity.
- Specifically, use the following.
 1. Renewable energy coefficient 3.6 MJ/kWh when suppressing renewable energy output.
 2. Thermal power weighting coefficient 9.40 (x α) MJ/kWh when the supply-demand situation is tight. → 12.2 (= 9.4 × 1.3)
 3. Average thermal power coefficient 9.40 MJ/kWh in other periods of time.
- Demand the business operators to improve by 1% or more on the annual average of the regular energy consumption intensity or electricity demand optimization intensity calculated based on the above-mentioned electricity conversion factor and evaluate them as Class S business operators when they achieve either of them. (Review of 1% improvement of the current electricity demand leveling intensity on the annual average)

■ Conceptual diagram of optimizing electricity demand



Source: Agency for Natural Resources and Energy

Two Evaluation Methods for “Optimization of Electricity Demand” in Revised EE&C Act

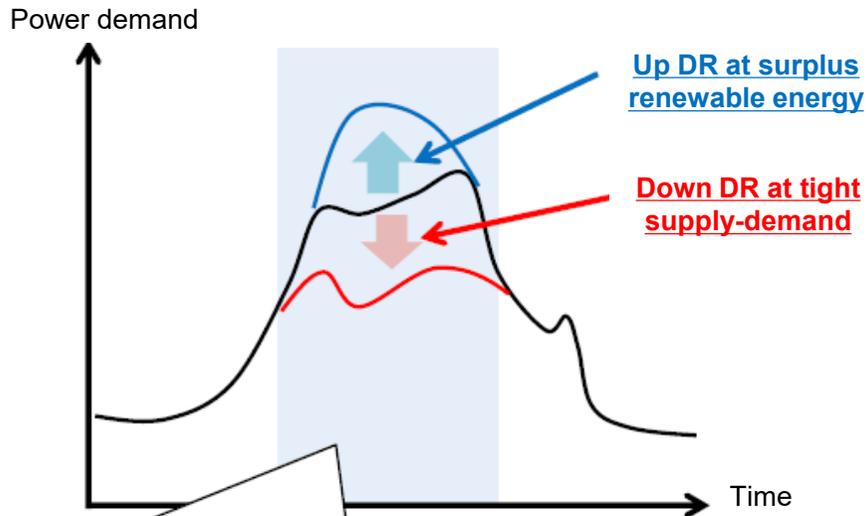
(1) Evaluation of actual DR results

- Concerning excellent business operators, consider the incentives such as publication of their names or preferential treatments for subsidies in the future based on a report on the DR practice count, etc.

(2) Evaluation in terms of the electricity demand optimization evaluation intensity

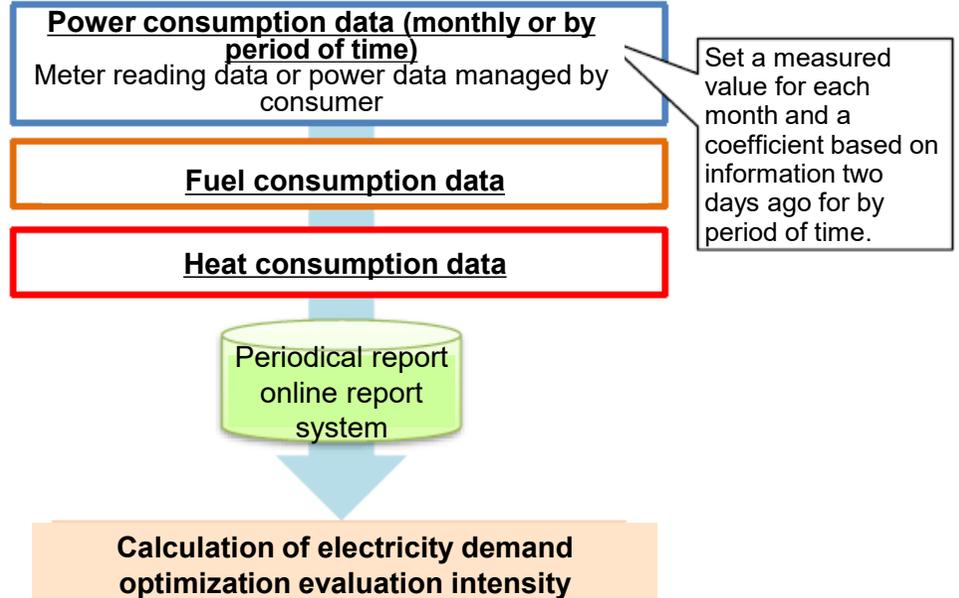
- In the S-, A-, B- and C-Class evaluations of “rationalization of energy use (conversion into MJ) demanded by the EE&C Act, make it an incentive for addressing electricity demand optimization (by setting an MJ/kWh coefficient low when suppressing renewable energy output and setting it high to the contrary at the time of tight supply-demand situation).

(1) Actual DR results



Consideration of details on actual DR results evaluation method (**Specific method discussed at “Study Group on Next-Generation Distributed Power Systems” has been reported today**)

(2) Electricity demand optimization evaluation intensity

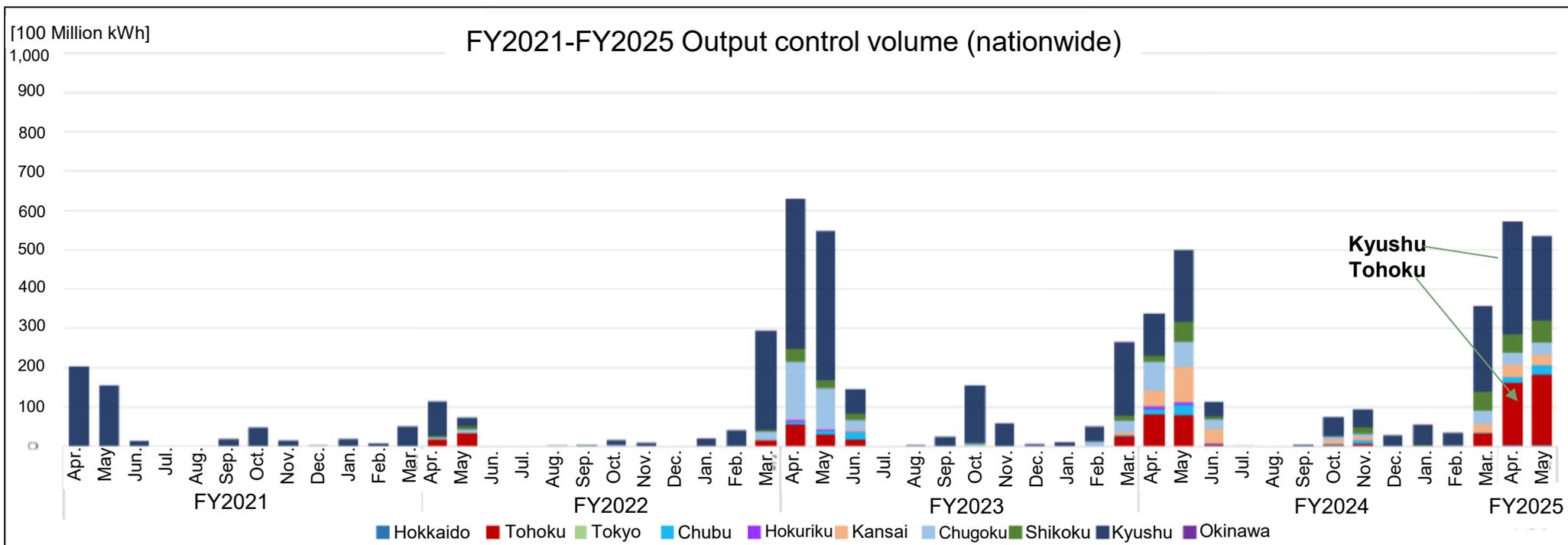


Source: FY2022 3rd WG EC guideline for factory, etc., Material 4 (partially created), Nov. 22, 2022

(Ref.) Renewable energy electric output control status

(Solar power generation, etc. temporarily disconnected from system)

- Due to wider introduction of renewable energy, output control areas have been expanded nationwide. Current output control volume is increasing owing to a lower transmitted power volume outside the area and lower power demand because of increased simultaneous output control in multiple areas.
- This spring, a **nationwide output control volume is increasing from the previous fiscal year** due to a climate, etc.



3. Periodical Report Disclosure System

Advantages of Disclosure System

By providing a framework capable of disclosing the information of the periodical report based on the EE&C Act, business operators can participate without feeling a burden because of an existing report basis and readers such as investors can expect it as an effective tool to facilitate evaluation with easy understanding. Furthermore, it contributes to judgment of stakeholders as well as disclosing business operators, and development of energy services.

Disclosing business operators

- **Serving as opportunity to invite investments such as ESG investments**
- **Leading to enhancement of corporate publicity and recruiting activity**
- **Less burden of additional responses** (information of periodical report is extracted)

Optional disclosure system

Stakeholders including ESG investors

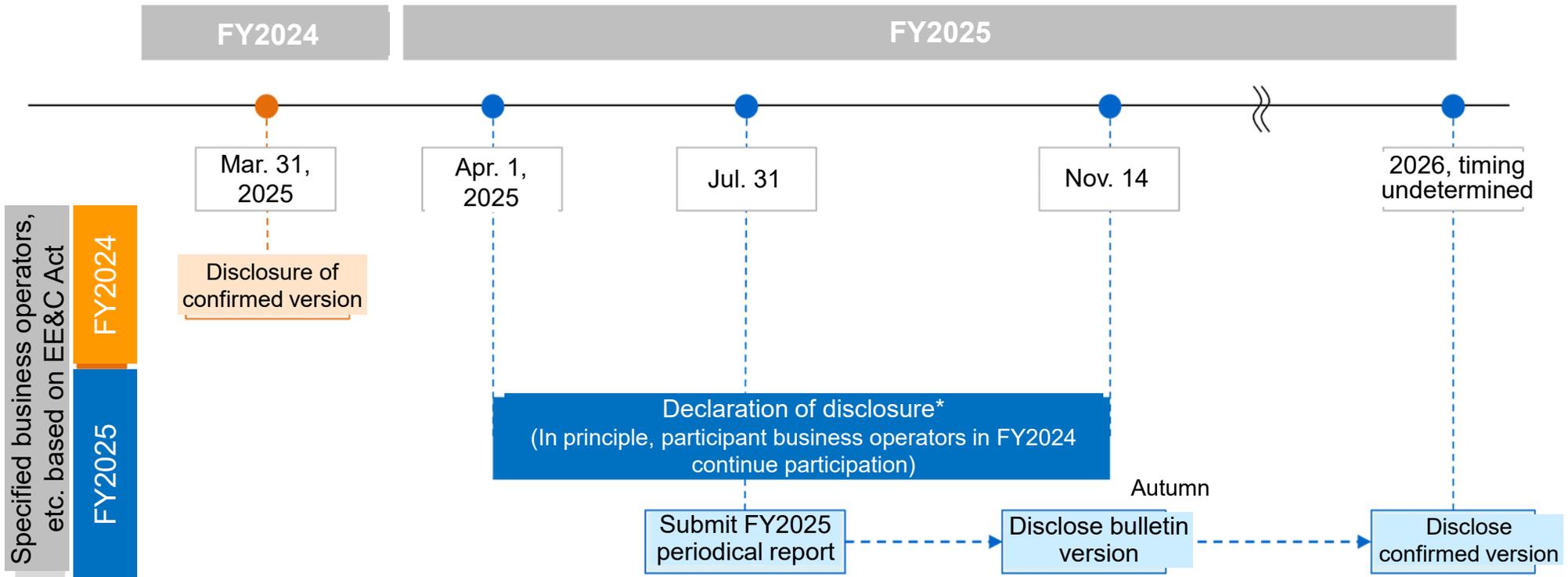
- **Efficient information collection due to highly visible disclosed information**
→ Promotion of research and engagement* of addressing company
- **Capable of obtaining highly reliable information based on EE&C Act**
- **Available not only for determination of investment, but also for job hunting and determination of business partner**

Energy service providers, etc.

- **Proposal of services to disclosing company**
- **Advanced service development through analysis of disclosed data**

Disclosure Schedule

- Intended for all specified business operators based on the EE&C Act (large-scale consumers with annual energy consumption of 1,500 kl or more), the disclosure system has been put into full practice since FY2024. Closing a declaration of disclosure on Oct. 31, a declaration of participation in the disclosure system was received from 1,695 specified business operators.
- As for FY2024, a confirmed version was published on Mar. 31, 2025 as to the business operators confirmed of no deficiency in the periodical reports.
- As for FY2025, a bulletin version will be published in the autumn of 2025 as to the business operators who have submitted the periodical reports, etc. by the deadline. Also, the government will check the periodical reports submitted by the business operators for any deficiency and publish the confirmed version in 2026. As of the end of July 2025, the declaration of disclosure has been received from 2,099 specified business operators.



* The declaration of participation will be accepted through the Energy Efficiency and Global Warming Countermeasures online reporting System (EEGS) since FY2025.

Composition of Disclosure Sheet and Example of Disclosure

A disclosure sheet based on this system is composed of

“A. Detailed disclosure of the business operator”,

“B. Efforts in view of industrial situations, etc.”,

“C. Business operator’s industrial information” and

“D. Business operator’s original efforts contributive to realization of carbon neutrality and research & development efforts for innovative technologies”.

Of these items, “A. Detailed disclosure of the business operator” is based on the information of the periodical report, etc. “B. Efforts in view of industrial situations, etc.” and “D. Business operator’s original efforts contributive to realization of carbon neutrality and research & development efforts for innovative technologies” can be freely described by the specified business operator who has made the disclosure declaration.

“C. Business operator’s industrial information” serves as reference industrial information provided by the Agency for Natural Resources and Energy.

Left: Information disclosure of each business operator

Right: Reference information for readers

The image displays two side-by-side screenshots of a disclosure sheet. The left screenshot, titled 'Information disclosure of each business operator', shows a detailed table with multiple columns and rows, including sections for 'Business Operator Information', 'Business Operator's Industrial Information', and 'Business Operator's Original Efforts'. A large yellow letter 'A' is overlaid on the table. The right screenshot, titled 'Reference information for readers', shows a bar chart and a table with columns for 'Year' and 'Value'. A large yellow letter 'D' is overlaid on the table. A yellow letter 'B' is also visible in the bottom left of the left screenshot.

Source: Agency for Natural Resources and Energy

4. Support System

Table: Outline of energy efficiency optimization diagnosis service, etc. of ECCJ

	Energy efficiency optimization diagnosis	Free dispatch of lecturer
Target	<ul style="list-style-type: none"> ● Small and medium-sized businesses (those defined by Small and Medium-sized Enterprise Basic Act) <p>Or</p> <ul style="list-style-type: none"> ● Factories, buildings, etc. not falling under the category of companies defined by the Companies Act and having energy consumption (crude oil equivalent value) of 100 kl or more and less than 1,500 kl as a rule (However, acceptable if receiving low-voltage, high-voltage or special high-voltage power, even if less than 100 kl) 	<p>“Energy efficiency information session” (seminar, conference, etc.) focusing on energy efficiency and held free of charge by a local government, public organization, private industry group, association or council</p>
Description	<ul style="list-style-type: none"> • Energy efficiency proposals classified into 3 types; operation improvement measure, simple investment and capital investment • Calculations of annual reduction, payback year, etc. • Proposal, etc. related to introduction of renewable energy equipment 	<p>(Briefing examples for business operators)</p> <ul style="list-style-type: none"> • Status quo of energy consumption • Carbon neutrality status • Approach to energy efficiency improvement • Presentation of typical energy efficiency technologies and audit examples
Report	<ul style="list-style-type: none"> • Submit a report in about 1 month after an on-site audit. • Hold an information session after submitting the report. 	

Subsidies for EE&C and Shift to Non-fossil Energy

- In order to respond to high energy cost and carbon neutrality at the same time, investments by enterprises are supported in 4 categories; **(I) Energy efficiency improvement of the entire factory**, **(II) Electrification and fuel shift of the manufacturing processes**, **(III) Renewal to the equipment selected from a list**, and **(IV) Introduction of energy management system**.
- Promote energy efficiency improvement strongly as the first approach step to GX such as **creating an investment promotion framework for small and medium-sized businesses in Category I**.

<p>(I) Factory and workplace type</p> <p>* Former A and B types</p>	<ul style="list-style-type: none"> ● Subsidy for measures to realize major energy efficiency improvement in an entire factory or workplace ● Subsidy rate: 1/2 (small and medium), 1/3 (large), etc. ● Maximum subsidy amount: ¥1.5 billion, etc. ● * Added a small and medium sized enterprise investment framework, etc. 	<p>[Flat pans] [Standing kilns] * Linking of several kilns to allow waste heat reuse.</p>  <ul style="list-style-type: none"> ● Previously, flat pans were individually heated to produce salt, but they were renewed with linked standing kilns. ● In order that the waste heat from the kilns could be reused as the heat source for the other kilns, the entire workplace equipment and design was reviewed. Energy conservation of 37.1% in three years is intended to be realized.
<p>(II) Electrification and decarbonization on fuel conversion type</p>	<ul style="list-style-type: none"> ● Subsidy for renewal with equipment following electrification or conversion to a lower carbon fuel ● Subsidy rate: 1/2 ● Maximum subsidy amount: ¥300 million, etc. ● * Added a subsidy target for construction costs only for small and medium sized enterprises. 	<p>[Cupola type] * Using coke [Induction heating type] * Using electricity</p> 
<p>(III) Equipment unit type</p> <p>* Former C type</p>	<ul style="list-style-type: none"> ● Subsidy for renewal with equipment selected from a list ● Subsidy rate: 1/3 ● Subsidy maximum amount: ¥100 million ● * EE&C requirements were added. 	<p>[Commercial water heaters] [High efficiency air conditioning] [Industrial motors]</p> 
<p>(IV) EMS type</p>	<ul style="list-style-type: none"> ● Subsidy for introduction of an EMS ● Subsidy rate: 1/2 (small and medium), 1/3 (large) ● Maximum subsidy amount: ¥100 million ● * EEE&C requirements were reviewed. 	<p>[Loss detection using visualization systems] [Optimum energy-saving operation using AI]</p> 

Thank you very much for your attention



The Energy Conservation Center, Japan