Introduction of the Energy Conservation Act in Japan

1 Outline of the Energy Conservation Act (EC Act)

Japan intensively introduced Energy Management System based on Energy Conservation Act (the formal name: Act on Rationalizing Energy use and Shifting to Non-fossil Energy), then achieved the lowest level of energy consumption performance (evaluated by the index, primary energy supply per GDP) in the world.

The Energy Conservation Act (hereinafter referred as EC Act) is Japanese domestic law enacted in 1979. This act provides measures for the rational use of energy in factories, buildings, transportation and machinery and equipment, etc. aiming to ensure the effective utilization of fossil fuel resources.

1.1 History of the EC Act

Since the enactment in 1979, the Act has undergone six major revisions up to the present date according to the social, economic and environmental requirement. Table 1-1 shows the changes in the EC Act since its establishment.

Table 1-1 Changes in the EC Act

Year	Major Revisions in the Energy Conservation Act	Background
1951	Enforcement of Heat Management Law ● Effective use of fuel in industrial sector	
1979	Energy Conservation Act establishment ● Establishment of designated energy (heat and electricity) management factories ● Establishment of EC Guideline in the residence and building fields, and in the machinery and equipment fields	1st Oil Crisis in 1973 2nd Oil Crisis in 1978
1983	Energy Conservation Act revision ● Introduction of examination for a qualified energy manager's license	
1993	Energy Conservation Act revision ● Establishment of Basic Policy ● Periodical reporting system introduced	COP(Kyoto Protocol) in 1993
1998	Energy Conservation Act revision ● Expansion of designated energy management factories (new introduction of type-2) ● Introduction of Top Runner Program to machinery and equipment and	

	automobiles	
2005	Energy Conservation Act revision ● Introduction of unified management of heat and electricity ● Expansion of stipulation courses to cover transportation sector	Kyoto Protocol put into effect
2008	Energy Conservation Act revision ● Introduction of business operator units including franchise chain stipulations ● Introduction of benchmark system in each industrial sub-sector	2008-2012: 1st committed term of Kyoto Protocol
2013	Energy Conservation Act revision ● User electricity peak demand measures ● Introduction of Top Runner Program to building materials	Electricity shortage due to Big Quake in 2011
2018	Energy Conservation Act revision ● Establishment of a certification system for collaborative energy-efficiency plan ● Establishment of a certification system for certified energy management control business operators	
2023	Energy Conservation Act revision ● Rationalization of energy use (expansion of the scope for rationalizing energy use) ● Shifting to non-fossil energy ● Optimization of electricity demand	Achieve carbon neutrality by 2050,

Japan, which relies most part of the energy supply on abroad, has implemented the EC measures that contribute both to securing of stable energy supply and prevention of the global warming as well as economic development.

1.2 Structure of the EC Act

The EC Act is composed of the Objective, Definition and the Basic Policies, followed by the measures for industries, transportation, buildings, machinery & equipment, etc. and electricity utility, and the miscellaneous provisions and penal provisions.

The EC Act stipulates the following key measures;

(1) The framework which requires the specified business operators, whose energy consumption of 1,500 kl COE/y or more, to appoint the qualified energy management persons (including the qualified energy manager) and execute daily energy management, annual report on their energy consumption to the Government, and annual submission of the mid to long term plan which is applied to the type-1 designated

company.

(2) The energy conservation guideline (hereinafter referred as EC guideline) for factories or workplaces

(3) The EC guideline for buildings and houses, and

(4) The EC guideline for machinery and equipment called as Top Runner system which is applied to the household appliances, automobiles, equipment and materials.

Supplemental explanation will be made by the section 2 “Designated energy consumers and qualified energy managers under EC Act” for the above item (1), and by the section1 for the above (2) & (3) respectively.

Table 1-2 shows the key regulatory measures for industrial, commercial, residential and transportation sector.

Table 1 -2 Key regulatory measures stipulated in the EC Act

	Industrial sector	Consumer sector		Transportation sector
		Commercial sector	Residential sector	
Regulatory measures	✓ Annual reports to the Government by business operators with energy consumption of 1,500 or more kl COE/y ✓ Appoint Energy Management Persons ✓ Standards of judgement ✓ Reduction efforts of EC by 1% per year	✓ Energy efficiency standards for buildings and houses (300m^2 or more)		✓ Periodical reports by freight carriers and consigners ✓ Reduction efforts of 1% per year
		✓ Top runner standards for household appliances , equipment, automobiles etc., 31 items in total currently. (Account for about 70% of household energy consumption)		

1 .3 Meaning of Energy Conservation stated in the EC Act

Energy Conservation (Rationalizing Energy use and Shifting to Non-fossil Energy) defined by the EC Act means the following two actions:

(1) Reduce energy consumption by means of improvement and refinement of both equipment/machinery (hardware) and operational management (software).

(2) Reduce the energy intensity (improve energy consumption efficiency)

Definition of energy intensity is shown in the Fig 1-1.

$$\text{Energy Intensity} = \frac{\text{Energy Consumption Volume (coe kl,}}{\text{Production Volume, etc.}}$$

Figure 1-1 Definition of energy intensity

The denominator of the energy consumption intensity stated in the EC Act is “the value that has a close relation with the energy consumption such as the production quantity, or the total floor area of a building, etc.” The details of the values are allowed to determine by self-decision of individual cases.

2 Designated energy consumers and qualified energy managers under EC Act

2.1 Designation of Specified Business Operator, etc.

Designation of Specified Business Operator, etc. is stipulated by the EC Act and specified by the Cabinet Order as shown in Figure 2-1.

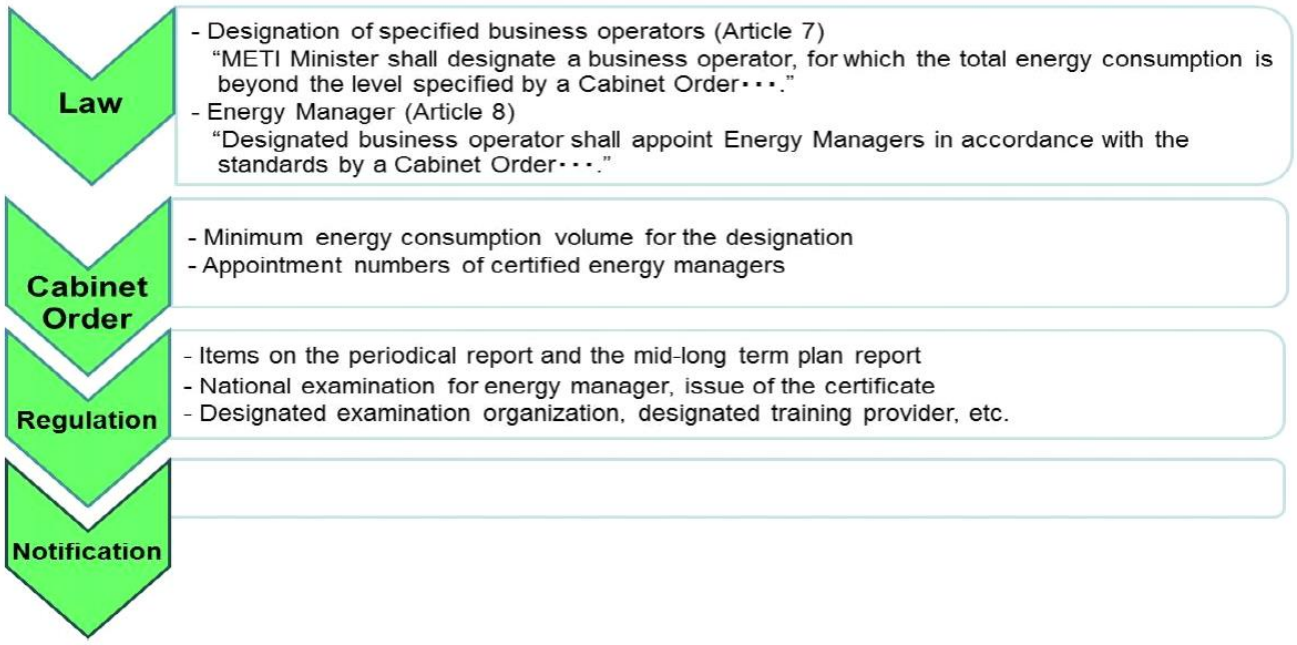

Figure 2-1 Legislation Hierarchy of the EC Act System

The “values specified by a Cabinet Order” are specifically given in the table 2-1 below. If the energy consumption in the previous year reaches or exceeds a certain value in a company as a whole, the company submits the notification on the status of energy use on its own to the government and is designated as the specified business operator or chain business operator. Likewise, the designation is stipulated for a designated energy management factory on a workplace basis.

The key point is that the Act provides a mechanism by which the workplaces, etc., undergo the concrete regulations as shown above in the case where their energy consumption exceeds a certain level.

Table 2-1 Designation of a factory and company as a whole

I. Obligations as a whole company

Annual energy consumption (COE kl)		1,500 kl or more /year	Less than 1,500 kl/year
Classification of business operators		Specified Business Operator, or Specified Chain Business Operator	—
Obligation	Person to be appointed	**Energy Management Control Officer, and Energy Management Planning Promoter**	—
	Matters to be observed	- Submit a periodical report and mid-to-long term plan - Implement the measures specified in the EC Guideline - Implement the measures specified in the guideline for electricity demand leveling	—
Target of business operator		- Reduce energy intensity by 1% or more on annual average for mid-to-long term period - Reduce the energy intensity for evaluation of electricity demand leveling	—

II. Obligations of designated factory

Annual energy consumption (Crude Oil Equivalent kl)	3,000 kl or more /year		1,500 – 3,000 kl/year	Less than 1,500 kl/year
Designation classification	Type 1 designated energy management factory, etc.		Type 2 designated energy management factory, etc	No designation
Classification of business operators	Type 1 specified business operator	Type 1 designated business operator	Type 2 specified business operators	—
Type of Business	5 business types including manufacturing (Mining, manufacturing, electricity supply, gas supply, heat supply) Offices are excluded.	Offices listed in the left column, and business types other than those listed in the left column (hotels, hospitals, schools, etc.)	All business types	All business types
Person to be appointed	Type 1 energy manager	Type 2 energy manager	Type 2 energy manager	—

A Type 1 specified business operator shall appoint a Type 1 energy manager for each of its Type 1 designated energy management factories, etc., from among persons who have a qualified energy manager's license. Likewise, a Type 2 specified business operator shall appoint a Type 2 energy manager. The qualification method for a Type 1 energy manager is described hereunder. However, that of a Type 2 energy manager is omitted due to a simple requirement for the qualification, receiving the designated one-day seminar.

(1) Energy manager's license

A qualified energy manager's license shall be issued by the Minister of Economy, Trade and Industry to persons who fall under any of the following items:

① A person who has passed an examination for a qualified energy manager's license; or

② A person who has been recognized by the Minister of Economy, Trade and Industry as having equal or greater knowledge and experience than the person listed in the preceding item.

(2) Examination for qualified energy manager's license

① An examination for a qualified energy manager's license shall be conducted by the Minister of Economy, Trade and Industry.

② The Minister of Economy, Trade and Industry may designate a "designated examining body" and cause such a body to administer the affairs concerning an examination for a qualified energy manager's license

③ The courses of an examination for a qualified energy manager's license, procedure for participating in the examination and other details concerning the examination for a qualified energy manager's license shall be specified by a Regulation of the Ministry of Economy, Trade and Industry.

(3) Duty of energy managers

Energy managers shall, with regard to the rational use of energy in Type 1 designated energy management factories, manage the maintenance of energy-consuming facilities, the improvement and supervision of methods for using energy, and other affairs specified by a Regulation of the Ministry of Economy, Trade and Industry.

(4) Appointment of energy management persons

A specified business operator shall appoint qualified energy management persons according to the Table 2-2 below. The appointment number of Type 1 energy manager differs from 1 to 4 based on type and energy consumption of a factory.

Table 2-2 Appointment of energy management persons

Person to be appointed	Classification of business operator			Number of appointment
EM Control Officer	Specified business operator/ Specified chain business operator			1
EM Planning Promoter	Specified business operator/ Specified chain business operator			1
Type-1 Energy Manager		(1) In case of business related to coke manufacturing, electricity supply, gas supply and heat supply	≧100,000 kl coe/y	2
			< 100,000 kl coe/y	1
		(2) In case of manufacturing (except coke manufacturing) and mining	≧100,000 kl coe/y	4
			≧50,000 - < 100,000	3
			≧20,000 - < 50,000	2
			< 20,000 kl coe/y	1
Type-2 Energy Manager	Type 1 designated business operator			1
	Type 2 designated business operator			1