Future tasks and countermeasures from the viewpoint of evaluation and inspection company after compliance with BEC have become mandatory

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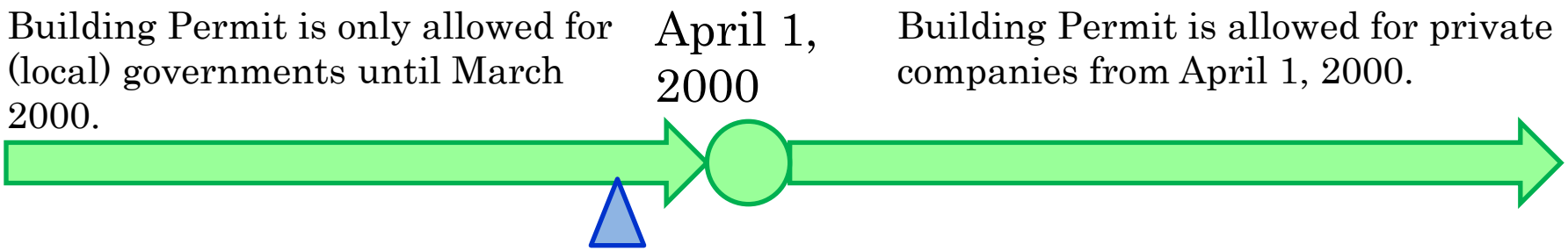
E Evaluation
R Rating
I Inspection



1 JAPAN ERI is the first private company that has attained building permits.
2 JAPAN ERI is the only company providing support all over Japan (ERI has 33 branch offices)

1　Outline of Japan's new Building Energy Code

Outline of the new Building Energy Code

Important points of the new Building Energy Code

1 Buildings over 2000 m^2 total area, except for residential/housing uses, require a “building energy consumption performance compatibility evaluation” for the building permit.
(An official letter for approval will be published.)

2 The new Building Energy Code requires construction as shown in the design documents for a building permit. When a difference is found, then an official letter for approval will not be published.
(The architect or building owner needs an alternative permit, or the builder needs to revise the building same as the documents.)

Standards of the new Building Energy Code

Buildings except residential/housing uses

Consumption of Primary Energy

BEI ≦ 1．0

（BEI Building Energy Index）

Definition of BEI

$$\mathrm{BEI} = \frac{\text{Designed Consumption of Primary Energy}}{\text{Standard Consumption of Primary Energy}}$$

Calculation System for BEI

Two calculation systems for BEI are regulated in the new Building Energy Code.

1 Standard input method

Inputs required window specifications, outside wall insulation, HVAC, domestic hot water supply, lighting system for all rooms, elevator, and solar cells.

2 Model building method

26 existing model buildings have already been prepared with this method. Much less input data are required versus the standard input method. Ministry of Land, Infrastructure and Transport (MLIT) recommend this method. Calculation precision is worse than the standard input method, but less time is required to obtain the BEI.

Comparison of old code and new codes

Total Area		Building Energy Code	
		old	new
≥ 2000 m²	Non-housing use	Notification	Fitness obligation (permit needed)
	Residential/ housing use	Notification	Notification
< 2000 m² ≥ 300 m²	Non-housing use	Notification	Notification
	Residential/ housing use	Notification	Notification
< 300 m²		Effort only	Effort only

The new Building Energy Code started as a partial regulation, but after 2020, all building permit will require a fitness obligation.

Permit and notification ①

We have two systems to check building construction.

Permit

1 The design document is checked by professionals having special license or experience.
2 The design document is checked mainly for legal, and partially for technical compliance.
3 An official letter for approval is issued.
4 A completion check performed by an authorized person is necessary.

Permit and Notification ②

Notification

1 The documents are submitted to the local government office.
2 The documents are checked by a professional, but in most cases, a license is not needed.
3 An official letter for approval is not issued.
4 A completion check is not needed, except as required by the code for the treatment of explosives and combustibles.

Permit and Notification ③

	Building Permit	Building Notification
Until end of March (old code)	①Building standards code ②Fire life safety code	①Building energy code (old code) ②Environmental codes (noise, vibration, drainage water, exhaust, indoor conditions)
From April 1st (new code)	①Building standards code ②Fire life safety code ③Building energy code (new code)	①Environmental codes (noise, vibration, drainage water, exhaust, indoor conditions)

2 ERI's activity

① Before April (preparation for the new Building Energy Code)

② After April (implementation of the new Building Energy Code starts)

Activity before April ①

■Company activity

1 ERI registered with the government as a private company for building energy consumption performance compatibility evaluation.

2 ERI organized the new Promotion of Energy Saving Department for this evaluation.

3 A special license is required for evaluation. ERI has 33 branch offices. Each branch is capable of performing the evaluations, as ERI has people with the special license in each office. In total, 168 ERI employees were licensed in March.

4 ERI created a management and accounting database system for the new building energy code.

5 ERI created a charges scheme for the energy consumption performance compatibility evaluation.

Activity before April ②

■ Activity for clients

1 ERI held many client seminars to explain the new building code.

2 ERI sent questions to the Ministry of Land, Infrastructure and Transport. ERI published a booklet of these questions and responses.

■ Activity for ERI's members

Technical skills in HVAC, plumbing, and lighting are required to evaluate energy consumption performance compatibility. ERI held lectures on the new code, HVAC, plumbing, and lighting systems, not only for M&E engineers but also architects. There are not many professional M&E engineers to design and construct buildings in Japan, so every company can not get enough of them. Thus, many architects in ERI have to evaluate energy consumption performance compatibility.

Note: HVAC = Heating, Ventilation, and Air-Conditioning

Activity after April

■ Activity for clients

1 ERI held seminars for architects and M&E engineers about calculation methods for the building energy code.

2 The new building energy code requires additional supervision compared to the old building standard code. So ERI held many seminars all over Japan about supervision.

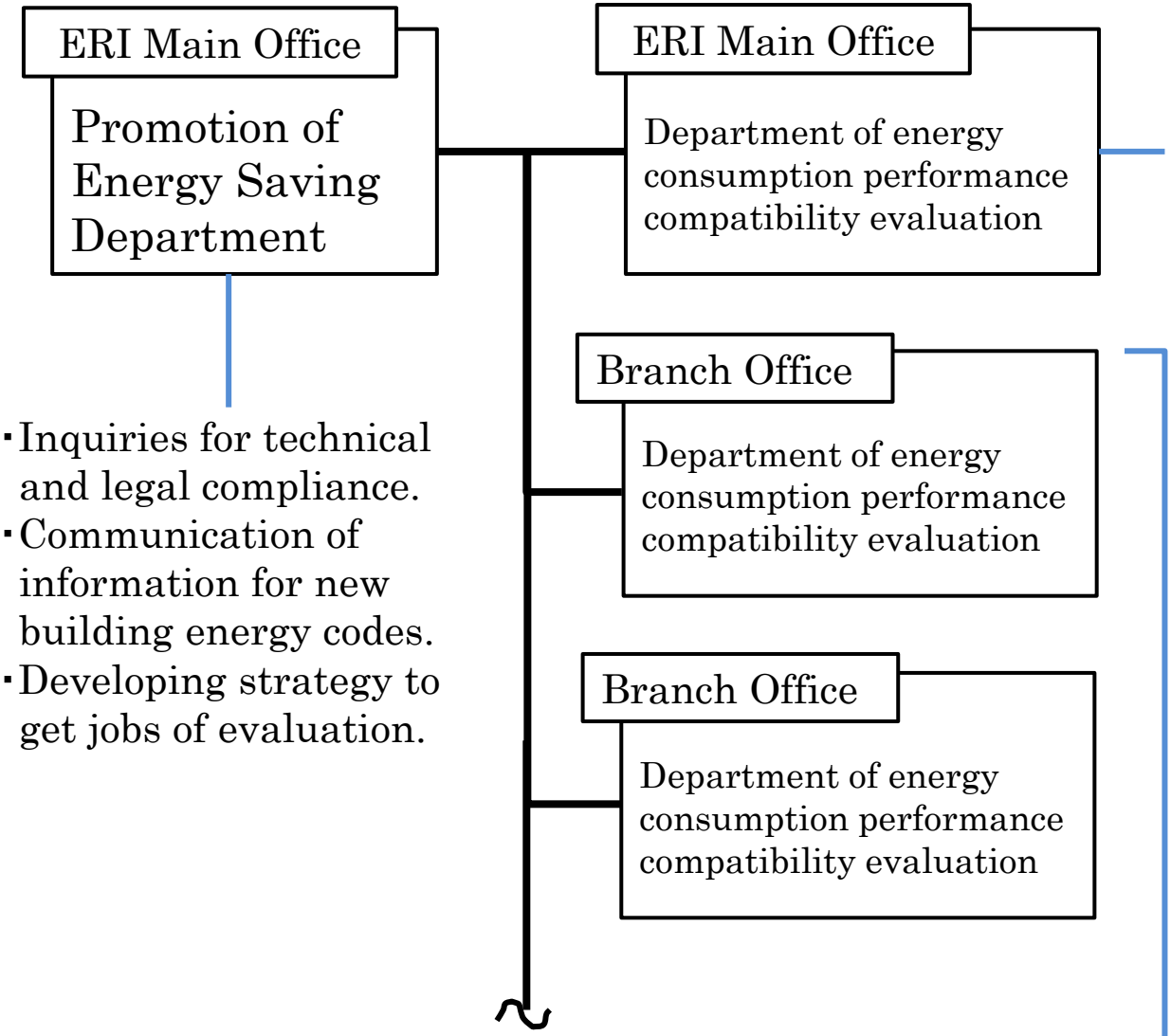
■ Activity for ERI's members

1 The Promotion of Energy Saving Department has answered many questions from ERI's clients, members, and even competitors.

2 The Department developed a questionnaire to choose new lectures for next year. Many architects have requested a lecture on HVAC, and thus, the text on HVAC must be made easily accessible to nonprofessional members.

3 ERI's evaluation system

ERI system for the new Building Energy Code



- Inquiries for technical and legal compliance.
- Communication of information for new building energy codes.
- Developing strategy to get jobs of evaluation.

A department of energy consumption performance compatibility evaluation in the ERI main office has experienced mechanical and electrical engineers.

ERI has 33 branch offices, and each branch has a section of energy consumption performance compatibility evaluation

Evaluation abilities by staff

Check point in new building energy code	Architect	Mechanical engineer	Electrical engineer
Skin (insulation and window specification)			
HVAC			
Domestic hot water supply			
Lighting system			
Elevator			
Solar cells			

How will ERI evaluate?

1 ERI staff need a wide range of knowledge about architecture, HVAC, domestic hot water supply, lighting systems, and other energy saving systems to evaluate energy consumption performance compatibility.

2 This knowledge is basic, so it is not difficult for even architects to become licensed for this purpose.

3 In ERI's branch offices, one architect evaluates both the building standard code and the new building energy code.

4 When the model building method is used to get the BEI, it is easy for architects to perform the evaluation.

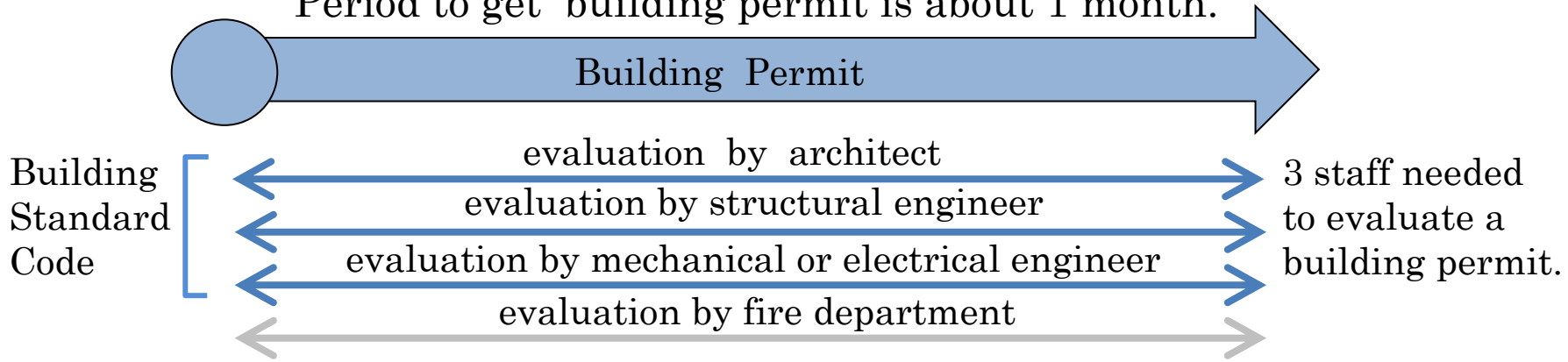
5 When the standard input method is used, it is sometimes not possible for a branch office architect to perform the assessment. If so, M&E engineers from the ERI main office will step in.

6 In cases with complicated HVAC systems, main office M&E engineers will advise the branch office architects.

Comparison of before and after April

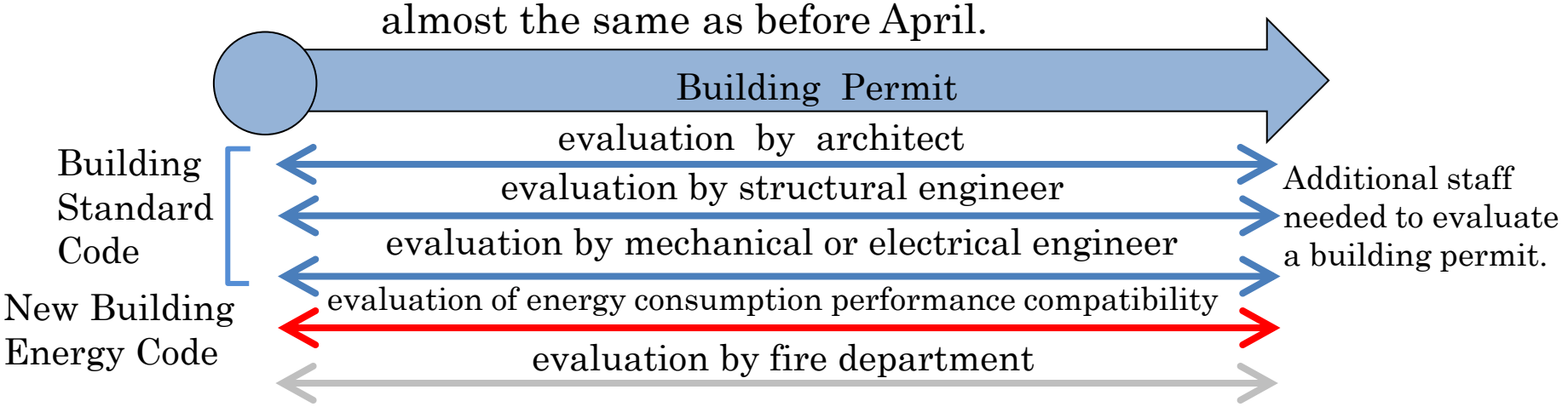
Before April

Period to get building permit is about 1 month.



After April

Period to get building permit is about 1 month, almost the same as before April.



Main trends of the past six months

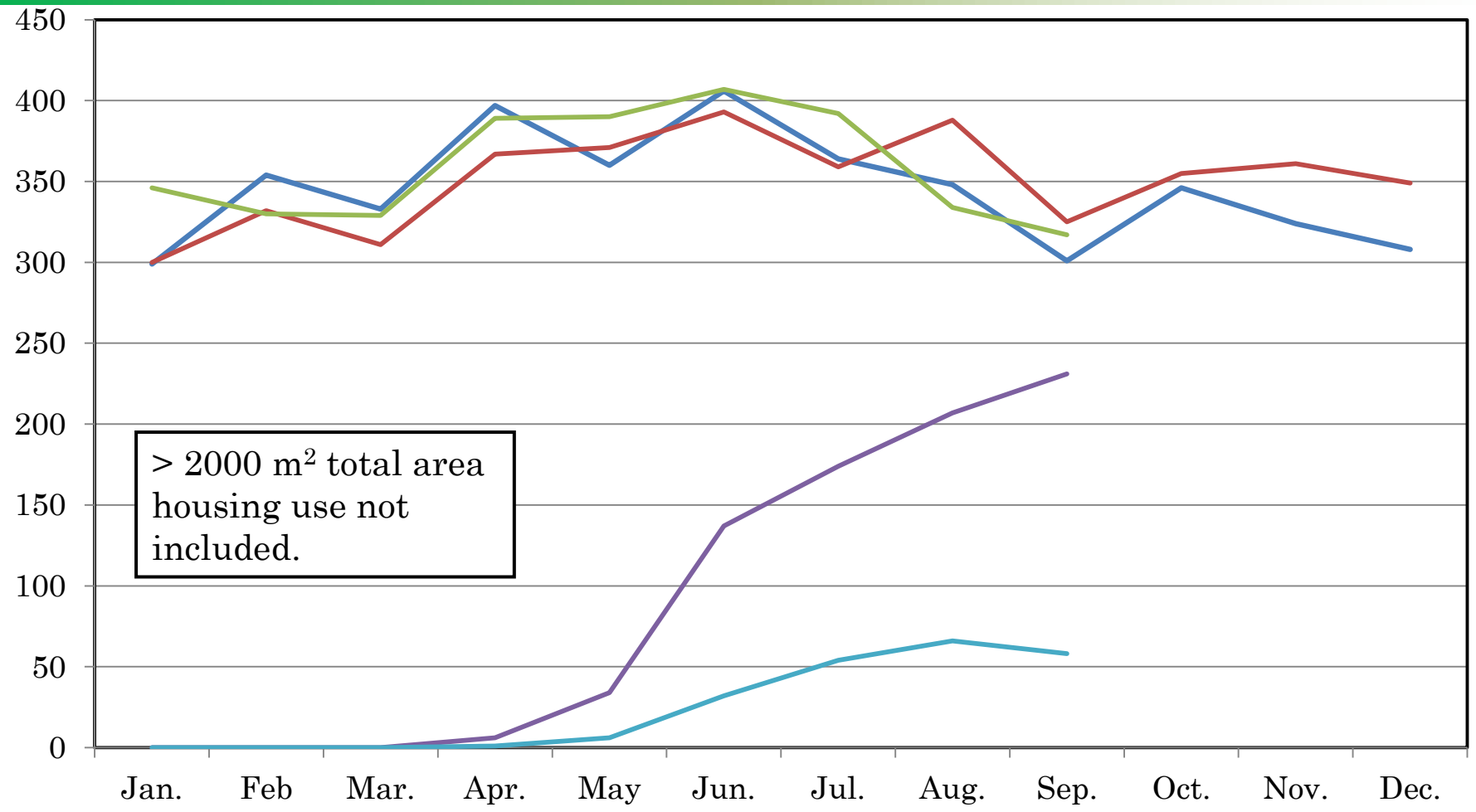
1 The period to get a building permit after April under the new Building Energy Code is almost the same as before April under the old code.

2 A few permits take longer, typically due to document's mistakes made by an architect or engineer unaccustomed to the new code.

3 The model building method is used to calculate the BEI in more than 95% of cases. Permits using the standard input method are very rare.

3 Numerical statements prepared after construction starts

Construction start and building permit numbers



Summary of construction start numbers in recent year

The number of evaluation for energy consumption performance compatibility from April to September		789 (ERI's evaluation 217)
Construction start of > 2000 m^2 from April to September	in 2015	2176
	in 2016	2203
	in 2017	2209

1 The number of constructions started after the new building energy code was enforced are almost the same as in 2015 and 2016.

2 About 1400 buildings are exempt from the new building energy code according to official rules.

4 Future tasks

Future tasks for clients

1 ERI has had many questions from clients, in-house architects and engineers over the past six months, and will likely have more. This information will continue to be shared.

2 The information to make the design document for evaluation of energy consumption performance compatibility is not enough in detail. ERI will work to make more easily, and inform to society.

Future tasks for the company

1 MLIT declares that all building permit of both housing and non-housing use will require fitness obligations until 2020 as a revision of the new Building Energy Code.

2 Then, the number of fitness obligations will increase annually. It is difficult to employ new professional engineers, so ERI will have to improve engineering knowledge, not only for M&E engineers but also architects.

3 It is especially necessary to improve the engineering knowledge of architects as soon as possible.

4 How to improve?
- Make the HVAC text more understandable.
- Educate staff to judge energy consumption performance compatibility using e-learning systems (a.k.a. network learning systems)

Thank you for your attention
and enjoy your stay in Japan.