EMAK 11

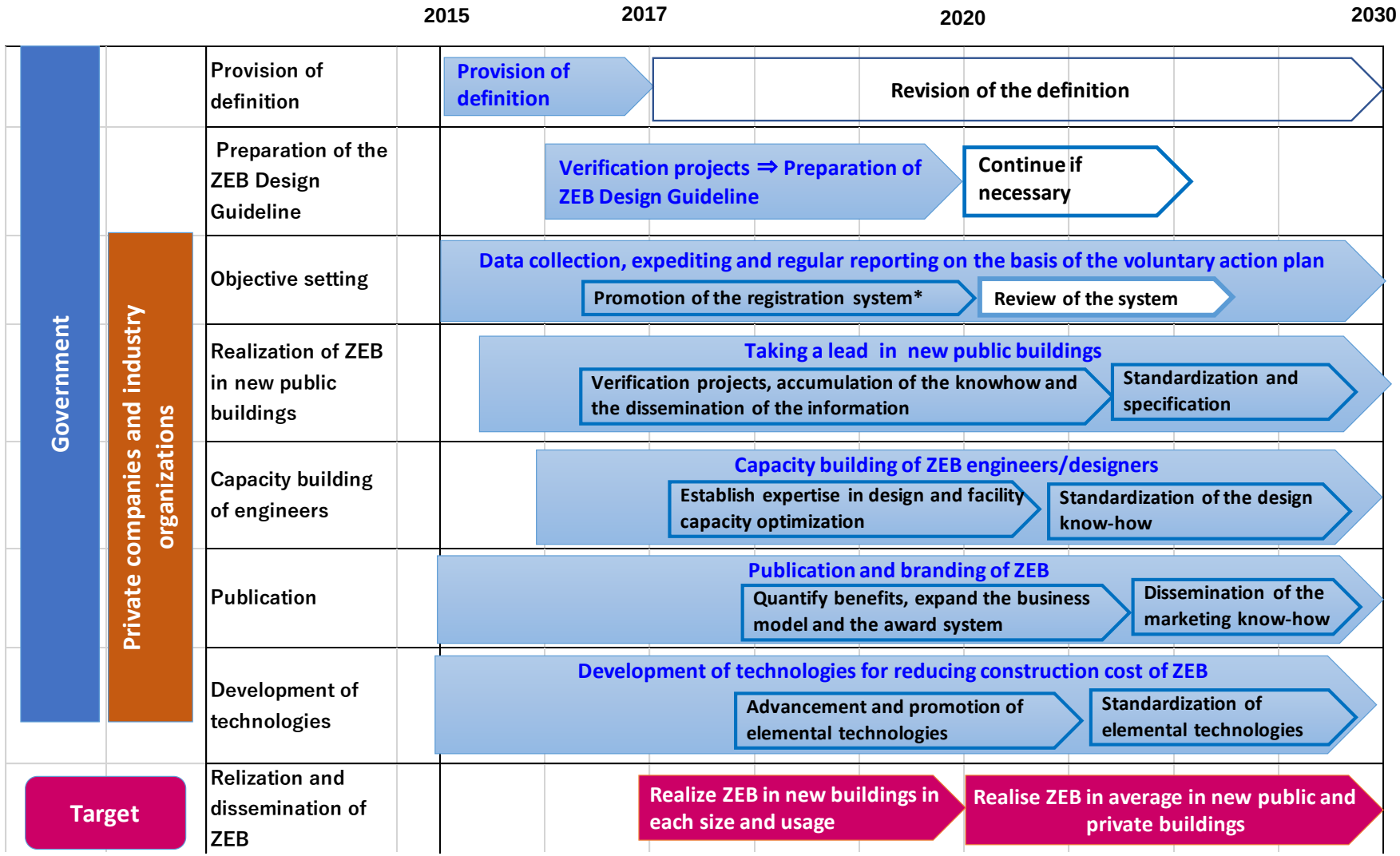
Transition toward Net-Zero Energy Buildings

The reference for Session 3 Panel discussion

February 9, 2023

Yoshitaka Ushio (ECCJ)

The road map toward realization and dissemination of ZEB (2015-2030)



Note: * The leading owner registration system and ZEB Planner registration system

Source: METI Website

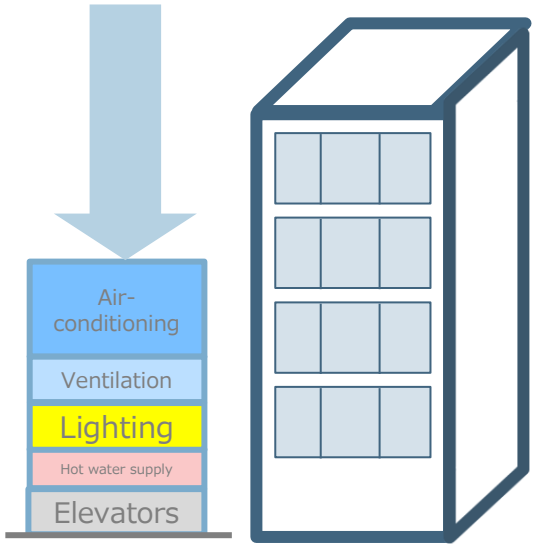
The ZEB dissemination

(2) Step by step approach toward ZEB

The concept of ZEB has been expanded to “ZEB series” according to actual conditions. First step is to aim for super energy efficient buildings which are defined as “ZEB ready”, and then aim for “ Nearly ZEB” and “(net) ZEB” which is a step-by-step approach.→ **ZEB family Concept (ISO TS 23764)**

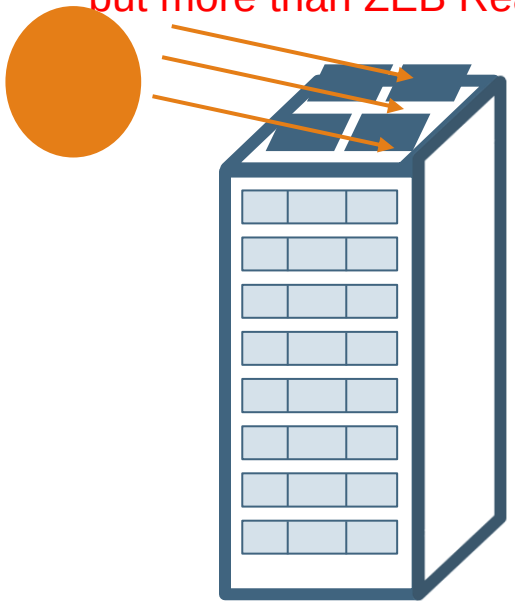
ZEB Ready

(Significant energy saving more than 50% from reference point)



Nearly ZEB

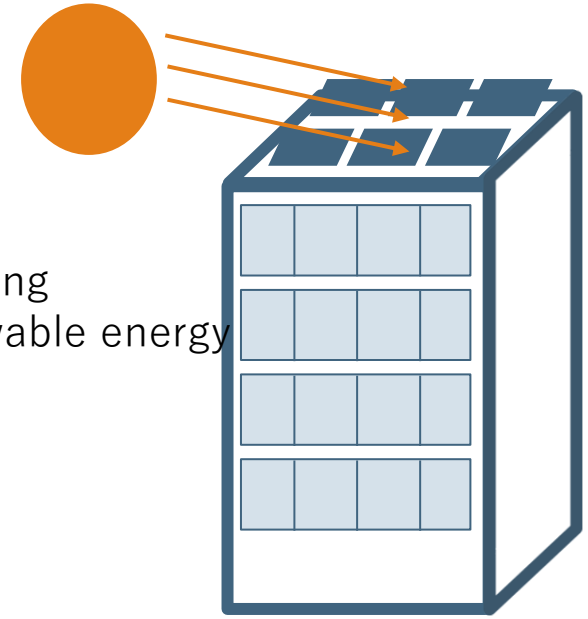
(Net energy saving (RE) not reach 100including% but more than ZEB Ready)



Including Renewable energy

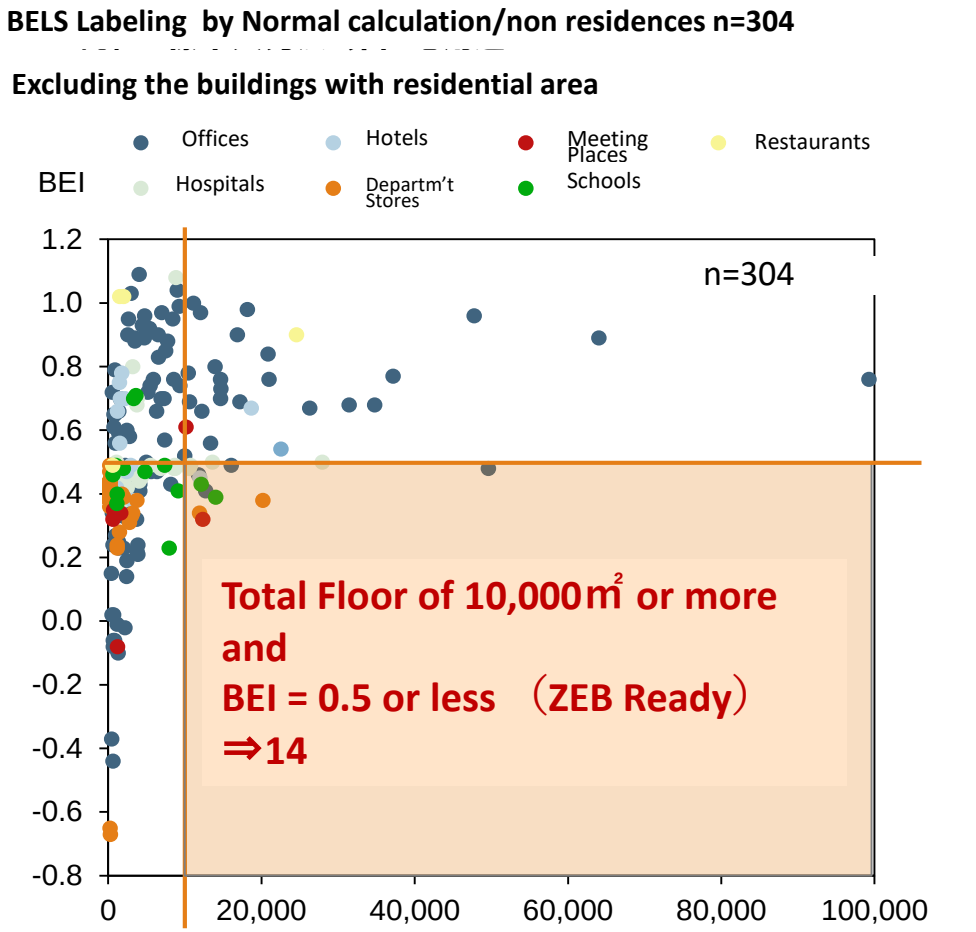
(net)ZEB

(Net energy saving (including RE) of 100% or more)



New definition of ZEB series

Relationship between total floor area and BEI for commercial buildings



Source: Presentation by SII at ECAP 20 Workshop on Dec 3, 2019

The number of ZEBs whose total floor area of 10,000㎡ or more is not greater than 14 out of a total of 304.

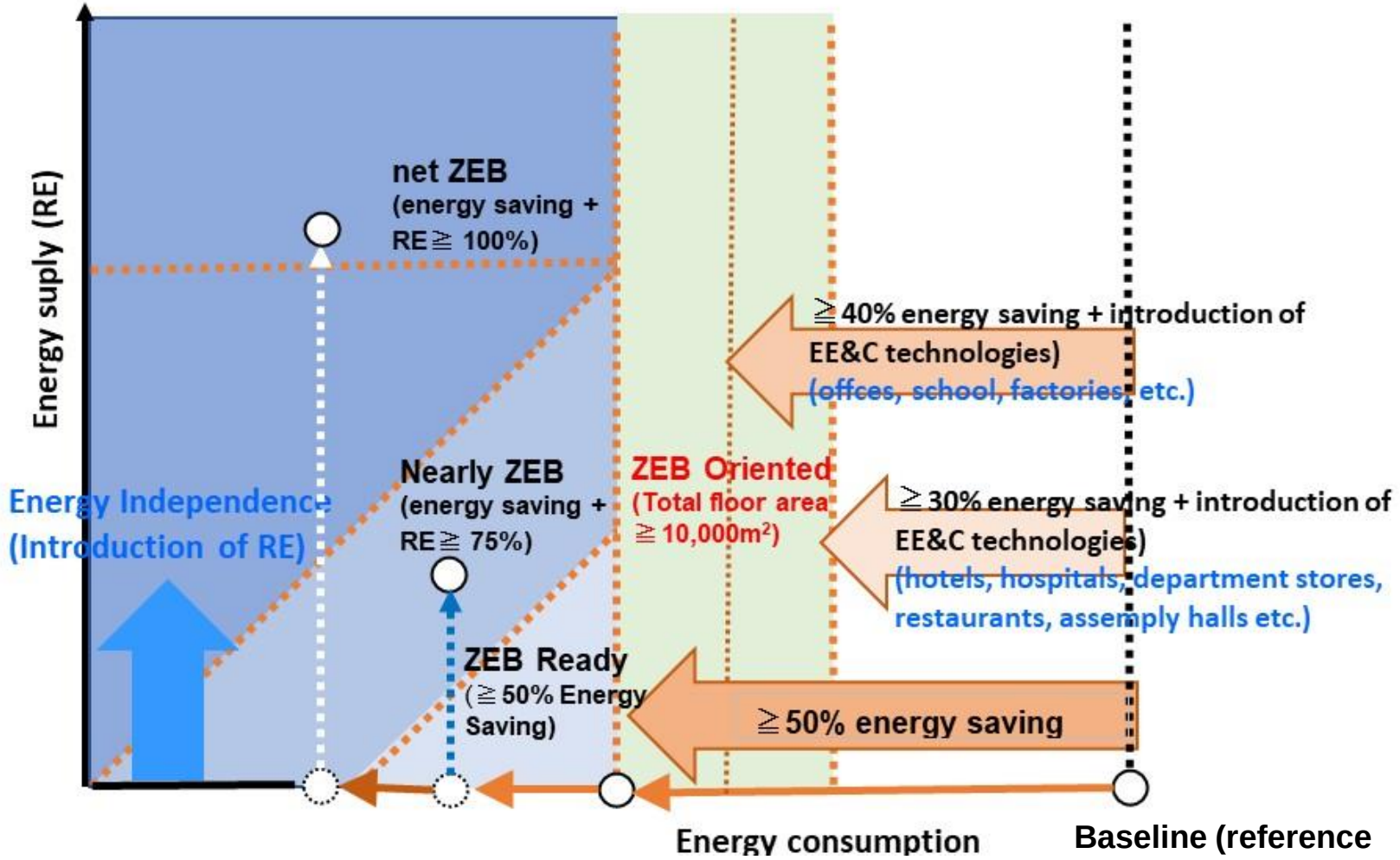
Introduction of new ZEB category i.e. "ZEB Oriented"

- a total floor area of 10,000 m^2 or more
- those reducing primary energy consumption except for renewable energy in the degree of ;
- 40% or over for offices, schools & factories
- 30% or over hotels, hospitals, department stores, restaurants & meeting places

The new definition of ZEB series

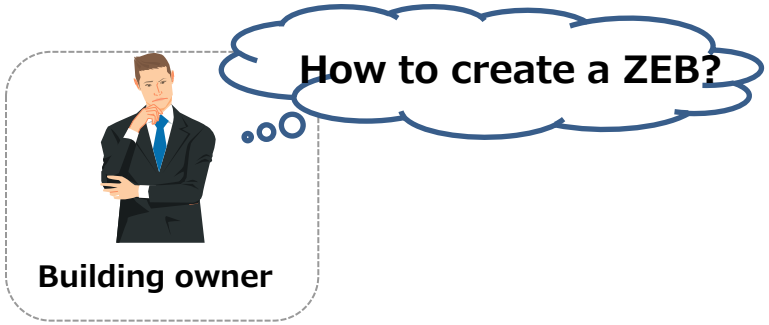
Introduction of ZEB Oriented

New evaluation method of ZEB family buildings including "ZEB Oriented"



Source: METI Website

ZEB Planner / ZEB Leading Owner Registration System



Consultation

Support

Building ZEB with the involvement of planners

ZEB Planner

Design Company

Design and construction company

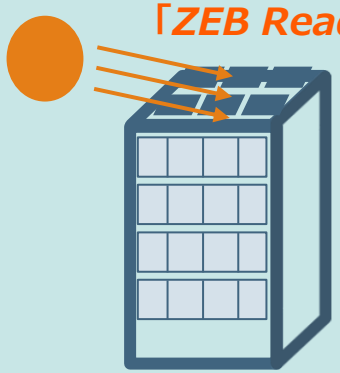
Consulting Companies

・Disclosure of planner information (scope of work, coverage area, etc.), ZEB planning results, and consultation services

ZEB Leading Owner Registration

・Owner information (companies, municipalities, etc.)
・Targets for ZEB initiatives
・Installation results, installation plans
・Case studies (building outline, energy-saving performance, etc.)

Building owner 『*ZEB*』
「*Nearly ZEB*」
「*ZEB Ready*」



Number of registered ZEB planners: **284 companies**
Number of registered ZEB Leading Owners: **378 cases**
(As of September 24, 2021)

Dissemination of ZEB building examples

Spread to new ZEB owners

Risk reduction for ZEB planning (increase in reference cases)

Better understanding of the benefits of ZEB

Expansion of initiatives through improved social reputation

The ZEB Design Guideline and ZEB Brochure

Sharing of know-how through design guidelines and brochures

ZEB Design Guidelines

Medium office | Home for the aged・Welfare homes | Small office | Supermarkets | hospital | school | hotel | assembly hall

ZEB Brochure

office | Supermarkets | Home for the aged・Welfare homes | hospital | school | hotel

✓For design engineers

- Combination of technologies for ZEB conversion
- Energy saving effect of the technology, additional cost
- Actual design cases

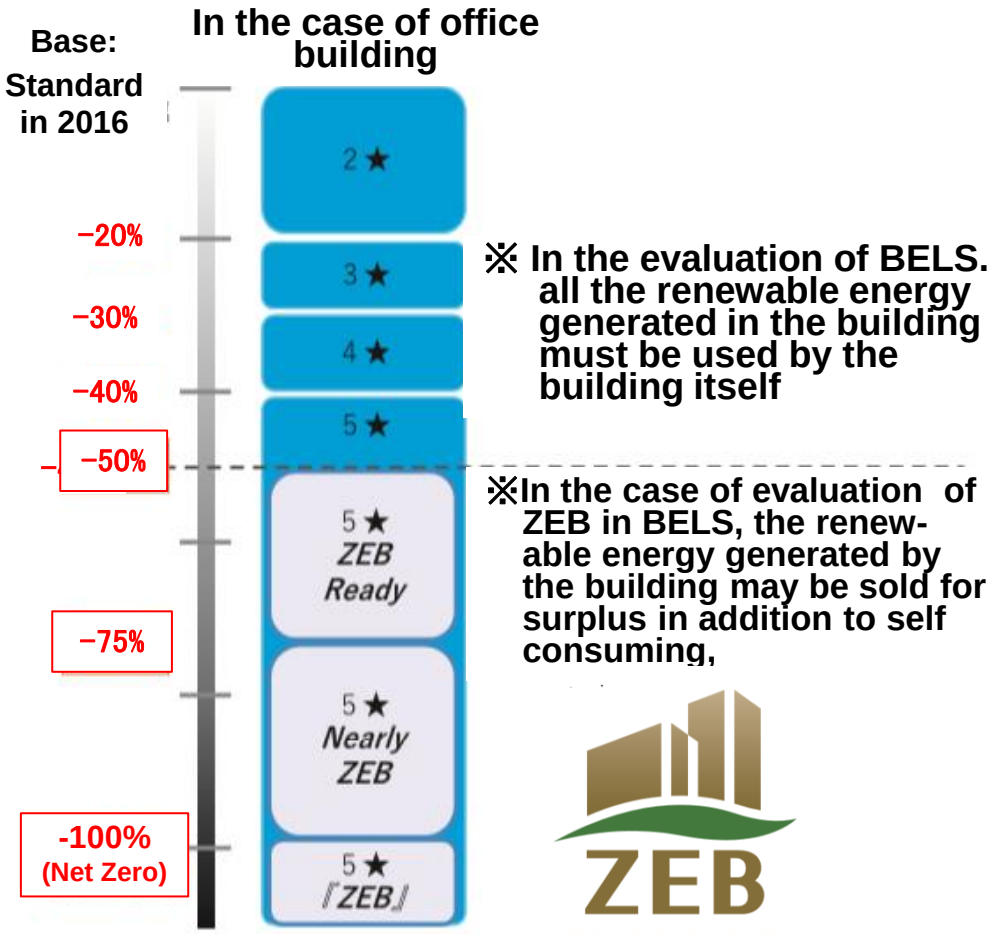
✓For building owners

- Benefits of ZEB (energy-saving benefits, improved working environment, etc.)
- How to achieve ZEB, actual design examples
- Available support systems, etc.

The Building Energy-Efficiency Labeling System (BELS)

Labeling system and Positioning of ZEB

ZEB certification and labeling system



※ In the evaluation of BELS. all the renewable energy generated in the building must be used by the building itself

※In the case of evaluation of ZEB in BELS, the renew-able energy generated by the building may be sold for surplus in addition to self consuming,

ZEB

The number of BELS acquisition

Status of BELS acquisition

- As of September 30, 2021: **2,040**
- ZEB series: **724 cases**
- Percentage of ZEB series: approx. **35.5**

Source: METI Website

Award System of ZEB · ZEH-M

Utilize the Energy Conservation Grand Prize (conducted by ECCJ)

In order to further enhance awareness of ZEB and to impress upon building owners and investors the benefits of ZEB, the framework of **the Energy Conservation Grand Prize**, which is already widely recognized as an award system for home appliances, etc., will be utilized. **The "ZEB/ZEH field" was newly established** in the "Energy Conservation Best Practice Category" and "Product and Business Model Category" of the Energy Conservation Grand Prize in fiscal year 2021.

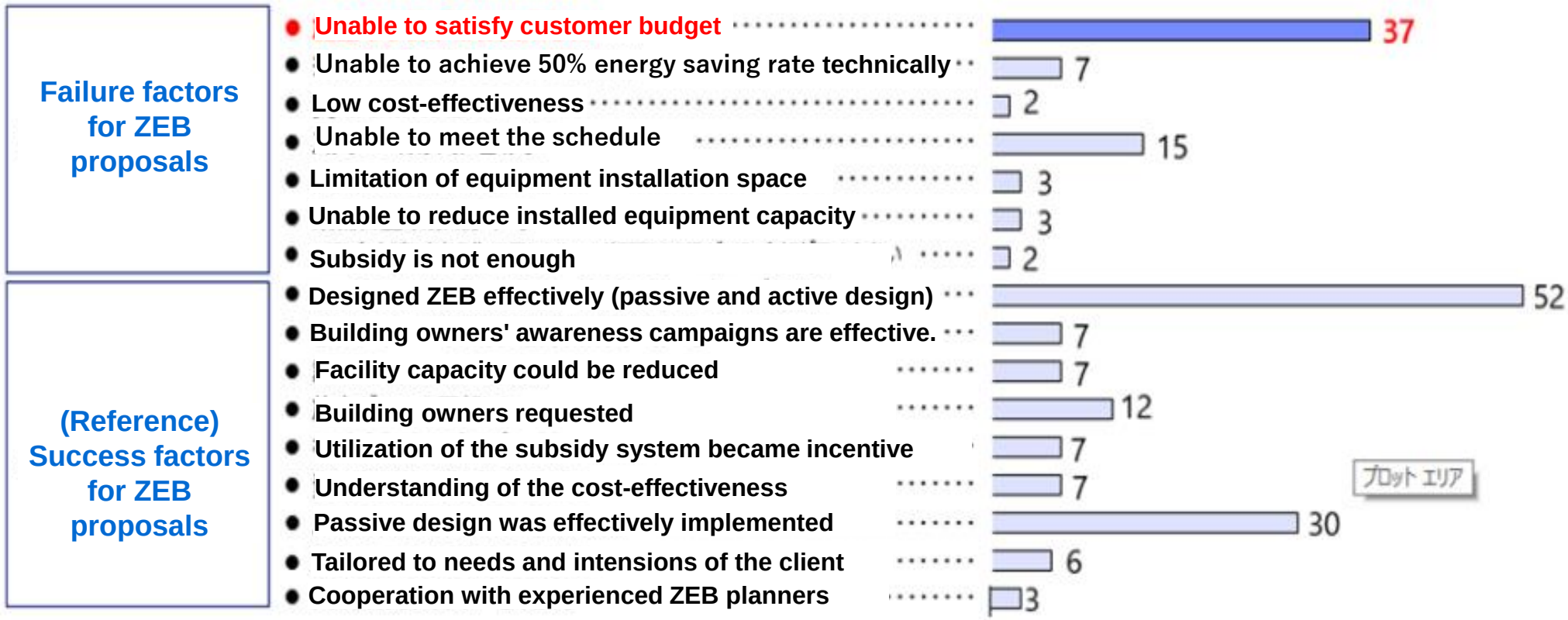
	Energy Conservation Best Practice Category	Product and Business Model Category
Evaluation targets	• Projects that are expected to lead to the future spread of ZEH and ZEB through activities that have achieved energy savings by converting to ZEH and ZEB. • Projects that have achieved a high ratio of ZEH in their own house supply or a large supply of ZEH on a national scale. • Activities of building owners that contribute to EE&C through the conversion of their buildings to ZEB	• Products that have achieved ZEH/ ZEB, have excellent functionality and design considering the surrounding environment and customer needs and are expected to be widely used in the future, • Standardized ZEB that is expected to spread in the future
Evaluation items	a. Innovativeness and originality b. Energy efficiency and conservation c. Replicability and spillover potential d. Sustainability of improvement	a. Development Process b. Innovativeness and originality c. Energy efficiency d. Resource saving/recyclability e. Marketability and economic efficiency c. Environmental preservation and safety

Note: ZEH in the Energy Conservation Grand Prize is "Nearly ZEH" and higher. ZEB is "ZEB Ready" or higher.

Source: Report of ZEB / ZEH-M Committee (2021)

Failure factors and success factors for ZEB proposal

According to a survey of ZEB planners, the main reason for the failure of ZEB proposals to the clients is that ZEB construction cost is unable the client's budget. Therefore, it is considered necessary to create an environment in which clients can easily understand the benefits of ZEB by enhancing the awareness of ZEB itself and its social reputation. The success factors for ZEB proposal were also surveyed and “Designed ZEB efficiency(passive and active design) and “Passive design was effectively implemented” got more votes.



Source: METI Website