

# ZEB family concept International Standardization

November 6<sup>th</sup>, 2018

**JASE-W** - JAPANESE BUSINESS ALLIANCE  
FOR SMART ENERGY WORLDWIDE



<http://www.jase-w.org/english>



*Japanese Business Alliance for Smart Energy Worldwide*

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# 1. Background of ZEB dissemination

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- ❑ The current energy efficiency measures may not achieve COP21 requirements for reduction of global warming gas easily in Japan.
- ❑ The current Japanese E. E. Law for buildings may not achieve easily the target for reduction of GHG in building sector. Therefore, the following new target has been set in order to promote and disseminate high level energy efficient buildings, “ZEB Ready” though the continuous efforts to realize (net)ZEB

- 1. Realize ZEBs in newly constructed public buildings by 2020**
- 2. Realize ZEBs in average newly constructed public and private buildings by 2030**



## 2. Practical Approach to ZEB

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- ❑ If you pursue only net Zero Energy Building at planning and design stage, there are many difficulties on finance and technologies in order to realize such Zero Energy Buildings.
- ❑ **But once if you plan and design the building with the clear policy of “ZEB Family concept”, you can realize ZEB by a step-by- step approach from ”ZEB Ready“.**
- ❑ “ZEB Ready” buildings can be designed, constructed and operated by use of not only advanced technologies but also other measures such as measurement, verification and management.

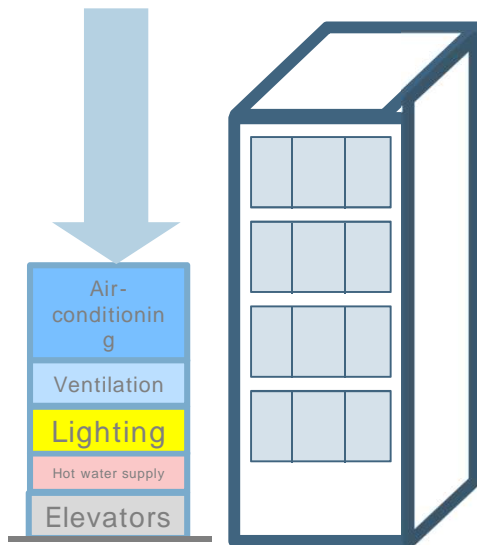


### 3. “ZEB family” Concept

The concept of ZEB has been expanded to “ZEB family” according to actual conditions. First step is to aim for super low-energy buildings which are defined as “ZEB ready”, and then aim for “ Nearly ZEB” and “(net) ZEB”.

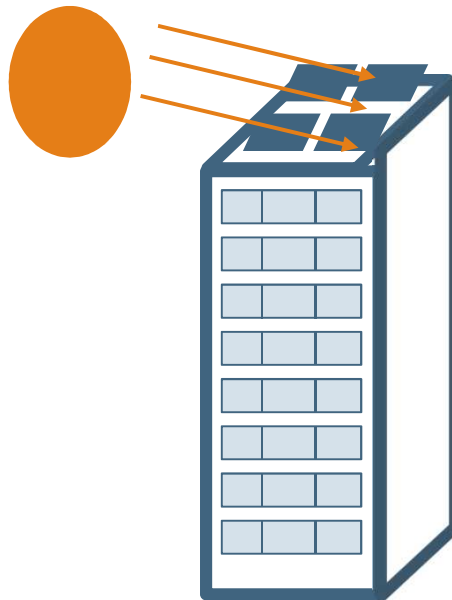
#### ZEB Ready

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



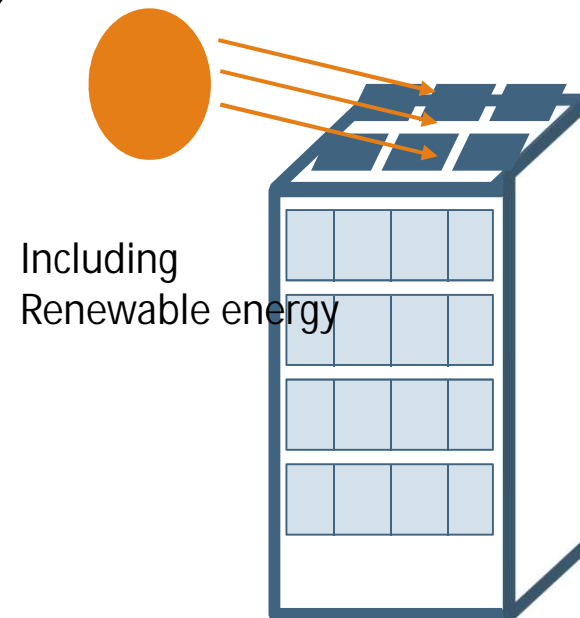
#### Nearly ZEB

(Net energy saving not reach 100% But more than ZEB Ready)



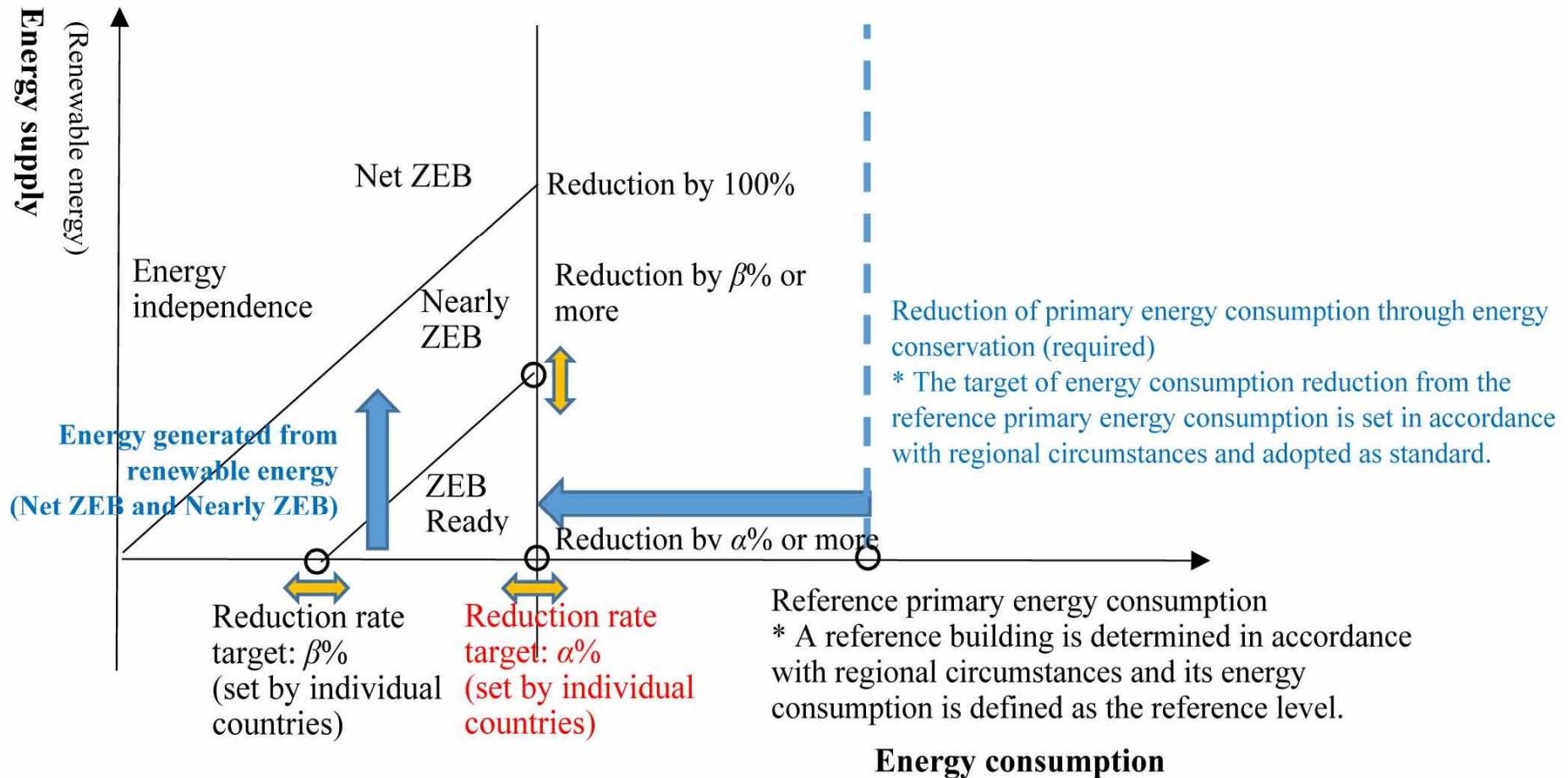
#### (net)ZEB

(Net energy saving of 100% or more)



# 3. “ZEB family” Concept

## Definition and evaluation methods of ZEBs



## 4. Standardization of ZEB family concept

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- ❑ We have decided that this step-by-step approach of “ZEB Family” concept should be disseminate as an International Standard (ISO).
- ❑ Now we have just proposed this step-by-step approach standard to ISO TC205 WG2 (Design of energy-efficient buildings) this September 27<sup>th</sup> at Oslo, Norway.
- ❑ The proposal includes six core elements for standardization of this “ZEB Family” concept.
- ❑ This proposal shall be officially the theme as a new proposal of TC205 if more than 5 countries agree at the ballot for this proposal. The ballot will be announced soon. After announcement, the voting will start and end within 3months.



## 4. Standardization of ZEB family concept

### Six Core elements for Standardization (ISO)

**At planning stage**, to have clear policy to achieve ZEB by the three steps, ZEB Ready → Nearly ZEB → (net)ZEB, but not to achieve it by only one step to (Net) Zero Energy Building.

**At the design stage**, to select proper materials and equipment, which are certified by the domestic standard or international standard, as much as possible.

**During construction**, to install the selected materials and equipment correctly according to the drawings and specifications.

**After completion of building**, to realize the energy consumption targeted at the design stage.

**After operation start**, to inspect actual energy consumption continuously (suitable times per year) whether there is any difference of energy consumption between targeted at design stage and measured at actual operation.

**After design and after completion**, to calculate the primary energy consumption by using simulation software, if possible.



# International Organization for Standardization

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- Proposed to TC205 WG2
  - TC205: Building environment design
  - WG2 : Design of energy efficient buildings
- Members of TC205
  - Many countries from Europe, but no ASEAN Countries as P-members who have the right to vote.
- One country has one vote right for decision making ballot at ISO.



# Need your cooperation

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In order to proceed the standardization, support from more than 5 countries are required in the ballot among the P-members among TC205.

- Be a P-member (Participating Member) instead of O-member (Observer Member)
- Vote with us at ballot for ZEB family standardization



Reflection to the evaluation guidelines of  
the special submission category of the  
ASEAN Energy Award



# Evaluation Point of “ZEB Ready special submission”

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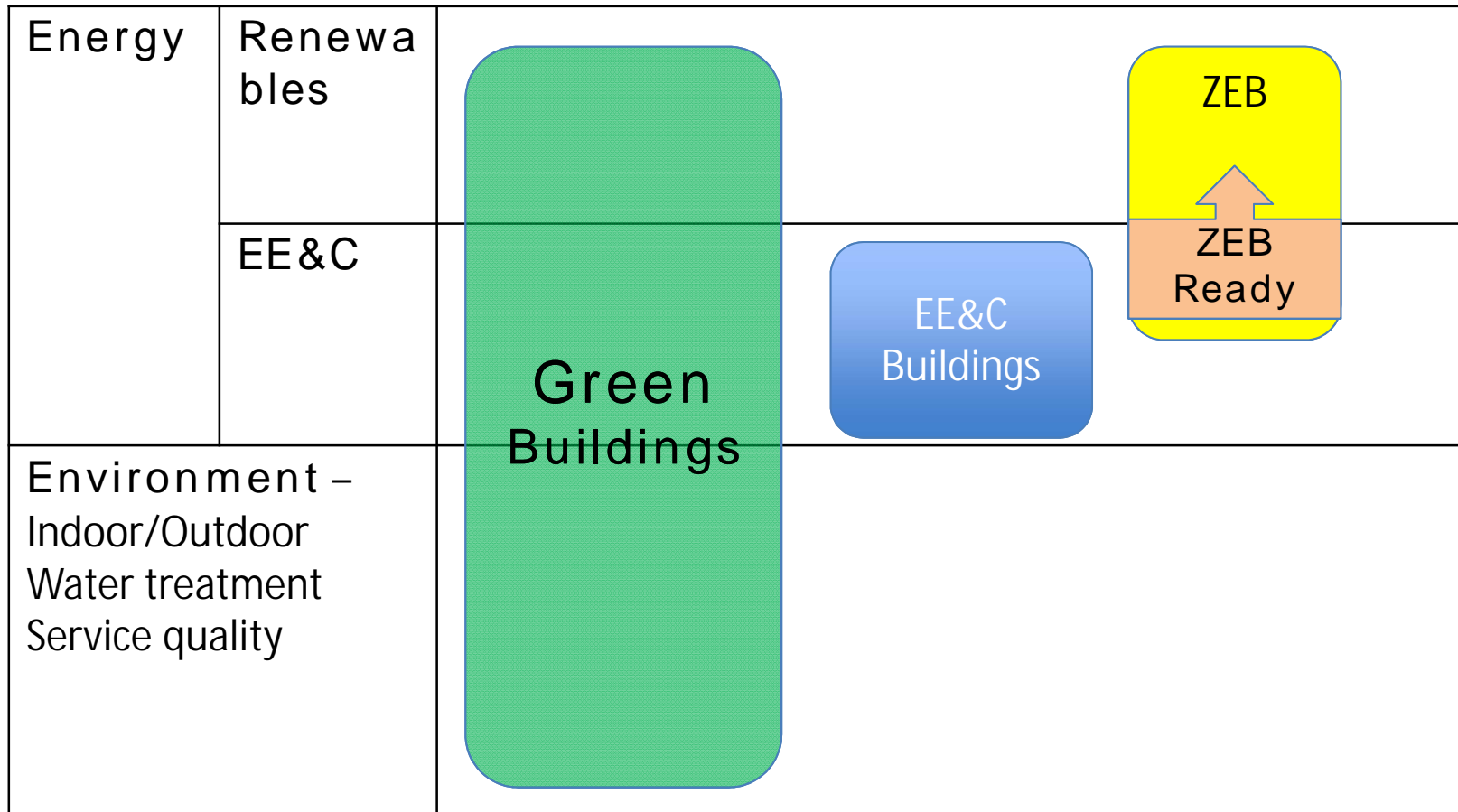
In addition to assessing the current building energy performance itself, it should be evaluated by the perspective of on going efforts to achieve “(net)ZEB” in the future as “ZEB Ready”

- Is it cover core 6 elements of “ZEB Family Concept”?
- Is future grade up plans are based concrete plans?

Therefore “ZEB Ready Special Submission” must be different from the purpose of existing awards.



# Criteria of ZEB Ready in A.E.A



Thank you for your  
attention.



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**ECCJ**

*The Energy Conservation Center, Japan*



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- The intention of this standard is raising the awareness of the easy way to ZEB by step-by-step approach
- It cover core 6 elements of “ZEB Family Concept
- The baseline can be decided by each countries considering their current situation.





# 5. Case study

(Example of a calculation for a 10,000 m<sup>2</sup> office in Japan (7-story building))

Equivalent to the 2013 Energy Saving Standard

Envelope

- Single layer 8 mm, etc.
- Roof insulation with 50-mm extruded polystyrene foam
- Wall insulation with 25-mm extruded polystyrene foam

Air-conditioning

- Air-cooled heat pump, EHP (electric heat pump)
- Secondary pump that controls a number of units and the revolving speed
- Constant air volume control etc.

Ventilation

- Static pressure: 250 Pa
- Fan efficiency: 40%
- Without control etc.

Lighting

- HF-type appliances
- Without control etc.

Hot water supply

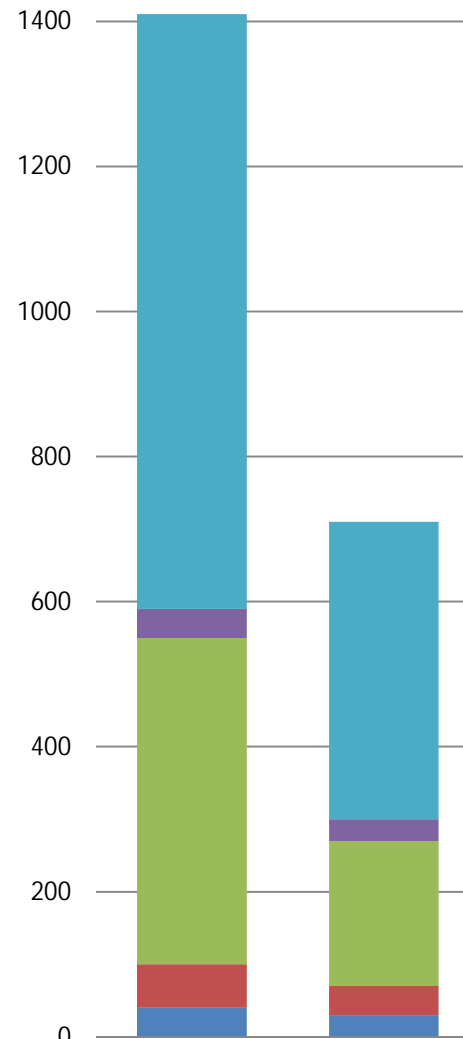
- Localized electric hot water storage system
- Without a hot water saving device
- With 30-mm piping heat insulation

Elevator

- AVAF (Adjustable Voltage Adjustable Frequency) (without electric power regeneration)



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Equivalent to ZEB Ready

- Low-E Double Glazing, full height, with horizontal eaves
- Roof insulation with 50-mm extruded polystyrene foam
- Wall insulation with 25-mm extruded polystyrene foam
- Air-cooled heat pump (controlling number of compressors), EHP
- Small-flow pump that controls a number of units and the revolving speed
- VAV control, outdoor air cooling, double fan, etc.
- Static pressure: 250 Pa
- Fan efficiency: 40%
- High-efficiency motor, temperature control, etc.

- LED lighting
- Human sensor, daylight dimming control, etc.

- Localized electric hot water storage system
- Automatic hot water supplying tap
- With 30-mm piping heat insulation

- AVAF (Adjustable Voltage Adjustable Frequency)