# Toward Zero Energy Buildings

## *Methodology for achieving non-residential zero-energy buildings (ZEBs)*

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# 1. Background of ZEB dissemination

## *Background of ZEB dissemination*

1. *The current energy efficiency measures cannot achieve COP21 requirements for reduction of greenhouse gas (GHG) in Japan.*
2. *The current Japanese E. E. Law for buildings does not have enough power to achieve the target for reduction of GHG in building sector.*
3. *Therefore, the following target has been set in order to promote and disseminate high level energy efficient buildings, "ZEB Ready" first and realize (net)ZEB by step-by-step approach though the continuous efforts.*

***Target:***
*Realize ZEBs in average newly constructed public and private buildings by 2030*

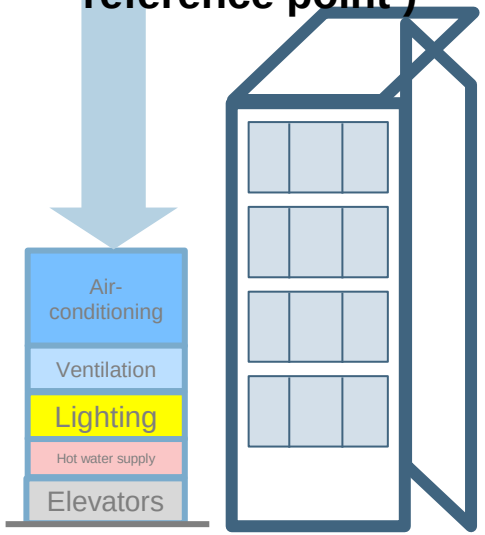
# 2. “ZEB Family” Concept described in TS23764 (ISO)

***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***

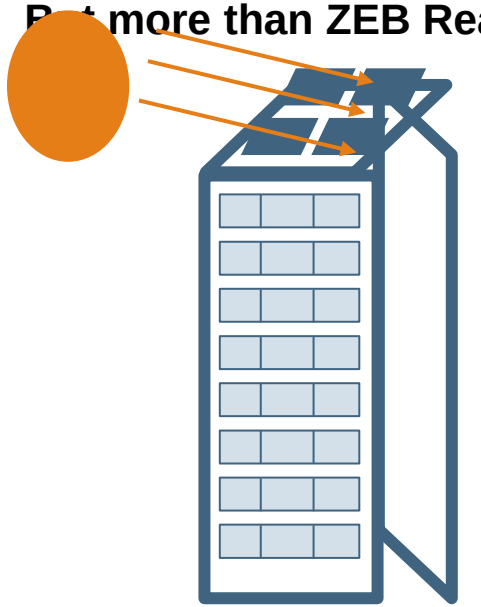
## ZEB Ready

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



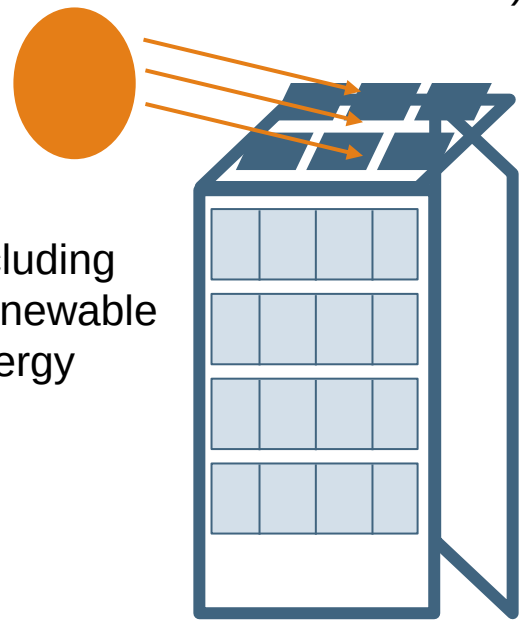

## Nearly ZEB

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



## (net)ZEB

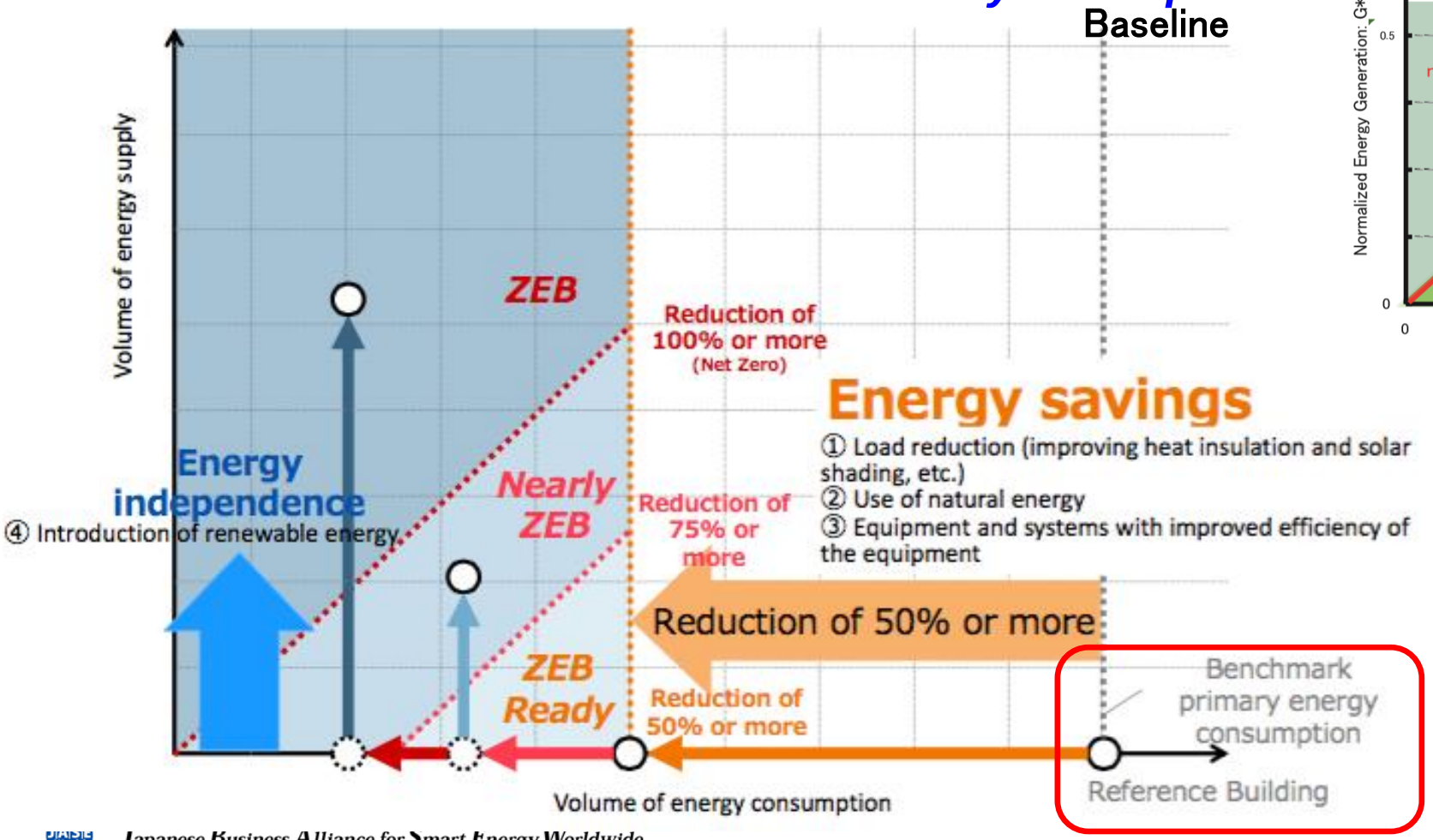
**(Net energy saving of 100% or more)**

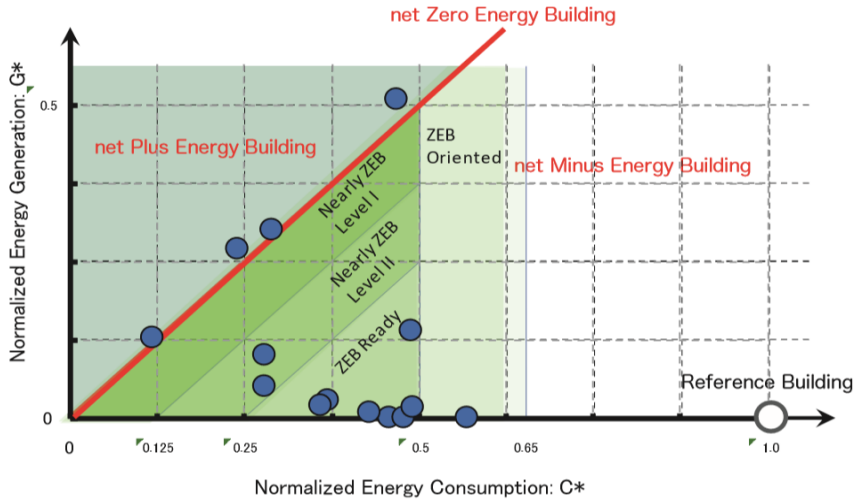


# “ZEB Family” Concept

## *Definition and evaluation methods of ZEBs*

### *The Building Energy Conservation Act specifies how to calculate the baseline to define ZEB Family Concept.*




* ZEB chart for 14 Best Practices

# Six core elements of ISO/TS 23764

## *Methodology toward Non-residential Zero Energy Building（ZEB）*

1. **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.

② **At the design stage,** to select proper materials and equipment, which are certified by the domestic standard or international standard, as much as possible.

③ **During construction,** to install the selected materials and equipment correctly according to the drawings and specifications.

④ **After completion of building,** to realize the energy consumption targeted at the design stage.

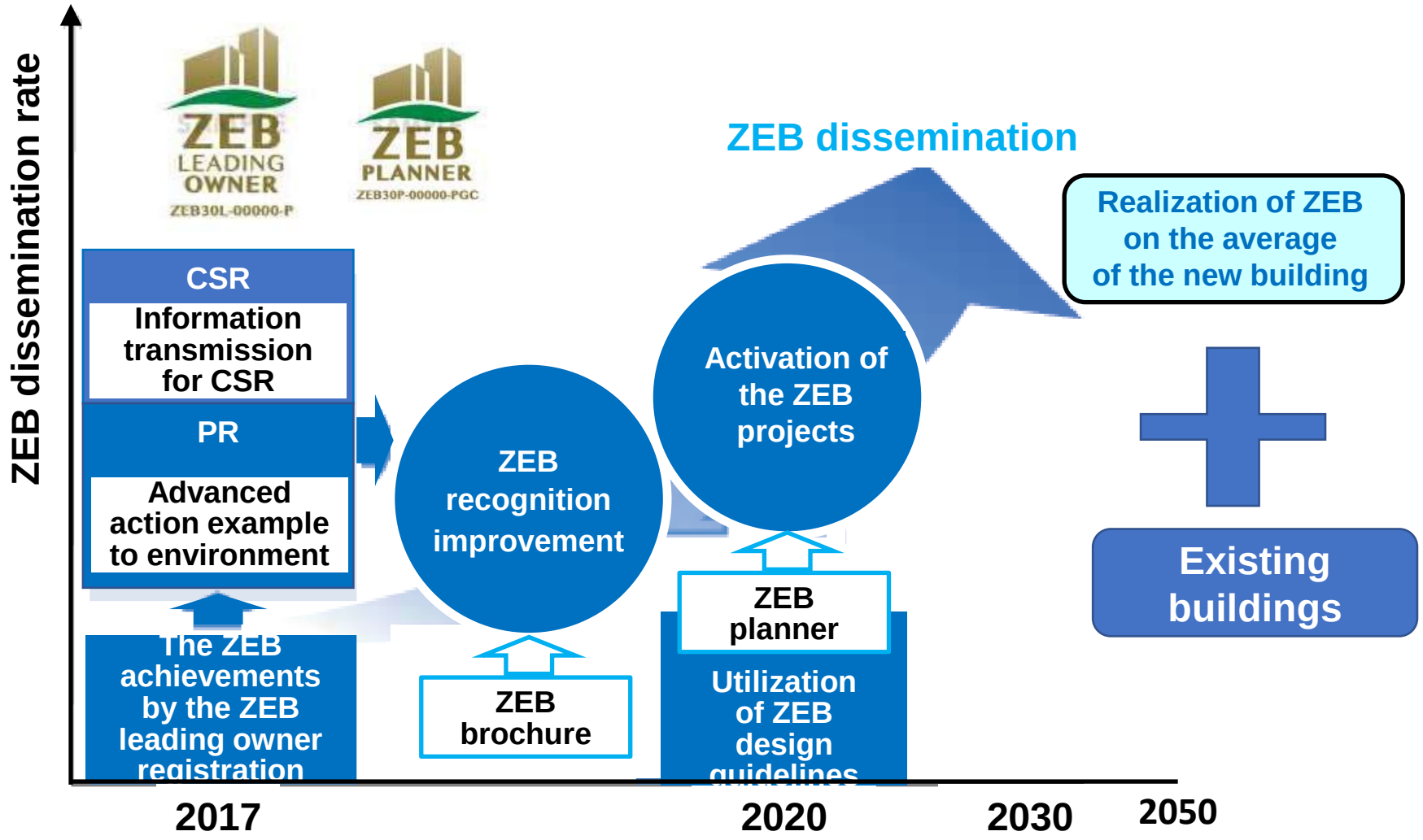
⑤ **After operation start,** to inspect actual energy consumption continuously (suitable times per year) whether there is any difference of energy consumption between the targeted at design stage and the measured at actual operation.

⑥ **After the start-up of the operation,** to calculate the primary energy consumption periodically by using simulation software, if possible.

# 3. Progress of ZEB promotion and dissemination

## *Progress image of ZEB*

***The government has been implementing the various measures and improve ZEB dissemination rate***



# 4. Realizing ZEB

Realizing ZEB

- **Awareness raising**
- **Sharing of experience and knowhow**
- **Policies and guidelines toward ZEB**

Supporting Activities By ECCJ&JASE-W

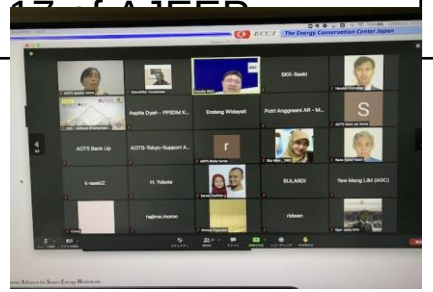
# 5. ZEB Dissemination in ASEAN

***METI cooperates with each Asian countries to establish the systems & policies to promote energy saving measures through the introduction of The advanced Japanese energy conservation policies, systems and technologies .***

| | 2017 | 2018 | **2019** | **2020** |
|---|---|---|---|---|
| JASE-W Public – private collaboration Activities | • Introduction of ZEB family concept in AJEEP Program<br>• One training workshop for private and public sectors in Japan. | 1. Proposal of ZEB Ready Building award in AEA<br>2. S & W in AMSs: Malaysia<br>3. Two training workshops for AMS in Japan<br>4. Introduction in the ASEAN Energy Business forum | 1. Seminar & Workshop:<br>• Thailand<br>• Malaysia,<br>2. Dispatched experts to the seminar in Philippines<br>3. Stated ZEB Ready Building award in AEA | **The online seminars:**<br>• **Vietnam (Dec 7-8),**<br>• **Malaysia (ZEB Guideline) (Dec 14 and Mar 1) and**<br>• **Indonesia(Feb.1,2021)** |
| ECCJ Activities | • The study of ZEB award in AEA in [illegible] | • Draft of the guideline for ZEB award in AEA in [illegible] | ECAP 20 of AJEEP in Japan | **ECAP 23 of AJEEP by online (Dec 8, 2020)** |

Feb. 2020@Malaysia

Oct. 2019@Bangkok



Feb. 2021@ Indonesia

Dec. 2020 @ Vietnam


Dec.2020 @ Malaysia

# ZEB Family Dissemination in ASEAN

## *Winners of ASEAN Energy Award*

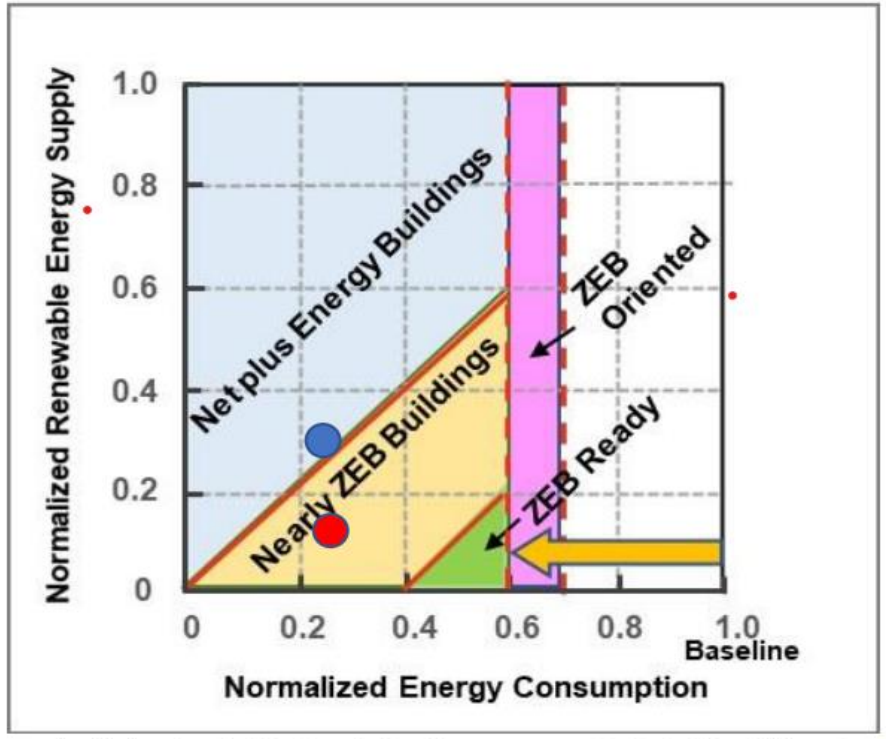
### *Special Submission Category of EE Building Area ZEB Sub-category (2020)*

***Green Energy Office (Malaysian Green Technology and Climate Change Centre (MGTC) ) GFA: 4300m²***

Nearly ZEB

***School of Design and Environment block SDE 4, National University of Singapore, GFA:8514m²***

Net Zero Energy Building




●: School of D & E (Singapore)
●: Green Energy Office (Malaysia)

# ZEB Family Dissemination in ASEAN

## *Winners of ASEAN Energy Award*

### *Special Submission Category of EE Building Area ZEB Sub-category (2021)*

***Nanyang Technology University Campus, Nanyang Technology University – Singapore***

***Ulu Pandan Bus Depot, SBS Transit Ltd – Singapore***

***Khonkean International Convention and Exhibition Center, CP Land Public Co., Ltd – Thailand***

**Dhanaphiphat Building, Dhanarak Asset Development Co., Ltd. – Thailand**

# Ref. BOOKLET : JAPANESE SMART ENERGY PRODUCTS AND TECHNOLOGIES

JASE-W is publishing a booklet every year which compiles various smart energy products and technologies developed by Japanese companies and applicable to the world. It can be accessed and viewed in the JASE-W website. **https://www.jase-we.org**



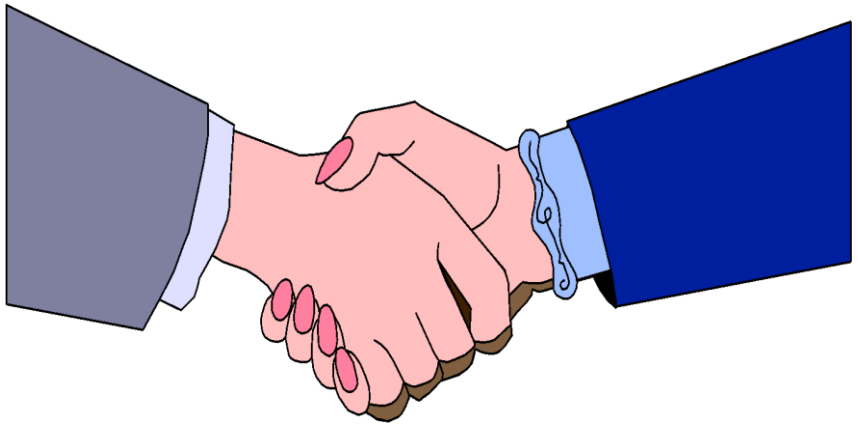
ex: Super Heat Insulation Windowpane (English)

ex: Efficient Heat Pump (Vietnamese)

# 6. Summary

- *The current Japanese E. E. Law for buildings does not have enough power to achieve the target for reduction of GHG in building sector. Therefore, the government implemented the policy of " ZEB Family Concept" to promote and disseminate high level energy efficient buildings, "ZEB Ready" though the continuous efforts to realize (net)ZEB finally.*
- *"The methodology for achieving non-residential ZEBs " has published on Sept.24th 2021 as Technical Specification: TS23764 which describes "Step-by-step Approach" toward ZEB by the approval by ISO TC205.*
- *The Japanese government is implementing the various measures to promote and disseminate ZEBs in Japan and overseas, particularly in ASEAN Member States due to long successful EE&C cooperation between Japan and ASEAN.*
- *We are willing to support ZEB dissemination in your country.*

# *Thank You Very Much*



**SMART CLOVER**

*ECCJ is promoting "Four Leaf Clover ", which is considered to bring happiness, as "SMART CLOVER", the symbol of the persons who implement EE&C .*

**The Energy Conservation Center, Japan**

**URL: https://www.asiaeec-col.eccj.or.jp**

Japanese Business Alliance for Smart Energy Worldwide

**URL: https://www.jase-we.org**