

The Japan's policy and strategy in the building sector towards "Carbon Neutrality"

**International Affairs Office,
Energy Efficiency and Renewable Energy Department
Agency For Natural Resources and Energy (ANRE),
Ministry of Economy Trade and Industry (METI), Japan
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1. Japan's Energy Efficiency Overview

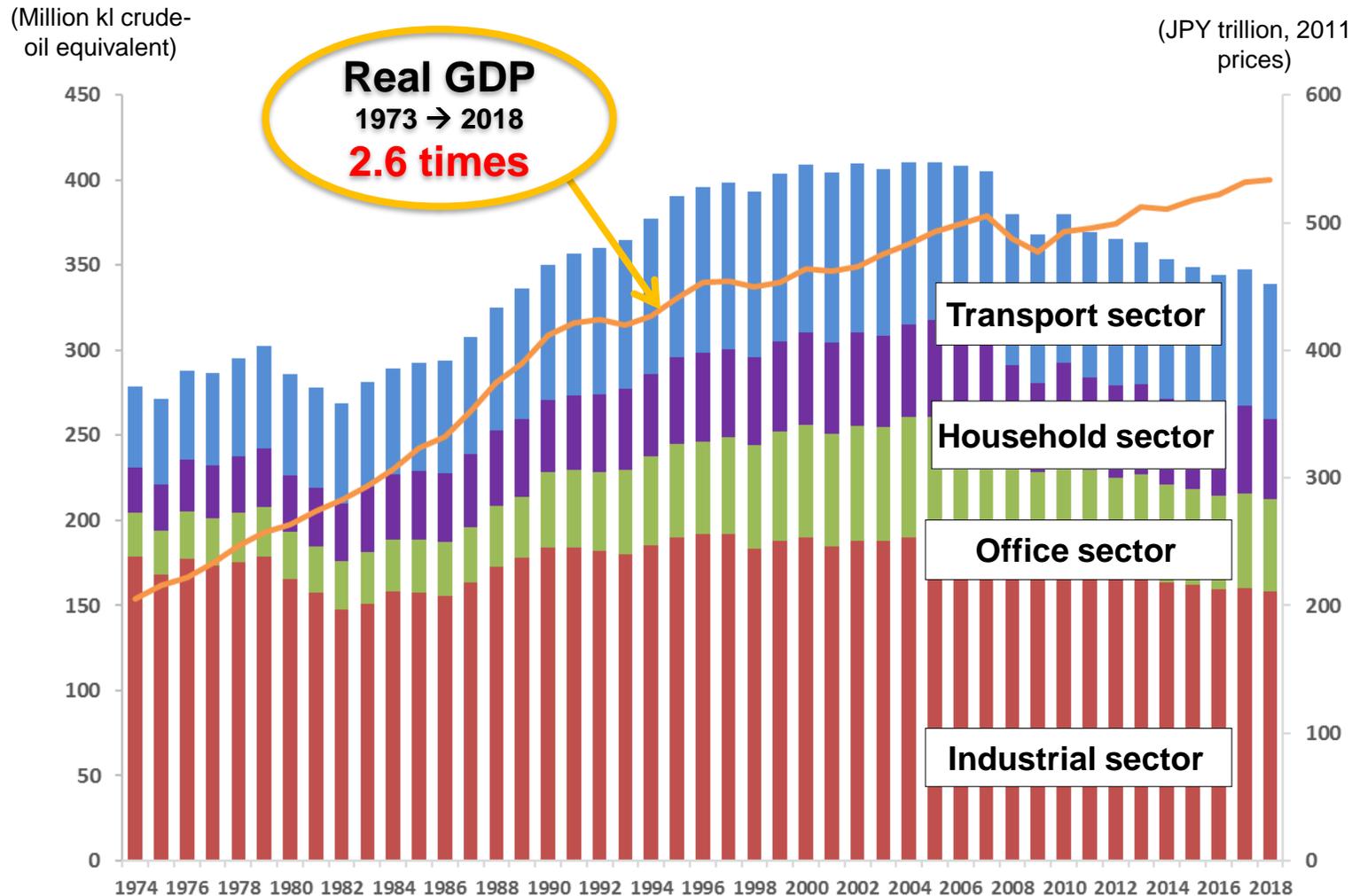
2. Points and Approach toward net Zero Energy Building(ZEB)

3. Japan's Policy in building sector towards ZEB

- Regulations**
- Supportive Measures**
- Information**

Trends in final energy consumption in Japan

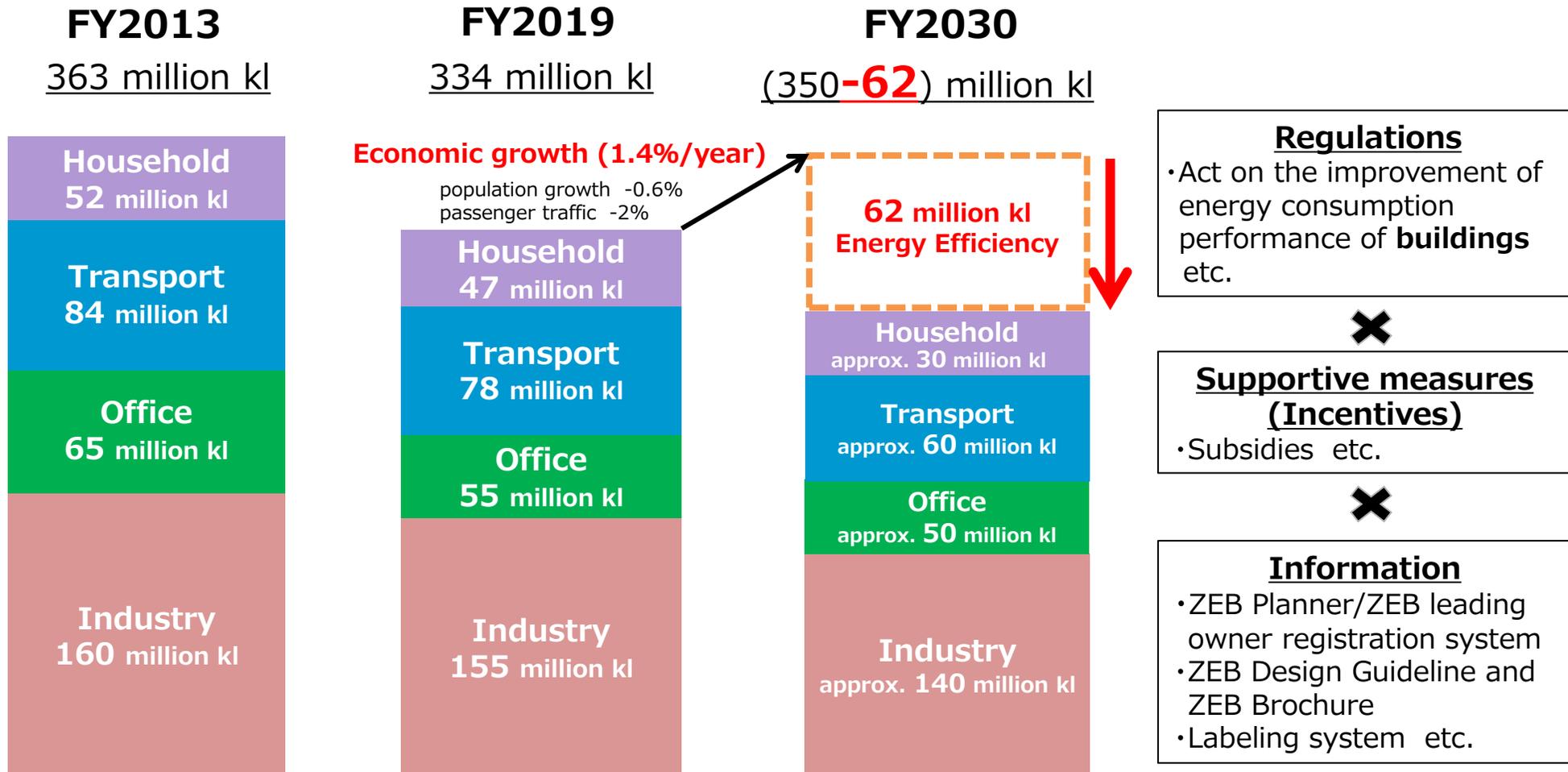
- Real GDP is up 2.6 times since the oil crisis in 1970s, while final energy consumption is up 1.2 times.



Final energy consumption	
Total	1973 → 2018 1.2 times
Transport	1973 → 2018 1.7 times
Household	1973 → 2018 1.9 times
Office	1973 → 2018 2.1 times
Industry	1973 → 2018 0.8 times

Energy Efficiency in the 6th Strategic Energy Plan

- In the 6th Strategic Energy Plan formulated in 2021, we expect energy demand in FY2030 to be 280 million kl-oe with **62 million kl-oe reduction** in final energy consumption by **thorough energy efficiency**, promoting energy efficiency improvement with **regulation**, **supportive measures**, and **information**.



Agenda

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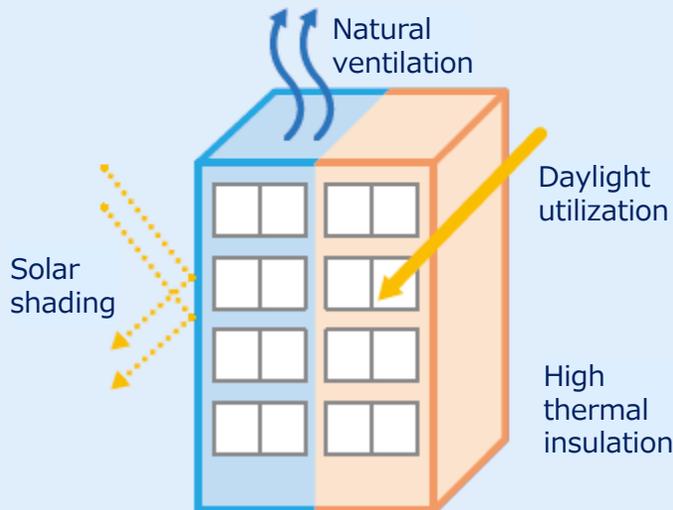
- Regulations
- Supportive Measures
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Points for realizing ZEB (net-Zero Energy Building)

- ZEB is a building with considerably reduced annual energy consumption by **saving as much energy as possible** via better heat insulation, solar shading, natural energy and **high-efficiency** equipment as well as **creating energy** (e.g., with photovoltaic power generation), **while maintaining comfortable environments**.

Points for realizing ZEB

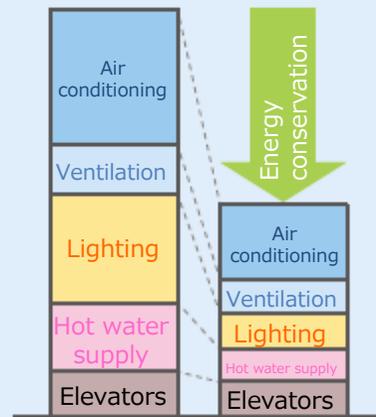
Save energy consumption and utilize natural energy



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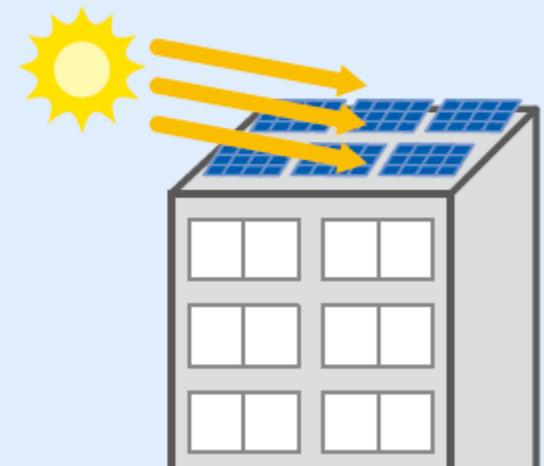
Utilize energy efficiently

High-efficiency equipment system



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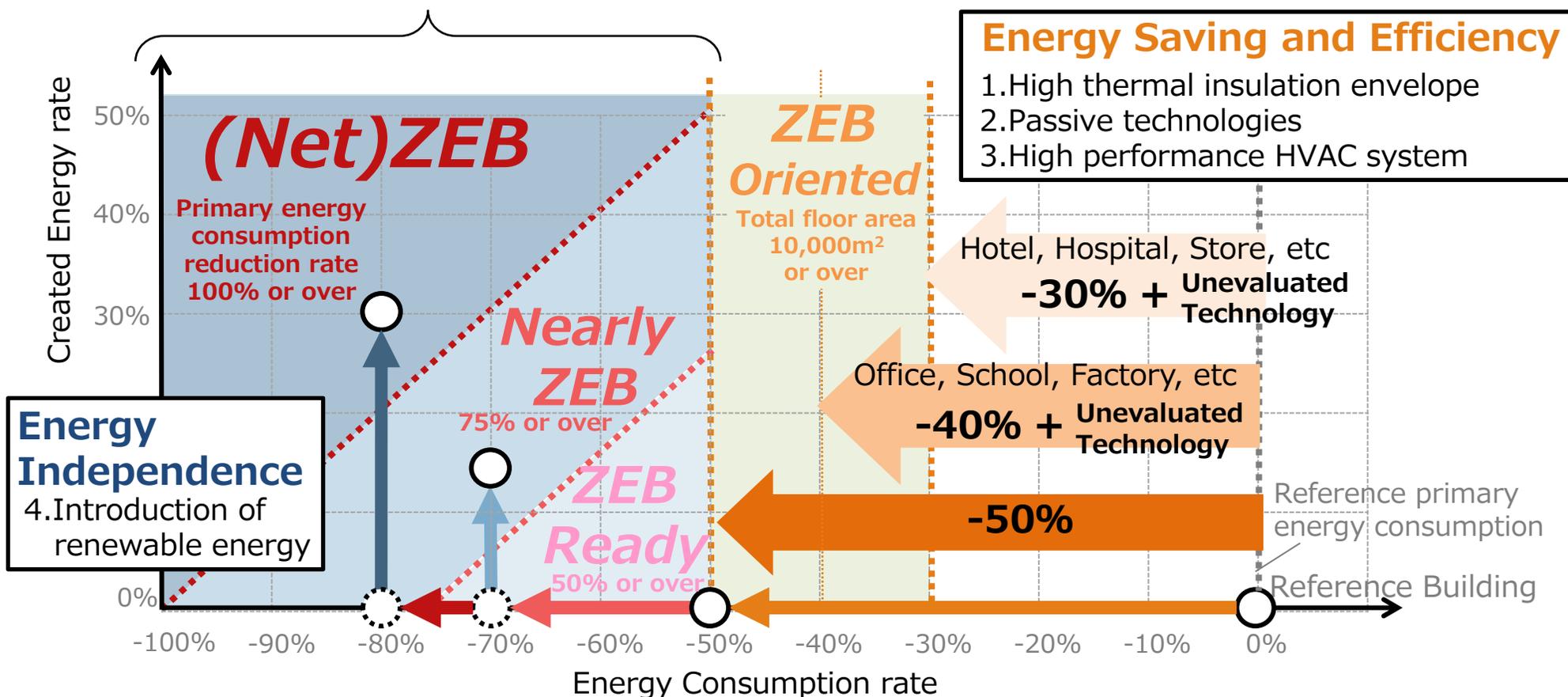
Create energy



Step by step approach toward ZEB

- ZEB is classified and defined as **(Net)ZEB**, **Nearly ZEB** and **ZEB Ready** depending on the amount of reduction from reference primary energy consumption
- **ZEB Oriented** has been added to ZEB since 2019 to popularize ZEB in large-scale buildings (total floor area or over 10,000m²)

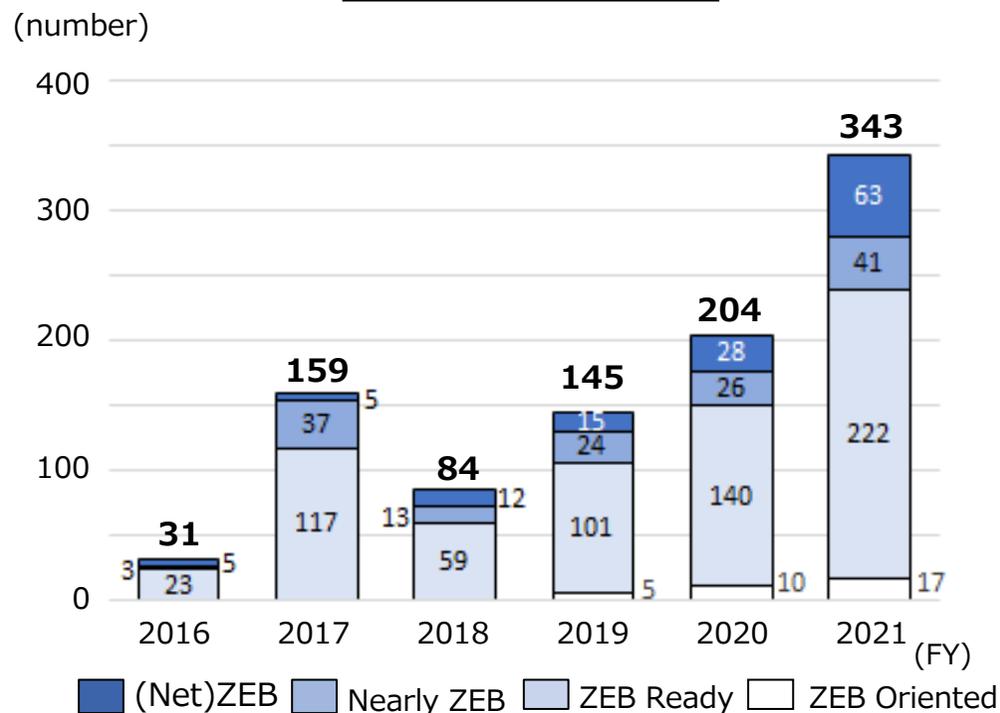
The same classification in ISO/TS23764



Dissemination of ZEB in Japan

- The number of ZEB in Japan is increasing steadily
- The proportion of ZEB compared with total non-residential buildings is still small

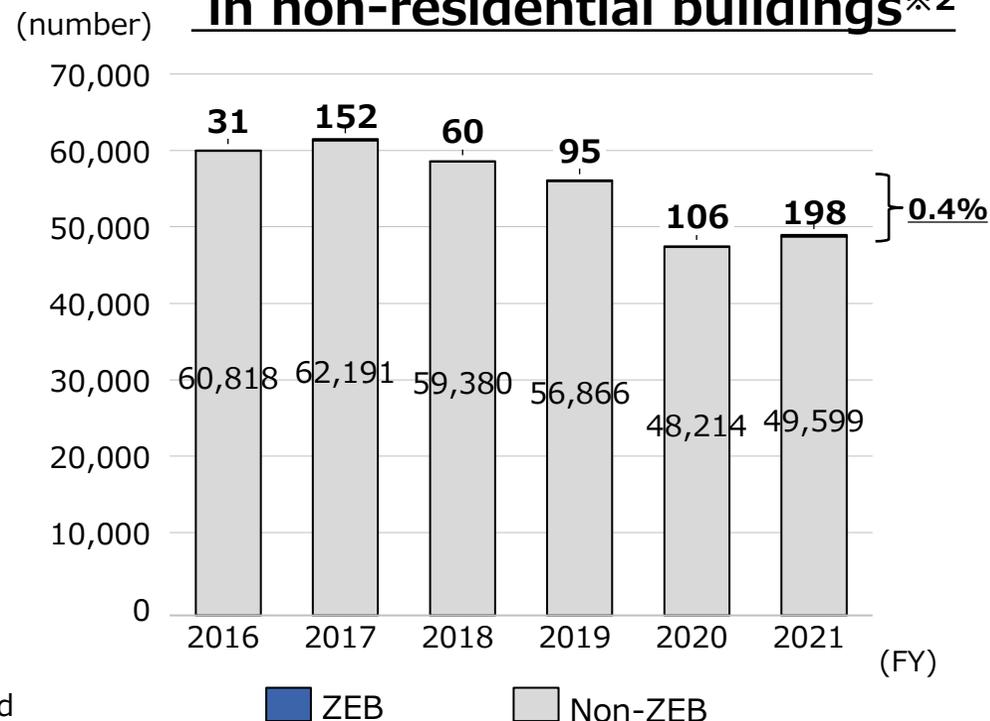
Trend of ZEB※1



※1 Including factories, etc. from total

Trend of ZEB

in non-residential buildings※2



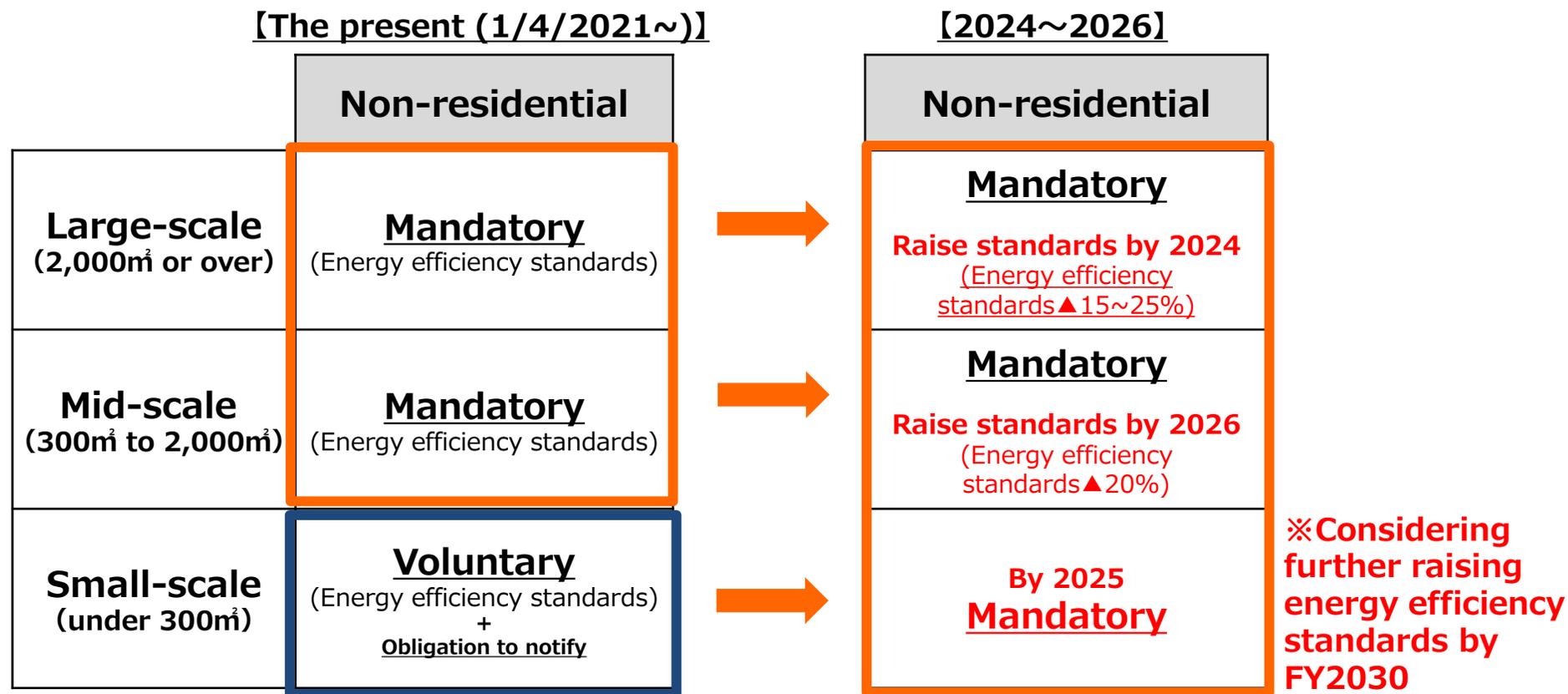
※2 Excluding factories, etc. from total

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Regulation on energy efficiency of building

- The Building Energy Efficiency Act^[1] requires new non-residential buildings to meet energy efficiency standards based on its scale
- In 2022, Japan has amended the Building Energy Efficiency Act^[1] to **make energy efficiency standards mandatory for all scale** and **raise the standards** in order to achieve FY2030 target in the 6th Plan



[1] Act on the Improvement of Energy Consumption Performance of Buildings

Supportive measures for ZEB

- **METI supports realizing ZEB in cooperation with MOE** (Ministry of the Environment) in accordance with the division of responsibilities depending on the building scale

METI Subsidized Project (※)

【Subsidized Project】



- **New private** building
Total floor area : **10,000m²** or over
- **Existing private** building
Total floor area : **2,000m²** or over
- * **Install unevaluated technology**

【Subsidy】

- Within 2/3 for subsidized costs
(Max.¥500million/year, ¥1billion/project)

【Subsidized costs】

- Design cost
- Equipment cost
- Construction cost

【Adoption method】

- Judgement method

MOE Subsidized Project (※)

【Subsidized Project】



- **New private** building
Total floor area : under **10,000m²**
- **Existing private** building
Total floor area : under **2,000m²**
- **Local public** building : **No area limit**

【 Subsidy 】

- Principle, within 2/3~1/3 (depend on scale, quality, etc) for subsidized costs
(Max.¥500million (under 2,000m²:¥300million)/project)

【Subsidized costs】

- Design cost
- Equipment cost
- Construction cost

【Adoption method】

- Judgement method

((※) Excerpts of application guidelines)

Common (Mandatory requirement to apply for subsidized project)

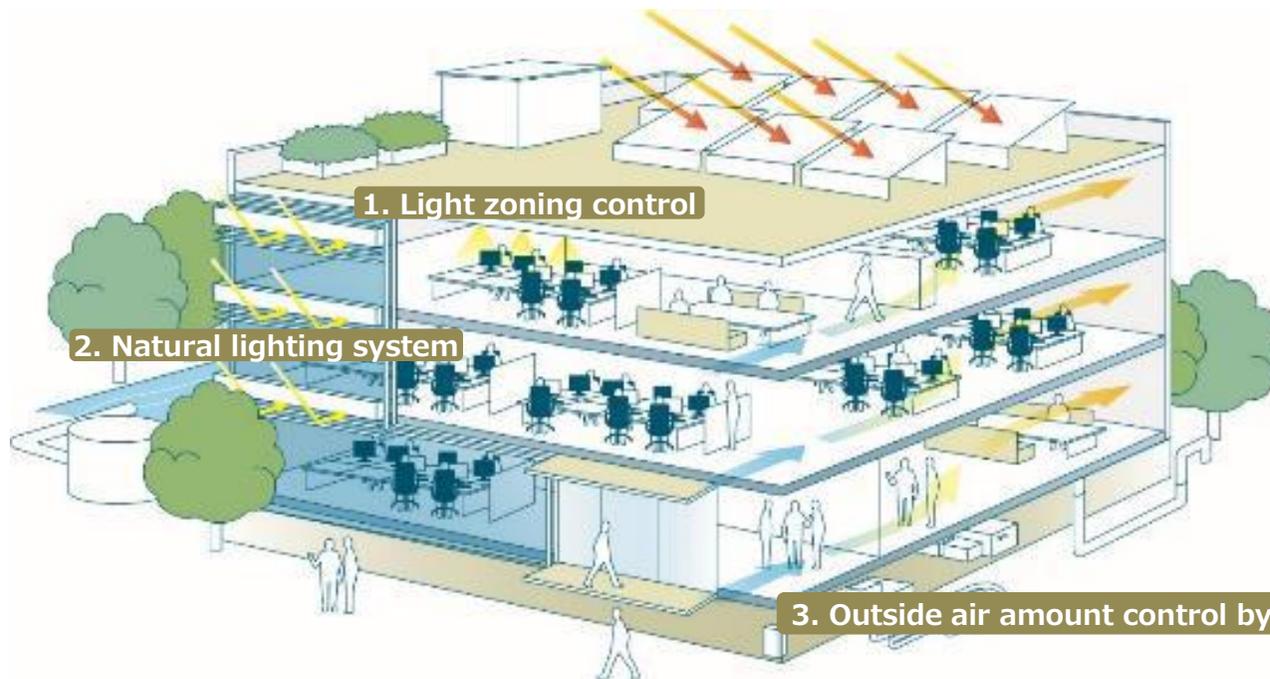
- Register the building owner as ZEB leading owner
- Involve ZEB planner to implement subsidized project
- Acquire BELS label based on Building Energy Efficiency Act

Demonstration of unevaluated technologies for ZEB

(METI subsidized project)

- It is difficult to realize ZEB in large-scale buildings only with existing energy efficiency technologies
- METI aims to disseminating ZEB in large-scale building by **demonstrating “unevaluated technologies^[1] in Web Program^[2]”, which have high energy efficiency potential**, through subsidized projects

Example of unevaluated technologies introduction in ZEB demonstration projects



15 unevaluated technologies

- Outside air amount control by CO₂
- Natural ventilation system
- Advanced air conditioning pump control
- Advanced air conditioning fan control
- Cooling tower fan/inverter control
- Light zoning control
- Free cooling system
- Desiccant air conditioning system
- Cool/heat trench system
- Hybrid hot-water supply system
- Advanced geothermal heat utilization
- Advance cogeneration system
- Natural lighting system
- Advanced high efficiency transformer
- Heat recovery heat pump

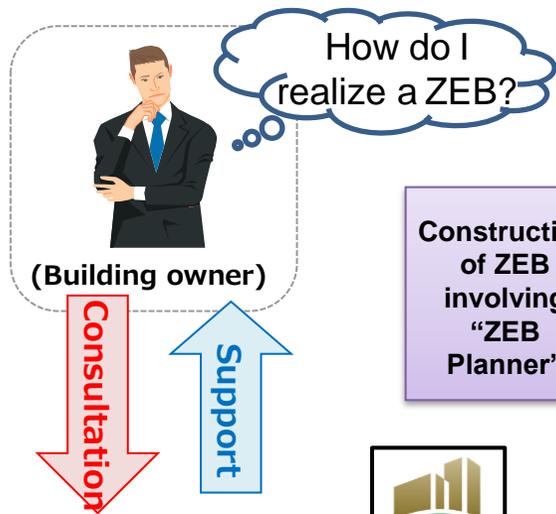
[1] Unevaluated technology : 15 technologies with high energy efficiency potential are published by The Society of Heating, Air-Conditioning and Sanitary Engineers of Japan

[2] Web Program : The program for calculating energy consumption efficiency

ZEB Planner/ZEB leading owner registration system

(April.2017~)

- To promote ZEB business, design companies, construction companies, and consulting companies that have knowledge to realize ZEB are **registered as ZEB Planner** from which building owners can get consultation service
- Building owners that have actual results and introduction plans of ZEB are **registered as ZEB leading owner** and **publish the examples of ZEB**



Construction of ZEB involving "ZEB Planner"

"ZEB leading owner"



(Building owner)

Disclosure information

- Owner information
- ZEB targets
- Actual results and introduction plans of ZEB
- Introduction of projects (overviews of buildings, facilities, energy saving performance, etc.)

Publish the examples of ZEB

Influence to new ZEB owners

Increases in the number of reference cases

Awareness development on the benefits of ZEBs

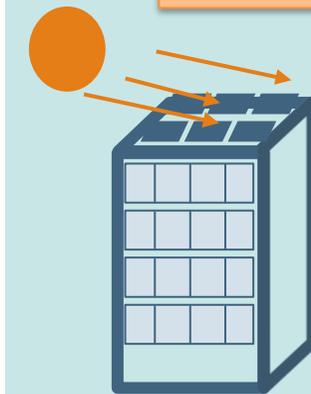
Social Capacity building through communicating best practices

"ZEB Planner"



Disclosure information

Company information, target of ZEB sales, achievements, contact points for (potential) customers



(Net)ZEB
Nearly ZEB
ZEB Ready
ZEB Oriented

- The number of **ZEB planner** : **449**
- The number of **ZEB leading owner** : **318**
(As of 09/2022)

※Detail <https://sii.or.jp/zeb04/>

ZEB Design Guideline and ZEB Brochure

- **ZEB design guidelines** for design engineers and **ZEB Brochure** for building owners has been created and published on the website.

ZEB Design Guidelines (for design engineers)

- Combination of technologies for ZEB conversion
- Energy saving effects of the technologies, additional cost, etc.
- Actual design examples

Med-scale Office



Small-scale Office



Senior homes·Welfare homes



Supermarket



Hospital



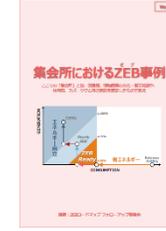
School



Hotel



Assembly hall



ZEB Brochure (for building owners)

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

Office



Senior homes·Welfare homes



Supermarket



Hospital



School



Hotel



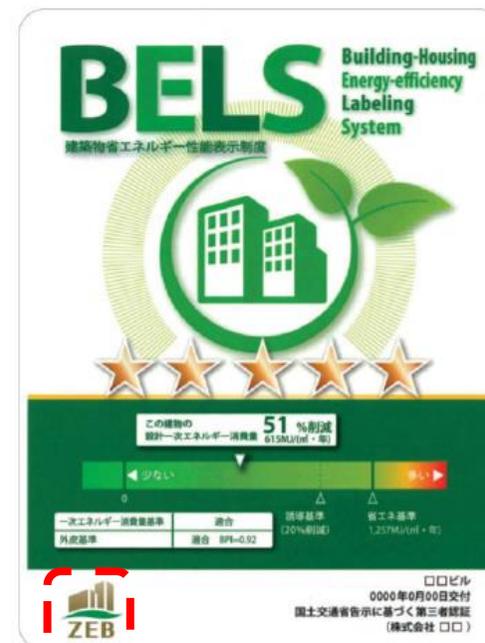
Labeling system related to ZEB

- **ZEB Label** has been formulated since 2017 to improve awareness of ZEB, which can be used in **BELS** (Building-Housing Energy-efficiency Labeling System)



※ In **BELS**, renewable energy is evaluated only for self consumption.

※ In the evaluation of **ZEB** in BELS, renewable energy is evaluated both for self consumption and surplus electricity sold



Summary

- ZEB is a building with considerably reduced annual energy consumption by **saving as much energy as possible, improving energy efficiency, and creating energy, while maintaining comfortable environments.**
- **Classifying ZEB as (Net)ZEB, Nearly ZEB and ZEB Ready,** which are also defined in ISO/TS23764, enables and promotes **practical step-by-step approach** toward (Net)ZEB.
- Japan aims to disseminating ZEB through **regulations** on building performance, **supportive measures** such as subsidies for ZEB projects, and **information** such as ZEB Planner/ZEB leading owner registration system, ZEB Design Guideline and ZEB Brochure, and Labeling system related to ZEB, which contribute to improving awareness of ZEB.

Thank you for your attention