Latest developments of energy conservation policies in Japan and its challenges for the future goal

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20-21 March, 2019

The Institute of Energy Economics, Japan (IEEJ)

Outline

1. International Comparison of Total Primary Energy Consumption per GDP
2. Energy Supply/Demand Structure toward CO_2 Emissions Reduction Target in 2030
3. Japan's Energy Efficiency and Conservation Policy Framework
4. Latest Developments
5. Toward Deepening Japan's Energy Efficiency Efforts – New or Enhancing Energy Efficiency

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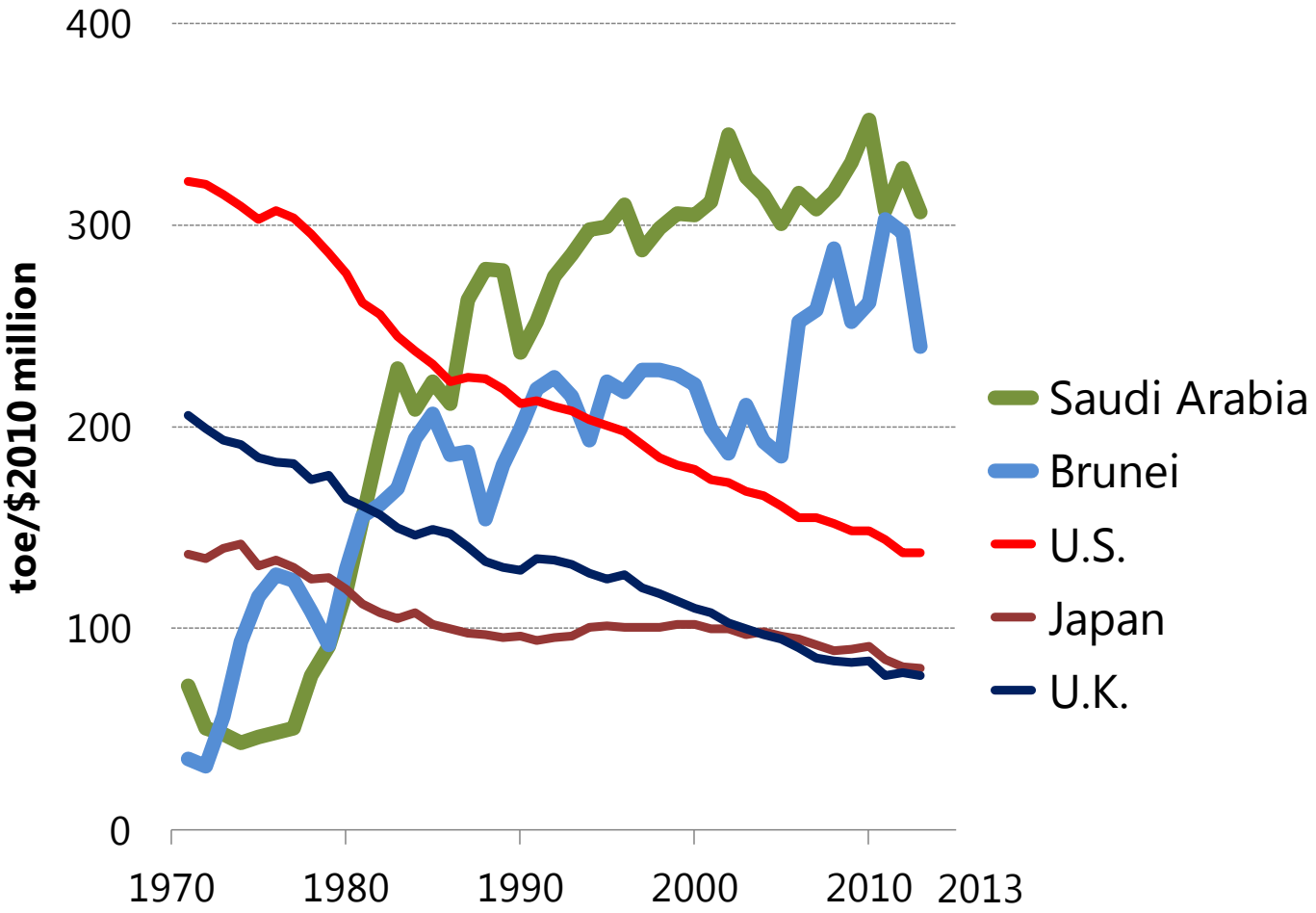
1. International Comparison of Total Primary Energy Consumption per GDP



(Source) IEEJ "Handbook of Energy & Economic Statistics in Japan"

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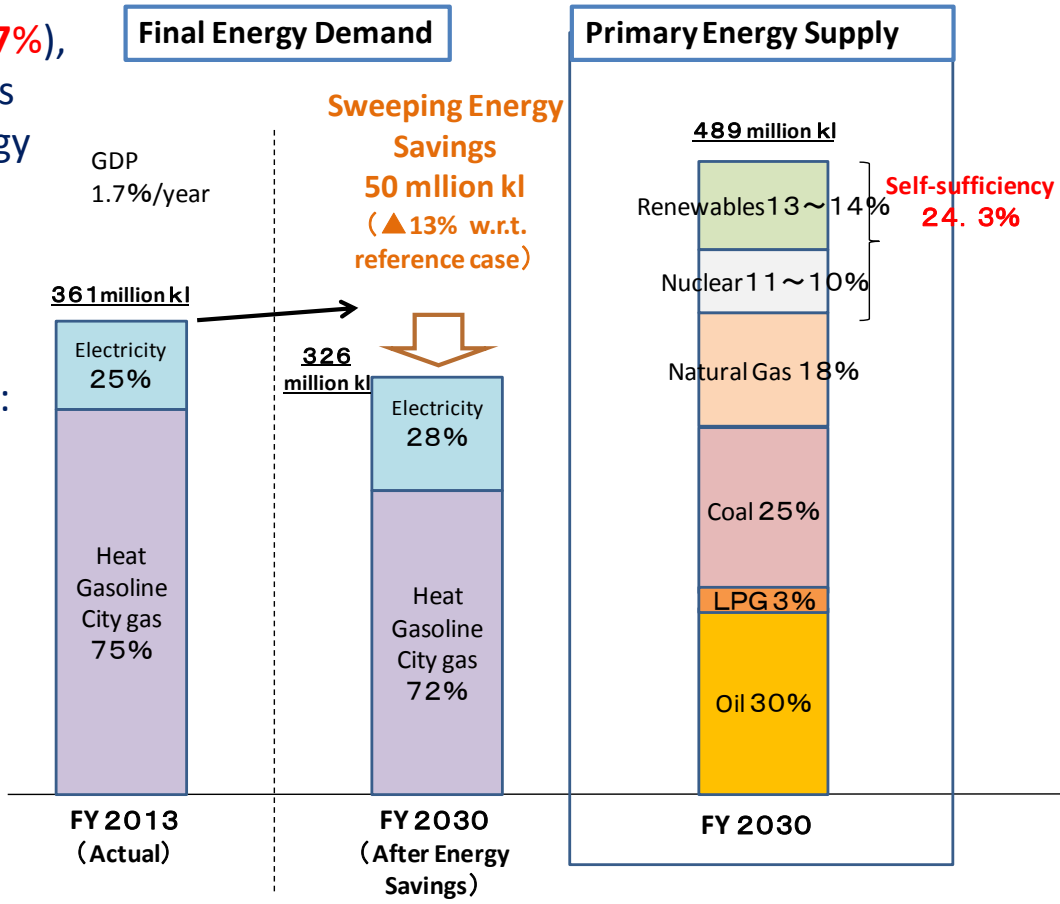
2-1. Energy Supply/Demand Structure toward CO_2 Emissions Reduction Target in 2030

- While energy demand growth is projected in line with economic growth (**an average 1.7%**), energy efficiency is expected to improve as much as after the oil crises thorough energy conservation (**35% in 20 years**).

- **Energy supply/demand structure improvement** (energy self-sufficiency rate: 6% in 2014 ⇒**24.3%** in 2030)

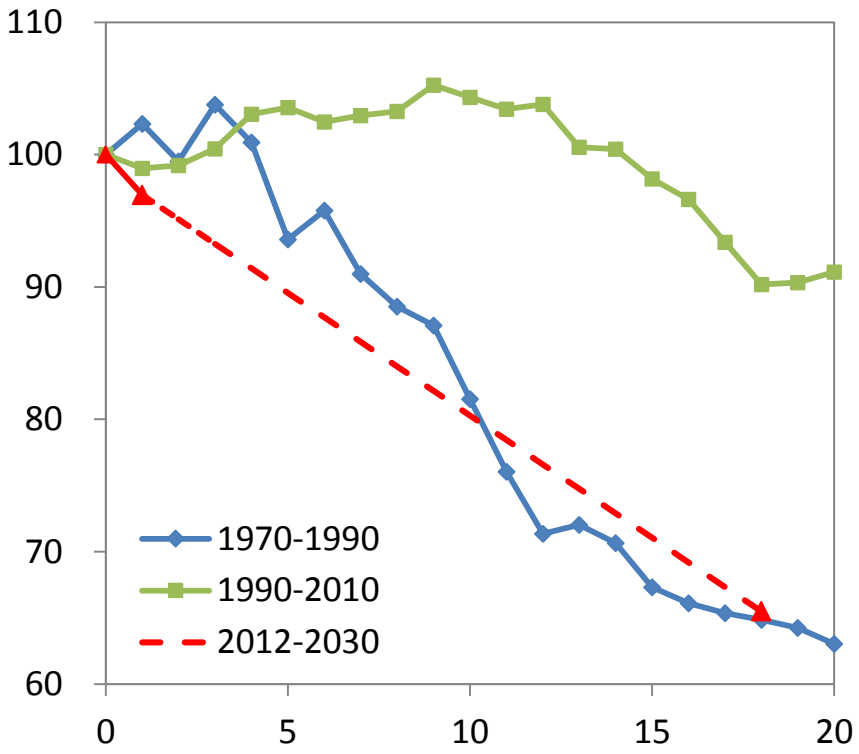
- **Japan's CO_2 emissions reduction target** (**26% CO_2 emissions reduction** in 2030 compared with 2013 level)



(Source) METI "Long-term Energy Supply/Demand Outlook" p.5 (July 16, 2015)

2-2. Need for Further Improvement of Energy Efficiency

【Improvement in Energy Intensity】



- Thorough energy conservation measures could save final energy demand by 13% to 326 million kl.
- Energy conservation measures would be accumulated to improve energy efficiency as much as just after the oil crises.

2-3. Measures and Energy Saving Potential by Sector

Industry <▲10.42 million kL>

- Energy-intensive industry (iron/steel, chemical, cement, paper/pulp)
  - Voluntary agreement
- Energy management
  - IT technology and energy management
- Innovative technology
  - COURSE50 (CO_2 Ultimate Reduction in Steelmaking process by Innovative technology for cool Earth 50)
  - Use of CO2 as feedstock
- Advanced EE technology
  - boiler, cogeneration

Transport <▲16.07 million kL>

- Next generation vehicles, fuel economy improvement
  - next generation vehicles to represent 1unit /2units
  - more than 100,000 fuel cell vehicles to be sold annually
- Traffic stream management

Commercial <▲12.26 million kL>

- Building EE improvement
  - Large-scale buildings' compliance on EE standards
- LED and OEL diffusion
- BEMS and energy management
  - half of buildings to install BEMS
- Awareness promotion

Residential <▲11.60 million kL>

- Building EE improvement
  - Residential buildings' compliance on EE standards after 2020
- LED and OEL diffusion
- HEMS and Energy management
  - all residential households to introduce the system
- Awareness promotion

2-4. Progress on Energy Efficiency toward 2030 Target

▲8.76 million kl（17.4%）in 2016

Industry <▲10.4 million kl>

▲1.91 Million kl（18.3%）in 2016

- LED [446 thousand kl/1080 thousand kl 41.3%)]
- Industrial Heat Pump [43 thousand kl/87.9万kl (4.9%)]
- Industrial Motor [88 thousand kl/1660 thousand kl (5.3%)]

Commercial <▲12.3 million kl>

▲2.06 million kl（16.8%）in 2016

- LED [880 thousand kl/2288 thousand kl (38.5%)]
- Top Runner [328 thousand kl/2784 thousand kl (11.8%)]
- EE Improvement in Commercial Building [529 thousand kl/3734 thousand kl (14.2%)]

Residential <▲11.6 million kl>

▲1.7 million kl（14.6%）in 2016

- LED [863 thousand kl/2011 thousand kl (42.9%)]
- Top Runner [130 thousand kl/1335 thousand kl (9.7%)]
- EE Improvement in Residential Building [196 thousand kl/3567 thousand kl (5.5%)]

Transport <▲16.1 million kl>

▲3.09 million kl（19.2%）in 2016

- Alternative Vehicles [715 thousand kl /9389 thousand kl(7.6%)]
- Other Transport Measures [2375 thousand kl /6682 thousand kl(35.5%)]
- Freight transport [962 thousand kl /3376 thousand kl(28.5%)]
- Passenger transport [1413 thousand kl /3305 thousand kl(42.8%)]

Source: METI (2017) ※Compiling data related to EE measures under Energy Mix

(Issues)

Encouraging investment other than LED

Enhancing transport related measures

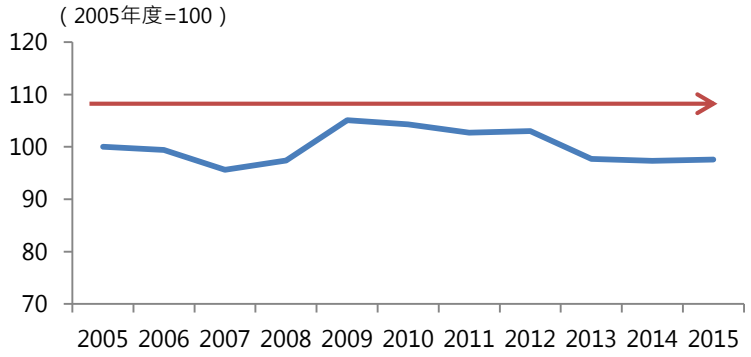
Others

Issues ① Industry・Commercial Sector

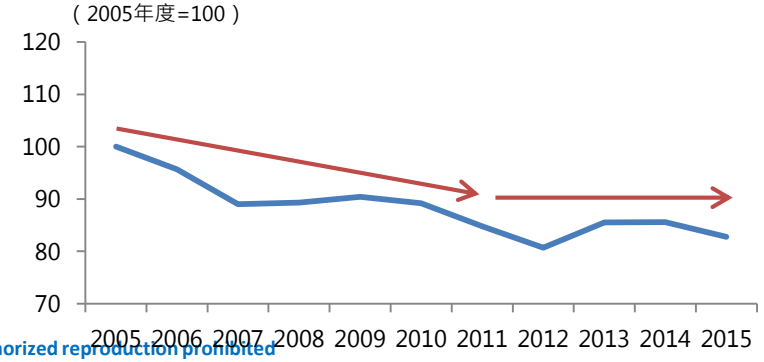
- Industry and commercial energy intensity had improved substantially, while the rate of improvement has been slowed recently. Nearly 30% of entities under the annual reporting obligation has shown energy intensity deterioration.
- It is important to encourage joint energy efficiency improvement among multiple business entities.

Energy Intensity Improvement

<Industry>



<Commercial>



Energy Intensity of Designated Business Entities

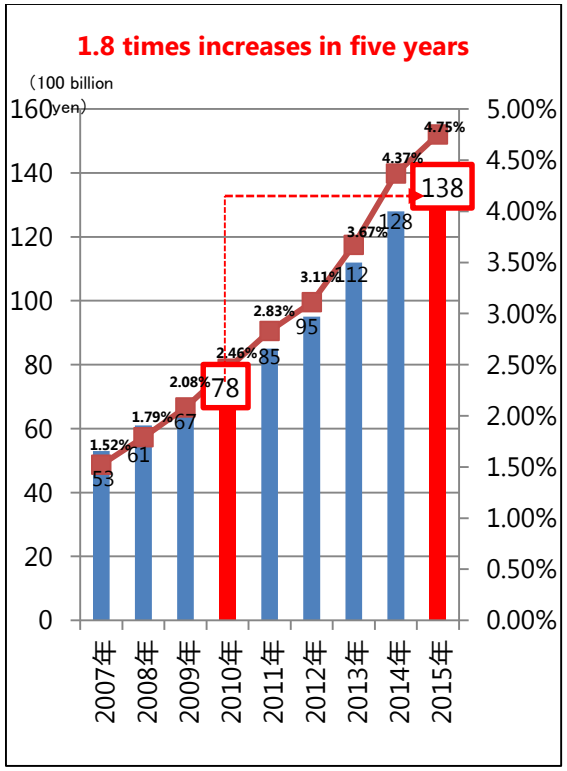
	Number of business entities	More than 1% improvement	0 ~ 1 % improvement	Those did not improve
Industry	5,545	2,743 (49%)	759 (14%)	2,043 (37%)
Commercial	5,513	3,439 (62%)	777 (14%)	1,297 (24%)
Total	11,058	6,182 (56%)	1,536 (14%)	3340 (30%)

Source : METI(2016). “Research study on factories and freight transport owners’ energy conservation situation”.

Issues ② Transport (Freight) Increases in small delivery and impacts on energy consumption

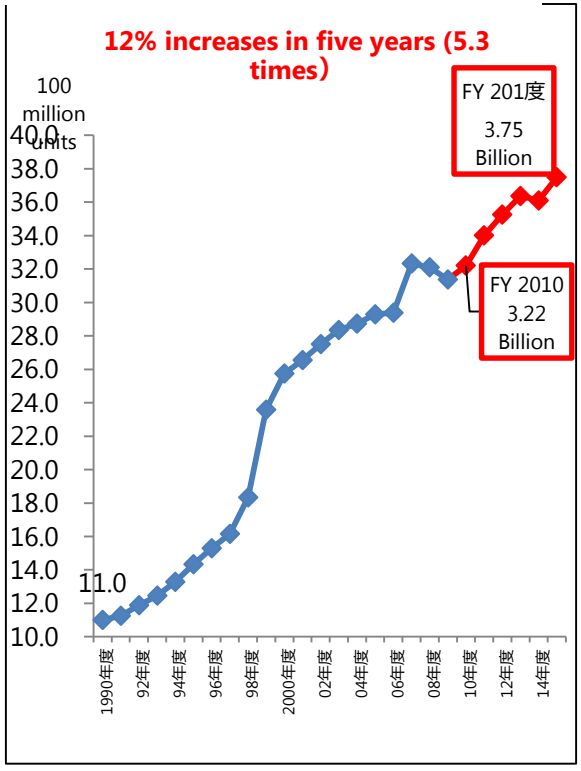
- Rationalization of freight transport would have to make progress aside from fuel economy improvement.
- Meanwhile, the below factors might increase freight transport energy consumption.
  - ✓ Market expansion and resulting increases in home delivery and re-delivery
    ※ About 25% of energy consumption from home delivery results from re-delivery accounting for 100 million liter.
  - ✓ Increases in waiting time in B to B transport.

【Market expansion of internet order】



Source：METI

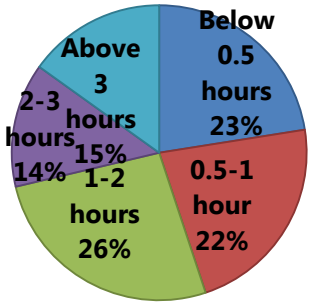
【Increases in home delivery】



Source：Ministry of Land and Transport

【Waiting time】

・waiting time per one transport
Over 1 hour: 55.1%, over 2 hours : 28.7%



・Waiting time for both depart and arrival

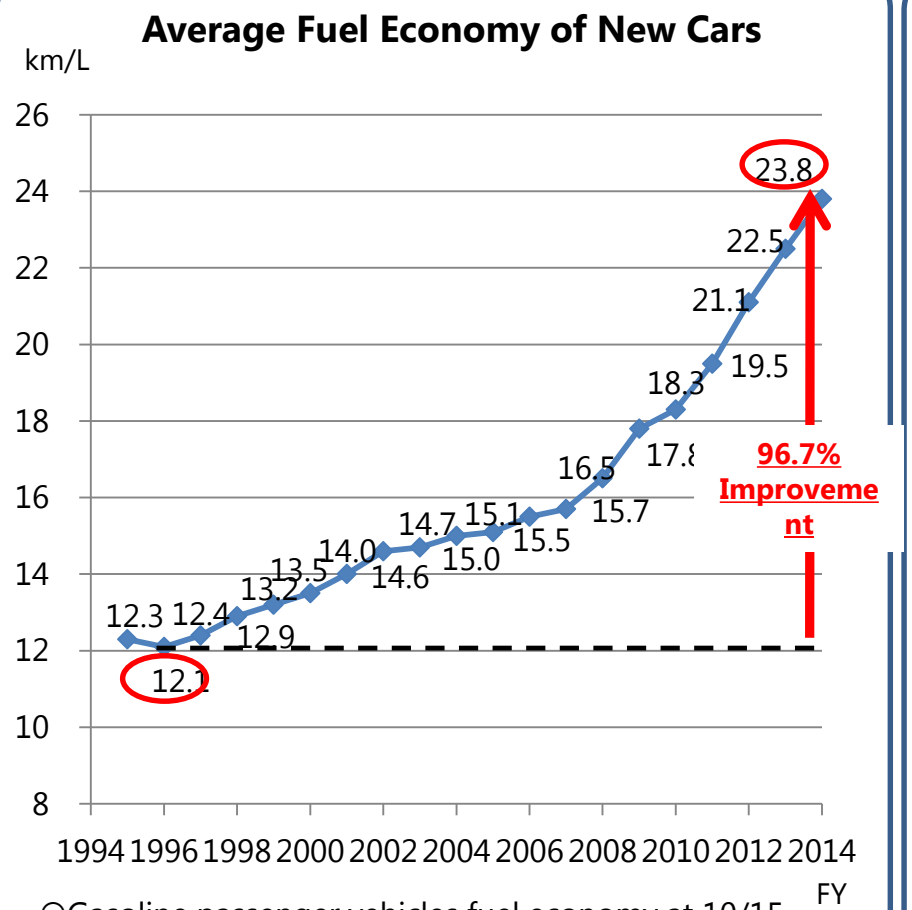
Total：13,101 times		Average time
Depart	(48.5%)	1:11
Arrival	(51.5%)	1:03

※1運行：回送運行を含め運転を開始してから運転を終了するまでの一連の乗務。

（Reference）Energy Efficiency Improvement

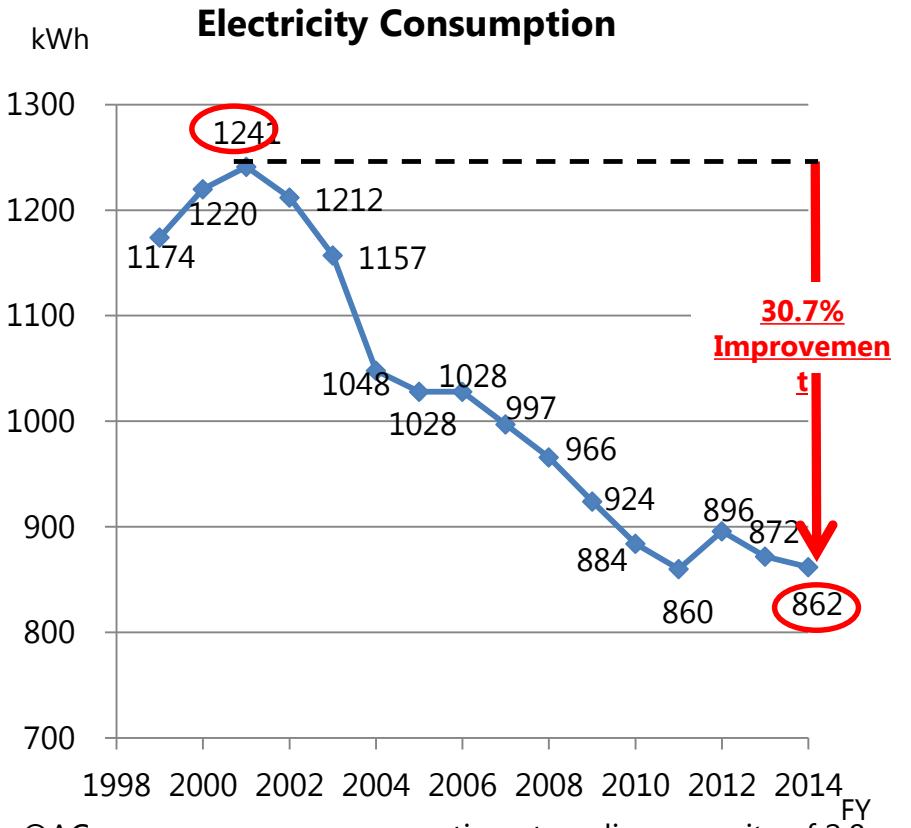
- Fuel economy of new passenger vehicles improved by **97%**（1996→2014）, while AC efficiency improved by **31%**（2001→2014）.

【Passenger vehicles】



〇Gasoline passenger vehicles fuel economy at 10/15 mode
〇Source：Ministry of Land and Transport

【AC】



〇AC average energy consumption at cooling capacity of 2.8 kW
〇Electricity consumption data is sourced from JISC9612:2005〇Source：Energy efficiency catalogue (Summer and Winter)

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3-1. Historical Development of Energy Conservation Law

Industry

1979 Establishment
Designated Energy Management Factories
Guidance for Buildings and Appliances

1983 Introduction of licensed energy manager system

1992 Introduction of periodical reporting system

1998 Amendment: Expand coverage of factories

2005 Amendment: Integration of Heat and Power Control

2008 Amendment: Company based rather than plant based regulation, introduction of Bench Marking.

2013 Evaluation of Peak Shift

2015 SABC class system

Residential/Commercial

1992 Amendment Periodical reporting

1998 Amendment: Introduction of Top Runner Program

2002 Amendment Energy Management of Office Buildings

2008 Amendment Energy Management of Office Buildings

2013 Amendment on building EE&C evaluation to primary energy basis, introduction of building material TR

2015 New Establishment of Energy Conservation Law for Buildings

Transport

Energy Conservation Law has been amended 7 times to cope with the changing market situation

2005 Amendment Reporting System on Energy by Carriers

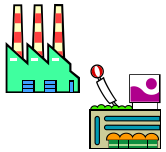
2018 Amendment on freight owner responsible for annual reporting system

2018 Amendment joint energy efficiency implementation

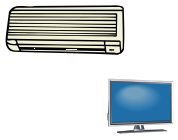
3-2 · Overview of Energy Conservation Law

- The Law provides guidelines for factories, commercial business entities and transport business entities and owners to follow and requires them to report their energy efficiency activities, middle and long-term plans. If their activities are not sufficient, necessary instructions and guidance will be made.
- For manufactures of appliances and automobiles are required to meet the respective targets. Necessary recommendations will be made if not sufficient actions are taken.

Direct Regulation

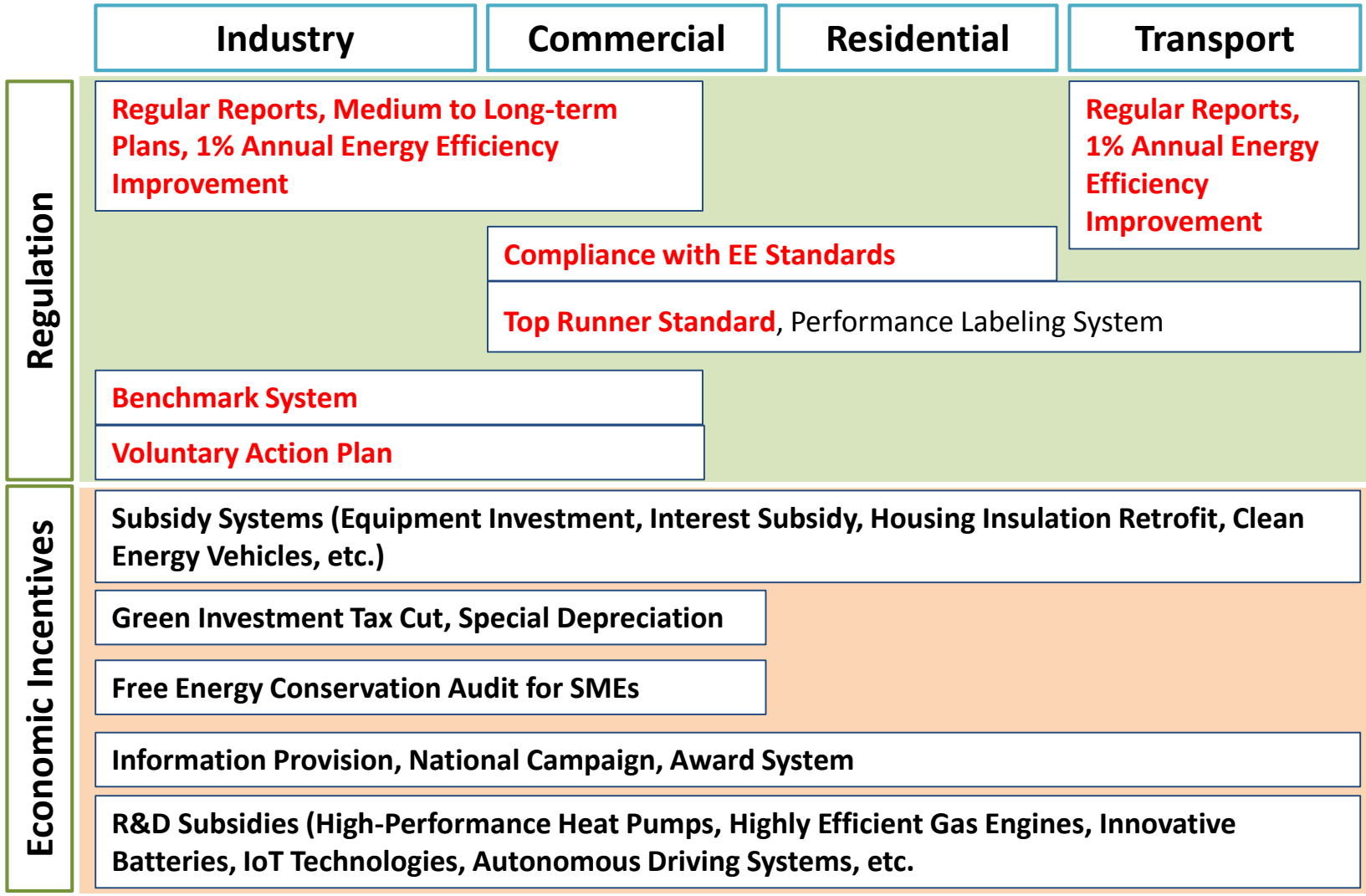
Factory · Business	Transport	
Aspirational Target		
Factories/commercial businesses · Aspirational target 	**Freight/passenger transport businesses** · Aspirational target 	**Freight owner** · Aspirational target 
Reporting Obligation		
Special business entities **(Annual energy consumption over 1,500kl/year)** · Designation of energy manager · Reporting obligation of middle, long-term plan · Reporting obligation of annual energy consumption	**Special business entities** **(Owning trucks of more than 200 units)** · Reporting obligation of middle, long-term plan · Reporting obligation of annual energy consumption	**Special business entities** **(freight transport goods of more than 30 million ton km per year)** · Reporting obligation of middle, long-term plan · Reporting obligation of annual energy consumption

In-direct Regulation

Top Runner Program	Information
Manufactures (At above certain level) · 32 products are under the energy efficiency improvement target 	**Retailers of appliances and energy** · Information provision to consumers (Aspirational goal)

※Building energy efficiency is regulated under the building energy conservation law since 2019.

3-3. Energy Efficiency and Conservation Policy Framework



3-4. Factors Affecting the Successful Implementation of Key EE Policies

Energy Management System

- EE&C improvement efforts by the **in-house experienced energy managers** being supported by government's **stable provision of economic incentives** and **know-how sharing platform**

Benchmark System

- Assist EE&C efforts by the factories/business entities with the **intra-industry comparison**

Voluntary Action Plan

- Facilitate **intra-industry sharing** and **deployment of best practices**

Top Runner Program

- **R&D efforts by the manufacturing industries** and **consumers' choice toward EE technologies** – supported by labeling and economic incentives

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4-1. Latest Developments

1. **Amendments on Energy Conservation Law**
- Encouragement of Joint Energy Efficiency Improvement
- Permission for Group Company Reporting System
- Redefinition of Freight Owner

2. **Widening the Coverage of Benchmark System**

3. **Top Runner Program**

4. **Zero Energy House**

5. **Zero Energy Building**

Amendment ① Joint Energy Efficiency Improvement

Article from 46 to 50 (Factories・Businesses), from 117 to 121 （Freight owners), from 134 to 138（Transport businesses)

【Current】

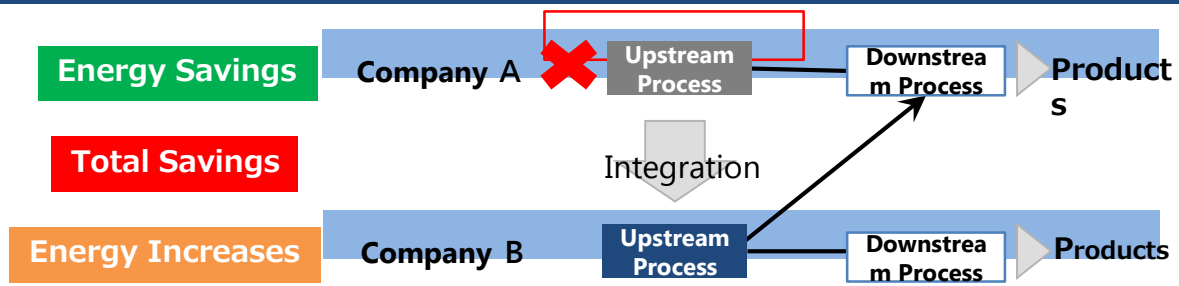
Evaluation by business entity

【Amendment】

Energy savings from joint efforts among different business entities would be shared among participating them.

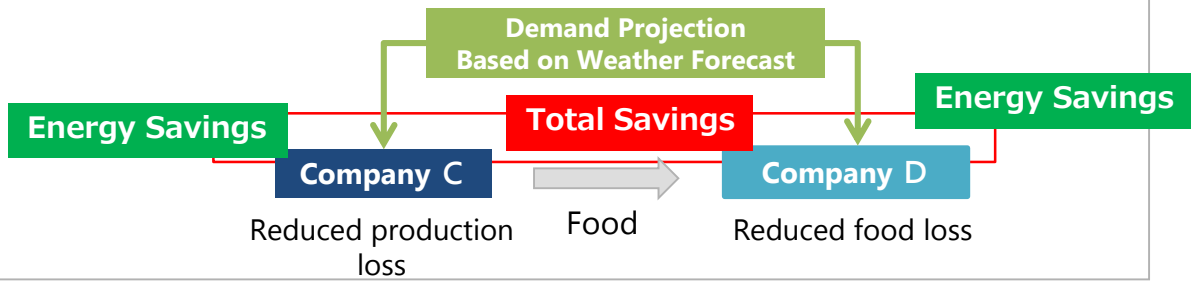
1 Production facility integration

- Savings from the integration of production process will be shared among the participating companies



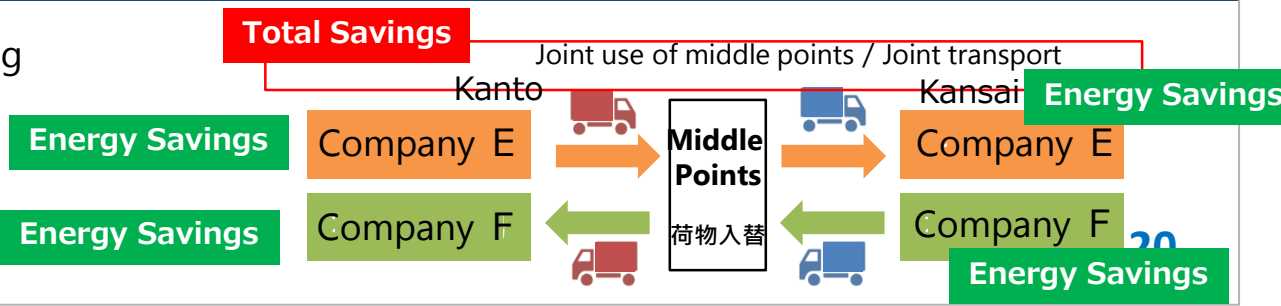
2 Coordination in supply chain

- Savings would be shared among the supply chain to encourage the joint efforts.



3 Coordination in freight transport

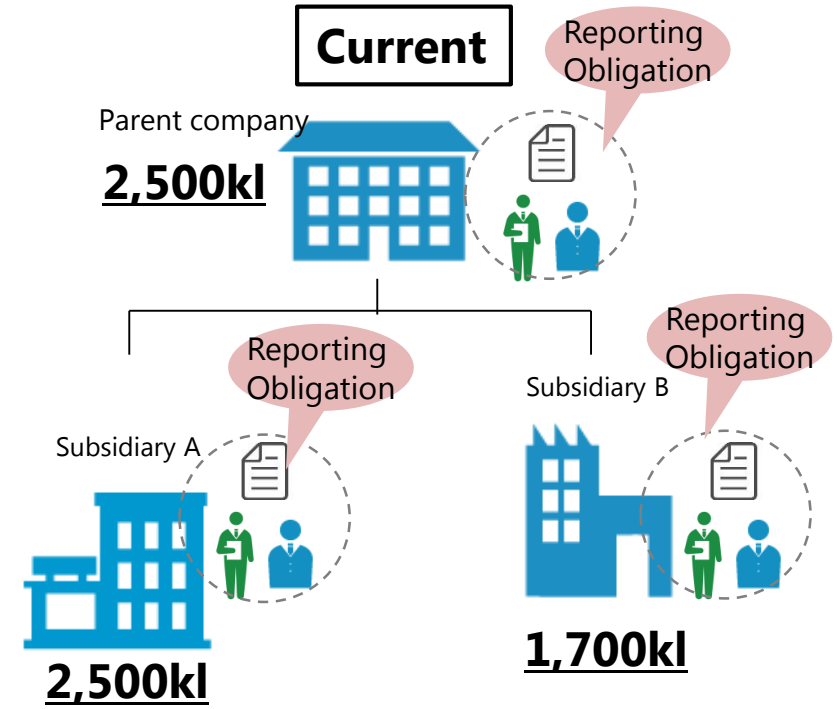
- Savings would be shared among the supply chain to encourage the joint efforts in freight transport.

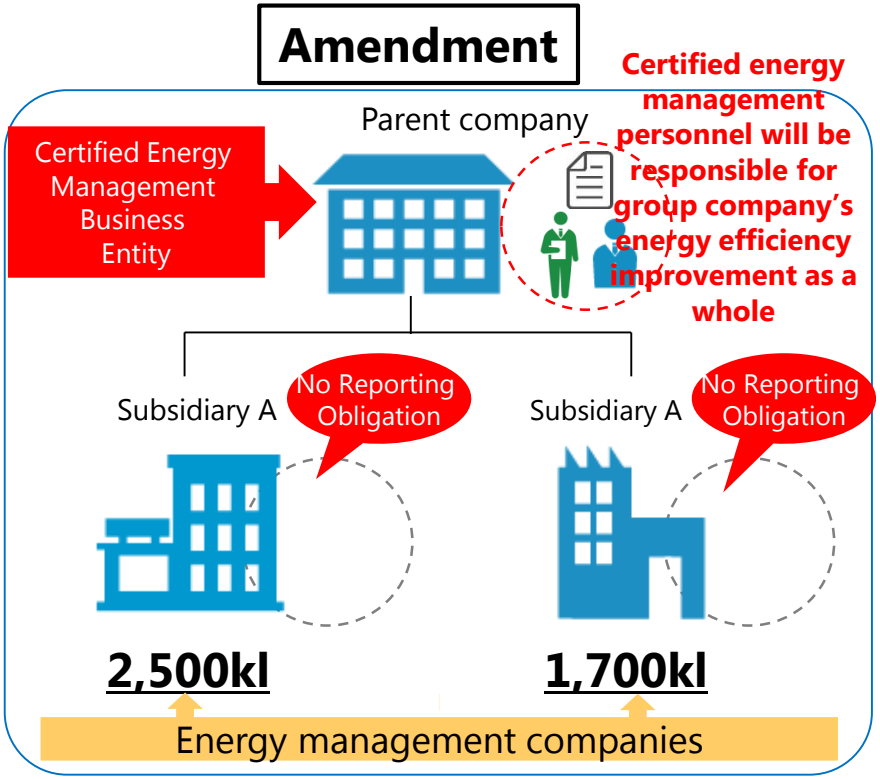


Amendment ② Permission for Group Company Reporting System

Article from 29 to 4（Factories・Businesses）, from 113 to 116（Freight Owners）, From 130 to 133（Transport businesses）

- **Certified energy management business entities will be able to implement energy efficiency efforts among group company.**



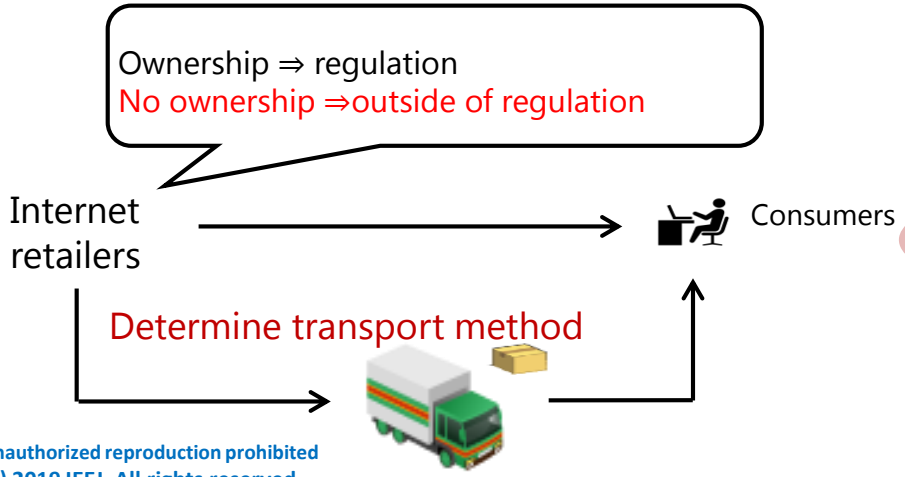


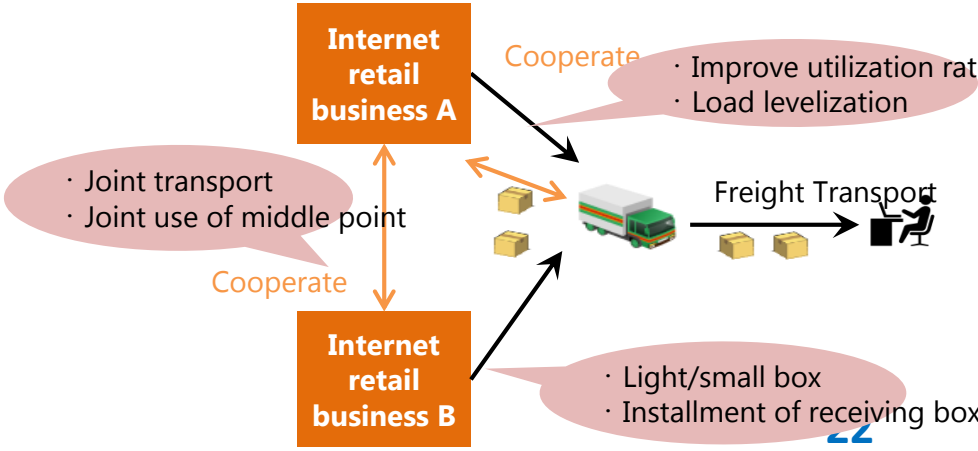
: Energy Manager : Energy Management Planner : Periodical reporting and middle/long-term planning

Amendment ③ Redefinition of Freight Owner
Article 105

- Regardless of the freight goods ownership, those entities determine the mode of freight goods are defined as freight owner. This expands the coverage to include internet retail business entities under the energy conservation law.
- Superior examples implemented by internet retail business entities will be included as examples to follow in the guidelines of energy conservation law.

Current	Amendment
Freight Owner = Owner of transporting goods · Transporting goods from factory to factory: Freight owner was defined as those owners of transporting goods. · Some of the internet retail business entities were outside of this regulation. (Only 5 internet retailers out of top 10 entities.)	**Freight Owner** = Those entities determining the transport methods · Regardless of the freight goods ownership, those entities determine the mode of freight goods are defined as freight owner. · Those mall business entities that do not determine the freight transport method will be outside of regulation.





Widening the Coverage of Industry Top Runner Program

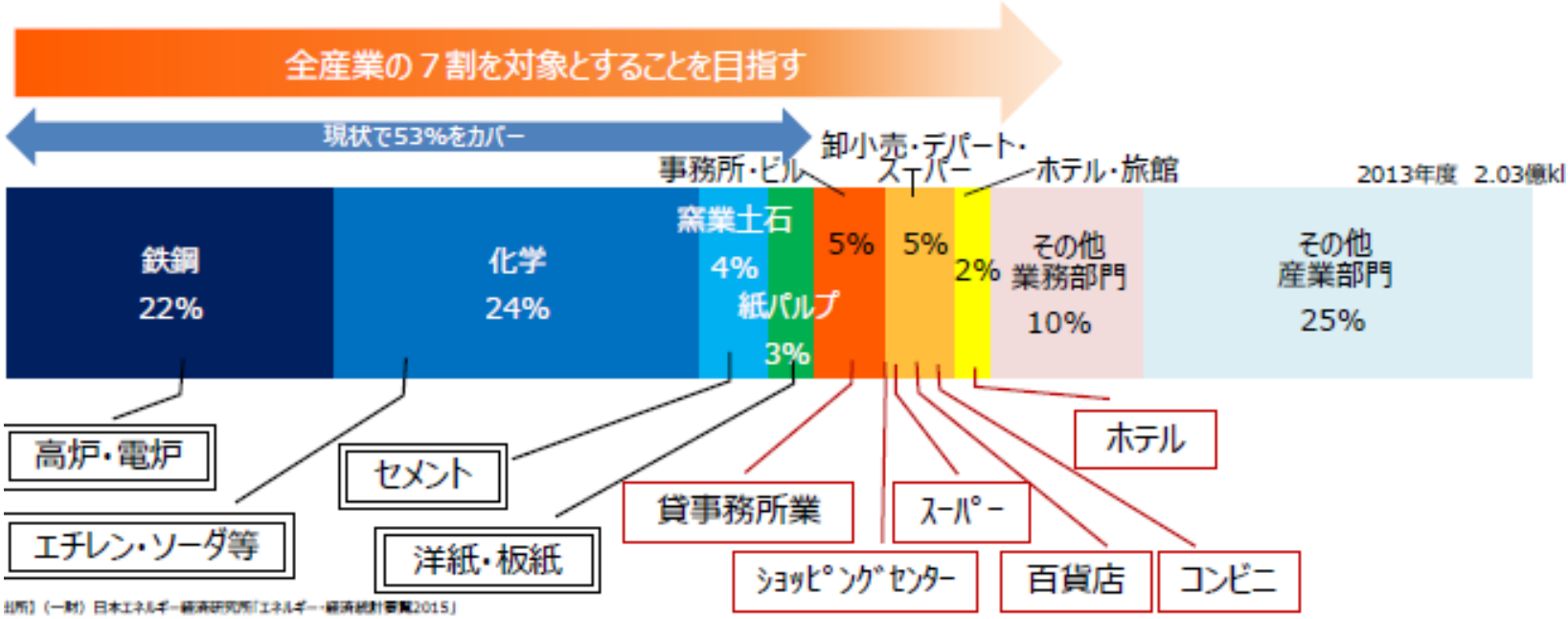
Dialogue between Public and Private Sector (26 Nov, 2015)

官民対話

「『日本再興戦略』改訂2015」（平成27年６月30日閣議決定）に基づき、グローバル競争の激化や急速な技術革新により不確実性の高まる時代に日本経済が歩むべき道筋を明らかにし、政府として取り組むべき環境整備の在り方と民間投資の目指すべき方向性を共有するため、未来投資に向けた官民対話を開催。第３回ではエネルギー関連の投資と課題を議論。

Prime Minister's Statement

We plan to expanding the benchmark system to the service industry with the coverage becoming 70% of total energy consumption of industry/commercial sectors.



出所）（一財）日本エネルギー経済研究所「エネルギー経済統計要覧2015」

Industry Top Runner Program (Benchmark System)

- **Latest Development**

< Expanded Coverage > April, 2018

✓ The program has been introduced in (1) **super market**, (2) **shopping center**, (3) **rental office businesses** since April, 2018. Altogether, the program covers 64.5% of energy consumption in industry/commercial sectors.

< Amendment on Benchmark System for Electric Supply Industries > April, 2018

✓ Maximum generation efficiency is set for biomass co-firing at coal (51%), gas (58%), and oil (49%)

- **Way Forward**

✓ Expand the coverage to government office buildings and schools

Coverage on Industry Top Runner Program

区分	事業	ベンチマーク指標（要約）	目指すべき水準
1 A	高炉による製鉄業	粗鋼生産量当たりのエネルギー使用量	0.531kℓ／t以下
1 B	電炉による普通鋼製造業	上工程の原単位（粗鋼量当たりのエネルギー使用量）と 下工程の原単位（圧延量当たりのエネルギー使用量）の和	0.143kℓ／t以下
1 C	電炉による特殊鋼製造業	上工程の原単位（粗鋼量当たりのエネルギー使用量）と 下工程の原単位（圧延量当たりのエネルギー使用量）の和	0.36kℓ／t以下
2	電力供給業	火力発電効率Ａ指標 火力発電効率Ｂ指標	1.00以上 44.3%以上
3	セメント製造業	原料工程、焼成工程、仕上げ工程、出荷工程等それぞれの工程における生産量（出荷量）当たりのエネルギー使用量の和	3,739MJ／t以下
4 A	洋紙製造業	洋紙製造工程の洋紙生産量当たりのエネルギー使用量	6,626MJ／t以下
4 B	板紙製造業	板紙製造工程の板紙生産量当たりのエネルギー使用量	4,944MJ／t以下
5	石油精製業	石油精製工程の標準エネルギー使用量（当該工程に含まれる装置ごとの通油量に適切であると認められる係数を乗じた値の和）当たりのエネルギー使用量	0.876以下
6 A	石油化学系基礎製品製造業	エチレン等製造設備におけるエチレン等の生産量当たりのエネルギー使用量	11.9GJ／t以下
6 B	ソーダ工業	電解工程の電解槽払出カセイソーダ重量当たりのエネルギー使用量と濃縮工程の液体カセイソーダ重量当たりの蒸気使用熱量の和	3.22GJ／t以下
7	コンビニエンスストア業	当該事業を行っている店舗における電気使用量の合計量を当該店舗の売上高の合計量にて除した値	845kWh／百万円以下
8	ホテル業	当該事業を行っているホテルのエネルギー使用量を当該ホテルと同じ規模、サービス、稼働状況のホテルの平均的なエネルギー使用量で除した値	0.723以下
9	百貨店業	当該事業を行っている百貨店のエネルギー使用量を当該百貨店と同じ規模、売上高のホテルの平均的なエネルギー使用量で除した値	0.792以下
10	食料品スーパー業	当該事業を行っている店舗のエネルギー使用量を当該店舗と同じ規模、稼働状況、設備状況の店舗の平均的なエネルギー使用量で除した値	0.799以下
11	ショッピングセンター業	当該事業を行っている施設におけるエネルギー使用量を延床面積にて除した値	0.0305kl/㎡以下
12	貸事務所業	当該事業を行っている事務所において省エネポテンシャル推計ツールによって算出される省エネ余地	16.3%以下

Gross Generation Efficiency

Gross Generation Efficiency on Biomass Co-firing

$$\frac{\text{Electricity Generation}}{\text{Input Fuel} - \text{Biomass Energy}}$$

※いずれも設計上における定格運転時の値

	Maximum Efficiency (HHV)
Coal-fired Generation	**51%**
Gas-fired Generation	**58%**
Oil-fired Generation	**49%**

Industry Top Runner Program (Benchmark System)

Super Market

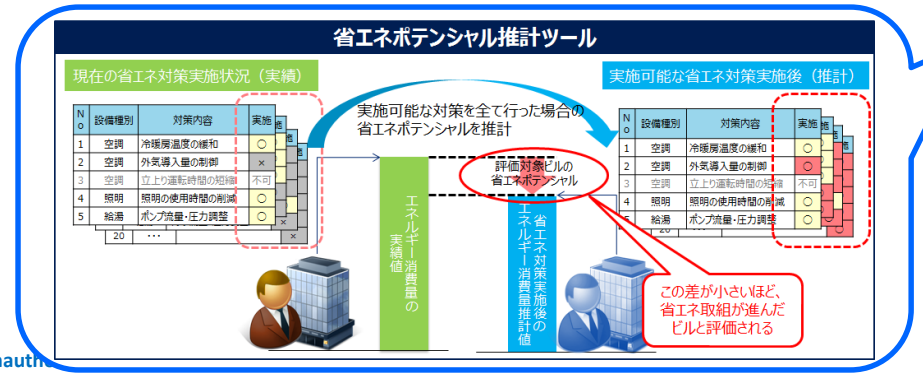
■ **Benchmark Indicator**

Actual Energy Consumption **(GJ)**

Multiple Regression Analysis
Estimated Energy Demand **(GJ)**

Floor Space (㎡) × 2.543	+	Operational Hours (Hour/Year) × 0.684	+	Size of Refrigerator (30.3 cm) × 5.133

■ **Aspirational Goal : Below 0.799**



Shopping Center

■ **Benchmark Indicator**

$$\frac{\text{Actual Energy Consumption (kl)}}{\text{Total Floor Space (㎡)}}$$

■ **Aspirational Goal : Below 0.0305（kl/㎡）**

Rental Office Business

■ **Benchmark Indicator**

Estimated Energy Savings Potential from Tool

■ **Aspirational Goal ：Below 16.3%**

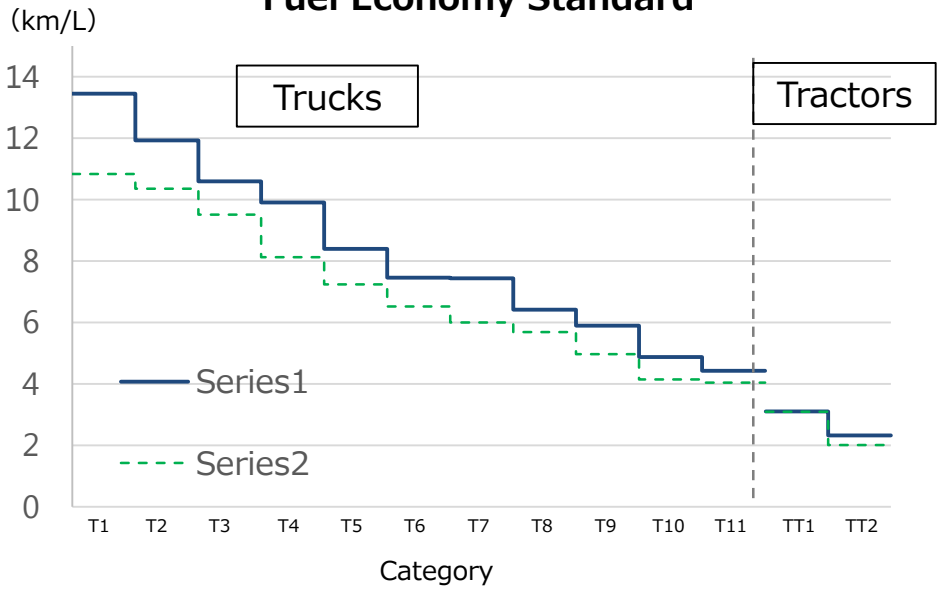
※ ただし、初年度の報告をもって水準の見直しを行う

Top Runner Standard

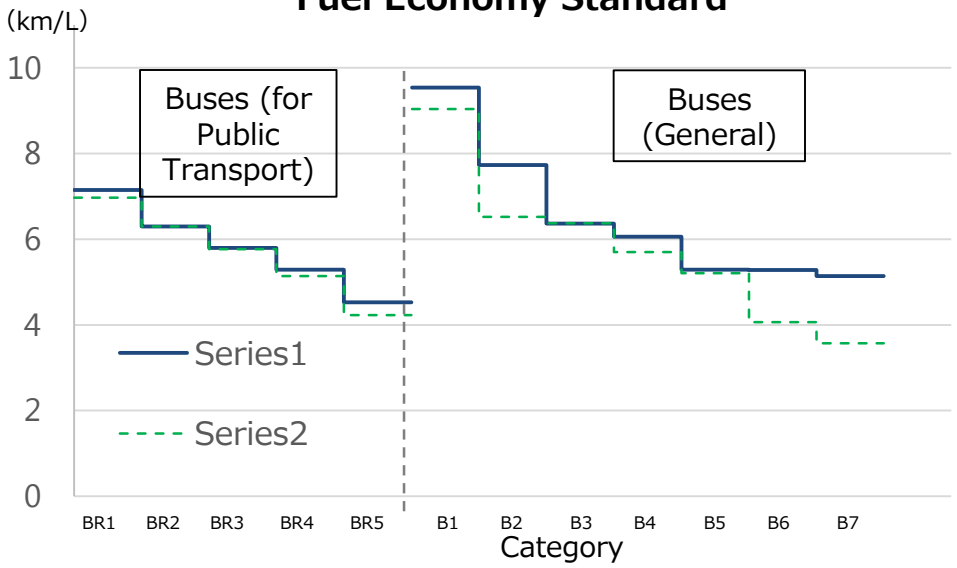
New Fuel Economy Standard for Heavy Duty Vehicles

- ✓ **All manufactures achieved 2015 fuel economy standard for freight transport/buses** (11.3% improvement from 2002 level)
- ✓ **2025 fuel economy standard for freight transport/buses are newly set (average 13.5% improvement from 2015 level)** (Freight Transport (Trucks, Tractors: 13.4%, Buses: 14.3%)
- ✓ Newly set 2025 fuel economy incorporates the improvement on air resistance and rolling resistance for technological innovation.

Freight Transport (Trucks, Tractors)
Fuel Economy Standard



Buses
Fuel Economy Standard



Top Runner Standard

- **New Targets for Top Runner Standards**

✓ New targets will be set from those technologies that have relatively large rooms for energy savings.

✓ New ones will reflect the use of IoT as a means of achieving the target level.

Current Status of Top Runner Standards by Technology

			目標年度 経過・待ち	次期基準 検討中	検討状況等
1	乗用自動車	軽・小型	2020	○	次期基準策定に向けて３月にWGを立上げ
		バス	2015 (2025)		2017年12月に2025年度を目標とする基準案を策定済
2	エアコンディショナー	家庭用	2012	○	年度内にWGで審議開始予定
		業務用	2015		
3	蛍光灯を主光源とする照明器具	蛍光灯器具	2012 (2020)		昨年3月に照明器具については2020年度、電球類については2027年度を目標とする基準案を策定、施行準備中
		電球形蛍光ランプ	2012 (2027)		
4	テレビジョン受信機	ブラウン管	2003		
		液晶・プラズマ	2012	○	年度内にWGで審議開始予定
5	複写機		2017		報告徴収実施中
6	電子計算機		2011	○	年度内にWGで審議開始、次期基準施行予定
7	磁気ディスク装置		2011	○	
8	貨物自動車	小型	2022		
		トラック・トラクタ	2015 (2025)		2017年12月に2025年度を目標とする基準案を策定済
9	ビデオテープレコーダー		2003		
10	冷蔵庫	家庭用	2021		
		業務用	2016		
11	冷凍庫	家庭用	2021		
		業務用	2016		

			目標年度 経過・待ち	次期基準 検討中	検討状況等
12	ストーブ	ガス	2006		
		石油	2006		
13	ガス調理機器		2008		
14	ガス温水機器		2008	○	2017年３月にWGで審議を開始
15	石油温水機器		2006		
16	電気便座		2012		
17	自動販売機		2012		
18	変圧器		2014		
19	ジャー炊飯器		2008		
20	電子レンジ		2008		
21	ＤＶＤレコーダー		2010		
22	ルーティング機器		2010	○	年度内にWGで審議開始、次期基準施行予定
23	スイッチング機器		2011	○	
24	複合機		2017		報告徴収実施中
25	プリンター		2017		報告徴収実施中
26	ヒートポンプ給湯器		2017	○	報告徴収実施中 年度内にWGで審議開始予定
27	三相誘導電動機		2015		
28	電球形ＬＥＤランプ		2017 (2027)		報告徴収実施中 2017年3月に電球類として2027年度を目標とする基準案を策定済
29	ショーケース		2020		

Target year - finished

Target year after 2020

27

Zero Energy House

- **Latest Developments：Publication of Report from ZEH Roadmap Follow-up Committee, May 2018**

✓ **Target:** Majority of custom-built house to be ZEH by 2020

✓ Progress: 42,000 newly built house was ZEH in FY2017 (about 22.9%), or increase by 8,000 units from FY2016.

✓ Increased measures to introduce ZEH for detached house, and newly introduced ZEH for apartments.

【戸建住宅のZEH化を強化】

・Newly introduced a definition on 「ZEG+」that increases the use of PV generation for own-use purpose and reduce reliance on FIT

・Newly introduced a definition on 「ZEH Oriented」in urban area of which PV capacity is limited.

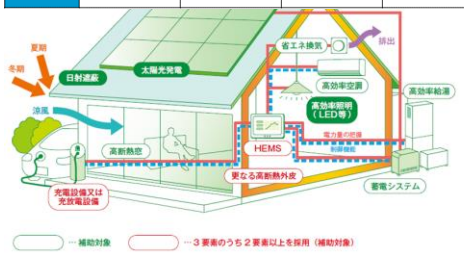
・Provision of economic incentives for ready-built house.

【集合住宅のZEH】

・Newly introduced a definition for 「ZEH-M」that consider different level of renewables depending on floor level

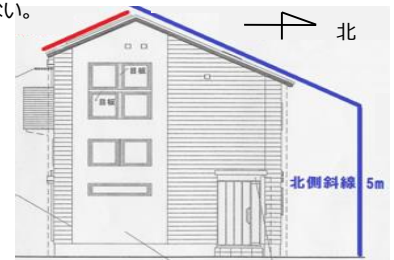
①ZEH+の定義

	断熱性能	再エネ除く省エネ率	再エネ含む省エネ率	再エネ自家消費拡大措置
ZEH+	ZEH断熱性能	25%	100%	下記３要素のうち２要素以上を採用
ZEH		20%		–

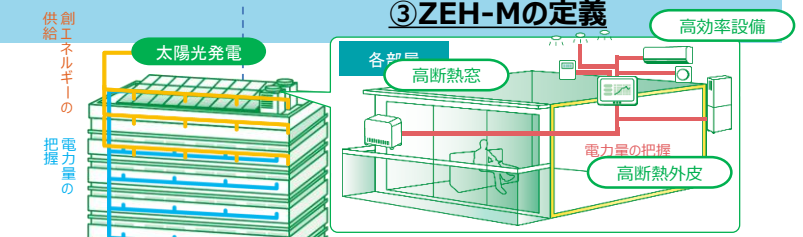


②屋根面積の確保が困難な事例

建築基準法等により青い線より外側に建築できず、赤い線で示した南側屋根の面積が制限された結果、太陽光発電設備の設置面積が十分に確保できない。



③ZEH-Mの定義



	断熱性能（全住戸）	省エネ率（住棟全体） 再エネ除く	再エネ含む	目指すべき水準
『ZEH-M』	ZEHの断熱性能	20%	100%以上	1～3階建
Nearly ZEH-M			75%以上	
ZEH-M Ready			50%以上	4・5階建
ZEH-M Oriented			-	3階建以上

Zero Energy Building

- **Latest Developments（Publication of ZEB Design Guideline）**

Publication of Report from ZEH Roadmap Follow-up Committee, May 2018

✓ **Publication of ZEB design guideline for office, super market, hospital.**

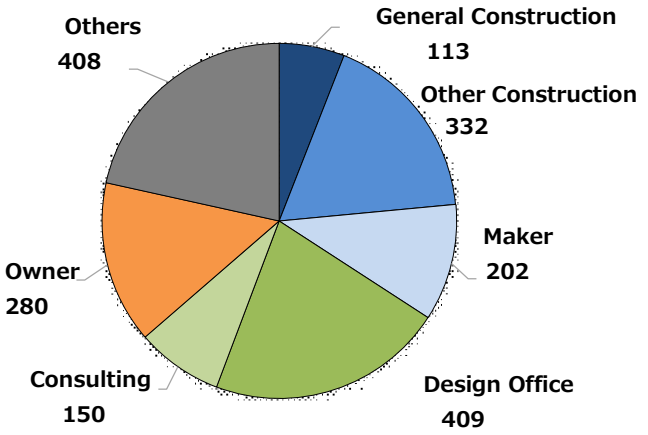
ZEB Design Guideline

Middle-sized office(10,000m²) | Elderly care center | Small-sized office(2,000m²) | Super market | Hospital（New）

✓ 設計技術者向け

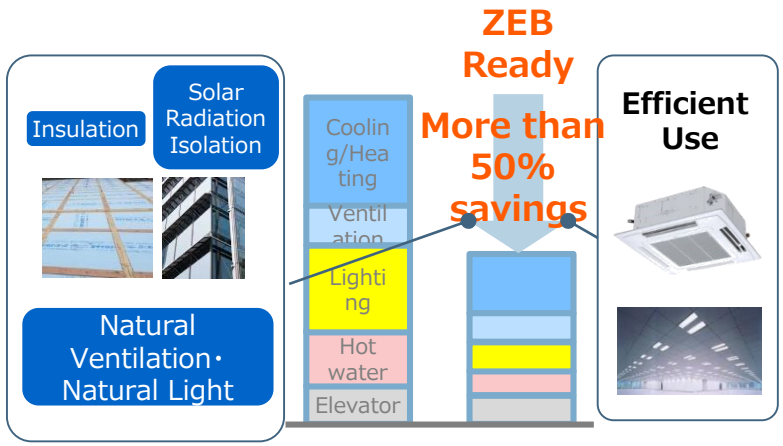
- ＺＥＢ化のための技術の組み合わせ
- 当該技術の省エネ効果、追加コスト等
- 実際の設計事例

ZEB Design Guideline: The number of downloads (1,900 downloads in 16 months)



Zero Energy Building

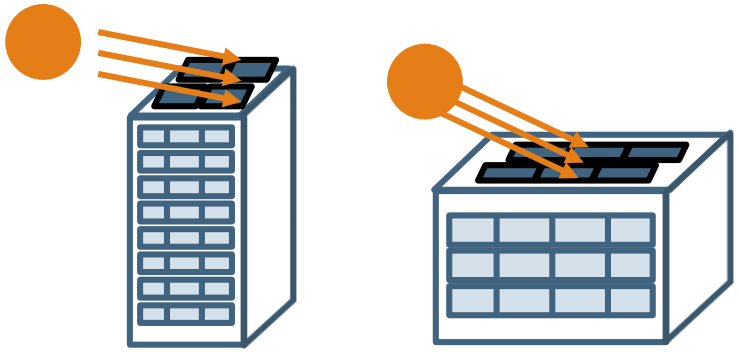
ＺＥＢ Definition



＋ **Renewables**

Nearly ZEB
（正味で**75%以上**省エネ）

ZEB
（正味で**100%以上**省エネ）



平成２８～３０年度ＺＥＢ実証事業の採択状況

	Below 2,000㎡	2,000㎡～10,000㎡	Over 10,000㎡
Office	23	20	3
Hotel	3	4	1
Hospital	2	5	3
Elderly Care Center	7	18	1
Super Market	1	6	5
School	3	2	1
Convention Center	3	1	1
Total	42	56	15

※その他用途：３件

注）「平成28～30年度 ネット・ゼロ・エネルギー・ビル実証事業（経済産業省）」及び
「平成28～30年度 二酸化炭素排出抑制対策事業費等補助金（環境省）」の採択状況
（平成28、29年度は事業確定数、平成30年度は交付決定数）

Outline

1. International Comparison of Total Primary Energy Consumption per GDP
2. Energy Supply/Demand Structure toward CO_2 Emissions Reduction Target in 2030
3. Japan's Energy Efficiency and Conservation Policy Framework
4. Latest Developments

1. Toward Deepening Japan's Energy Efficiency Efforts – New or Enhancing Energy Efficiency

5. Toward Deepening Japan's EE Efforts

- **Japan is the leader in EE efforts across the world with the use of (1) regulation, (2) economic incentives and (3) human resources (energy managers).**

- **Toward deepening Japan's EE efforts, strengthening existing policies and practices is the key with the use of new technologies.**

- **Establishment of new policies would be necessary with the changing policy/market environment.**
  - Energy efficiency as the tool for grid stabilization
  - Demand response from energy efficiency and evaluation mechanism
  - Use of IT and measurement and verification
  - Zero energy building as the virtual power plant

(Reference) Toward Deepening Japan's Energy Efficiency – Overview of New or Enhancing EE Policies

Sector	Energy Savings in 2030	EE&C Policies to Realize the Estimated Energy Savings
Industry	Factories：10.42 billion Liter	■ **Strengthening Benchmark Standard** ■ **Strengthening Review System for Energy Management System** ■ Energy Audit for Small and Medium Sized Entities ■ Promoting Joint EE&C Efforts by Multiple Entities
Commercial	Buildings・Stores：12.26 billion Liter	■ Strengthening Benchmark Standard ■ Strengthening Review System for Energy Management System ■ Energy Audit for Small and Medium Sized Entities ■ Top Runner Standard ■ Mandatory Compliance on Building EE Standard ■ Wider Diffusion of Zero Energy Building ■ **Provision of EE Information by Energy Suppliers and Potential for Energy Efficiency Obligation**
Residential	Appliances：6.03 billion Liter Housing：5.57 billion Liter	■ Top Runner Program ■ Mandatory Compliance on Housing EE Standard ■ Wider Diffusion of Zero Energy House ■ **Provision of EE Information by Energy Suppliers and Potential for Energy Efficiency Obligation**
Transport	Freight Truck：6.68billion Liter Vehicles：9.39 billion Liter	■ Traffic Demand Management・Eco-Driving ■ **Improvement of Freight Delivery Service Increased from E-Commerce** ■ Top Runner Program ■ Autonomous Car Driving