Deepening Japan's Energy Efficiency Policy

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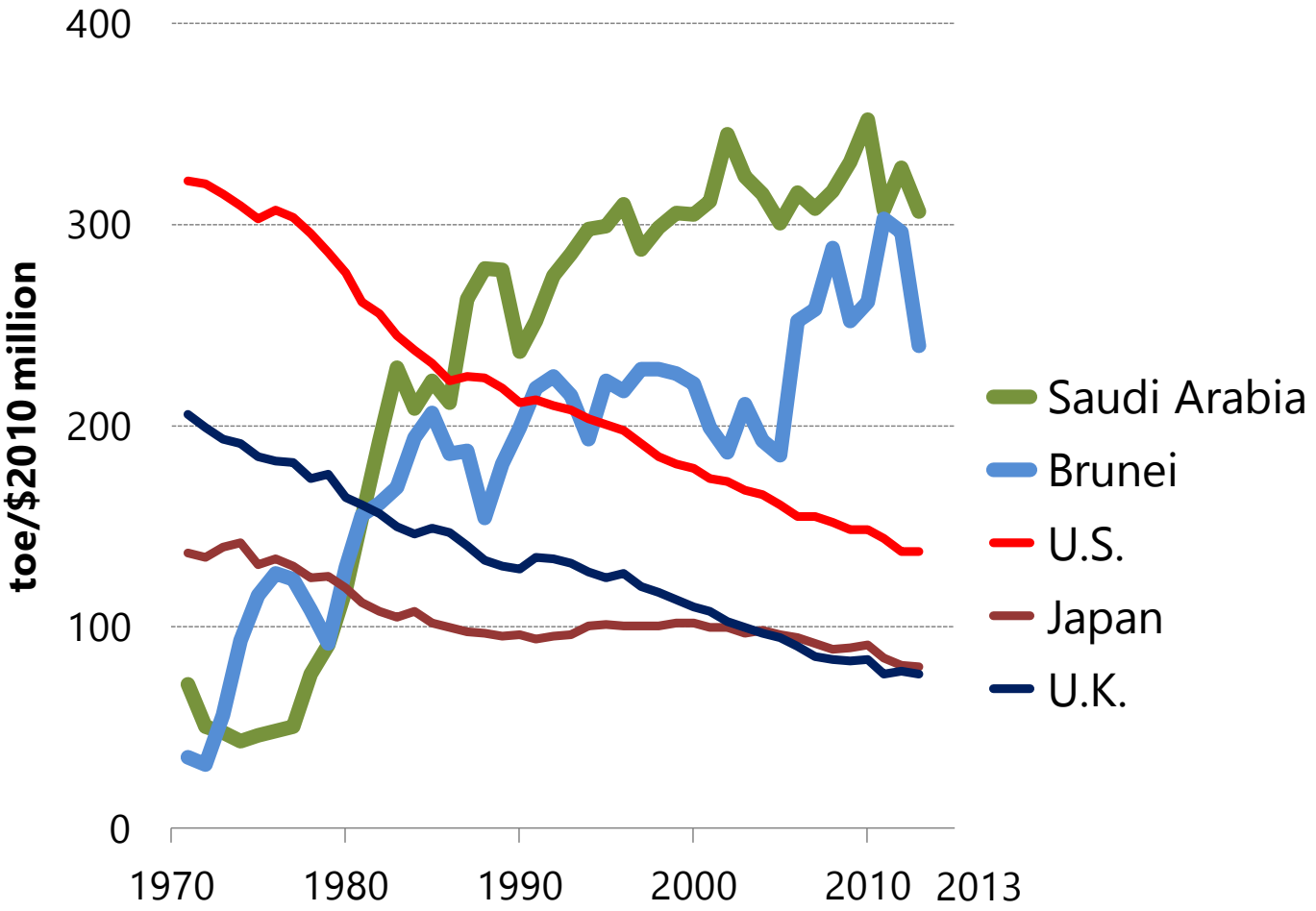
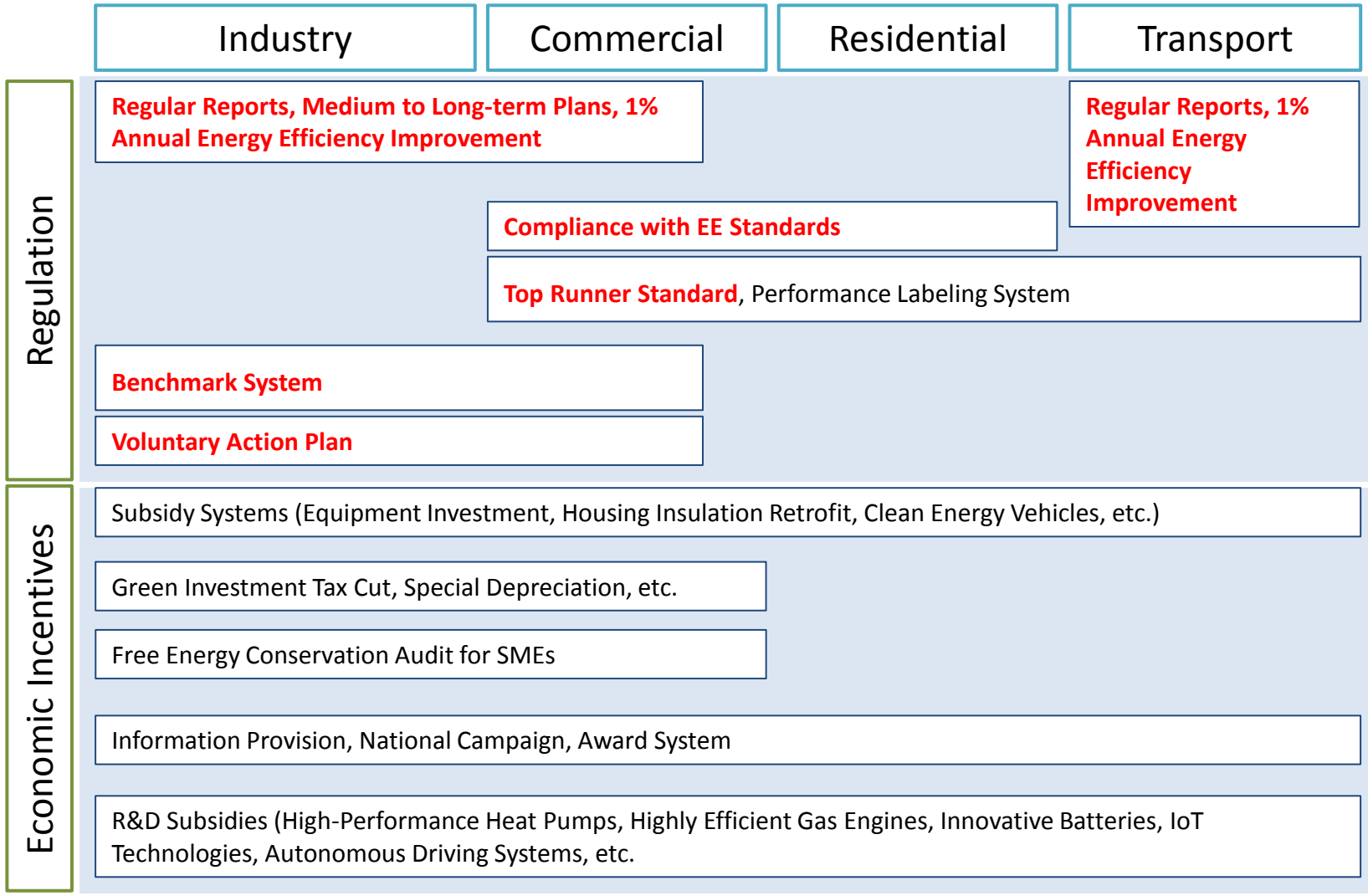
5. Toward Deepening Japan's Energy Efficiency and Conservation – Overview of New or Enhancing EE&C Policies

1. International Comparison of Total Primary Energy Consumption per GDP



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

2-1. Energy Efficiency Policy Framework



2-2. 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 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

3-1. Challenges and Changing Market Environment for Japan's Energy Efficiency

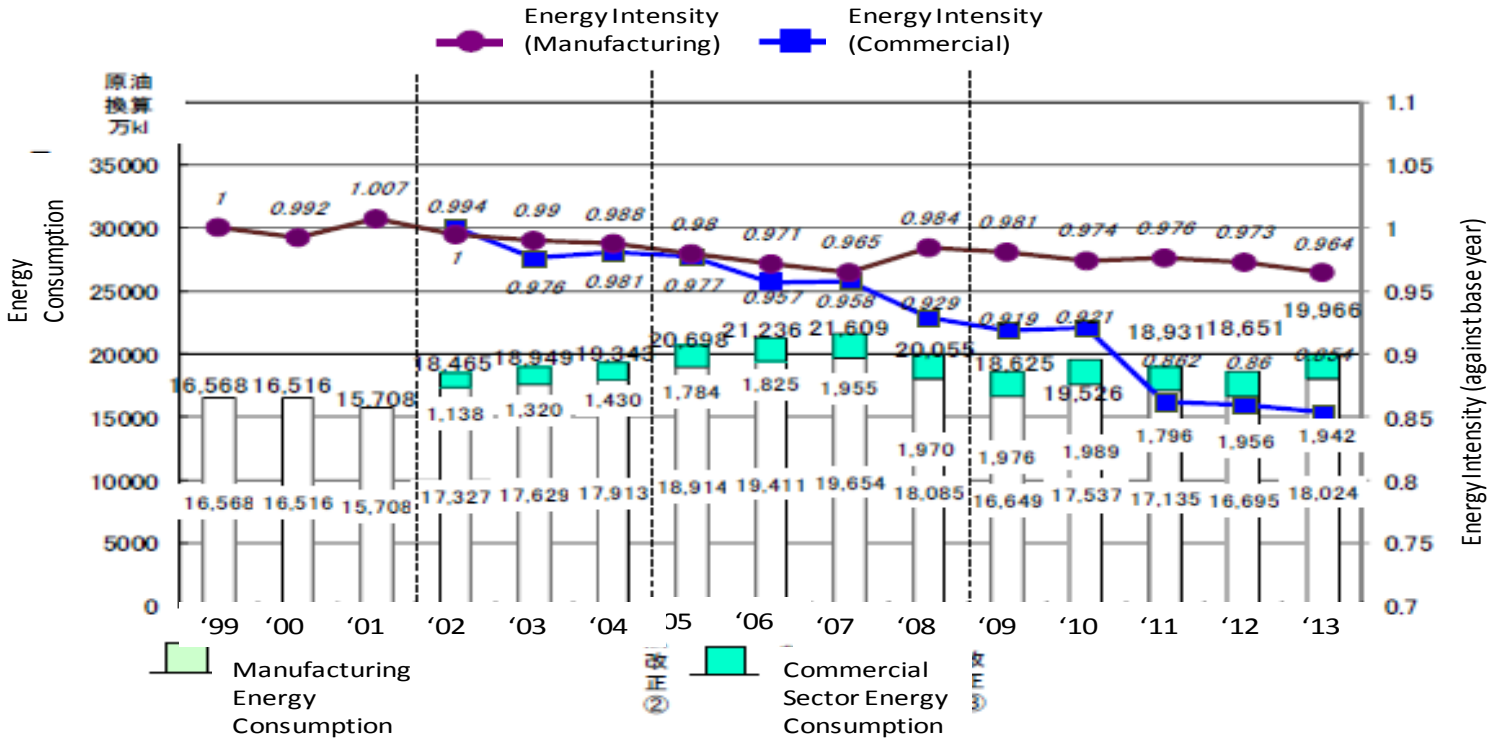
- **Japan faces challenges to continuously make progress on energy efficiency building on the conventional approach.**
  - Energy Management System
    - Manufacturing industry's pace of energy intensity improvement represents slower compared with that of commercial sector.
  - Top Runner Program
    - Substantial achievement in technology energy efficiency has been made historically (AC: 30%, Passenger Vehicles: 48.8%). Manufactures may face challenges to find technological options for cost effective energy efficiency improvement.

- **Consumers' energy consumption pattern may change under the deregulated energy market environment.**
  - Electricity retail competition introduced in April 2016
  - Gas retail competition – to be introduced in April 2017

3-2. Japan's Large-Scale Energy Users' Energy Intensity Improvement

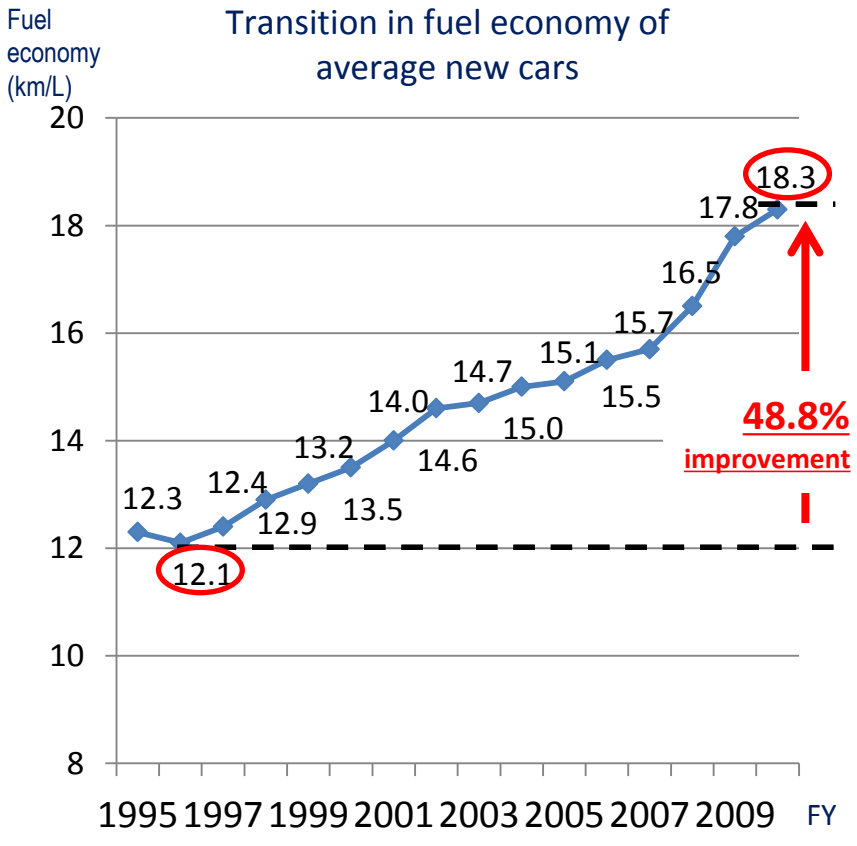
- Manufacturing industry's energy intensity level showed relative small improvement since 1999.
- By contrast, the commercial sector's energy intensity substantially improved since its start in 2002.

Trends in Energy Intensity: Manufacturing Industry and Commercial Sector



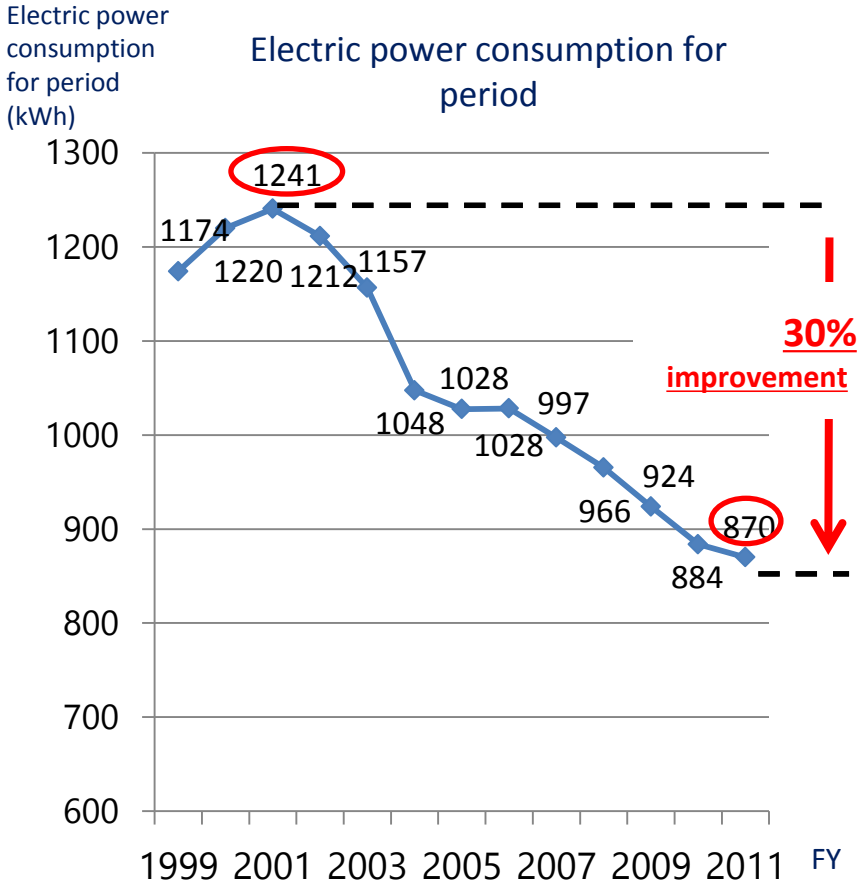
3-3. Improvements in Energy Efficiency with Top Runner Program

[Passenger cars]



(Note) Fuel economy values for the 10-15 mode.

[Air conditioners]



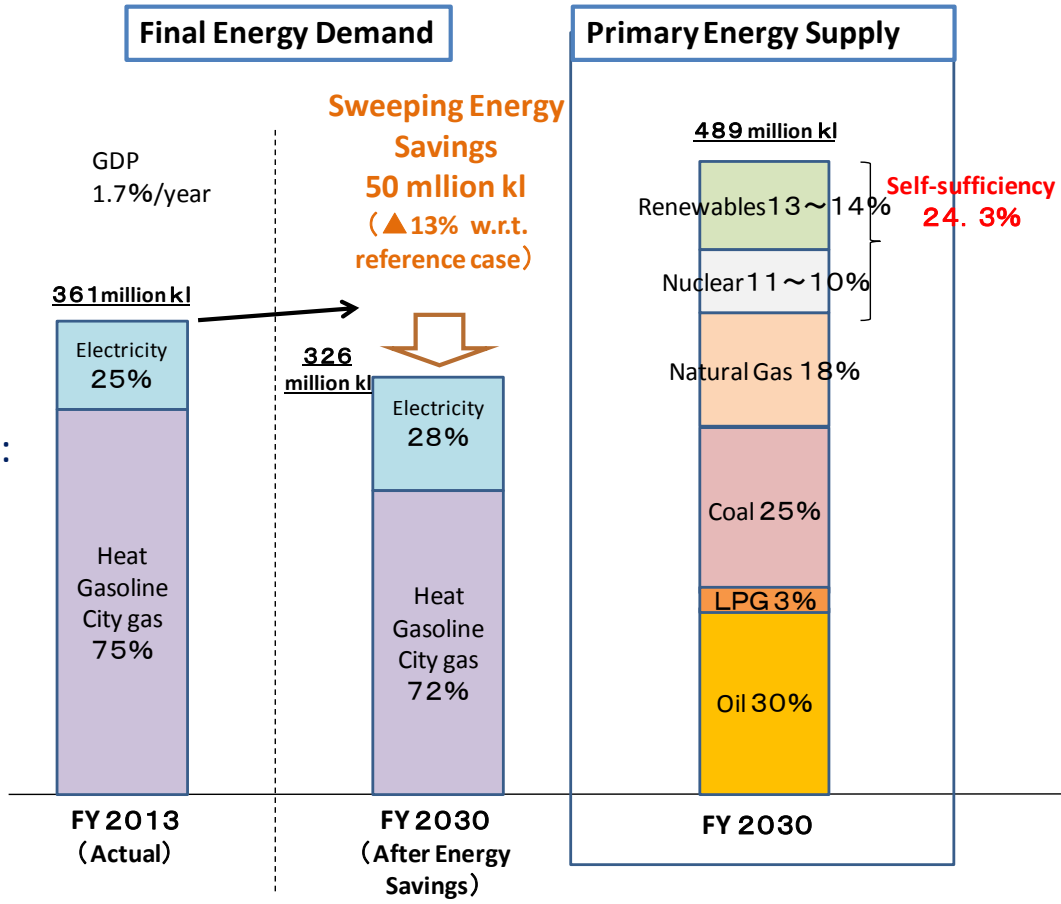
(Note) Wall mounted cooling and heating units with cooling capacity of 2.8kW-class model; simple average values for a representative model of energy conserving-type products.

4-1. 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**).

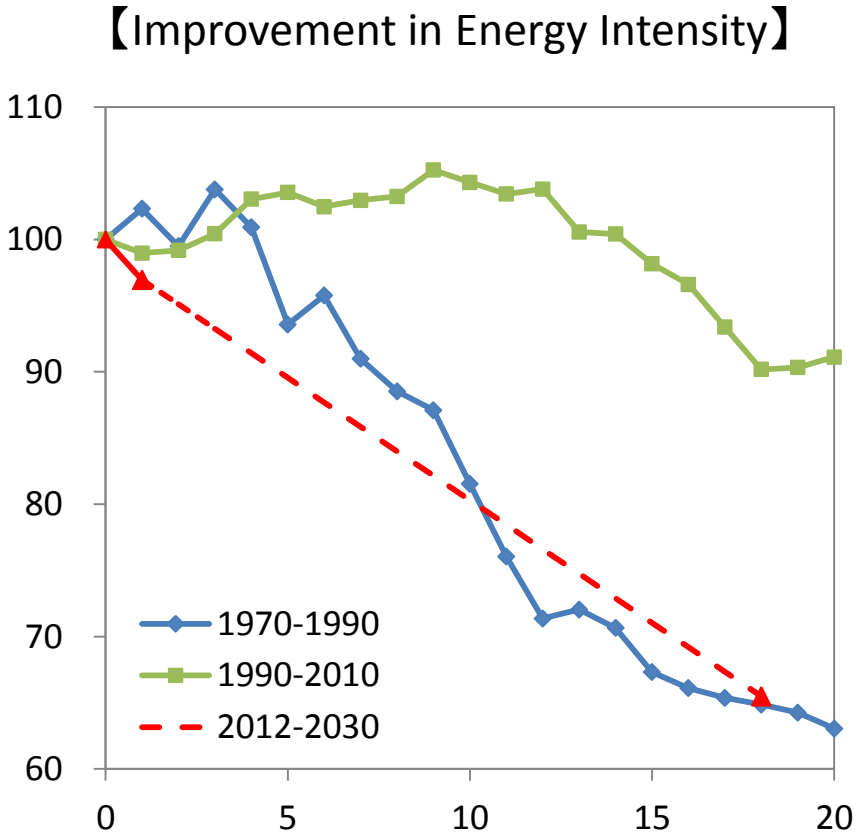
○ **Energy supply/demand structure improvement** (energy self-sufficiency rate: 6% in 2014 ⇒**24.3%** in 2030)

○ **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)

4-2. Need for Further Improvement of Energy Efficiency



- 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.

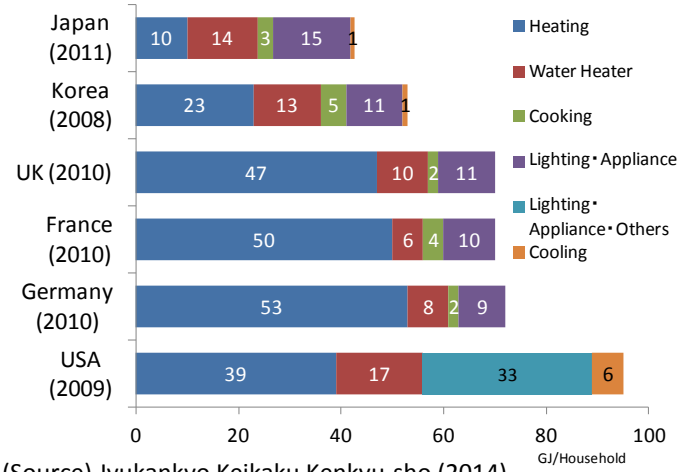
5-1. Toward Deepening Japan's Energy Efficiency – Overview of New or Enhancing EE Policies

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 ■ Top Runner Program ■ Autonomous Car Driving

Amendment of Energy Conservation Law to mandate electric utilities to provide consumers with EE information in 2013

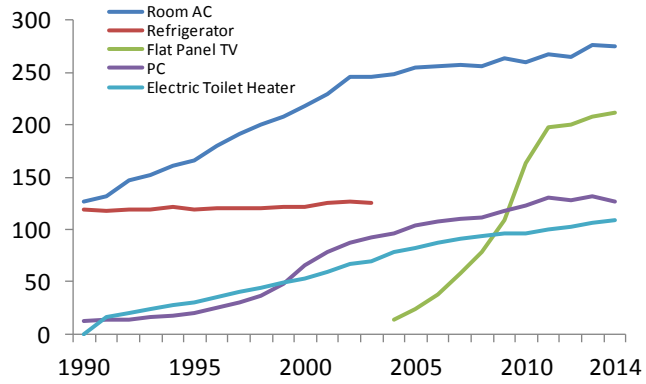
5-2. Some Issues for Deepening EE – Residential and Commercial Sectors

Residential Energy Consumption per Household (GJ/household)



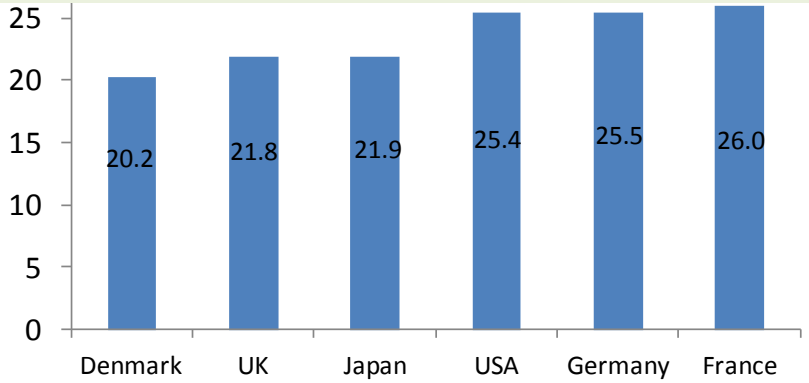
(Source) Jyukankyo Keikaku Kenkyu-sho (2014).

Japan's Household Appliances Diffusion (units/household)



(Source) IEEJ (2014):「Energy Statistics」.

Commercial Energy Consumption per Floor Space (toe/m²)



(Source) Denmark・France・Germany・UK:IEA(2013):Energy Balances of OECD Countries, BPIE(2011).Europe's Buildings Under the Micro Scope. Japan:IEEJ (2014):「Energy Statistics」, USA:IEA(2013):Energy Balances of OECD Countries, US EIA (2013).2012Commercial Buildings Energy Consumption Survey.

Issues for Deepening Middle/Small Sized Commercial EE

- Information Gap
- Financial Constraint
- Short-term View
- Split Incentive

5-3. Japan's Energy Conservation Law: Article 81.7 – Requirement for Electric Power Companies

Article 81.7 Electricity supply business entities are required to plan for measures that can facilitate leveling of electricity load.

1. Preparation of electricity tariffs and other options/menus for consumers to leveling electricity load.

Retail suppliers' preparation on electricity tariff menus

2. Preparation of providing technologies that can measure consumers' electricity consumption and information to facilitate electricity load leveling.

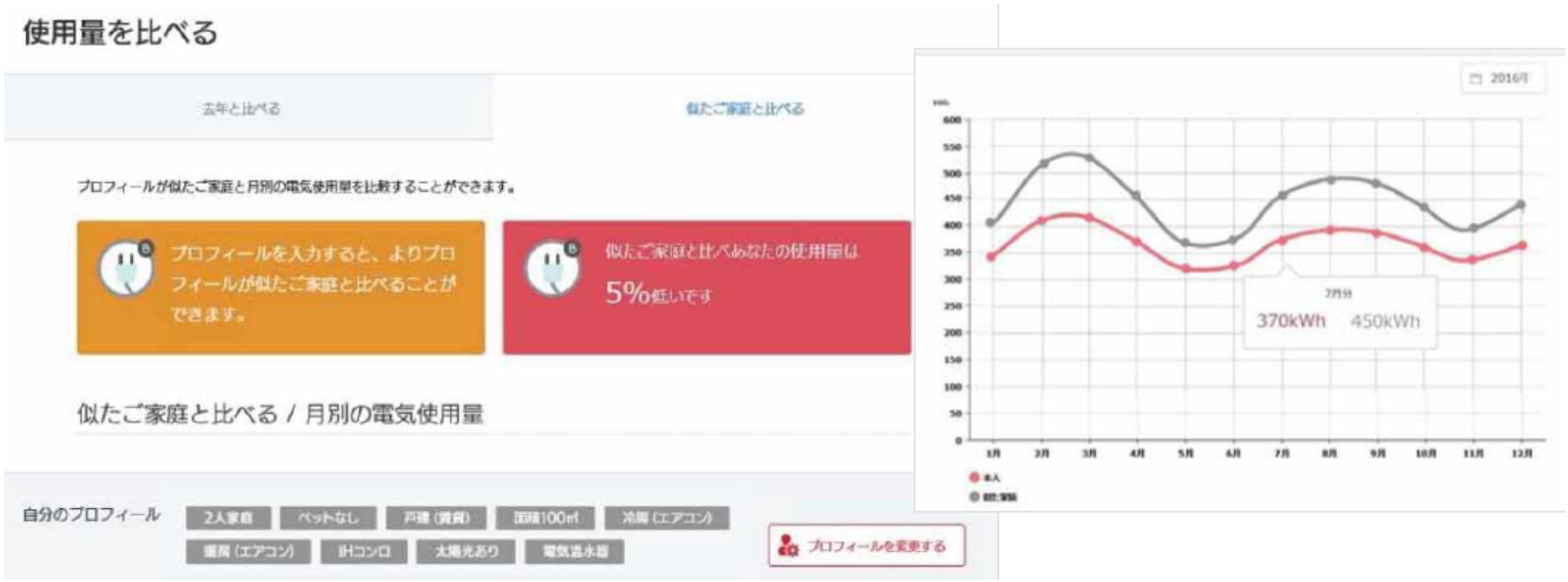
T&D companies' preparation on smart meters

3. Preparation of information regarding electricity demand and supply including actual and projection.

T&D companies' preparation on information provision

5-4. Electricity Suppliers' Provision of Energy Savings Information to Consumers

Example of Tokyo Electric Power Company



The website allows comparison of monthly electricity consumption with a similar household structure, floor space, number of heating/cooling units, and hot water boiler technology.

(Source) Ministry of Economy Trade and Industry. 2016. "Study Group on Guidelines for Energy Retail Suppliers' Energy Efficiency"

5-5. Electricity Suppliers' Provision of Energy Savings Incentives to Consumers

	Service	Energy Supplier	Energy Savings Incentives
Economic Incentives	Discount	Tokyu Power Supply	• Electricity tariff discount for those customers utilize rails to go to department store related to Tokyu group.
	Provision of Refundable Points	Tokyu Power Supply	• Provision of point to those customers utilize rails related to Tokyu group during the summer peak hours.
		ENET NTT Facilities	• Provision of points to those customers save energy during the peak hours.
	Provision of Refundable Coupon	Hokuriku Electric Power Company	• Provision of coupons during the peak hours to encourage consumers' energy savings
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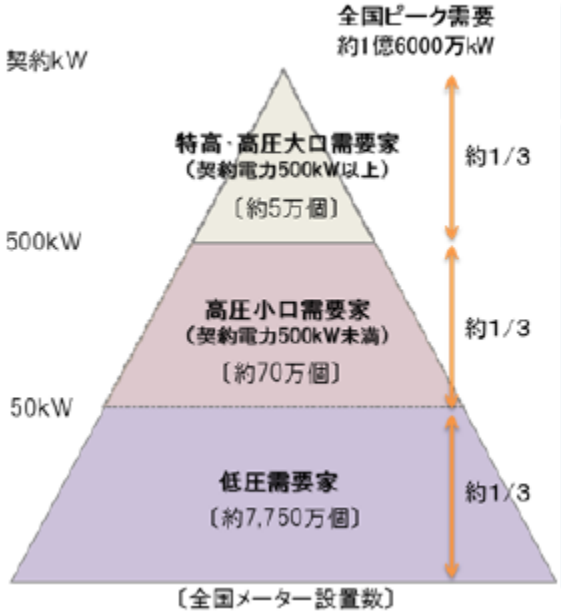
(Source) Ministry of Economy Trade and Industry. 2016. "Study Group on Guidelines for Energy Retail Suppliers' Energy Efficiency"

Example of Hokuriku Electric Power Company

Log-in to the website ▶ Print out the coupon or download to smart phone ▶ Turn off AC/lighting for shopping…

5-6. Status/Plan for Smart Meter Rollout



		北海道	東北	東京	中部	北陸	関西	中国	四国	九州	沖縄
高圧	導入完了	2016年度末	完了	完了	2016年度末	完了	2016年度末	2016年度末	2016年度末	完了	2016年度末
低圧	本格導入開始	開始済	開始済	開始済	開始済	開始済	開始済	開始済	開始済	開始済	開始済
	導入完了	2023年度末	2023年度末	2020年度末	2022年度末	2023年度末	2022年度末	2023年度末	2023年度末	2023年度末	2024年度末

Smart meter rollout for large-scale consumers have been completed, while that of residential/commercial customers will be completed by 2023.

(Source) Ministry of Economy Trade and Industry. 2016. “Study Group on Guidelines for Energy Retail Suppliers’ Energy Efficiency”

5-7. Toward Deepening Japan's EE Efforts

- **In view of the need to introduce new EE policy approach, Japan strengthens provision of EE information by energy suppliers to facilitate consumers' behavior change.**

- **Introduction of Energy Efficiency Obligation system is under consideration, while its benefits and costs across the world will be investigated further. Issues to be considered are:**
  - Maintain consistency with the existing EE policy framework
  - Obliged parties/funding source
    - T&D companies/network tariff
    - Retail companies/electricity fare
  - Appropriate incentive mechanisms for energy suppliers.
  - Appropriate monitor, review and verification mechanism.

Thank you for your attention.