

Japan's Policy on Energy Saving, Renewable Energy

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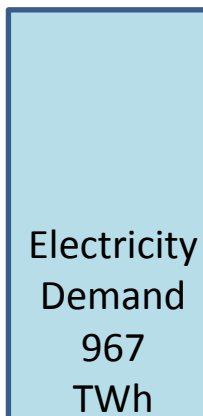
Agency for Natural Resources and Energy
Ministry of Economy, Trade and Industry, Japan

Japan's New Energy Mix

【Direction】

- (1) To improve the self-sufficiency ratio to around 25% surpassing the level before the Earthquake.
- (2) To reduce the electricity costs lower than today.
- (3) To set a high-level GHG reduction goal compared with other developed countries to lead the world.

Electricity Demand



2013
(actual results)

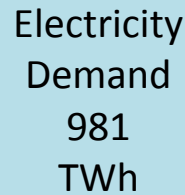
GDP growth
1.7%/year

Energy conservation

196TWh
(▲17%)

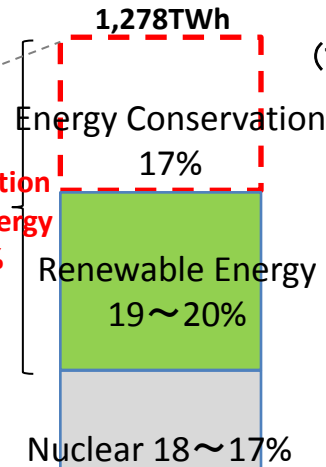
(loss from Electricity transmission etc.)

Energy Conservation
+ Renewable Energy
= about 40%

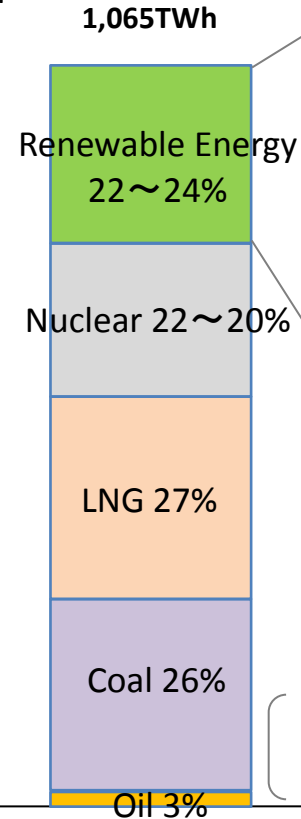


2030

(Total Electricity generation)

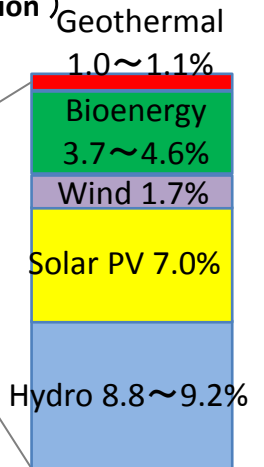


(Total Electricity generation)



2030

Electricity generation mix



Total base load
power ratio
: 56%

Data on National Energy Consumption in Japan

1973-2012

GDP: 2.4x

Final Energy Consumption: 1.3x

→ Energy Consumption / real GDP 40%down

Industry 0.8x

Commercial/ Residential 2.4x

Transport 1.8x

Basic Structure of Energy Conservation Policy

Incentives

- Subsidies for introducing equipment
- Tax incentive
- Subsidize interest payment
- Subsidize R&D

Regulation

- Energy Conservation Law
- Mandatory Labelling

Energy Conservation Law

1. Requires companies to **measure and report** their energy consumption to Government
2. Set **energy efficiency standards** for new buildings and houses
(will be mandatory for large-scale buildings to comply from 2017)
3. **Top Runner Program**

Industry sector

Commercial sector

Residential sector

Transportation sector

- ✓ Annual reports to the Government by business operators with 1,500 or more kl/yr energy consumption
- ✓ 15,000 manufacturing plants & offices
- ✓ **Reduction efforts of 1% per year**

- ✓ Periodic reports by freight carriers and consigners
- ✓ **Reduction efforts of 1% per year**

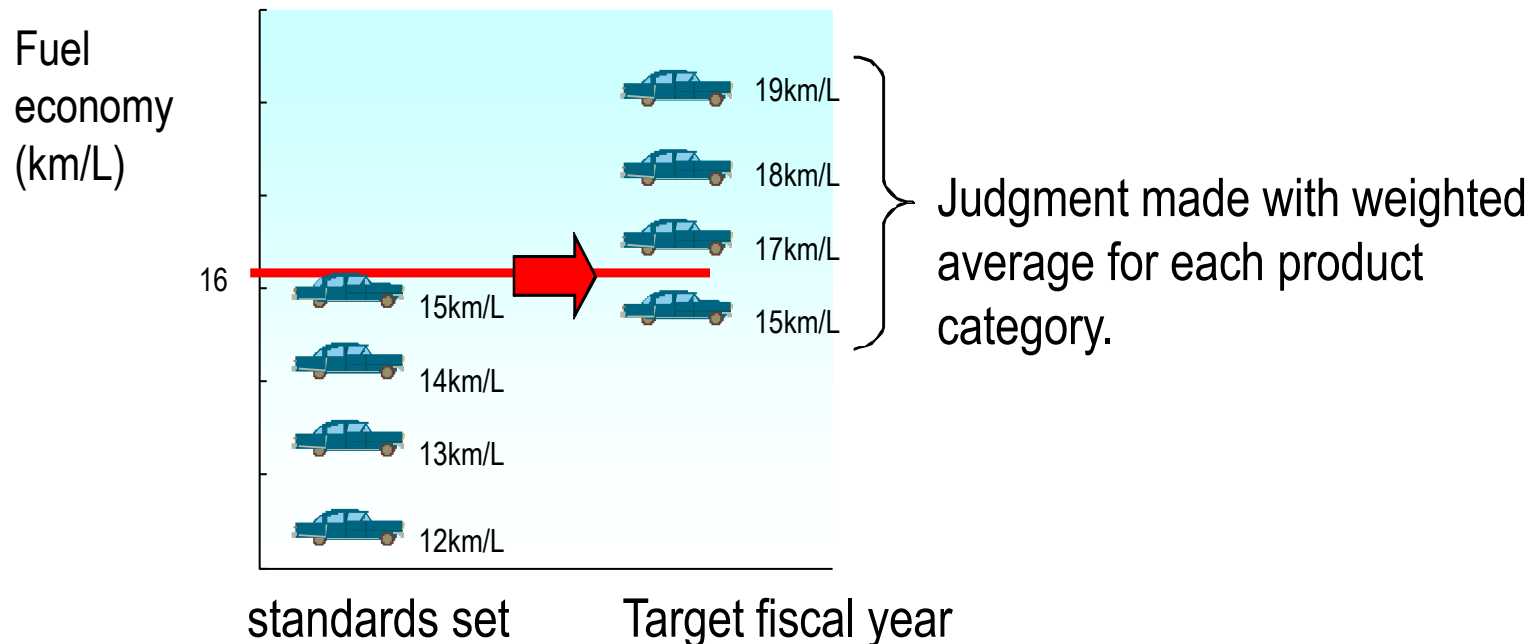
- ✓ Energy efficiency standards for buildings and houses

- ✓ Top runner standards for household appliances , equipment, automobiles etc.

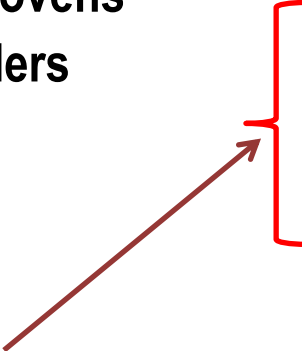
Top Runner Program

- The program requiring manufacturers and importers to fulfill the efficiency targets within 3 to 10 years
- Targets are set, based on currently commercialized products with best energy consumption efficiencies, namely top runner products.
- encourages competition and innovation without price hike

Image of Top Runner Program



31 equipment and materials are subject to the program, which cover approximately 70% of the energy consumption in household.

- | | | |
|------------------------------|----------------------------------|-------------------------------|
| 1. Passenger cars | 12. Heaters | 22. Routing equipment |
| 2. Trucks | 13. Gas cooking appliances | 23. Switching equipment |
| 3. Air conditioners | 14. Gas water heating appliances | 24. Multifunction Devices |
| 4. Television receivers | 15. Oil water heaters | 25. Printers |
| 5. Video tape recorders | 16. Electric toilet seats | 26. Heat Pump Water Heater |
| 6. Lighting apparatuses | 17. Vending machines | 27. AC motors |
| 7. Copying machines | 18. Power transformer | 28. LED lamps |
| 8. Computers | 19. Jar rice cookers | 29. Heat insulating materials |
| 9. Magnetic disk devices | 20. Microwave ovens | 30. Sashes |
| 10. Electrical refrigerators | 21. DVD recorders | 31. Multi-Paned Glazing |
| 11. Electrical freezers | | |
- 

It also covers materials for building.

Achievement of Top Runner Program



Gasoline passenger vehicles

48.8% (FY1995→FY2010)



Air-conditioners

(Types other than direct airflow & wall-mount)

32.3% (FY1997→FY2007)



Electric refrigerators

43.0% (FY2005→FY2010)



TV sets (LCD and PDP TVs)

29.6% (FY2004→FY2008)

Labelling Program

Energy conservation label

- Displayed by manufacturers
- 18 equipment, primarily household equipment with a large amount of general consumer usage

Unified energy conservation label

- displayed by retailers
- air conditioners, television receivers, electric refrigerators, electric toilet seats and fluorescent lighting apparatuses
- Enable consumers to compare energy efficiency by consumers when purchasing
- five star ranking with costs reduced

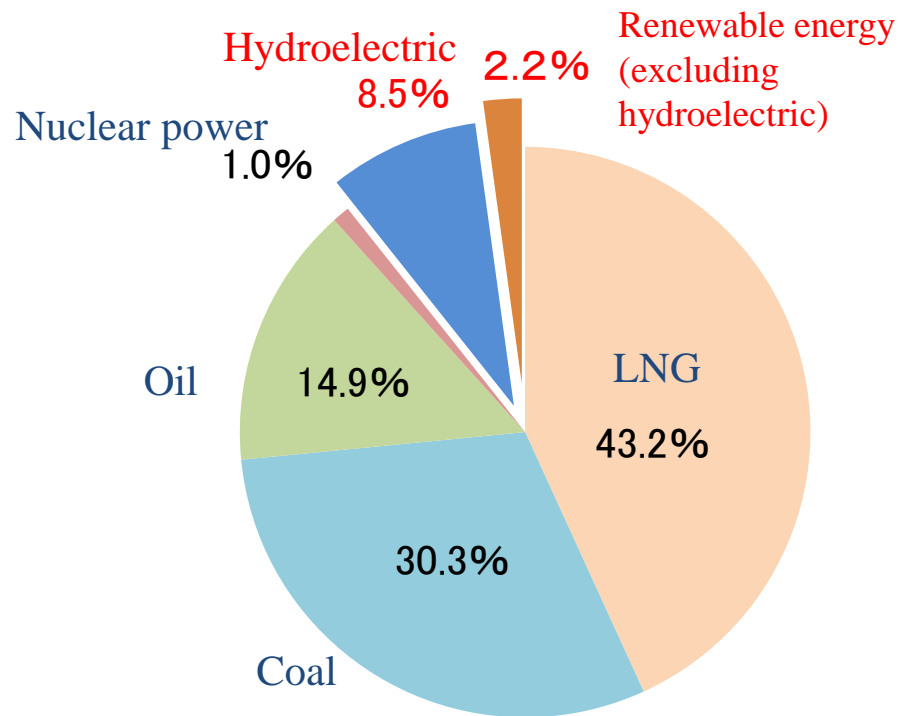


(Unified energy conservation label)



(simplified version label)

Composition of Power Generation in Japan (FY2013)

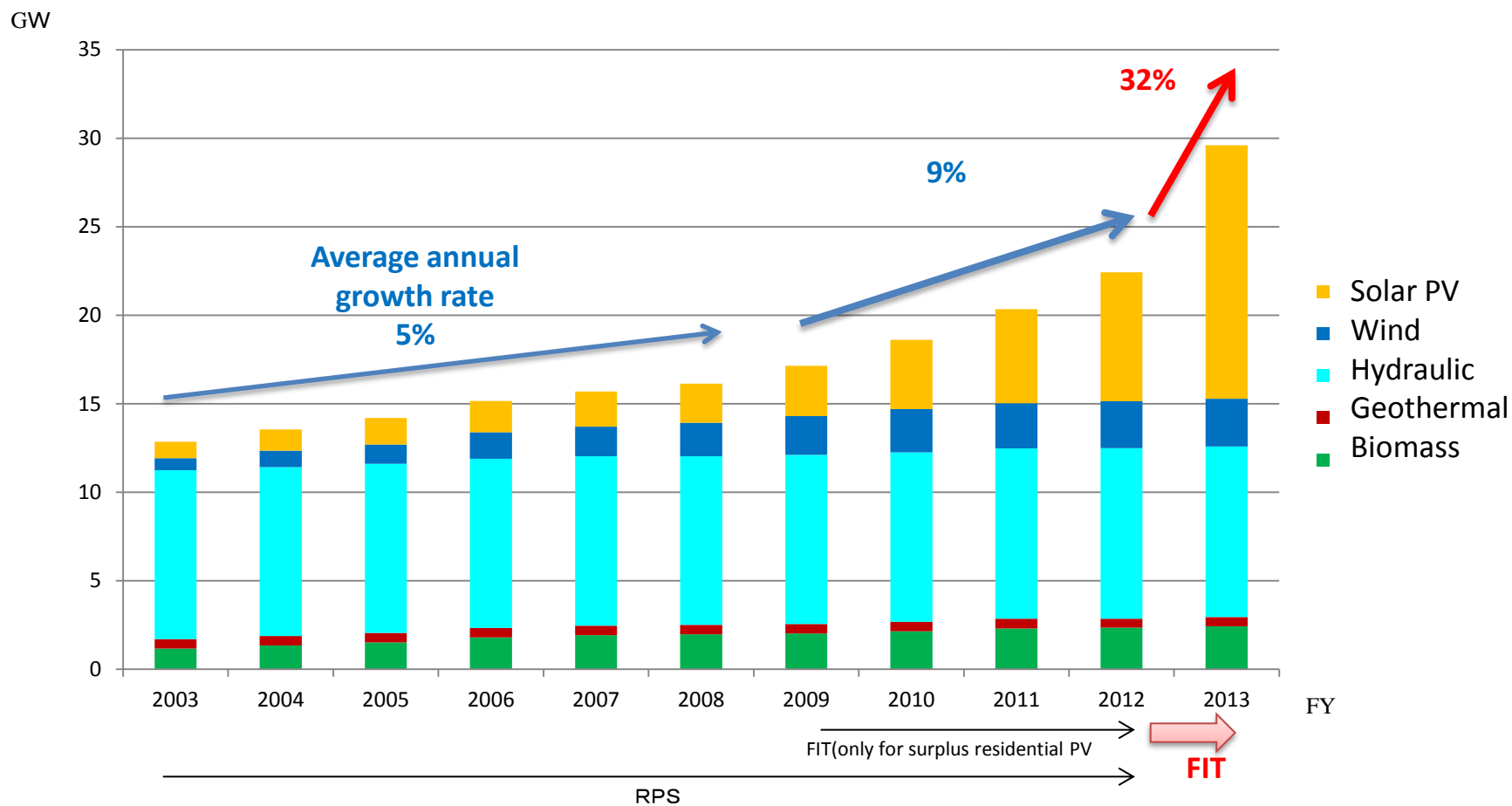


Source: Federation of Electric Power Companies of Japan, 9

2003-2012 RPS (Renewables Portfolio Standard)

2009-2012 Feed-In-Tariff only for residential PV

2012- Feed-In-Tariff



(From various sources including JPEA statistics, NEDO wind power generation statistics, hydrogenation capacity studies, geothermal surveys, and actual RPS/feed-in tariff figures)

Note: FY2013 figures show Mar. 2014 status

From start of FIT (July 2012) to Oct. 2014, 72 GW of RE capacity has received certificate and 14GW has actually started operation, mostly by Solar PV.

Energy Source	Accumulated capacity (approximate #) As of June 2012	Capacity introduced after FIT from Jul.2012 to Oct.2014
Solar PV (residential)	4.7 GW	2.7 GW
Solar PV (non-residential)	0.9 GW	11.1 GW
Wind	2.6 GW	0.20 GW
Geothermal	0.5 GW	0.001 GW
Mid-to small-sized hydraulic (Less than 30MW)	9.6 GW	0.032 GW
Biomass	2.3 GW	0.010 GW
Total	20.6 GW	14GW

Note 1. Biomass capacities are estimates based on the constituting percentage of the energy source of each year.

2. Each energy source figure is rounded up/down separately, while the Total figures are the sum of non-rounded data – hence their discrepancies.

-Under FIT, Electric Utility is obliged to accept RE generators' request of signing power purchasing contract at the price and period which are fixed by government.

- Utility has right to deny connection in limited cases stipulated in Ministry ordinance.

Those engaged in the power generation business using renewable energy sources



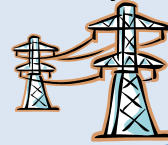
Those who generate power at home



Sale of electricity produced from renewable energy sources



Electric utility



Electricity supply



Purchase of electricity at a fixed price for a government guaranteed period



Payment for the purchase cost

Submission of the collected surcharge

Collection of surcharge together with the electricity charge

Surcharge adjustment organization (organization to collect and distribute the surcharge)

Deciding tariffs and durations, respecting the opinion of the special committee (every fiscal year)

Decision of surcharge unit price per kWh (every fiscal year)

Minister of Economy, Trade and Industry

Opinion on tariffs and duration

Special committee for determination of tariffs and durations

Government

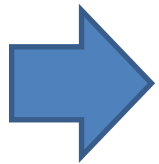
• Approval of facilities (Government confirms whether the facility can generate electricity stably and efficiently. The approval is cancelled when the facility no longer satisfies the requirements.)



Electricity customers



Last year, 5 out of 10 electric utility companies suspended the applications for grid connection by RE power producers due to constraint of connection capacities.

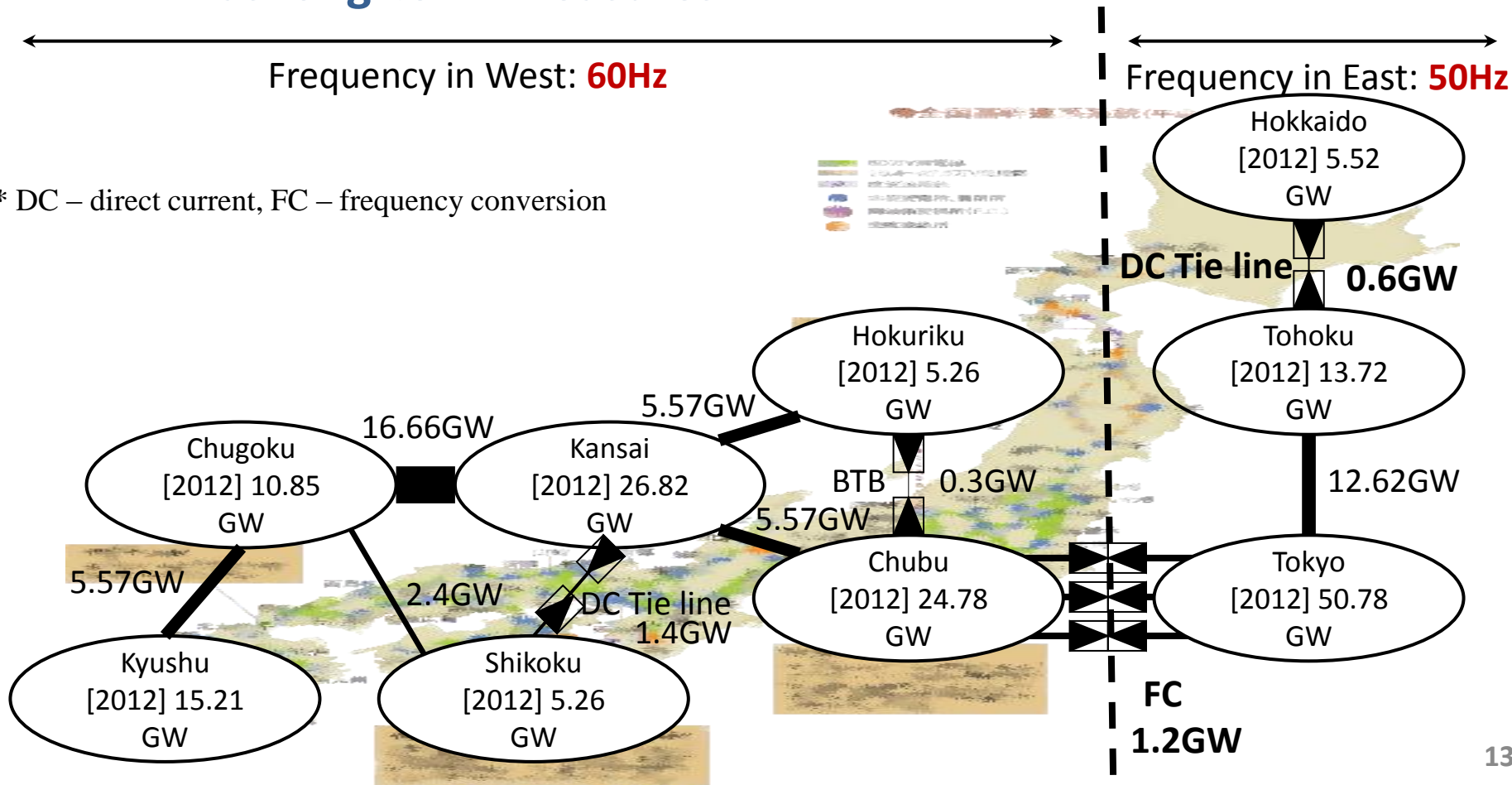


- 1) Introduced more stringent output control scheme
- 2) Will increase energy storage and inter-area connection as long-term measures

Frequency in West: **60Hz**

Frequency in East: **50Hz**

* DC – direct current, FC – frequency conversion



Policy Measures

1) Electricity Market Reforms

(retail liberalization, unbundling T/D sector)

2) Introduction of Smart Meter to all Households by 2024

3) Rule-making e.g. Negawatt Trading Guidelines



New business opportunities for distributed power generators, ancillary services, demand response aggregators, CEMS service etc.



By 2030

- 17% by Energy Saving

- 22% by Renewables

Thank you for your kind attention