

Japan's vision and actions on DER toward Carbon Neutrality

**Advanced Energy Systems and Structure Division
Ministry of Economy, Trade and Industry**

2050 Carbon-Neutral Declaration and 2030 Climate Goal

- In October 2020, Prime Minister Suga declared that by 2050 Japan will aim to reduce greenhouse gas emissions to net-zero, that is, to realise a carbon-neutral, decarbonised society.
- At Leaders Summit on Climate in April 2021, Prime Minister Suga announced that Japan aims to reduce its GHG emissions by 46 percent in FY 2030 from its FY 2013 levels.

Prime Minister's remarks at Leaders Summit on Climate

Japan aims to reduce its greenhouse gas emissions by 46 percent in fiscal year 2030 from its fiscal year 2013 levels, setting an ambitious target which is aligned with the long-term goal of achieving net-zero by 2050.

Furthermore, Japan will continue strenuous efforts in its challenge to meet the lofty goal of cutting its emission by 50 percent.



Points of energy supply-demand outlook in 2030

* Figures are all interim and subject to change in the future.

- Focused on FY2030 new GHG emission reduction target, this outlook shows energy supply and demand on the ambitious assumption that various challenges in both aspects of supply and demand in promoting thorough energy conservation and expansion of non-fossil energy will be overcome.
- In implementing the measures towards this ambitious outlook, strength and implementation timing of the measures need to be fully considered not to be detrimental to energy security. (e.g. If reduction measures for fossil fuel-fired power sources were immediately taken at a stage prior to full introduction of non-fossil fuel power sources, stable supply of electricity could be affected.)

		(2019 ⇒ current target)	2030 energy mix <u>(ambitious outlook)</u>
Energy conservation		(16.55 billion L ⇒ 50.30 GL)	Approx. 62 billion L (Final consumption before energy conservation: approx. 350 GL)
Power generation mix Electricity generated: 1,065 TWh ⇒ Approx. 930-940 TWh	Renewable energy	(18% ⇒ 22-24%)	36-38%
	Hydrogen/Ammonia	(0% ⇒ 0%)	1%
	Nuclear	(6% ⇒ 20-22%)	20-22%
	LNG	(37% ⇒ 27%)	20%
	Coal	(32% ⇒ 26%)	19%
	Oil, etc.	(7% ⇒ 3%)	2%
(+ non-energy related gases/sink increase equivalent to the above)			
GHG reduction rate		(14% ⇒ 26%)	46% Further, 50% target is aimed at.

Points of the policy responses towards 2030 [Demand side's efforts]

- Further pursuit of thorough energy conservation
 - Transport sector will address introduction and expansion of electrified cars and infrastructure; enhancement of electrified car related technologies such as batteries and supply chains; and support for introduction of new technologies such as AI and IoT for optimization of whole freight transport by collaboration of shippers and carriers.
- Study of responses in terms of systems with a view to amendment of the Energy Conservation Act to encourage demand side's energy conversion.
 - Review of Energy Conservation Act aimed at rational use of fossil energies will be studied for its transition to the regulation system to encourage rational use of overall energies and introduction and expansion of non-fossil energies.
 - The framework will be established to appropriately assess improvement in the businesses' introduction rate of non-fossil energies and optimization of demands such as demand response according to supply side's variation.
- Sophistication of the secondary energy structure including effective use of distributed energy resources such as batteries
 - Aggregation businesses utilizing distributed energy resources such as batteries will be promoted; and efficient energy use, enhanced resilience and activation of the local community by local production for local consumption will be promoted by microgrid implementation.

Policies and action toward 2030

present

direction

Overview

- DER increases at high speed with lower prices
- Role of DER (adequacy and balancing supply-demand); limited

- 36-38%- renewable energy at 2030
- Design capacity/balancing market to be DER fairly evaluated
- Promote aggregator with R&D/subsidy

Battery

- Japan has the largest battery market.
- Invalid FIT would promote installing batteries at home.
- High prices compared with other countries
- Batteries need to be classified as generator in.

- Set target prices and volume
- Facilitate EV integrated to grids
- Subsidies/tax incentive for building factories
- Amendment Electricity Business Act (EBA)
- Technology demonstration

Aggregator

- Much potential
- ✓ Balancing market: 176 million kW
- ✓ Capacity market: 415million kW
- Technologies to be established to control demand and forecast volatility of DER
- Aggregator get license in EBA in 2022

- Balancing/Capacity Market rules will be arranged
- Technology demonstration for aggregate DER in FIP
- Demand response when DER surplus to avoid curtailment and load congestion.

Micro grid

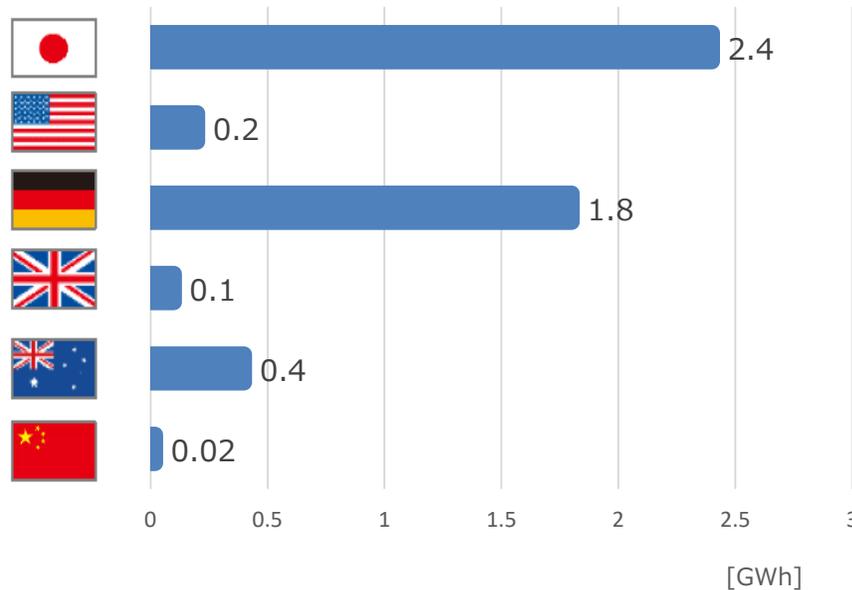
- Production and consumption of local energy contribute resilience, grid congestion, vitalize local economy.
- Lack of economic efficiency

- Technology for microgrid.
- Improvement economic efficiency

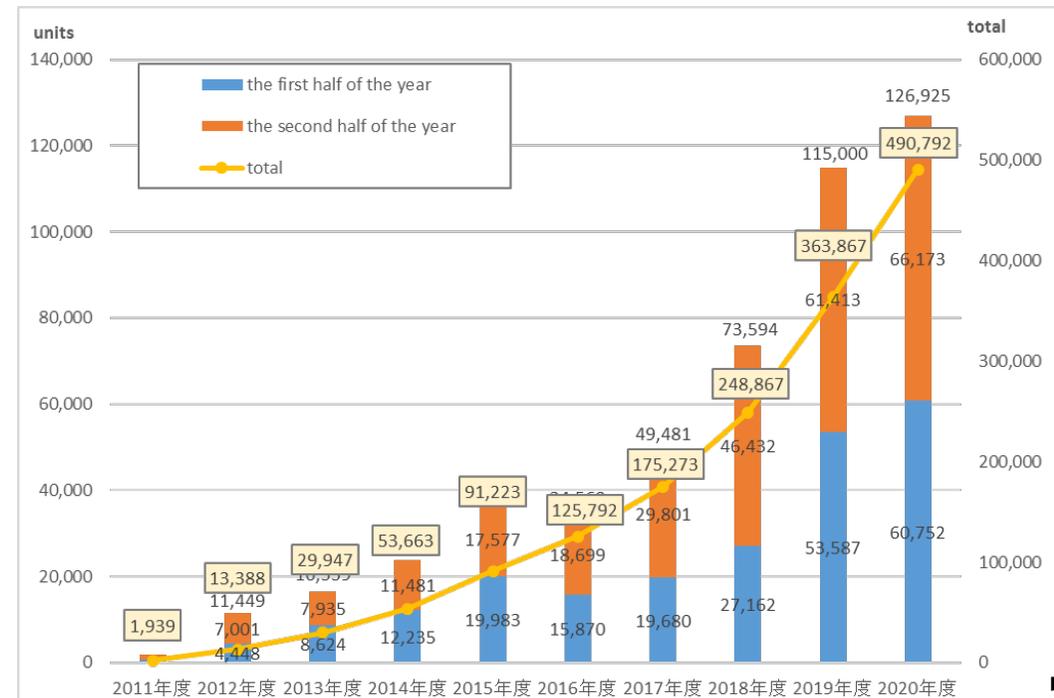
Battery market in major countries and Japan

- The amount of batteries in Japan is the highest among major countries.
- Incentive to use electricity from due to expiration of FIT.
Catastrophic natural disasters occur every year.
- ➔ Number of installed batteries has increased by four times in the past 5 years.
- From next year, FIP would accelerate installing batteries near electricity grids since it's imperative for DER business to balance demand and supply.

Batteries in major countries (2010-2019)



Batteries in Japan



Two projects start in this autumn

- Virtual Power Plant: sell stabilized electricity through the balancing market with a multi-access edge computing system controlling enormous batteries
 - Aggregate DER: sell stable DER on whole sale market
- ➔ Expanded DER will need electrolyzers in near future.



Project 1 Virtual Power Plant



関西電力 TEPCO SB Energy
LAWSON azbil ENERES
中部電力ミライズ 九州電力
豊田通商株式会社 東北電力

Project 2 Aggregate DER



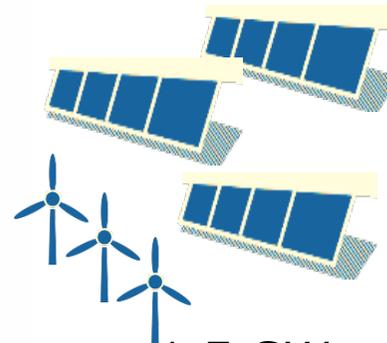
ENERES
TOSHIBA X next
SB Energy



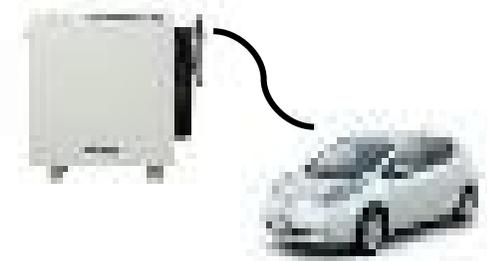
5000 batteries
(home, building, factory)



7000
fuel cell batteries



1.5 GW
DER



Electric Vehicle

Thank you