



Country Presentation, Japan

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61st Task 1 Meeting 24th October [Adelaide, Australia]

Technology Collaboration Programme

by **iea**

Japan – general information

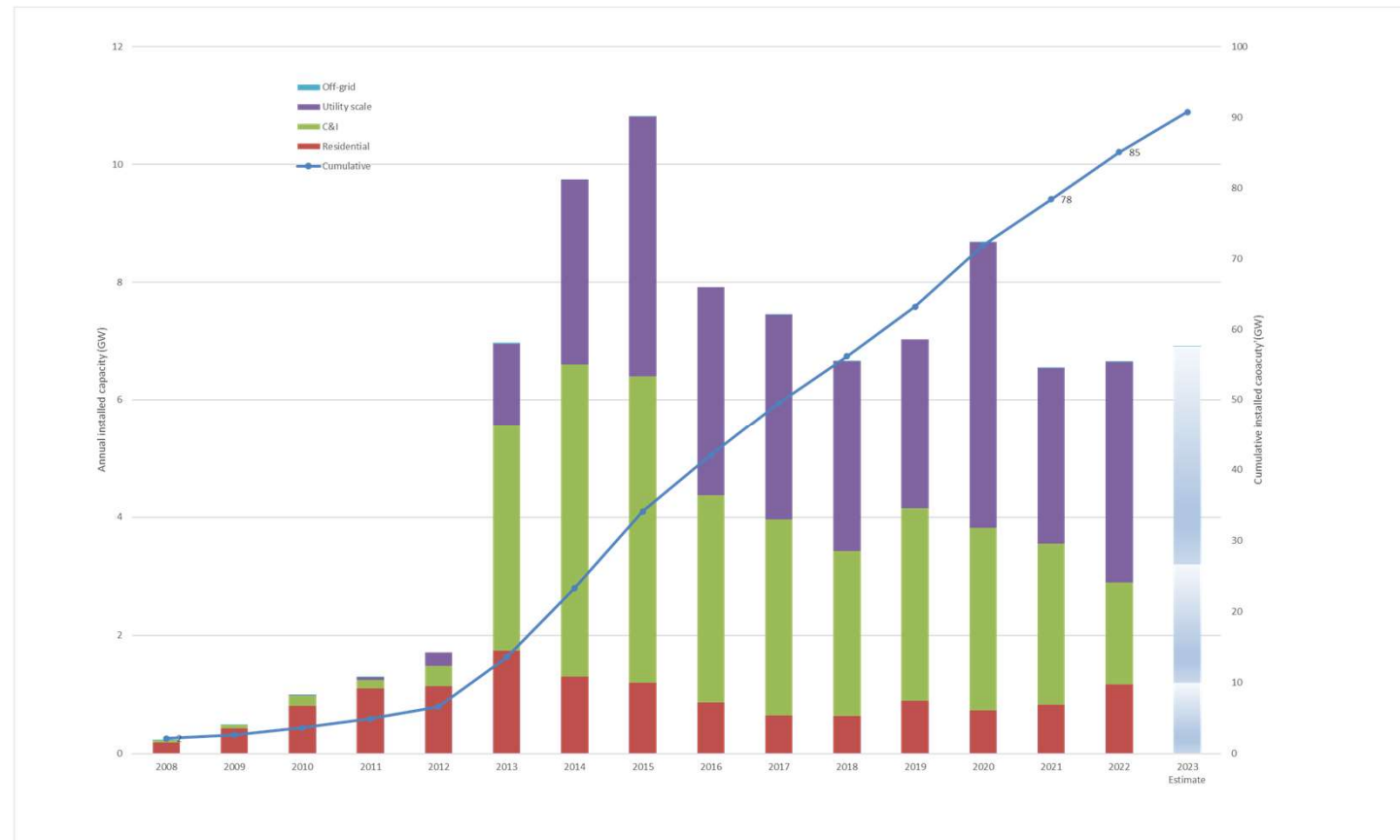


- Population : 121.57 Million
- Total electricity demand: 939 Twh
- Share of renewables : 20.5%
- Share of solar: 9.6%
- Solar development targets (capacity and year)
 - 103.5 to 117.6 GWac (147GWdc) by FY 2030 (6th Energy Master Plan)
 - 117.6GWac by FY 2030 : must-achived goal under Green Transformation (GX) policy

PV Market evolution



- 2022 : 6,652 MW installed, almost flat from 2021 (6,545 MW)
- Cumulative capacity reached 85 GW ,7.75 GW annual market need to achieve 147GW



Overview of market drivers : FIT and FIP



<Key points>

- ✓ Purchase price for ≥10 kW rooftop PV systems will be raised to 12 Yen/kWh (9.02 cents/kWh) from the second half of FY 2023 starting in October 2023
- ✓ The unit rate of surcharge in FY 2023 decreased by 2.05 Yen/kWh (1.54 cents/kWh) from the previous year to 1.40 Yen/kWh (1.05 cents/kWh), which was lower than the level of FY 2015. Although purchase costs have continued to increase, soaring electricity market prices have significantly increased avoidable costs linked to market prices

Purchase prices for PV systems in FY 2023 onward

(Unit: Yen/kWh)

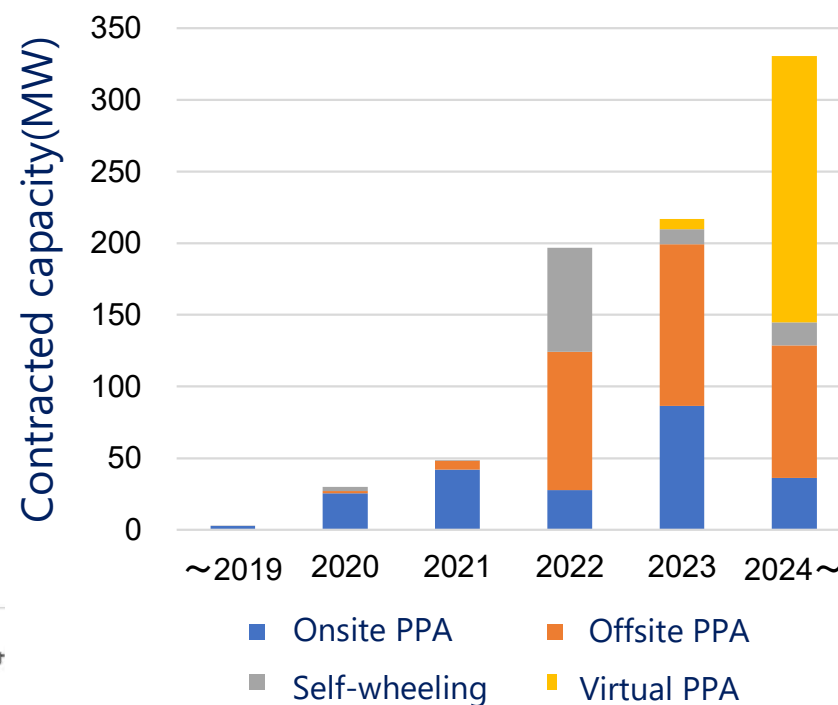
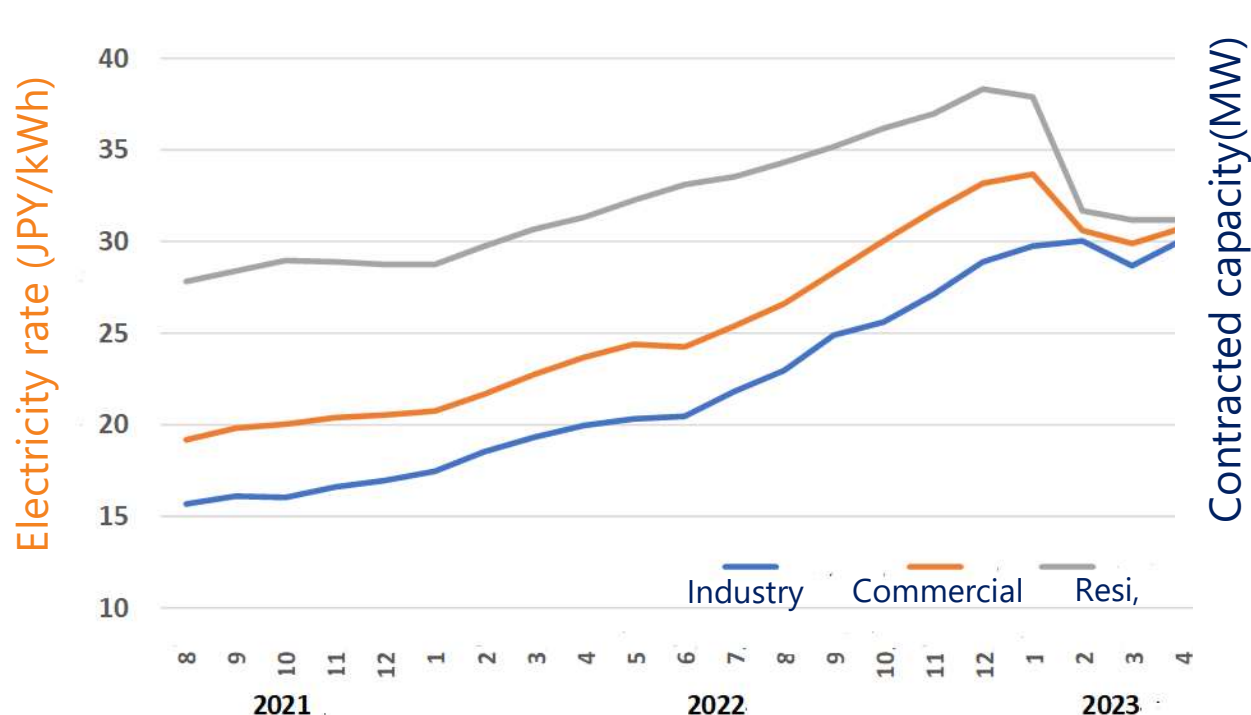
System size	FY 2022 (reference)	Apr. to Sep. 2023 (1H of FY 2023)	Oct. to Mar. 2023 (2H of FY 2023)	FY 2024
< 10 kW	17	16		16
Ground 10 to < 50 kW	11	10		10
Ground 50 - < 250 kW	10	9.5		9.2
Rooftop 10 - < 50 kW	11	10	12	12
Rooftop ≥ 50 kW	10	9.5		

- For 10 to < 50 kW systems, requirements for approving power sources as locally-used power sources for self-consumption have been applied from FY 2020
- The subjects of tenders in FY 2023: 250 - < 500 kW systems for FIT tender and ≥ 500 kW systems for FIP tender

Market drivers : Corporate PPAs



- Electricity hike and growth of Corporate PPAs

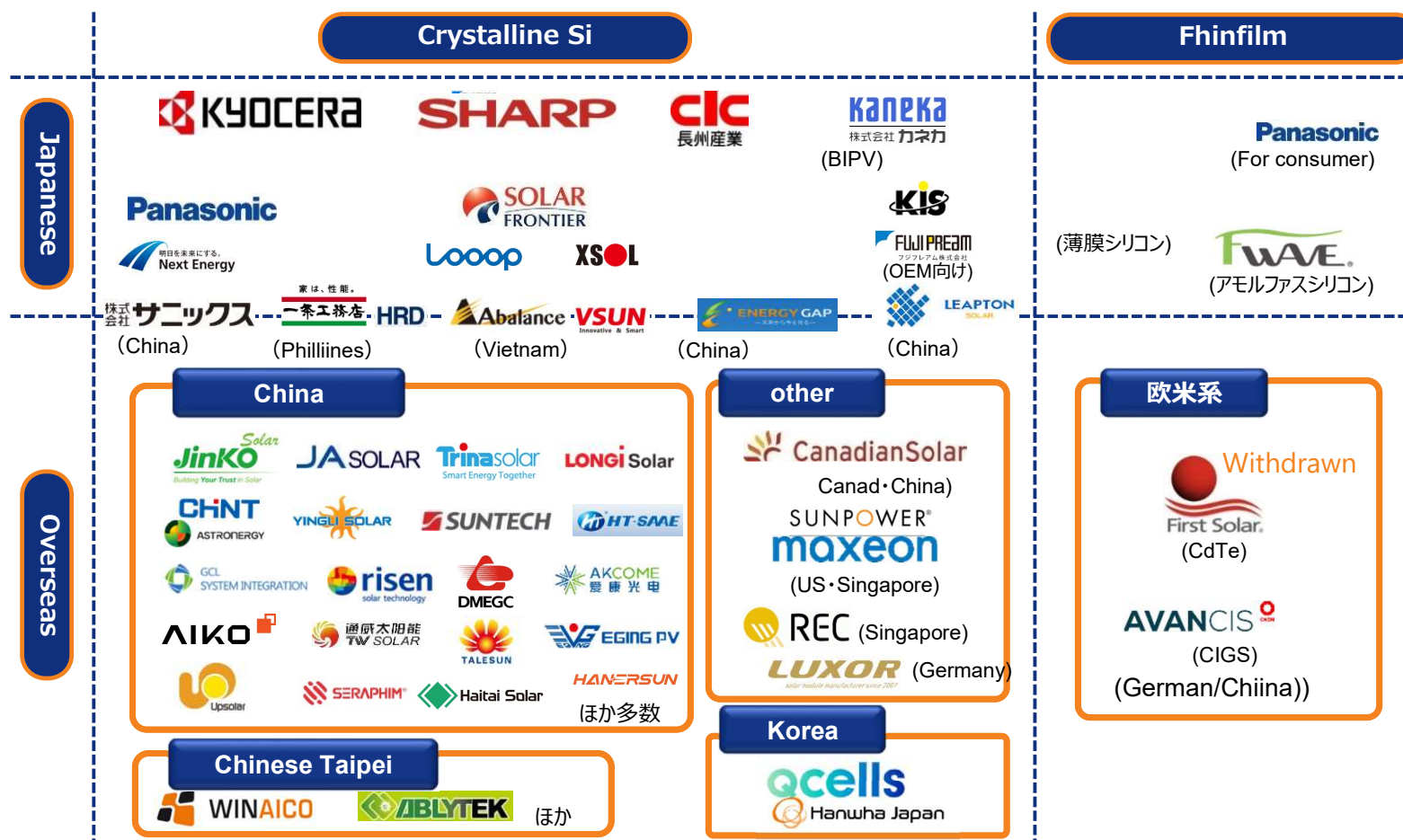


Source:RTS Corporation

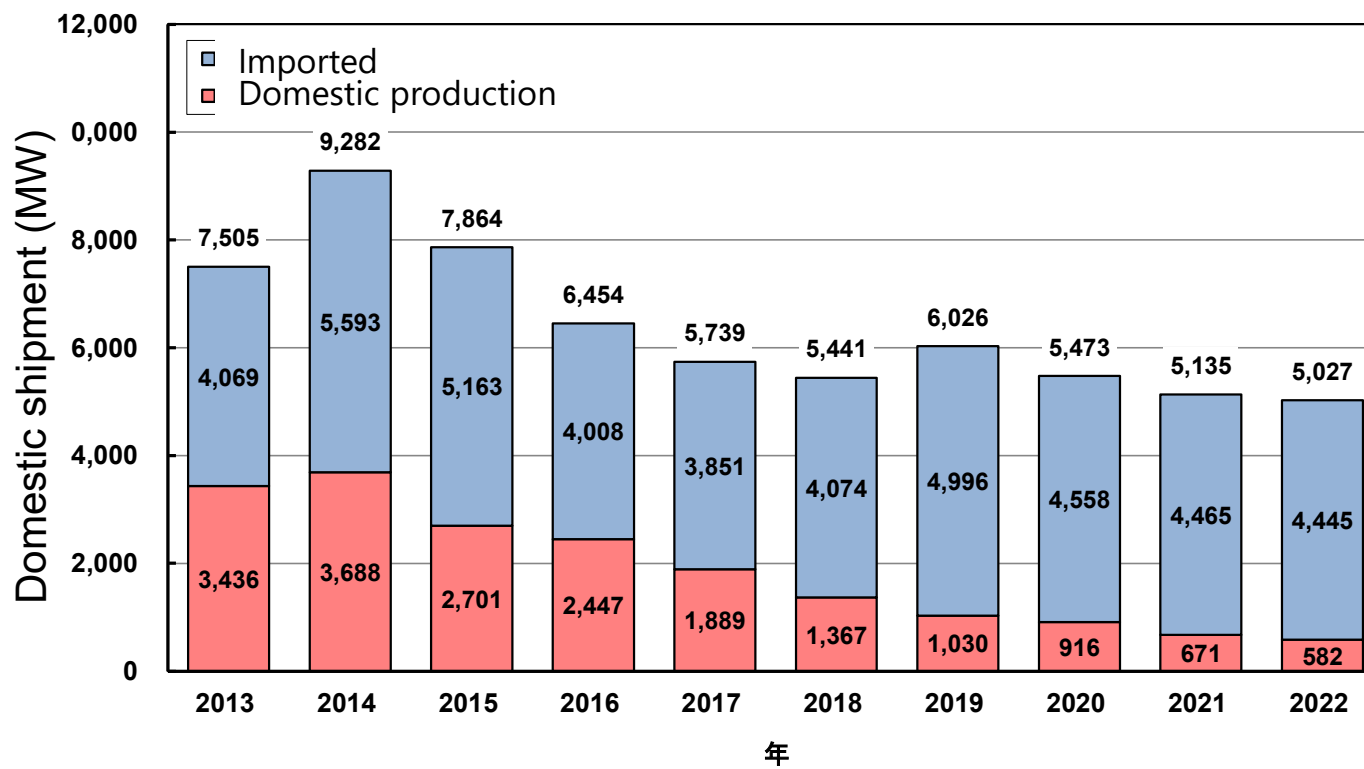
PV Industry (if relevant)



PV module suppliers in Japan



Shipment of PV module

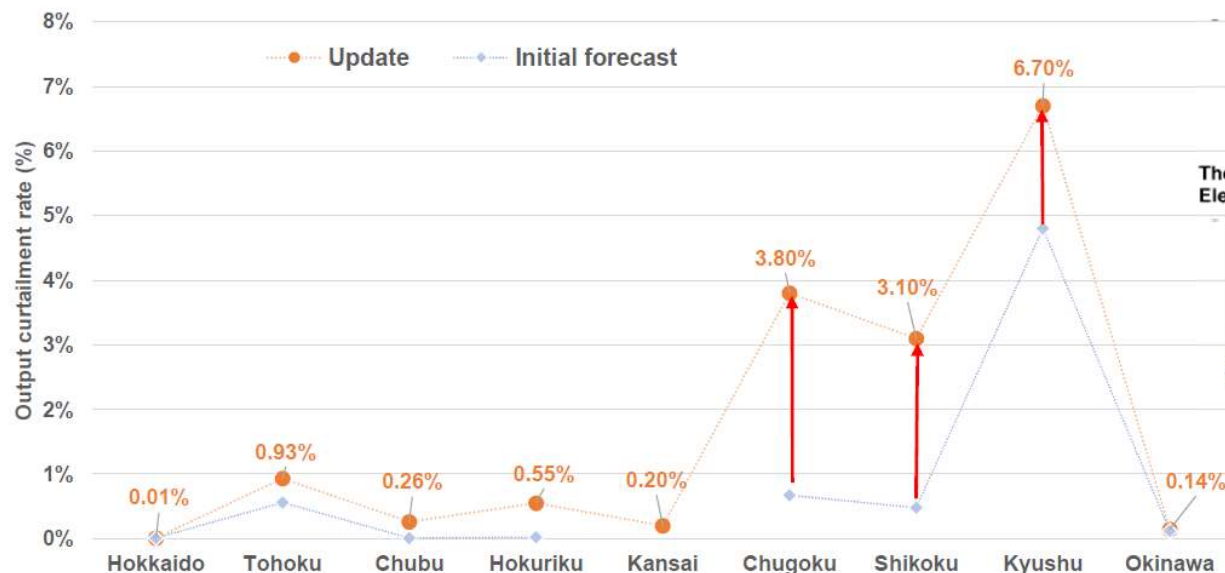


Key subject: Curtailment of PV

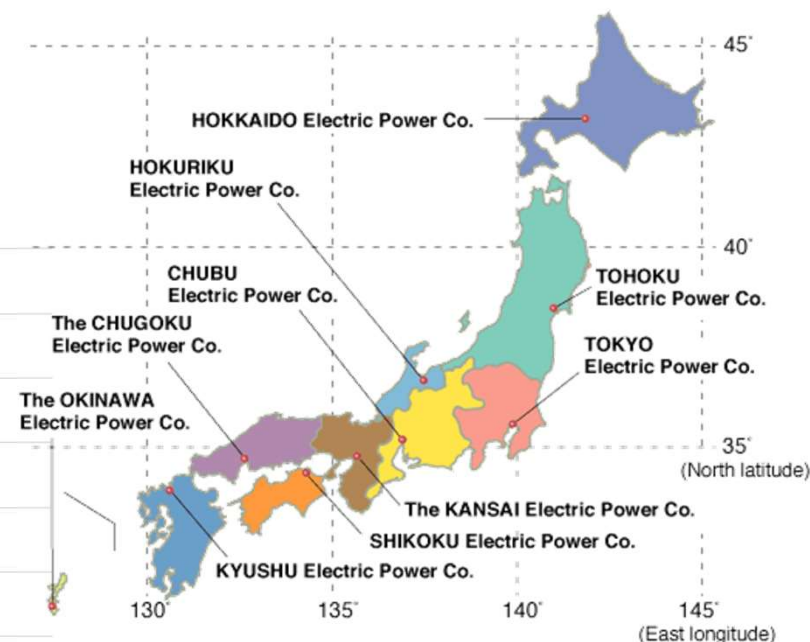


- In Kyushu, curtailment ratio increased

Forecast of renewable energy output curtailment in each area in FY 2023 (updated)



The forecasts are changing more than slightly, such as an increase of the output curtailment rate by 2~3%, in the Chugoku, Shikoku, and Kyushu areas



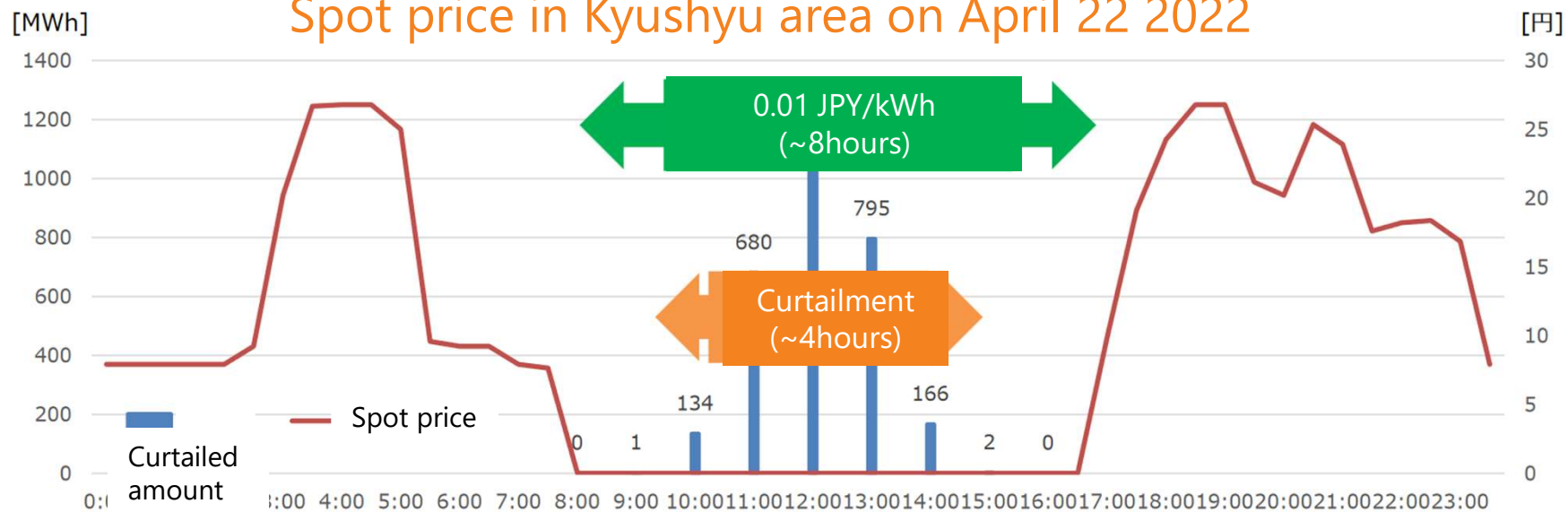
ESS projects are increasing
In Kyusyu and Hokkaido

METI considering mechanisms for better balancing



- The spot price is 0.01 yen/kWh in sunny days with low demand periods and holidays, and the time with 0.01 Yen/kWh is >8 hours, longer than the hourly capacity of general grid storage batteries (about 2 to 6 hours).
- The METI is considering mechanisms that encourages charging at the timing when output control occurs.

Spot price in Kyushu area on April 22 2022



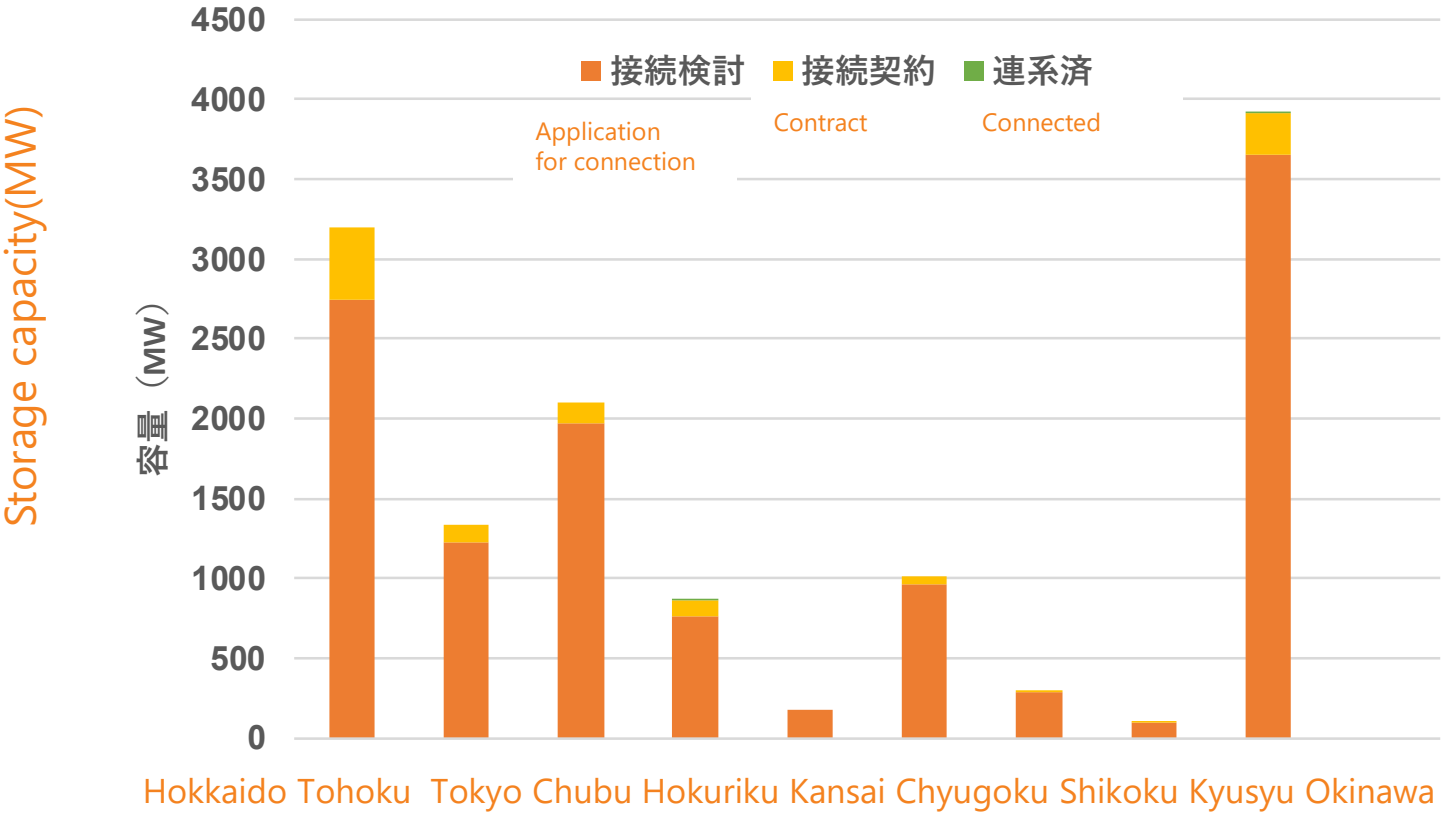
Source: The 46th working group of grid, METI, (May 2023)

Energy storage for Grid



In general, 2 years from contract to installation

Application: ~12GW, 1.12 GW is under contract conclusion (as of May 2023)



*Kyusyu: As of the end of 10

PVPS

Source : \$7th Grid Working group (August 2023), compiled by RTS Corporation

Grid cost : Basic fee for power producers (BFFPP), proposed by METI



- Starting from FY 2024 (Details will be fixed in FY 2023)
- Current wheeling fee is calculated based on the bellow
 - Transmission cost and cost for substation equipment for receiving power
- Proposed BFFPP level
 - Original proposal: 1,800 JPY/kW
 - Current proposal: 900JPY/kW plus kWh fee (different fee by area)
- Exemption
 - Residential PV (< 10 kW)
 - PV systems installed under FIT and FIP programs (After finishing the term (20 years), those will be subject to charge)

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Source: METI. 80th committee for system design, Dec. 2022

VIPV in Japan



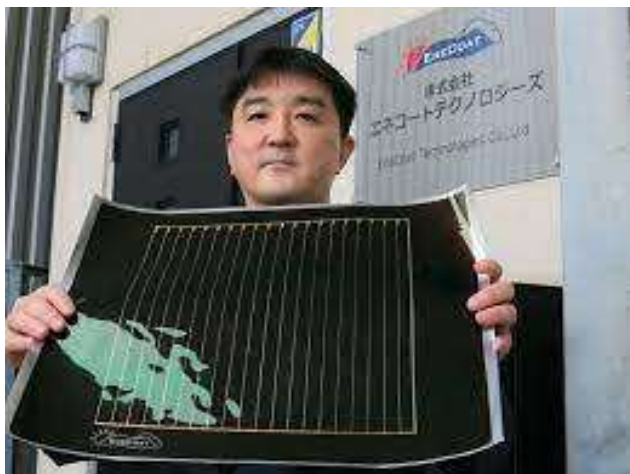
- NEDO conducting demonstration of VIPV vehicles of Toyota and Nissan
- NEDO, Sharp, and Toyota to Begin Public Road Trials of Electrified Vehicles Equipped with High-efficiency Solar Batteries
<https://global.toyota/en/newsroom/corporate/28787347.html>
- <https://www.youtube.com/watch?v=RnTckl47nSU>



Perovskite start up and Toyota to develop VIPV



- **EneCoat Technologies Co., Ltd and Toyota Commence Joint Development of Perovskite Solar Cells for Automotive Applications ~Next-generation solar cells with high power generation efficiency and expected to reduce CO2 emissions during driving (June 2023)**



EneCoat Technologies, a startup of Kyoto University, aims to achieve solar roof for Evs

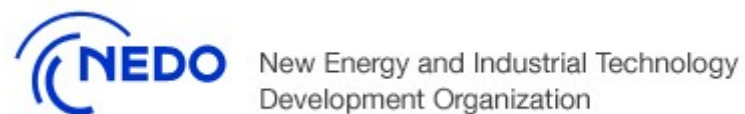
- <https://www.nikkei.com/article/DGXZQOUF2365T0T20C23A6000000/>
- <https://enecoat.com/news/enecoat-technologies-co-ltd-and-toyota-commence-joint-development-of-perovskite-solar-cells-for-automotive-applications-%ef%bd%9enext-generation-solar-cells-with-high-power-generation-efficiency-and/>

Tokyo Metropolitan Gov and Toyota made partnership

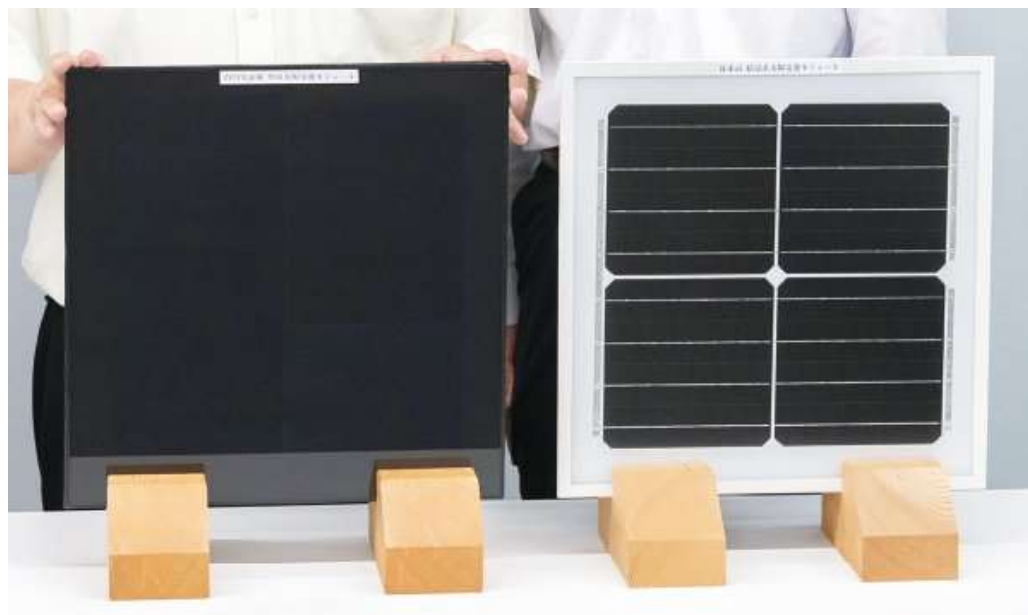
- The Tokyo Metropolitan Government (TMG) is aiming CO2 half in 2030
- TMG and Toyota conduct demonstration of PV-equipped Prius (PHEV) until March 31, 2025
- TMG: operating PHEV: Coordination and information dissemination of the project
- Toyota Motor Corporation: Analyze the power generation performance of PV, estimated travel distance derived from on-vehicle PV power generation, and temperature and amount of charging electricity. Verification of the usefulness of vehicles equipped with solar panels based on analysis results



BIPV in Japan



- NEDO supported development of BIPV modules for façade
- Kaneka produced PV modules
- Taisei Corporation, a major construction company installed in ZEB buildings



AGC developed BIPV glass modules



<https://www.asahiglassplaza.net/products/sunjoule/special2/>

AgriPV in Shizuoka Prefecture



- Organic lemon cultivation in Shizuoka Prefecture
- Good shading and the owner is proud of the quality of lemon
- Jam and other products sold out!

PVPS



Solar PV in the 100% RES Power System in your country



- Prof. C. Breyer studied for Renewable Energy Institute in Japan

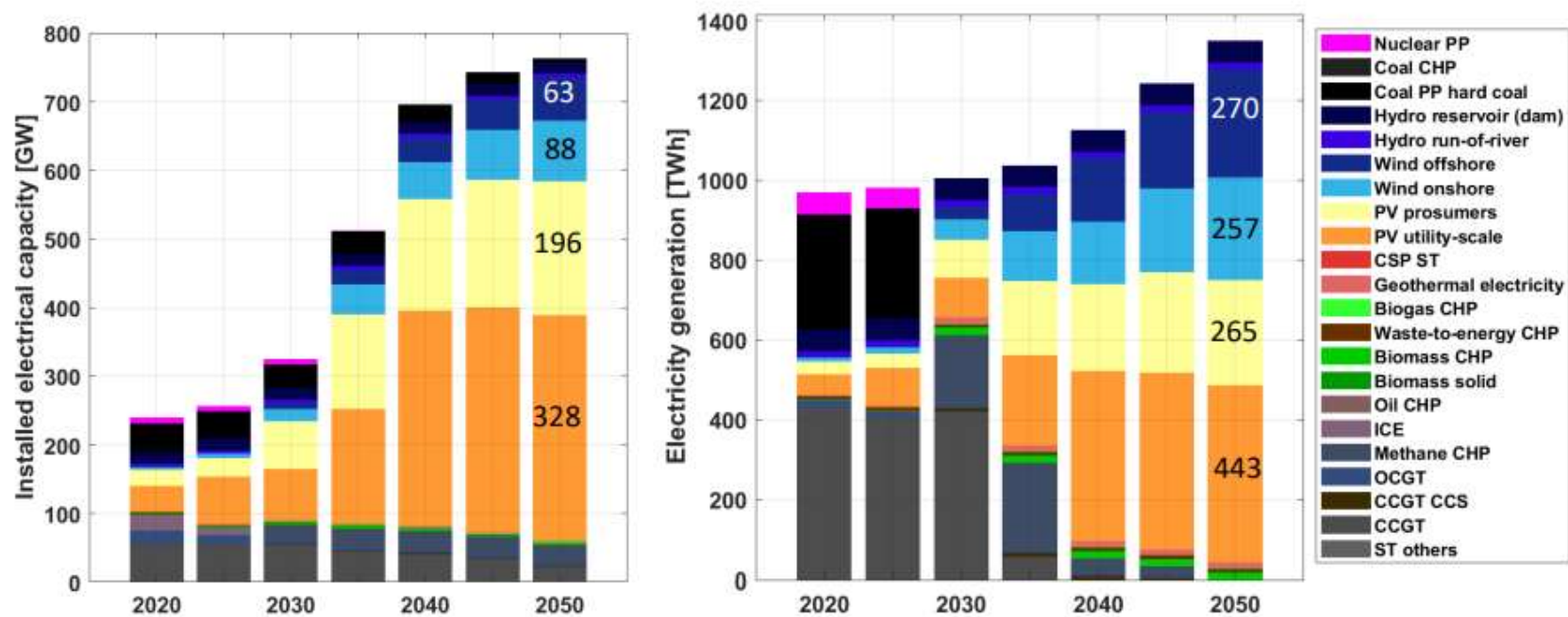


Figure 7: Base Policy Scenario with imports – evolution of power generation capacity (left) and generation (right) from 2020 to 2050.



PVSEC-35

35th International
Photovoltaic Science
and Engineering
Conference

10-15 Nov. 2024

"Fuji" Conference

5th to 8th: EXCO will be
held in Yokohama

12th Nov. PVPS Workshop
Is under planning



www.iea-pvps.org

***Thank you for your kind
attention !***

感谢您的关注

끝까지 정청해 주셔서 감사합니다

ご清聴ありがとうございました

Acknowledgement for the support of PVPS activities



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Development Organization

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