Enabling active consumers for Demand-side Flexibility

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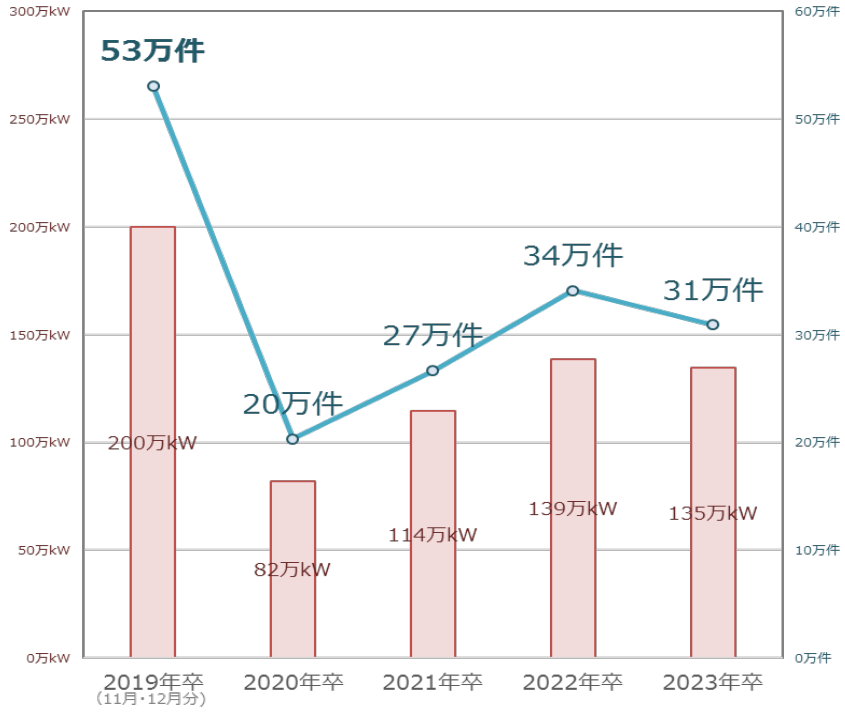
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Paris, 7 February 2020

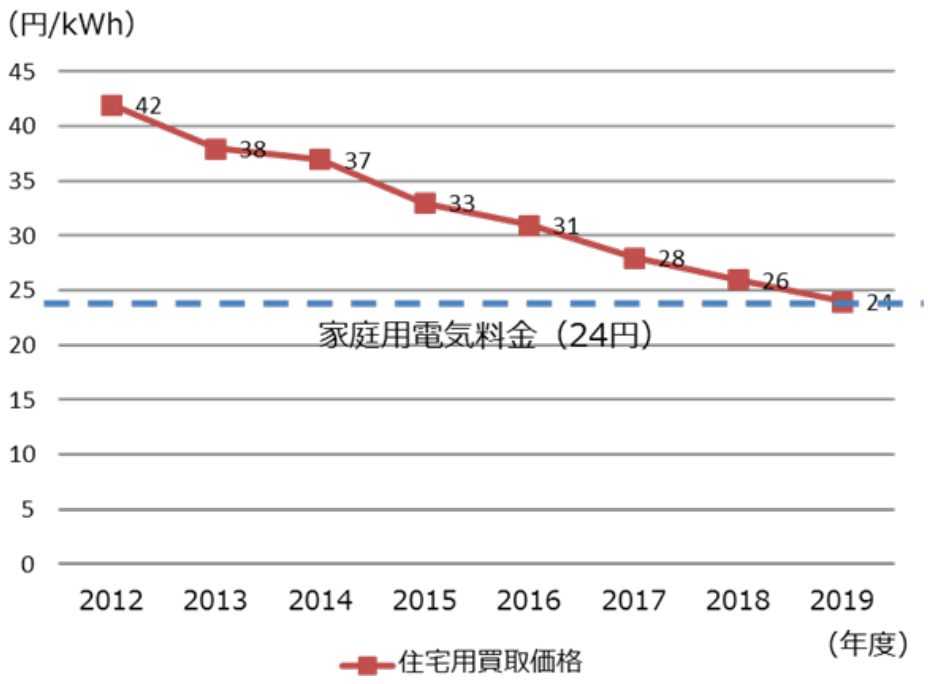
New opportunity; households PV

- **Closure of FIT for household PV has began Nov. 2019.**
- **Residential PV will be purchased at 24 JPY/kWh, equal to household prices for electricity.**
- **Self-consumption is a key driver for use of renewables.**

【Number of residential solar PV, post FIT】



【Price of solar PV (below 10kW)】



（出典）費用負担調整機関への交付金申請情報、設備認定公表データをもとに作成。一部推定値を含む

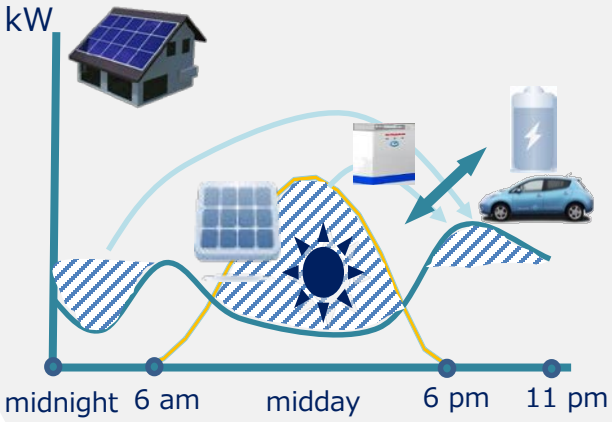
V2X

- **V2X provides electricity to houses, buildings and grids. No major sites that can transfer electricity back to the grid exist in Japan**

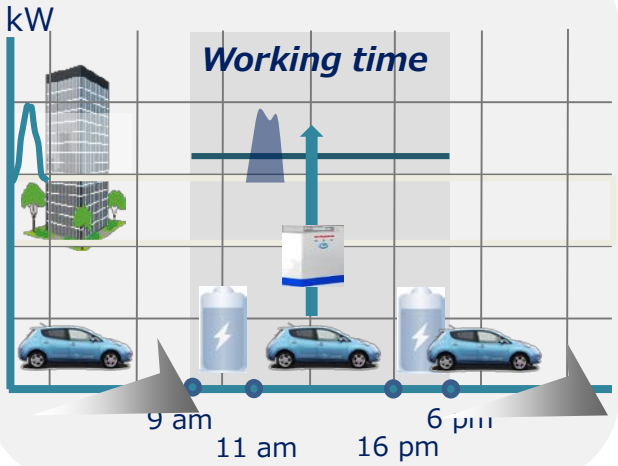
Resilience

back-up power at ***grid power outage***

Solar PV pro-sumers

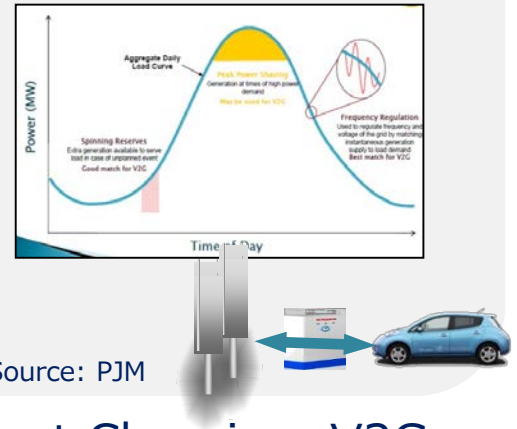


Peak cut



Grid Stabilization

Charge/discharge to/from the grid



Source: PJM

V2H



V2B



Smart Charging, V2G

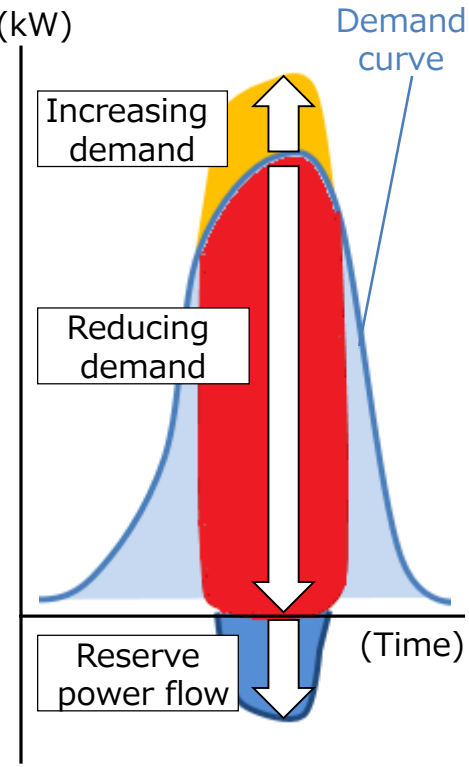


Source: Nissan

Home 3~ 8 kW | **Building** 10 ~ 100 kW | **Grid** 100kW~ aggregation

DER's values

Type of power	Business models		
	Demand Response		Reverse power flow
	Reducing demand	Increasing demand	
Supply power (kWh)	• Incentive based demand response by retail electricity supplier • Avoidance of imbalance for retail electricity supplier	• Demand shifting when wholesale market price is low • Contributing to avoidance of renewable energy curtailment	• Increasing reverse power flow when wholesale market price is high
Reserve power (kW, kWh)	• Reserve power, named as "Reserve I' ", is provided.	–	• Reverse power flow may be used as reserve power by aggregation of "Reserve I' " and electricity in the capacity market.
Balancing power (ΔkW, kWh)	• Energy balancing services are offered in the balancing market.	–	• Reverse power flow may be used as balancing power by energy aggregation in the balancing market.



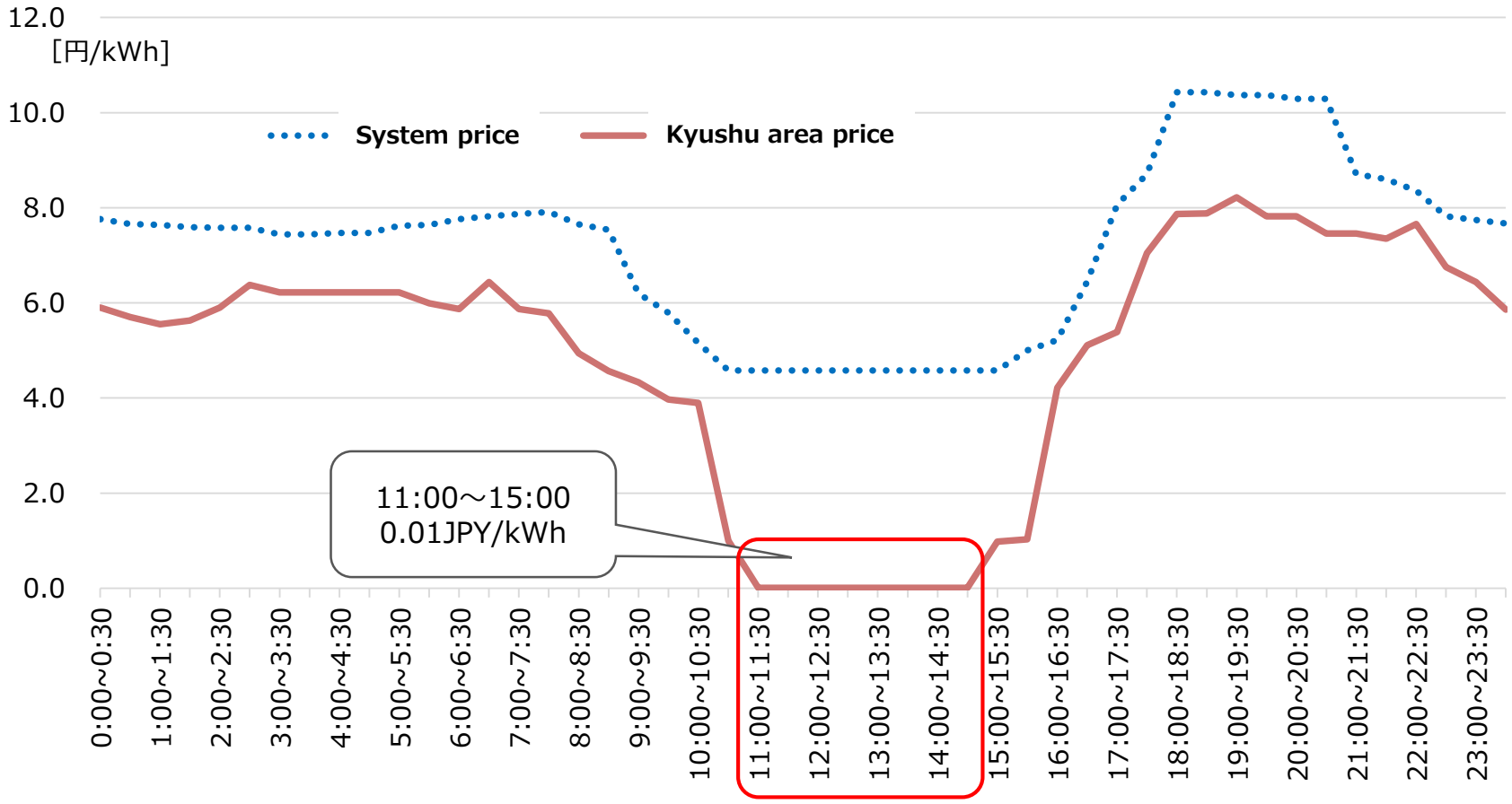
※Deregulation and system adjustment are required to utilize reverse power flow as reserve and balancing power.

REF. Recent transaction prices in Kyushu

METI Ministry of Economy, Trade and Industry

- **Renewables are installing rapidly in Kyushu, traded by lowest prices. Need to use lower electricity.**

System price and area price in Kyushu, as of 24 Feb. 2019



Source: JEPX

Key actions for consumers engagement

METI
Ministry of Economy, Trade and Industry

1. Clear price signal
   - ① Selling cost of kWh from Non-FIT PV
   - ② Dynamic pricing
   - ③ Cooperation profits to shift load by DR
2. Maximum use of assets value
   - ① Need to consider using flexibility aggregated reverse power flow from small-scale DER, like Battery system
3. Simple operation
   - ① Automated operation are acceptable
   - ② Opt-in and Opt-out