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and Electric Vehicles in Japan

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Introduction

Since the entry into force of the Paris Agreement, countries around the world have intensified efforts to achieve carbon neutrality. Despite a series of global events that have severely impacted the economy, energy systems, and society, these efforts have continued to accelerate in many nations. The adoption of electric vehicles (EVs) in the transport sector has advanced rapidly. By the end of 2024, the electric car fleet had reached almost 58 million, approximately 4% of the total passenger car fleet and more than triple the total electric car fleet in 2021(IEA,2025). In Japan, partly due to the introduction of new models, EV sales reached a record high in 2022. However, the share of EVs in total vehicle sales remained at 1.71%. To promote EV adoption more effectively in the future, further analysis and research from an economic perspective are essential.

The diffusion of EVs could contribute to the power system in multiple ways, including demand-supply balancing (peak shifting) within balancing groups comprising multiple power generation and retail companies, alleviation of grid disturbances, and enhanced resilience through power supply during disasters. However, the simultaneous charging of rapid and ultrarapid chargers could negatively affect the grid. Moreover, the high initial investment costs for EVs and vehicle-to-home (V2H) charging/discharging equipment make it crucial to consider EV–power system integration from the perspective of "user benefits", particularly in relation to integration with renewable energy–dominated power systems.

This study organizes the technical aspects of renewable energy–based power systems and the coordination between EVs and renewable self-generation systems, and subsequently examines relevant policy trends in Japan.

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Current Status of Electric Vehicles and the Power System

(1) EV Adoption Trends and Challenges

Following a series of global declarations to achieve carbon neutrality, the widespread adoption of EVs has begun. In 2018, EVs accounted for only 2% of all new car sales worldwide. In 2022 and 2023, this proportion increased to approximately 14% and 18%, respectively (IEA, 2024), indicating both maturation and consistent expansion of the EV market. This growth has been particularly notable in China, the European Union (EU), and the United States, which collectively accounted for approximately 95% of global EV sales, nearing 14 million units in 2023¹.

Despite being the first country to launch EV sales in 2010, Japan has lagged behind in promoting EV adoption. Between 2019 and 2023, the number of registered EVs increased from 38,943 to 96,134 units, representing approximately 3.63% of new registrations (Table 1). In 2023, the breakdown of newly registered vehicles by fuel type was as follows: gasoline vehicles (GVs) 35.77%, hybrid electric vehicles (HEVs) 55.07%, and fuel cell vehicles (FCVs) 0.02%, indicating that GV and HEVs continue to dominate the domestic automobile market. Moreover, the share of HEVs has been increasing annually, surpassing that of GV since 2022. In contrast to the global trend toward EV adoption, HEVs have become the most preferred alternative to GV in Japan.

Previous studies have identified economic factors, psychological influences, and policy incentives as determinants of eco-friendly vehicle selection. Hamamoto (2019) surveyed households in Sōka City, Japan, and found that higher-income households were more likely to choose HEVs, and households with shorter annual driving distances preferred HEVs. Wang & Matsumoto (2022) point out that the influence of income was particularly pronounced during eco-car subsidy periods. Specifically, they find out that wealthier households were more likely to purchase HEVs when these incentives were available².

Given the higher purchase prices of eco-cars compared to conventional GV, incentive measures, especially subsidies, are highly effective in promoting their adoption. For instance, Aasness & Odeck (2015) highlighted that Norway's rapid surge in EV adoption was fueled by government incentives, including toll road exemptions, purchase tax waivers, and bus lane access. By

¹ According to IEA (2024), approximately 60% of all new EVs sold worldwide in 2023 were sold in the Chinese market, while the EU and the United States accounted for about 25% and 10%, respectively.

² The eco-car subsidies examined in Wang & Matsumoto (2022) were implemented in two periods—April 2009 to September 2010 and December 2011 to September 2012—and represented the first eco-car subsidy policy introduced in Japan. These two subsidy programs led to a substantial increase in the number of newly registered HEVs.

significantly lowering the total cost of ownership, these measures proved that financial incentives are a decisive factor in the early-stage diffusion of eco-friendly vehicles, such as EVs and HEVs.

In Japan, HEVs dominate over EVs, largely due to financial pragmatism. As shown in Table 2, HEVs remain significantly more affordable than PHEVs and BEVs, with a price advantage ranging from 600,000 to 2,500,000 yen. Conversely, the price gap between an HEV and a traditional GV is relatively narrow, amounting to only 250,000–550,000 yen for the same model. When accounting for tax exemptions (such as automobile weight and environmental performance taxes) and the superior fuel efficiency of HEVs, the total cost of ownership becomes highly competitive. These factors make HEVs the most economically attractive choice for Japanese consumers to date.

In the automotive sector, a key policy target for achieving carbon neutrality by 2050 is to ensure 100% electrification of new passenger car sales by 2035 (METI, 2023). Under this framework, "Electrified Vehicles" encompasses EVs, FCVs, PHEVs, and HEVs. Given that HEVs already accounted for over 50% of registrations in 2023 (Table 1), meeting the 2035 electrification target appears to be attainable. However, if the ultimate objective is the total elimination of CO₂ emissions, heavy reliance on HEVs remains problematic because they continue to emit CO₂ during operation.

To accelerate the adoption of non-HEV "Clean Energy Vehicles" (CEVs), the Japanese government introduced the CEV Subsidy Program. Under this initiative, consumers can receive up to 850,000 yen for EVs and 550,000 yen for PHEVs (METI, 2025), significantly offsetting the higher purchase prices of these models³ (Table 2). Compared to the previous, uniform eco-car subsidy of 100,000 yen⁴ (and 50,000 yen for Midget passenger cars), the current CEV program represents a much more substantial financial commitment to driving the transition toward full electrification. Until FY2023, the subsidy amounts were determined strictly based on vehicle performance. However, starting in FY2024, the assessment criteria were broadened to incorporate

³ The CEV subsidy can be combined with subsidy programs independently implemented by local governments. For example, Fuchu City in Tokyo offers a "Next-Generation Vehicle Purchase Subsidy" program, under which a subsidy of 100,000 yen is provided for the purchase of an EV (Next Generation Vehicle Promotion Center, 2024a). As a result, households residing in Fuchu City can receive a total subsidy of up to 950,000 yen when purchasing an EV.

⁴ In the case of purchasing a new vehicle accompanied by the scrapping of an older vehicle, the subsidy amount is 250,000 yen (125,000 yen for Midget passenger cars). However, under the eco-car subsidy program, the environmental requirements for newly purchased passenger cars are limited to exhaust gas performance and fuel efficiency standards only (Ministry of Land, Infrastructure, Transport and Tourism, 2010).

the essential elements of Green Transformation (GX) within the automotive sector. A notable addition to the evaluation is the development of charging infrastructure, reflecting a policy shift that recognizes user convenience and infrastructure readiness as critical drivers of EV adoption.

The expansion of the charging infrastructure is inextricably linked to EV adoption. To facilitate widespread use, a robust network that ensures user convenience must be established. In response, the Japanese government has set an ambitious target of installing 300,000 charging points (including fast chargers) by 2030. Generally, the development of this infrastructure follows three strategic patterns:

1. **Base Charging:** Primarily located at detached houses or apartment⁵ complexes. These systems utilize normal (Level 2) charging for overnight or long-duration energy replenishment while the vehicle is parked at home.
2. **En-route Charging:** Strategic installations at highway service/parking areas, roadside stations (Michi-no-Eki), and convenience stores. These sites focus on fast charging to provide quick energy bursts and minimize downtime during long-distance travel.
3. **Destination Charging:** Facilities such as commercial complexes, hotels, and employee parking lots. Depending on the typical duration of the visit, these sites utilize a mix of normal or fast charging, allowing users to charge while shopping, staying overnight, or working.

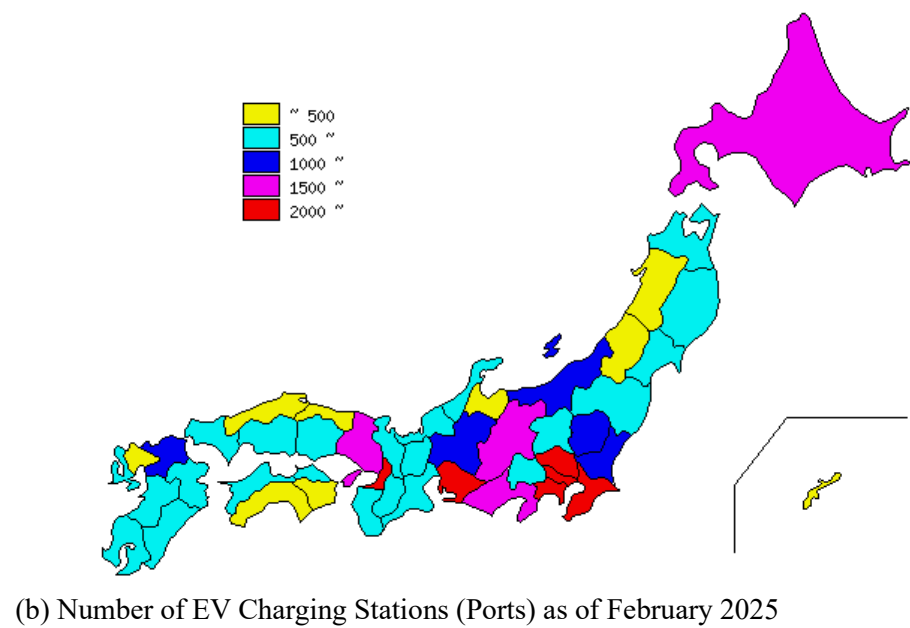
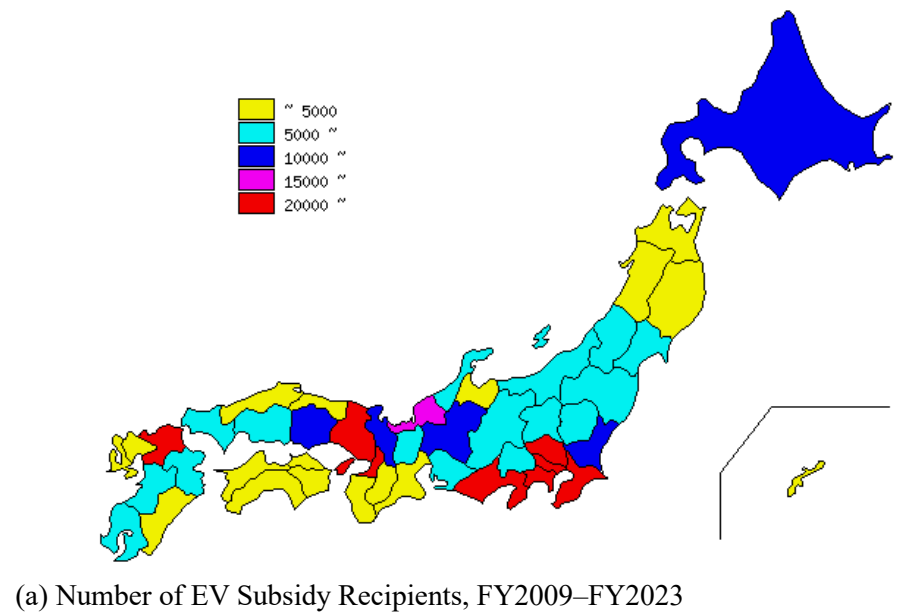
As of March 2024, Japan's national charging network comprises 40,323 units. This total includes 8,105 base charging units and 32,218 combined en-route and destination units (10,128 fast chargers and 22,090 regular chargers) (METI, 2024). These figures highlight two critical bottlenecks: the significant underdevelopment of charging infrastructure in apartment complexes and the fact that high-speed, fast-charging options have not yet reached mainstream saturation.

To address these bottlenecks, the national charging infrastructure subsidy program focuses on cost-effective deployment via tiered incentives. For fast charging, priority is given to high-output installations along the major transit routes. Notably, the installation of 150 kW+ fast chargers at highway service and parking areas receives 100% coverage for both equipment and installation costs, with subsidies capped at 38 million yen for two units each. Simultaneously, to resolve the lag in residential infrastructure, the government provides up to 1.7 million yen for normal charger installations in apartment complexes (Next Generation Vehicle Promotion Center, 2024b).

⁵ This refers to condominiums, monthly rental parking lots, offices and factories, as well as shared-use charging facilities.

These findings suggest that the Japanese government is not only providing substantial purchase subsidies but is also actively fostering an environment in which EVs are practical for daily use. Despite these initiatives, EV adoption remains stagnant, and infrastructure development continues to lag. A critical emerging issue is the significant regional disparity; while the national averages stand at 10,889.66 units for subsidy-supported registrations and 1,025.47 points for charging stations, Figure 1 reveals that these figures are skewed. Most regions fall considerably below the national average, highlighting a concentrated rather than uniform distribution of EV resources.

Figure 1. Status of EV Subsidy Allocation and EV Charging Station Deployment by Prefecture



Source (a) GoGoEV, EV Charging Station Information Website. Compiled by the author based on the "Number of EV Charging Stations by Prefecture".

(b) Next Generation Vehicle Promotion Center. Compiled by the author based on "Status of Subsidy Allocation for Electric Vehicles by Prefecture".

Higher EV ownership rates are concentrated in the Kanto-Koshin and Kinki regions, where superior charging infrastructure and shorter travel distances align with lower-than-average household vehicle ownership⁶. In contrast, promoting EV adoption in regions with higher vehicle dependency requires strategies tailored to specific local characteristics. The stark regional disparities in infrastructure are particularly evident in Hokkaidō. While Sapporo City has 460 charging ports, other municipalities average only 10.56, and 43 municipalities lack charging stations. Consequently, policies targeting areas where public charging is inaccessible are urgently needed. In these regions, providing incentives for household power generation and storage systems can serve as an effective alternative to traditional infrastructure.

With the adoption of residential renewable energy generation and storage systems, the role of households in the electricity sector has significantly evolved. Rather than acting as simple consumers, households now play a multifaceted role in managing their own demand through self-generation and energy storage. From a broader grid perspective, these domestic systems function as critical mechanisms to enhance stability and improve economic efficiency. This is particularly valuable during periods of supply demand tightness or when electricity prices increase. The following section examines the concept of demand response and the theoretical foundations that support these mechanisms.

(2) Demand Response (DR) in the Context of Electric Vehicles and the Power System

In recent years, "Demand Response (DR)" has gained significant attention as a mechanism to facilitate the active participation of consumers in power system operations. This concept refers to actions taken by owners of demand-side resources (DSRs) or third-party aggregators to modify electricity consumption patterns⁷. Because electricity cannot be easily stored in bulk, maintaining a constant balance between supply and demand is essential for ensuring grid stability. Historically, large-scale power plants have been the primary actors in balancing processes. However, the future energy landscape is expected to rely more heavily on decentralized energy systems and demand responses to maintain this equilibrium.

DR can be categorized into two types based on the specific demand control pattern. The first type

⁶ In 2021, the national average number of vehicles owned per household was 1.01, with the Kanto-Koshin region (0.77), Kinki region (0.79), and Hokkaido (0.99) falling below the national average, while all other regions exceeded it (Ministry of the Environment, 2021).

⁷ Ministry of Economy, Trade and Industry, *Glossary of Terms Related to VPP and DR* (https://www.enecho.meti.go.jp/category/saving_and_new/advanced_systems/vpp_dr/term.html).

is "downward DR," which involves reducing or suppressing electricity demand. This is typically achieved during peak-load periods by curtailing the outputs of demand-side equipment. The second type is "upward DR," which focuses on increasing consumption. This occurs when demand-side equipment is operated to absorb surplus renewable energy or when storage batteries are charged to avoid energy waste. By utilizing these two approaches, the grid can more effectively manage the fluctuations inherent to renewable energy production.

Technologies such as V2H and Vehicle-to-Building (V2B) allow electricity to be supplied from EVs to homes or commercial facilities. These systems are already being utilized to lower electricity costs and enhance the efficiency of residential solar power systems. Furthermore, they provide a reliable power supply during grid outages and serve as essential mobile energy sources in natural disasters.

According to a simulation by Ota (2013) regarding the impact of EV charging on existing distribution systems, the timing of residential charging significantly affects power grids. This study assumed a scenario in which commuting EVs were charged at home immediately upon the driver's return. In the Kanto region, approximately 64% of passenger vehicles are used for morning and evening commutes. If these commuting vehicles, which travel an average of 26.6 km over 67.8 minutes daily, begin charging as soon as they return home, the resulting surge would increase the evening peak power demand. This peak increase is estimated to be 35 MW in total, or approximately 280 W per vehicle on average. However, the average charging time per vehicle is only 52.5 minutes, while the vehicles remain in a standby state for roughly 22 hours per day.

Ota also pointed out that this extensive standby time presents significant opportunities. By implementing smart charging systems that coordinate the charging timing and power output, the grid can better manage the distribution loads. This coordination can incorporate both commuting vehicles and the remaining 36% of non-commuting household vehicles. Such an approach could unlock the substantial potential of V2H and V2G applications to support the overall energy system.

The integration of V2H and V2G technologies creates a high level of compatibility between electric vehicles and solar power. These systems allow surplus energy generated during the day to be stored in EV batteries and supplied back when solar generation is unavailable, such as during the night.

While the rapid decline in renewable energy costs is accelerating the transition toward carbon neutrality, Japan faces unique geographical challenges as an island nation with limited land

availability. In this context, rooftop solar panels are a strategic choice because they utilize existing structures rather than productive land. This approach also ensures that electricity is supplied to consumers with minimal loss within the local distribution system.

However, the full integration of EVs into the power system requires the vehicles to be in a constant standby mode and necessitates advanced bidirectional power control. Furthermore, economic concerns regarding energy loss during the conversion process exist. The increased frequency of the charge and discharge cycles may also lead to the accelerated degradation of storage batteries, which could impact the overall cost-effectiveness of these systems.

(3) Status of Solar Photovoltaic (PV) System Deployment

As part of efforts to construct a renewable energy-centered power system, the dissemination of PV systems has been positioned as a key priority. In the Strategic Energy Plan established by the Japanese government in 2021, the 2030 power source mix target for renewable energy was set between 36% and 38%. Within this target, PV systems are expected to account for 14%–16% of the total energy supply (Ministry of the Environment, 2025). Progress toward these goals has been consistent. By FY2022, the PV introduction rate reached 9.2%, representing a significant increase from the 0.4% recorded in FY2011 (Agency for Natural Resources and Energy, 2024). This rapid expansion demonstrates the success of the initial policy measures in scaling solar capacity across the country.

Although PV systems were first introduced to Japanese residences in 1993, they only began to proliferate on a large scale approximately two decades later. As of 2023, the percentage of households using PV systems reached 6.3% overall and 11.7% specifically for detached houses (Ministry of the Environment, 2024). Several factors have contributed to this widespread adoption. The steady decline in PV module costs, introduction of government subsidy programs, and implementation of the Feed-in Tariff (FIT) scheme have made solar technology more accessible to the average household. The reduction in costs was particularly significant. The price of PV modules fell from approximately 3.7 million yen per kW in 1993 to roughly 660,000 yen per kW in 2006. By 2016, costs had decreased further to approximately 360,000 yen per kW (SMART MIRAI, 2021). This long-term downward trend has significantly lowered the financial barriers to residential energy production.

The Japanese government provided subsidies for residential PV systems from 2009 to 2013. A key characteristic of this program was the gradual reduction in the subsidy amount each year.

During the first two years, the subsidy was set at 70,000 yen/kW. This amount decreased to 48,000 yen per kW in 2011 and further declined to a range of 30,000–35,000 yen/kW in 2012. By 2013, the final year of the policy, the subsidy had fallen to between 15,000 and 20,000 yen/kW (Tainavi, 2024).

This decline significantly impacted the financial support available to households. For a standard 4 kW PV system, the initial subsidy provided 280,000 yen in support, but this figure dropped to a maximum of only 80,000 yen by 2013. Furthermore, Wang & Matsumoto (2021) suggests that the program specifically targets consumers of lower priced systems. Because the subsidy represented a higher proportion of the total cost for more affordable units, the policy effectively encouraged the adoption of cost-competitive PV technologies.

The FIT scheme was launched in July 2012. Under this system, the government guarantees that power companies will purchase electricity generated from renewable sources, such as PV, at a fixed price for a specific period. However, the purchase prices under the FIT scheme have trended downward over the past decade. Specifically, the purchase price fell from 42 yen per kWh in FY 2012 to 16 yen per kWh by FY 2023. In contrast, residential electricity rates have followed a different trajectory. Following the 2011 nuclear accident, prices began rising. Although there was a temporary decrease after the liberalization of the electricity market in 2016, rates surged significantly in recent years owing to global events such as the invasion of Ukraine.

Based on these trends, the characteristics of PV adoption in Japanese households can be summarized in several ways. During the early stages of the FIT scheme when purchase prices were high, the adoption rate was particularly strong. However, as purchase prices declined, the volume of new PV installations dropped by approximately 50 percent from 1.036 million kW in FY 2014 to 660,000 kW in FY 2017. However, this trend reversed after FY 2018, when the introduction rate began to increase again. This resurgence is likely driven by the rising electricity costs. In FY 2022, when electricity prices soared to 34 yen per kWh, the volume of PV installations reached 1.059 million kW, surpassing the high levels seen in FY 2014.

In this section, the challenges and prospects for further expansion of PV systems are examined. Since FY 2018, residential electricity rates have exceeded the FIT purchase price, and the gap between them continues to widen. For residential PV users, the FIT purchase period is limited to ten years, after which the selling price of surplus electricity decreases significantly. For households whose FIT contracts have expired, the incentive to sell surplus electricity to the grid

diminishes. Consequently, it will become a more desirable option for households to store surplus energy or prioritize self-consumption. By combining PV systems with storage batteries or V2H technology, households can achieve 100% energy self-sufficiency. Furthermore, integrating an EV into this system ensures that a reliable power supply is maintained even during prolonged disasters or grid outages. In this sense, the widespread adoption of PV systems may serve as a significant catalyst for promoting electric vehicles.

Future Challenges for EV–Power System Integration

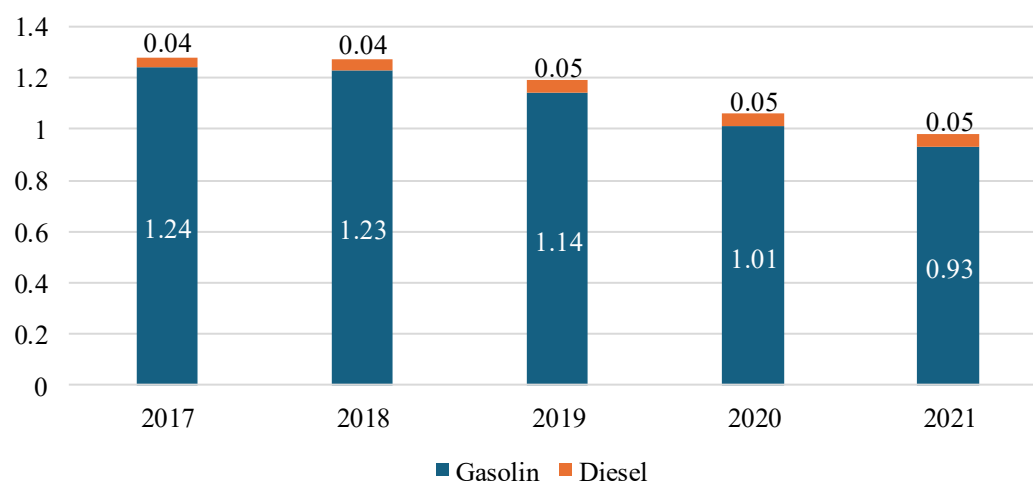
(1) Current CO₂ Emissions from Household Vehicle Use

The Ministry of the Environment conducts Statistics on Household CO₂ Emissions to understand the actual state of energy consumption and carbon dioxide emissions across Japanese households. Historically, the promotion of public transportation has been a primary strategy for reducing greenhouse gas emissions in the transport sector according to the 2022 White Paper on Land, Infrastructure, Transport and Tourism.

However, the onset of the COVID-19 pandemic in 2020 triggered a significant shift in the mobility patterns. Concerns over virus transmission led many passengers to move away from public transit options such as trains, buses, and shared taxis. This trend was particularly evident among the elderly, who increasingly favored private vehicles and bicycles for their personal mobility. While the reluctance to use public transportation has gradually eased as movement restrictions were lifted, these changing behaviors highlight a critical point for future policies. In the post-pandemic era, strategies to reduce greenhouse gas emissions in the transport sector must place greater emphasis on the decarbonization of individual vehicles. Consequently, the accelerated promotion of CEVs is essential for achieving long-term environmental objectives.

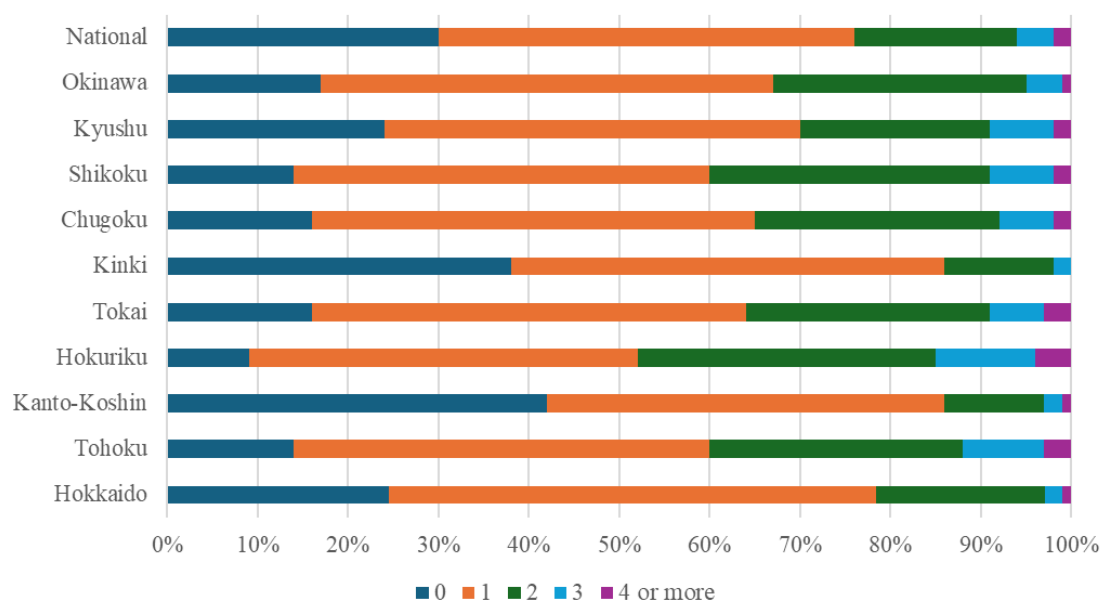
Regional data reveal significant disparities in household vehicle ownership and carbon dioxide emissions across Japan. Approximately 40% of households in the Kinki and Kanto-Koshinetsu regions do not own vehicles. In contrast, nearly half of the households in the Hokuriku region own two or more vehicles. Statistical analysis indicated a clear linear relationship between the number of vehicles owned and the annual carbon dioxide emissions. Because areas like Hokuriku rely more heavily on multiple private vehicles, their environmental footprint from transportation is naturally larger than that of dense urban centers. These regional differences underscore the importance of implementing decarbonization policies tailored to the specific mobility needs of each area.

Figure 2. Trends in Annual Household CO₂ Emissions from Automobiles by Fuel Type



Source: Ministry of the Environment, "Statistics on CO₂ Emissions in the Household Sector"

Figure 3. Number of cars per household



Source: Ministry of the Environment, "Statistics on CO₂ Emissions in the Household Sector"

(2) Financial Support for EV–Power System Integration

As discussed earlier, the Japanese government has actively provided financial incentives to promote PV and EV adoption as part of its CO₂ reduction strategy. However, with the transition from the FIT scheme to the Feed-in Premium (FIP) system, residential PV installations are now generally excluded from the national-level support. Some local governments continue to provide subsidies for household PV systems.

In regions with low sunlight hours, where PV generation efficiency is relatively poor, substantial subsidies are necessary to incentivize the adoption of expensive systems. The fiscal capacity to provide such subsidies also varies depending on the municipality's population size.

We examined the relationship between subsidy amounts and regional characteristics at the municipal level using an Ordinary Least Squares regression. Specifically, for 673 municipalities offering subsidies for PV, EVs, and distributed energy storage systems (including batteries and V2H) as of 2023, correlation coefficients were calculated between subsidy amounts (PV, Battery, EV and V2H), solar irradiation levels, and population size.

Table 3. Correlation Matrix

Variable	Solar adiation	Population	PV	Battery	EV	V2H
Solar Radiation	1					
Population	0.0451	1				
PV	-0.2714	-0.0512	1			
Battery	-0.3388	0.0633	0.879	1		
EV	-0.3093	-0.0981	0.586	0.525	1	
V2H	-0.2359	-0.0504	0.76	0.848	0.563	1

The verification of the relationship between subsidies and regional characteristics yields several significant findings. First, subsidies for both electric vehicles and photovoltaic systems show a statistically significant negative correlation with both annual average solar irradiation and municipal population size. As detailed in the regression results, solar radiation yields strong negative coefficients for both PV (-11.056, $p < 0.01$) and EV (-16.569, $p < 0.01$) subsidies.

Furthermore, the data reveals a negative relationship with municipal population size. Compared to a baseline of small municipalities (populations under 50,000), larger population tiers consistently exhibit negative coefficients. Specifically, PV subsidies are shown to be significantly lower (-3.421, $p < 0.10$) in municipalities with populations between 50,000 and 200,000. Supported by robust sample sizes ($N=673$ for PV; $N=188$ for EV), This suggests that smaller municipalities and regions with less favorable sunlight conditions tend to offer higher subsidies per unit.

A significant positive correlation was confirmed between subsidies for electric vehicles and those for related infrastructure, such as storage batteries and charging equipment. This relationship indicates that local governments that provide robust support for EV purchases are also likely to invest heavily in the infrastructure required for residential power generation and storage.

To achieve greenhouse gas reduction targets, many local governments have established PV subsidy programs. This study clarifies that municipalities in regions with shorter daylight hours, where PV efficiency is relatively low, provide higher total subsidies to incentivize consumer adoption. It can be inferred that municipalities that offer substantial EV subsidies are more proactive in supporting capital investments in self-generation systems. These local strategies are essential for bridging the gap between geographic constraints and the national environmental objectives.

Conclusion

This study examined the current status, challenges, and integration potential of EVs and PV systems in Japan. The findings indicate that Japan lags behind global trends in EV adoption, with HEVs remaining the dominant choice. This preference is largely driven by economic factors such as initial purchase costs and fuel efficiency. Although the government has implemented subsidy programs and expanded charging infrastructure, regional disparities and overall infrastructure shortages remain significant obstacles.

In contrast, PV systems have proliferated owing to the historical success of subsidy programs and the FIT scheme. Rising electricity prices have further incentivized households to adopt solar energy technology. However, as the FIT period expires for many users, the incentive to sell surplus power decreases. Consequently, prioritizing self-consumption through the use of storage batteries has become a more practical strategy for Japanese households.

The integration of EVs and PV systems through technologies such as V2H and V2G offers a high

potential for improving energy efficiency and reducing costs. These systems also enhance energy security by providing reliable power sources during disasters. By utilizing the storage capacity of EVs to compensate for the intermittent nature of renewable energy, a powerful synergy can be created to achieve carbon neutrality in the transportation sector. Nevertheless, technical and economic challenges remain, including battery degradation caused by increased charge and discharge cycles and the need for advanced bidirectional power control infrastructure.

Ultimately, achieving carbon neutrality by 2050 requires the reinforcement of economic and institutional support for both EVs and PV systems. Establishing decentralized energy frameworks and charging networks tailored to specific regional characteristics is essential. As a future research priority, further investigation is needed to analyze the differences in consumer purchase incentives for integrated household energy systems across different regions of Japan.

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Appendix

Table 1. Number of Newly Registered Passenger Cars by Fuel Type

	2019		2020		2021		2022		2023	
	Share (new car sales)		Share		Share		Share		Share	
GV	1,507,311	53.42%	1,380,762	55.70%	1,183,129	49.30%	938,750	42.22%	948,445	35.77%
HEV	1,098,704	38.94%	920,275	37.13%	1,027,104	42.80%	1,089,077	48.98%	1,460,133	55.07%
EV	38,943	1.38%	29,345	1.18%	43,916	1.83%	69,364	3.12%	96,134	3.63%
BEV	21,321	0.76%	14,604	0.59%	21,139	0.88%	31,592	1.42%	43,991	1.66%
PHEV	17,622	0.62%	14,741	0.59%	22,777	0.95%	37,772	1.70%	52,143	1.97%
FCV	690	0.02%	761	0.03%	2,464	0.10%	848	0.04%	422	0.02%
Diesel	175,694	6.23%	147,503	5.95%	143,088	5.96%	125,200	5.63%	146,164	5.51%
other	544	0.02%	186	0.01%	161	0.01%	64	0.00%	99	0.00%
total	2,821,886	100.00%	2,478,832	100.00%	2,399,862	100.00%	2,223,303	100.00%	2,651,397	100.00%

Source: Compiled by the author based on statistics from the Japan Automobile Dealers Association, "Statistics on Vehicle Registrations by Fuel Type".

Table 2. Vehicle Model Specifications and Total Purchase Cost

Vehicle Model	Toyota Corolla Sports G		Honda CIVIC LX		Toyota Prius Z	Nissan LEAF e+ X	
Engine Type	GV	HEV	GV	HEV	PHEV	HEV	BEV
Vehicle Weight (kg)	1,350	1,360	1,330	1,460	1,570	1,420	1,670
Fuel Efficiency (km/L)	18.3	29.5	16.3	24.2	26	28.6	
Driving Range (km)							458
Base Vehicle Price (JPY)	2,476,500	2,726,500	3,487,000	4,037,000	4,600,000	3,700,000	5,253,600
Taxes and Insurance (JPY)							
Recycling Fee	12,190	12,190	18,510	19,770	13,660	12,540	9,840
Automobile Tax (Type-Based)	6,000	6,000	5,000	6,000	6,000	6,000	6,200
Automobile Weight Tax	36,900	0	36,900	0	0	0	0
Automobile Tax (Environmental Performance-Based)	60,700	0	85,500	0	0	0	0
Compulsory Automobile Liability Insurance	24,190	24,190	24,190	24,190	24,190	24,190	24,190
Dealer Fees	70,410	70,410	53,700	53,700	71,880	70,760	50,414
National Subsidy (JPY)					550,000		850,000
Total Purchase Cost (JPY)	2,686,890	2,839,290	3,710,800	4,140,660	4,165,730	3,813,490	4,494,244

Source: Compiled by the authors based on publicly available data from each manufacturer