Nowhere to Go: How South Korea's Siting Regulations are Strangling Solar

Regarding Regulation of Separation Distances, Siting and Installation

SFO°C
Solutions for Our Climate

Supported by

This publication was produced with the financial support of the European Union's Partnership Instrument. Its contents are the sole responsibility of Solutions for Our Climate (SFOC) and do not necessarily reflect the views of the European Union.

Nowhere to Go:
How South Korea's Siting Regulations are Strangling Solar

Regarding Regulation of Separation Distances, Siting and Installation

SFO°C
Solutions for Our Climate
사단법인 기후솔루션

SFO°C
Solutions for Our Climate

Solutions for Our Climate (SFOC) is a non-profit corporation based in Korea established in 2016 in order to advocate for stronger climate and air policies.
SFOC is led by legal, economic, financial, and environmental experts with experience in energy and climate policy and works closely with domestic and overseas nonprofit organizations

---

Nowhere to Go: How South Korea's Siting Regulations are Strangling Solar
– Regarding Regulation of Separation Distances, Siting and Installation –

Publication	Solutions for Our Climate (SFOC)
Publication Date	December 2020
Author	Kyungrak Kwon, Yeji Kim and Eunbyeol Jo
Design	indnp
Inquiries	solutions@forourclimate.org

Table of Contents

Summary

Solar photovoltaic (PV) power generation is at the core of the 「Renewable Energy 3020 Implementation Plan」 and the 「Master Plan for Korean New Deal」, both of which the current administration is promoting with a particular focus. Due to various policies on a central government level of providing support, including the provision of subsidies, the scale of diffusion of solar PV power generation projects has been growing rapidly to date. However, despite the central government's efforts in its policies of providing support, due to the expansion of siting regulations applicable to solar PV power generation, which is being enforced by the municipalities, the potential of solar PV power generation projects is gradually being reduced and a decline in the diffusion of solar PV in rural communities is becoming a reality.

Despite the announcement in March 2017 by the Ministry of Trade, Industry and Energy of guidelines which had as its essence the fundamental abolition of siting regulations applicable to solar PV power generation, the relevant guidelines were inadequate in their binding legal force and, instead, the number of municipalities introducing siting regulations increased sharply as of August 3, 2020 to 123.

Siting regulations of municipalities can broadly be divided into: (1) distance regulations; (2) regulations restricting siting; (3) regulations on installation; and (4) qualitative regulations. In particular, distance regulations constitute a typical type of regulation, having been introduced by 122 out of 123 municipalities. An approach which, by establishing separation distances with an average of 300m and a maximum of 1,000m from the roads and houses, imposes a fundamental restriction on the siting of solar PV

power generation projects within the relevant area is becoming the biggest obstacle to invigoration of solar PV power generation projects. It is also the reality that the intensity of separation distance regulations is steadily rising, as separation is required from farm roads around farmlands or even a single house, and so on.

In this report, in order to find out about the impact of separation distance regulations such as these in detail, we selected three municipalities and used the Geographic Information System (GIS) to analyze the area within the relevant municipalities in which no solar PV power plant may be sited by reason of the separation distance regulations. The results of the analysis showed that the area excluded on the application of separation distance regulations ranged from a minimum of 46% to a maximum of 67% of the total area; the impact of regulations on the actual generation sites was therefore very high. If this phenomenon continues, it is likely that in the future the target for the supply of solar PV, as well as the target for reducing greenhouse gases, will not be met.

To solve this, separation distances need to be restricted and abolished by either a modification of municipal ordinances through draft standard municipal ordinances, or an amendment of the 「Act on the Promotion of the Development, Use and Diffusion of New and Renewable Energy」, and it is necessary for the central government or regional governments to take action and establish restrictions on the municipalities' authority to regulate separation distances.

I. Background to Examination

SFO°C
Solutions for Our Climate

1. Renewable Energy 3020 Implementation Plan and Green New Deal

The 'Renewable Energy 3020 Implementation Plan,' which was announced after the current administration took office, is having a great impact not only on the electric power industry but also on policies on climate change and greenhouse gases. The current administration's plan to increase the share of renewable energy generation within the electric power sector to 20% of total generation by 2030, was reflected in part in the subsequent promotion of the '8th Basic Plan for Electricity Supply and Demand (2017)', the '3rd Energy Master Plan (2019)' and the '2030 Greenhouse Gas Reduction Roadmap (2018).'

According to the 'Renewable Energy 3020 Implementation Plan,' the plan is to supply at least 95% of the new facilities for renewable energy by way of clean energy, such as solar PV and wind, and it also establishes a plan to supply 17.5GW (6.7GW by 2022 and 10.8GW by 2030) through small-scale projects such as farmhouse solar PV and cooperatives, as well as large-scale projects. In order to implement this smoothly, plans were made to support small-scale projects and introduce a planned siting scheme led by the local governments and, not only that, in order to improve the supply conditions, a groundbreaking improvement was planned in relation to both the siting regulations and various schemes that stunt the profitability of projects. However, as this report will go on to consider, siting regulations applicable to renewable energy generation are, if anything, continuing to expand, the spread of regulation of separation distances by reference to roads and houses led by the local governments being an example. Accordingly, the reality is that business opportunities for small and medium-scale solar PV power generation projects of 1MW or less are being fundamentally reduced.

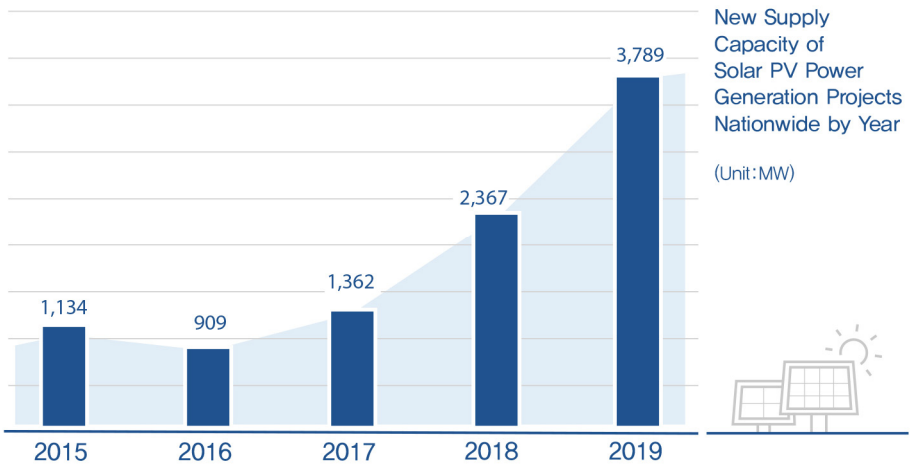
In order to respond to the economic downturn and structural shifts caused by the continuation of the COVID-19 pandemic, in July 2020 the government established the 'Master Plan for Korean New Deal,' and presented the 'Green New Deal' as one of the two broad axes of the plan. The plan states that it is necessary, following an increase in the demand for a low-carbon and environmentally friendly economy, to accelerate the conversion to a green economy, and it was explained that a green economy can create opportunities for the creation of jobs and new industries while at the same time improving the quality of life for the citizens.

In the plan, a plan to establish the foundation for diffusion of new and renewable energy was mentioned, and, particularly in the case of solar PV, plans were presented on matters such as introduction of resident-participatory model profit sharing projects, expansion of loan support for rural areas and industrial complexes, and subsidies for installation costs of new and renewable energy generation equipment for private use. However, plans for a groundbreaking increase to the supply capacity shown in the renewable energy implementation plan announced in 2017, or for financial investments, were inadequate, and policies of support, such as an expansion in loan support for commercial solar PV, failed to break free of the previous support system. In this regard, civil society has raised a criticism that there are not enough measures to eliminate siting regulations on a municipal level, which are the largest obstacle to the expansion of renewable energy supply.

2. Current Status and Development of Solar PV Power Generation Project Installations

The supply capacity of solar PV power generation projects in Korea is increasing at a rapid pace; together with invigoration of large-scale solar PV power generation projects of units of 100MW or above, the effect of policies of providing support, such as long-term fixed contracts applied to companies, can be considered as the reasons for such an increase.[1)]

1) Korea Energy Agency, New and Renewable Energy Supply Statistics (2015-2019)



〈Figure 1. New Supply Capacity of Solar PV Power Generation Projects Nationwide by Year (Unit: MW)〉

However, despite the increase in the solar PV supply capacity nationwide, when one looks at the statistics for the supply of small and medium-scale solar PV power generation facilities of 1MW or less by region, new supply capacity has been in continuous decline since 2016-2017.

〈Table 1. New Supply Capacity of Small and Medium-scale Solar PV Power Generation Facilities of 1MW or Less by Region (Unit: kW)〉[2)]

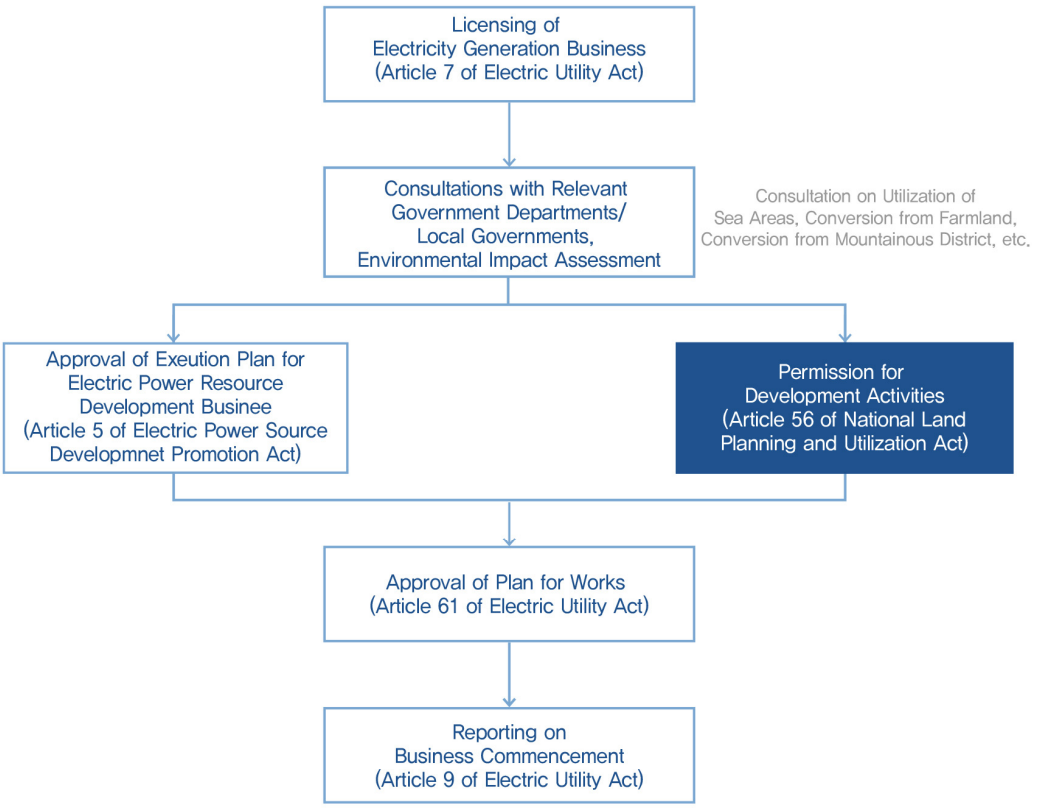
지역	2016년 (A)	2017년	2018년 (B)	Fluctuation (B-A)/A
Gyeonggi	125,085	112,699	120,124	-4%
Gangwon	123,876	83,288	196,024	58%
Chungbuk	114,291	57,313	91,221	-20%
Chungnam	194,416	124,083	199,024	2%
Jeonbuk	520,769	176,289	364,716	-30%
Jeonnam	468,697	45,204	422,277	-10%
Gyeongbuk	274,983	65,370	311,434	13%
Gyeongnam	177,351	53,272	140,709	-21%
Total	1,999,468	717,518	1,845,528	-8%

2) Data taken from New and Renewable Energy Supply Statistics (2015-2019), Korea Energy Agency, and reconstructed by Solutions for Our Climate

In rural areas where, solar PV power generation projects are active due to low land prices and rent, new supply capacity of solar PV in 2018 fell by 8% on average compared to 2016 and, in the case of some local governments, including Jeonbuk, Chungbuk and Gyeongnam, new supply capacity fell by as much as 30%. This trend of decline appears to stem from siting regulations that are in force in the majority of municipalities in relation to solar PV power generation facilities.

3. Licensing Process for Solar PV Power Generation Projects

The licensing process for solar PV power generation projects in Korea involves the issuance of an electricity generation business license pursuant to Article 7 (Electric Utility Licenses) of the 「Electric Utility Act」, followed by consultations with the relevant government departments and local governments, an environmental impact assessment, and finally the permission for development activities by the municipality. In the case of large-scale generation projects falling within the Basic Plan for Electricity Supply and Demand, the approval process for execution plan for electric power resource development business is necessary. However, for renewable energy generation projects, the municipality's permission for development activities is required under Article 56 (Standards for Permission for Development Activities) of the 「National Land Planning and Utilization Act」irrespective of capacity.

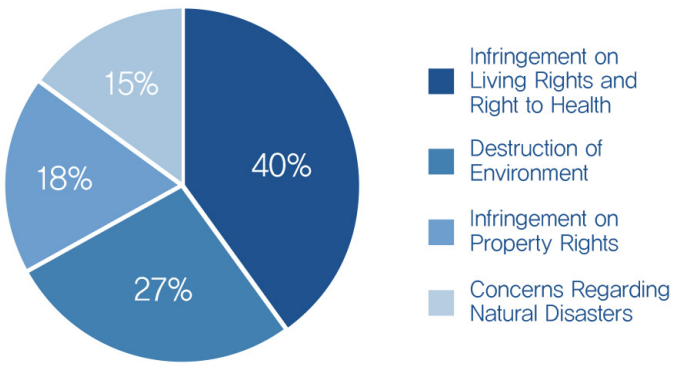


〈Figure 2. Licensing Process for Renewable Energy Generation Projects in Korea〉

As a result, even in the case of a project that has secured an electricity generation business license, if it fails to obtain license at the stage of permitting development activities, it would not be able to proceed with the project; for this reason, it is inevitable that heads of municipalities effectively make the decision as to whether or not projects would go ahead.

As solar PV supply capacity has grown rapidly across the country centering around the rural areas, complaints from the residents in areas neighboring the solar PV power generation projects are also continuing to increase. According to data from the 2019 inspection of state administration by the Trade, Industry and Energy Committee, complaints relating to new and renewable energy nationwide since 2015, up to the first half of 2019, numbered 1,483 in total.

The main reasons for the complaints from the residents can be classified as: (1) infringement on living rights and the right to health; (2) destruction of the environment; (3) infringement on property rights; and (4) concerns regarding natural disasters such as floods. The majority of complaints are concentrated on the infringement on living rights and the right to health.



〈Figure 3. Types of Occurrence of Complaints Regarding Renewable Energy(2019)〉[3)]

Since complaints from the local residents regarding solar PV power generation projects are continuing to increase, there is a structure whereby the heads of municipalities, who are in charge of granting permissions for development activities, have an incentive to suppress solar PV power generation projects as much as possible in order to minimize complaints from the local residents. This is because the heads of municipalities, who are elected, have to be sensitive to complaints from the local residents.[4)]

In circumstances where the incentive regarding solar PV power generation projects on a central government level were very weak, for the sake of minimizing complaints from the local residents, heads of municipalities competitively introduced siting regulations in the form of guidelines and municipal ordinances that restricted solar PV development projects. To begin with, the majority of local governments introduced

3) Today Energy, October 7, 2019, Complaints Relating to Solar PV and Wind Surge in Five-Year Period
4) Electimes, August 6, 2020, Local Governments Swayed by Complaints… to Frustration of Solar PV Companies

siting regulations in the form of urban planning guidelines, but following a court judgment[5] that it would be improper to implement siting regulations based on guidelines, for which there is insufficient legislative basis, the majority oflocal governments are enforcing the same regulations in the form of urban planning ordinances.

4. Ministry of Trade, Industry and Energy Guidelines That Have Insufficient Binding Legal Force

As siting regulations increased sharply at the stage of permitting development activities on a municipal level to respond to and minimize complaints from the local residents, in March 2017 the Ministry of Trade, Industry and Energy produced the 'Solar PV Power Generation Facilities Siting Guidelines.'

In the guidelines, a position was put forward that it was unlawful for municipalities to impose general restrictions on the permission for development activities, since to do so would go beyond concretizing the matters delegated by the law and constitute a case of legislating new laws. In addition, the results of tests and verifications carried out by public institutions, such as Korea Testing & Research Institute and Korea Energy Technology Evaluation and Planning, found that none of the matters relating to living rights, the right to health and the destruction of the environment, which were mainly put forward by the local residents, had any basis. Accordingly, it was understood that the basic reason for the raising of complaints was related to the sharing of benefits of power generation facilities, rather than any scientific or technological harm.

In addition, by examining cases overseas, the case of Japan, where solar PV power generation equipment are not subject to permissions for development activities, and the case of the United Kingdom, where separation distance in itself does not constitute a ground for refusing permission for a site, were presented. In the states of California and Minnesota in the United States, there have been cases involving the establishment of separation distances at a local government level, but the majority of

5) Gwangju High Court Decision 2015Nu74127

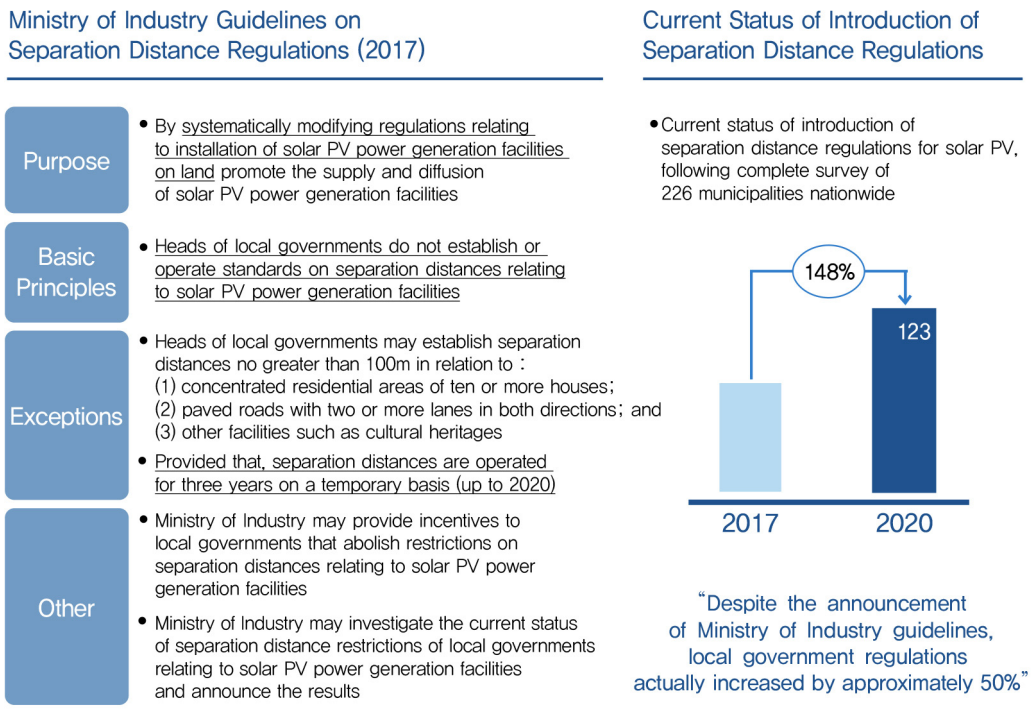
the cases concerned were merely instances where minimum separation distances were being specified for reasons such as fire, safety and property rights.

Country	Main Details	Remarks
United States (State Government)	• (State of California) Separation distance of 150 feet (45.72m) from real estate boundary lines and adjacent buildings for prevention of fires; set back from road boundaries by 25 feet (7.62m) • (Lanesboro, State of Minnesota) Set back from land boundary lines by at least 15 feet (4.57m); set back from residences by at least 30 feet (9.14m)	Separation distances prescribed for reasons such as **fire, safety and property rights.**
Canada (State Government)	• (South Dundas, Province of Ontario) Set back from scrap yards or sites used for the purpose of scrap yards by 150m; in the case of County or District roads, set back from the center of the road by at least 10m; set back from railroad boundaries by at least 30m	

〈Figure 4 Cases Overseas Involving Introduction of Separation Distance Regulations〉[6)]

Accordingly, in order to promote the supply and diffusion of solar PV power generation facilities, the Ministry of Trade, Industry and Energy set the principle that separation distance standards would not be established for solar PV power generation facilities, though separation distances no greater than a maximum of 100m would be allowed to be established in cases where objective necessity was recognized in the next three years. However, even in these cases it was suggested that the separation distances would only be operated until 2020.

6) Ministry of Trade, Industry and Energy, 2017, Solar PV Siting Guidelines



〈그림 5. Main Content of Ministry of Trade, Industry and Energy Guidelines and Current Status of Increase in Separation Distance Regulations〉[7]

However, notwithstanding the announcement of the guidelines by the Ministry of Trade, Industry and Energy, since those guidelines do not carry binding legal force as guidelines, municipalities are under no obligation to comply with the relevant guidelines. In fact, following the production of the guidelines by the Ministry of Trade, Industry and Energy, separation distance regulations such as the above increased by approximately 50%.

The municipalities' position is that, since the establishment of separation distance regulations relating to solar PV power generation facilities has been delegated to them under Article 56 (Permission for Development Activities) of the 「National Land Planning and Utilization Act」 and the standards for permission for development activities under Attached Table 1-2 of the Enforcement Decree of the same Act, they are reflecting the separation distance regulations in their urban or Gun planning

7) Ministry of Trade, Industry and Energy, 2017, Solar PV Siting Guidelines, Law Information Center (reconstructed by Solutions for Our Climate)

ordinances. In this process, since the guidelines of the Ministry of Trade, Industry and Energy lack specific legal status, the guidelines are not being considered at all in the municipalities' processes in enacting municipal ordinances.

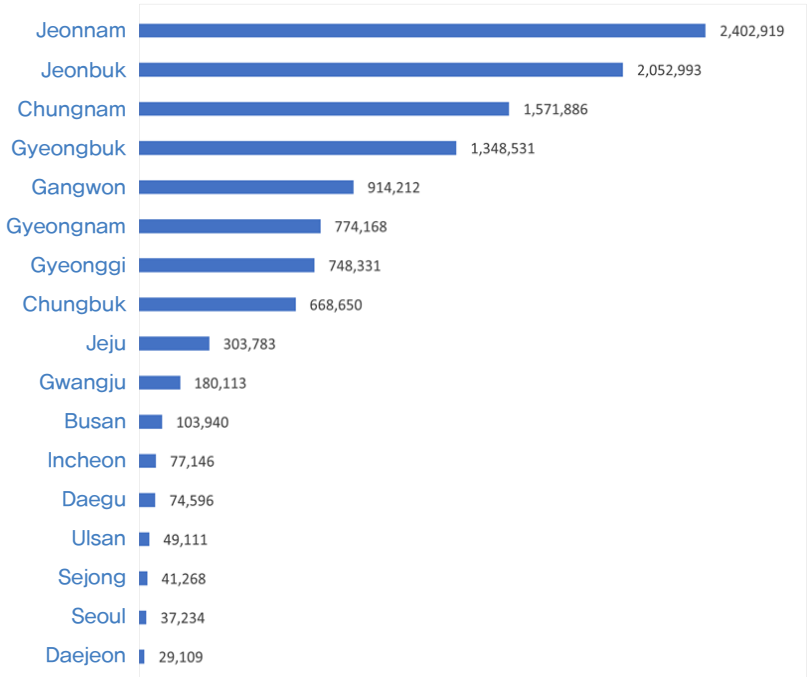
Ⅱ. Current Status of Siting Regulations and Issues

SFO°C
Solutions for Our Climate

1. Current Status of Introduction of Siting Regulations by Municipalities and Types

As of late June 2020, the cumulative number of sites of solar PV power generation equipment (by reference to facilities subject to RPS) nationwide was 65,940, and the cumulative installed capacity amounted to 11GW in total.[8] Inparticular, with the sum of the cumulative installed capacity of solar PV in the eight provinces of Jeollanam-do, Jeollabuk-do, Chungcheongnam-do, Gyeongsangbuk-do, Gangwon-do and Chungcheong buk-do being 10GW, solar PV equipment installations in Korea are concentrated in eight out of 17 provinces and cities.

8) Korea Energy Agency, New and Renewable Energy Supply Statistics (2020)



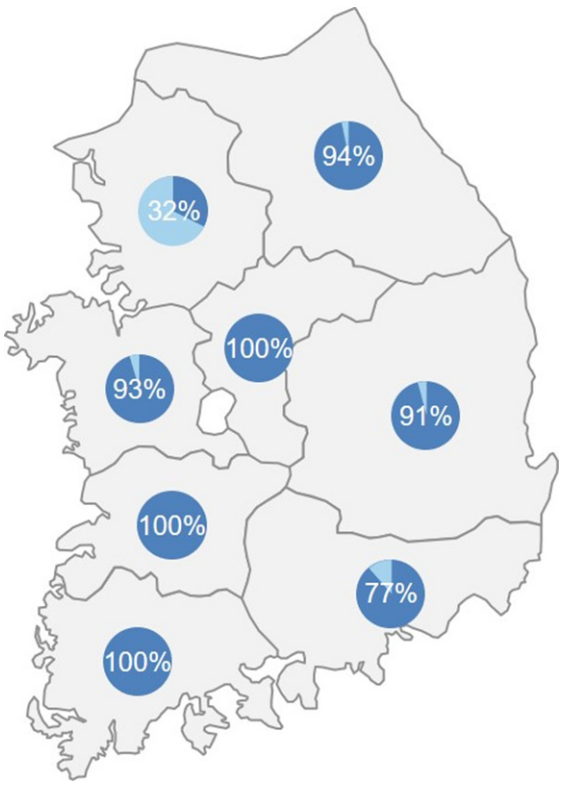
〈Figure 6 Installed Capacity of Solar PV Power Generation Facilities Nationwide (Cumulative, kW) (as of June 2020)〉

As solar PV power generation projects have increased, licensing siting regulations relating to the permission for development activities by region have also increased. The results of a complete survey carried out in respect of 226 municipalities nationwide showed that, as of August 3, 2020, municipalities that had introduced siting regulations for solar PV power generation facilities in the form of municipal ordinances numbered 123.[9)]

9) The results of complete survey showed that local governments with siting regulation ordinances, including Metropolitan Cities (Ganghwa-gun in Incheon Metropolitan City and Dalseong-gun in Daegu Metropolitan City), numbered 125 nationwide. However, in this study, analysis has been conducted on the current status of siting regulation ordinances in 123 municipalities, excluding the two Metropolitan Cities, by focusing on municipalities in the eight regions of Jeonnam, Jeonbuk, Chungnam, Gyeongbuk, Gangwon and Chungbuk. Local governments (Cheongdo-gun in Gyeongbuk and Cheonan-si in Chungnam) that had siting regulations in the form of guidelines, rather than municipal ordinances, have also been excluded from the analysis.

Facilities Siting Guidelines by the Ministry of Trade, Industry and Energy, local governments that had siting regulations numbered 83, municipalities that have regulations at present number 123, meaning that the number has increased by 48%.

This constitutes half the municipalities nationwide and, save for Seoul Special Metropolitan City and other Metropolitan Cities/Provinces where it is difficult to proceed with solar PV projects due to the high costs of securing sites, it has been found that the majority of mixed urban–rural areas and rural areas have regulations in place.



〈Figure 7 Current Status on Introduction of Regulations by Region (as of August 2020)〉

Looking at the current status on introduction of regulations by region, 100% of municipalities in Chungbuk, Jeonbuk and Jeonnam have introduced siting regulations as municipal ordinances. While regulations are in force at the rate of 94% in Gangwon, 93.3% in Chungnam, 91.3% in Gyeongbuk and 77.8% in Gyeongnam, it has been shown that 32.3% of municipalities in Gyeonggi have introduced regulations.

Siting regulations of municipalities relating to solar PV power generation projects can broadly be categorized into four types as set out below. In particular, of the siting regulations, the municipalities that have established separation distance regulations on solar PV power generation facilities amount to 99%.

(1) Distance regulations: a form of regulation under which permission for development activities is granted only if a minimum separation distance is secured between the solar PV power generation equipment and specific roads, facilities and sites. The extent of separation varies by local government, and standards for separation distances from roads and residential areas are typical. In addition to this, it means a restriction on separation distances centering around public facilities, tourist attractions, cultural heritages, coastlines, accommodations, etc.

(2) Regulations restricting siting: standards that impose restrictions on siting according to the presence of reservoirs, lakes and dams, farmland redevelopment zones (absolute farmland), gradient, etc.

(3) Regulations on installation: these refer to regulations that require a buffer zone so that the solar PV power generation equipment are set back from adjacent lands by at least a certain distance, or require boundary fencing, covering shrubs, screens, etc. to be installed around the equipment. Some local governments have regulations that require access roads to be built from the solar PV power generation equipment and require drainage facilities, etc. to be installed, or specify that vehicle evacuation spots, etc. be installed so that there is no disruption to the passage of vehicles.

(4) Qualitative regulations: these refer to qualitative standards which, by taking into consideration matters such as the surrounding scenery and beauty, safety and disaster prevention, determine whether or not permission is to be granted in cases recognized by heads of local governments such as the mayor or the head of Gun, or in cases where special reasons can be deemed to exist given the regional conditions or the characteristics of the project.

2. Distance Regulations

Distance regulations can broadly be divided into: (1) roads; (2) houses; and (3) other types. The majority of municipalities regulate separation distances from roads by requiring that solar PV equipment be installed at least a certain distance away from the national expressways, general national highways, Special Metropolitan City roads, Metropolitan City roads, local roads, Si roads, Gun roads and Gu roads specified in Article 10 (Categories and Ranking of Roads) of the 「Road Act」.

The distances of separation and the types of roads on which regulations are applied differ for each local government. There are local governments that regulate separation distances by including roads determined under Article 43 (Installation and Management of Urban or Gun Planning Facilities) of the 「National Land Planning and Utilization Act」, toll roads defined in Article 2 (Definitions) of the 「Toll Road Act」 and so on.

Where separation distances are being established from roads in agricultural and fishing villages, there are cases where separation distances are set from the roads defined in Article 2 (Definitions of Roads in Agricultural and Fishing Villages) of the 「Act on the Maintenance and Improvement of Road Networks in Agricultural and Fishing Villages」 in their entirety, or cases where restrictions are set on separation distances from roads such as Myeon roads (main roads in the area of an Eup/Myeon), Ri roads (roads branching out from roads of a higher grade than a Gun road or from Myeon roads and connecting villages or connected to major industrial complexes, etc.) and farm roads (roads connected to farmlands, etc. and commonly and directly used for production activities of farmers and fishermen) in accordance with Article 4 (Types of Roads, Standards for Facilities, etc.) of the same Act.

Where separation distances from residential areas are being specified, various standards are being prescribed by each municipality, including a separation distance standard that, even where there is a single house, power generation equipment is required to be installed at least a certain distance away from it. In general, separation distances are regulated in a graded manner through a classification into one or more but less than five houses, five or more but less than ten houses, and concentrated housing areas with ten or more houses.

1) Regulation of Separation Distances from Roads

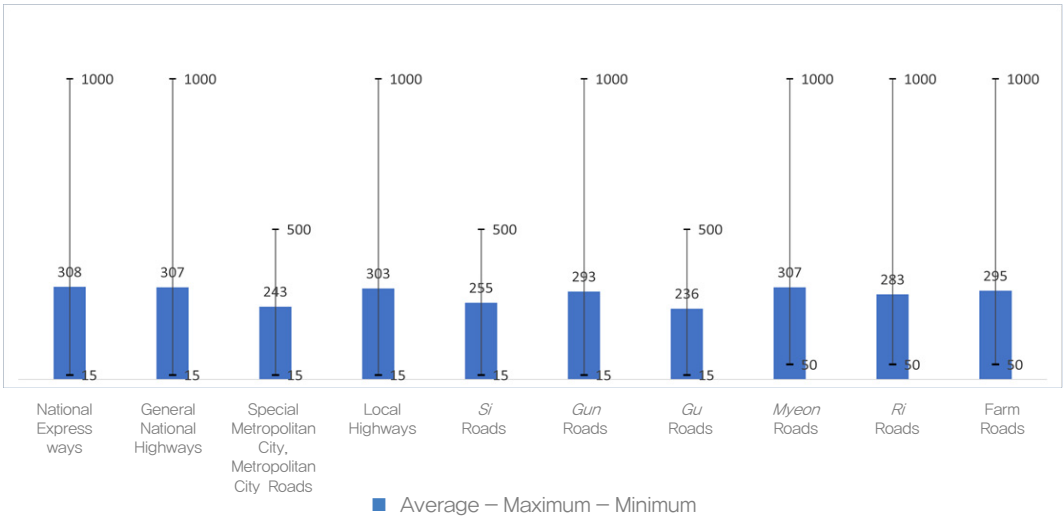
In the results of complete survey, local governments that impose regulations on separation distances from expressways amounted to 96% of the total of 123 local governments that specify solar PV siting regulations as municipal ordinances. 98% of those local governments specified separation distances from general national highways and local highways, and the local governments that specified separation distances from Gun roads took up 87% of the total.

As for roads in agricultural and fishing villages, local governments that regulate separation distances from Myeon roads made up half (53%) of the total number of local governments and local governments that regulate separation distances from farm roads, which are roads of a lower grade than Myeon roads, were also shown to amount to 1/3 of the total.

〈Table 2. Types and Proportion of Regulations on Separation Distances from Roads〉

Item	Detailed Types	Local Governments (number)	Proportion
Roads (Road Act)	Expressways	118	96%
	General national highways	121	98%
	Special Metropolitan City roads and Metropolitan City roads	54	44%
	Local highways	121	98%
	Si roads	76	62%
	Gun roads	108	88%
	Gu roads	50	41%
Roads in Agricultural and Fishing Villages (Act on the Maintenance and Improvement of Road Networks in Agricultural and Fishing Villages)	Myeon roads	66	54%
	Ri roads	53	43%
	Farm roads	40	33%

The maximum separation distance from national expressways, general national highways, local highways and Gun roads were shown to be 1,000m. The maximum separation distance from Myeon roads, Ri roads and farm roads, which are roads in agricultural and fishing villages, were also shown to be 1,000m, indicating that, in extreme cases, regulations were of a similar level to those applicable to expressways and general national highways.



〈Figure 8 Average, Maximum and Minimum Separation Distances Nationwide by Road Type (Unit:m)〉

On an examination of the average separation distance for each road type, it is possible to ascertain that the level of separation distances from roads being enforced by the municipalities is very high, and also that the forms and types of regulations are inconsistent.

First, on an examination of separation distances by road type under the Road Act (expressways, general national highways, Special Metropolitan City roads, Metropolitan City roads, local highways, Si roads, Gun roads and Gu roads), the average separation distance from expressways was the longest, at 308m. The average separation distance from general national highways was shown to be 307m, and the separation distance from Special Metropolitan City roads and Metropolitan City roads was shown to be 243m. The separation distance from local highways, at 303m, was shown to be longer than that from Special Metropolitan City roads and Metropolitan

City roads, from which it was possible to discern that, despite their being roads of a lower grade, tighter regulations were in operation. It means that, from local highways in particular, 121 municipalities, amounting to 98%, are regulating separation distances in relation to solar PV equipment. Other than the above, the average separation distance from Si roads was shown to be 255m, and 293m from Gun roads, from which it was possible to discern that the average separation distance was longer for Gun roads, which are roads of a lower grade than Si roads. The average separation distance from Gu roads, being roads of the lowest grade out of the road types under the Road Act, was the shortest, at 236m.

On an examination of average separation distances by road type under the Act on the Maintenance and Improvement of Road Networks in Agricultural and Fishing Villages (Myeon roads, Ri roads and farm roads), the average separation distance from Myeon roads was shown to be 307m, and 283m and 295m from Ri roads and farm roads respectively. Here, the average separation distance from Myeon roads was longer than the average separation distances relating to roads of a high grade like national expressways (308m), general national highways (307m) and Metropolitan City roads (243m) and, as such, it was possible to confirm that municipalities are intensifying the level of regulation relating to solar PV power generation facilities, irrespective of the road system or width, etc. Furthermore, the average separation distance from farm roads, which are used in farming, was shown to be higher not only than that relating to Ri roads (283m), being roads of a higher grade, but also than those applicable to major roads under the Road Act (Special Metropolitan City roads, Metropolitan City roads, Si roads, Gun roads and Gu roads), indicating that the level of regulation was very strong.

On an examination by road type under the Road Act, the maximum separation distances from national expressways, general national expressways, local highways and Gun roads were shown to be the longest, at 1,000m. Here, roads of a relatively low grade, such as local highways and Gun roads, also had a level of regulation applicable to roads at a high level in the system, on par with national expressways, indicating that the level of regulation was strong irrespective of the road system. Areas that have established a separation distance of 1,000m from national expressways and general national highways are Uljin-gun and Cheongsong-gun in Gyeongbuk,

and Gurye-gun, Naju-si and Jangheung-gun in Jeonnam. Places with a separation distance of 1,000m from local highways and Gun roads are Uljin-gun and Cheongsong-gun in Gyeongbuk, and Gurye-gun and Naju-si in Jeonnam. The place with a separation distance of 1,000m from Si roads is Naju-si in Jeollanam-do.

The maximum separation distance was shown to be 1,000m not only for roads under the Road Act, but also for roads in agricultural and fishing villages. Areas that have established a separation distance of 1,000m from Myeon roads are Uljin-gun and Cheongsong-gun in Gyeongbuk, and Gurye-gun in Jeonnam. The area that has established a separation distance of 1,000m from Ri roads and farm roads, which are roads of a lower grade than Myeon roads, is Gurye-gun in Jeonnam.

In addition, there are local governments that apply separation distances in a graded manner according to the area of the equipment, and those that specify separation distances from planning roads or planning facilities. In Yesan-gun in Chungnam, where the area of application exceeds 2,000㎡ but is no greater than 15,000㎡solar PV power generation equipment may not be built within a linear distance of 100m from boundaries with major roads. Further more, where the area of application exceeds 15,000㎡but is no greater than 20,000㎡, no equipment may be sited within a linear distance of 150m, and this increases to 200m where the area of application exceeds 20,000㎡.

There are also places where separation distance regulations are in force based on standards other than road type under the Road Act and the Act on the Maintenance and Improvement of Road Networks in Agricultural and Fishing Villages set out above. For example, cases in which separation distances are established based on planning roads and facilities amount to ten, consisting of Hapcheon-gun in Gyeongnam, Gyeongsan-si, Gimcheon-si, Andong-si and Uljin-gun in Gyeongbuk, Gyeryong-si and Taean-gun in Chungnam, and Okcheon-gun, Eumseong-gun and Cheongju-si in Chungbuk. By establishing additional separation distances from sites for Si/Gun planning roads or planning facilities that are due to be constructed, restrictions are being imposed on development activities.

In addition to the above, various other aspects were visible, including those in Danyang-gun and Jincheon-gun in Chungbuk, where separation distances of 200m and 300m respectively were established from the access road to the village and siting regulations relating to solar PV power generation equipment were tightened.

〈Table 3. Regulation of Separation Distances from Planning Roads and Planning Facilities〉

Local Government	Separation Distance
Hapcheon-gun, Gyeongnam	100m from state-funded local highways and urban planning roads
Gyeongsan-si, Gyeongbuk	300m from boundaries of urban planning roads
Gimcheon-si, Gyeongbuk	300m from urban planning roads
Andong-si, Gyeongbuk	300m from urban or Gun planning facilities
Uljin-gun, Gyeongbuk	1,000m from Gun planning roads
Gyeryong-si, Chungnam	200m from urban planning roads
Taean-gun, Chungnam	200m from urban planning roads
Okcheon-gun, Chungbuk	200m from urban planning roads that are open and have two or more lanes
Eumseong-gun, Chungbuk	200m from Gun planning roads that are paved and have two or more lanes in both direction
Cheongju-si, Chungbuk	100m from urban planning roads

2) Regulation of Separation Distances by Reference to Houses

Local governments that have set separation distances between solar PV power generation equipment and residential areas were shown to be 96% (where there is housing concentration of ten or more houses) of the total number of local governments. In general, residential area means dwellings where residents actually live. The criteria for setting separation distances relating to residential areas are

different for each local government; many specify separation distances from 'concentrated residential areas' and, for these purposes, the definition of concentrated residential area is different for each case. For example, Boseong-gun in Jeonnam defines concentrated residential area as 'area where there is concentration of ten or more dwellings, where residents actually live,' and Bonghwa-gun in Gyeongbuk establishes 'areas of concentration of five or more dwellings, where residents actually live' as concentrated residential areas. Furthermore, when defining concentrated residential area, though the space between each of the houses is defined as 50m or 100m in the majority of cases, in the case of some local governments, due to the absence of relevant criteria, this is determined in accordance with arbitrary judgments made by the public officials.

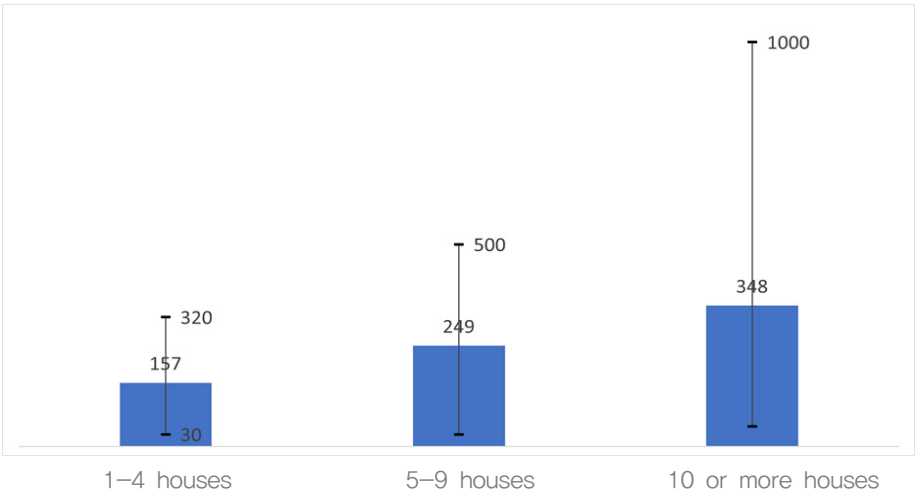
〈표 4. 주택 이격거리 규제 유형 및 비중〉

Classification According to Number of Houses	Local Governments (number)	Proportion
One or more houses	83	67%
Five or more houses	97	79%
Regulated where there are ten or more houses	118	96%

Local governments that apply separation distances where there is even a single house are at a 67% level, amounting to seven out of ten areas. In addition, 118 local governments, amounting to 96% of 123, were shown to be regulating separation distances so that power generation facilities could not be sited in areas where there is a concentration of ten or more houses.

As the concentration of housing rose, the level of separation distances from residential areas showed signs of intensification; 348m was recorded as the average separation distance from concentrated housing areas with ten or more houses, and the maximum separation distance was tallied to be 1,000m. For a concentration of five or more but less than nine houses, the average and maximum separation distances were shown to be 249m and 500m respectively. The average and maximum separation distances from areas with the concentration of one or more but less than five houses were recorded as 157m and 320m respectively.

By region, for a concentration of less than five houses, Gangwon, Gyeonggi, Gyeongnam, Gyeongbuk, Jeonnam, Jeonbuk and Chungbuk, with the exception of Chungnam, all imposed separation distances up to a maximum of 300m, and for a concentration of five or more but less than ten houses, Gangwon, Gyeonggi, Gyeongnam, Jeonnam, Chungnam and Chungbuk established separation distances up to a maximum of 500m. In areas where there is a concentration of ten or more houses, only Chungnam established a separation distance of 1,000m, indicating that it was heavily regulating the siting of solar PV power generation facilities.



〈Figure 9 Average, Maximum and Minimum Separation Distances Nationwide by Housing Type (Unit: m)〉

Furthermore, there are also local governments that apply the methods of setting separation distances in a graded manner, according to the number of houses or the capacity of the relevant power generation project.

〈Table 5 Graded Methods of Regulation According to Number of Houses and Generation Capacity〉

Local Government	Separation Distance Regulations
Gyeongsan-si, Gyeongsangbuk-do	Minimum 50m + add distance calculated by multiplying number of houses by 25m
Gumi-si, Gyeongsangbuk-do	Minimum 300m + add distance calculated by multiplying number of houses by 20m
Seongju-gun, Gyeongsangbuk-do	Minimum 200m + add distance calculated by multiplying number of houses by 30m
Gyeryong-si, Chungcheongnam-do	Minimum 50m + add distance calculated by multiplying number of houses by 20m
Gongju-si, Chungcheongnam-do	Minimum 100m + add distance calculated by multiplying number of houses by 50m
Nonsan-si, Chungcheongnam-do	Add distance calculated by multiplying number of houses by 30m
Dangjin-si, Chungcheongnam-do	Add distance calculated by multiplying number of houses by 50m
Asan-si, Chungcheongnam-do	Minimum 50m + add distance calculated by multiplying number of houses by 20m
Hongseong-gun, Chungcheongnam-do	Minimum 200m + add distance calculated by multiplying number of houses by 80m (where there are less than seven houses)
Geochang-gun, Gyeongsangnam-do	300m (less than 300kW), 400m (300kW or more, less than 600kW), 500m (600kW or more, less than 1,000kW), 600m (1,000kW or more)
Hapcheon-gun, Gyeongsangnam-do	200m (100kw or less), 250m (over 100kw)

In addition to the above, there are also cases where unclear qualitative regulations are included, including 'the natural scenery and beauty viewed from sites of concentrated residential areas, etc. of ten or more houses shall not be spoiled' (Pohang-si, Gyeongbuk), 'visible areas' including 'cases where the project site is not a visible area' (Jangseong-gun, Jeonnam), and 'permission may be granted if there is no impact on the surrounding environment.'

In the case of some local governments, there are cases where, as regulations on separation distances from residential areas are being enforced, a provision is added

to make an exception from the relevant regulations where consent form is obtained from residents in the concentrated residential area. In other words, under certain conditions, an exception is made from the separation distance regulations, or such regulations are eased, when consent is obtained from the heads of households or residents in the surrounding area. However, provisions of exception such as these are not very effective, both because companies must obtain consent from the heads of households directly, and because it requires consent from 100% of the residents.

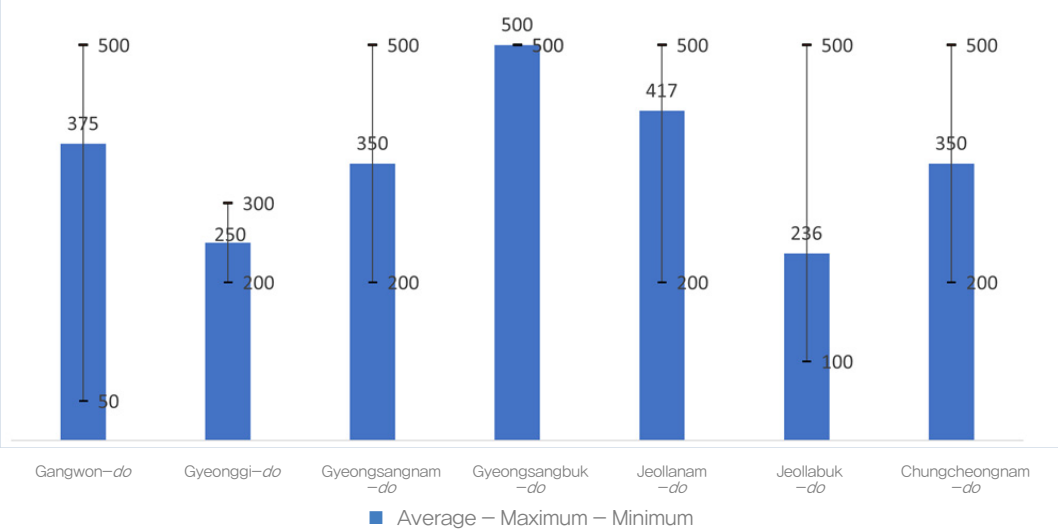
3) Other Separation Distance Regulations

Some municipalities also impose restrictions on solar PV power generation facilities as regards separation distances from places other than roads and housing. These typically include public facilities, tourist attractions and tourist complexes, cultural heritages and nature community areas. Across the country, there are 39 local governments that impose restrictions on separation distances from public facilities; the number is 83 in the case of tourist attractions and tourist complexes, 43 in the case of cultural heritages, and 35 in the case of nature community areas.

In the case of public facilities, out of the eight regional governments as the research subjects of this investigation, seven local governments excluding Chungbuk were shown to have separation distance regulations relating to public facilities. The average separation distance for public facilities was 354m, with Jeonnam having the highest value at 417m and Jeonbuk having the lowest value at 236m. Other than the fact that a separation distance is being established, that the detailed definitions and types of public facilities are different for each local government is an issue with the regulation of separation distances from public facilities.

Although public facilities are defined in Article 2, Subparagraph13 of the 「National Land Planning and Utilization Act」, there are local governments that have specified public office buildings, out of the business facilities in Subparagraph 14 in Attached Table 1 of the 「Enforcement Decree of the Building Act」, as public facilities, and also those that have defined the term themselves, with definitions such as 'hospitals, schools and public institutions' or 'facilities built by the State or local governments for local residents' welfare, etc. so that they may use it at their convenience.'

That the definition of public facilities and the applicability of separation distance regulations have been established randomly in this way for each of the local governments can become an obstacle to the invigoration of solar PV power generation projects. In particular, considering that the main cause behind the introduction of regulations arises from complaints made by residents, it is difficult to see why separation distances should be set in relation to public facilities.



〈Figure 10 Current Status of Establishment of Separation Distances by Reference to Public Facilities〉

In addition, there are many cases where separation distances are established from parks and boundaries of touristic and recreational type district-unit plans, and rivers. Parks refer to national parks, provincial parks and county parks, and the separation distance of 1,000m put forward by Sancheong-gun, where Jirisan is located, is representative of such cases. In terms of a representative case of a touristic and recreational type district-unit plan, Sangju-si has a separation distance of 1,000m and, as for rivers, Danyang-gun, Yecheon-gun, etc. each have separation distances of 500m.

〈Table 6 Current Status of Separation Distance Regulations Relating to Parks, Rivers and Boundaries of Touristic and Recreational Type District-unit Plans.〉

Item	Local Government
Park (average of 439m)	Inje-gun (1,000m), Sancheong-gun (1,000m), Goseong-gun(Gyeongnam) (500m), Muju-gun (500m), Gochang-gun (300m), Yeongdeok-gun (200m), Gwangyang-si (200m), Jangsu-gun (150m) and Buan-gun (100m)
Touristic and Recreational Type District-unit Plan (average of 514m)	Sangju-si (1,000m), Gyeongsan-si (500m), Gumi-si (500m), Mungyeong-si (500m), Seongju-gun (500m), Chilgok-gun (500m) and Shinan-gun (100m)
River (average of 307m)	Danyang-gun (500m), Yecheon-gun (500m), Jecheon-si (500m), Chungju-si (300m), Yeoncheon-gun (200m), Samcheok-si (100m) and Buan-gun (50m)

3. Regulations Restricting Siting

The majority of municipal ordinances regulate, in addition to regulating separation distances, the installation of solar PV by specifying sites in which no solar PV power generation facilities may be installed in principle. Prohibition on the installation of solar PV in agricultural community development promotion areas and at gradients above a specific level, etc. amount to the regulation of siting. Since agricultural community development promotion areas are areas in which there is a restriction on development activities under the 「Farmland Act」, a statute that ranks above municipal ordinances, it is difficult to view this as applying a discriminatory restriction on solar PV power generation facilities. Accordingly, in this report only the issues relating to gradient are described.

When the regulations on gradient are examined, a restriction is being imposed on sites by limiting the average gradient of sites, on which solar PV power generation facilities can be built, within a specified gradient. For the purposes of development activities permits, in order to prevent slopes from collapsing, the gradient of land is designated at 25 degrees in accordance with Attached Table 1-3 of the

「Enforcement Rule of the Mountainous Districts Management Act」. According to this, buildings, accommodations, factories, etc. that must obtain a permit for development may carry on business within an average land gradient of 25 degrees. However, where solar PV power generation projects are concerned, some local governments grant development activities permits only where the average gradient is no more than 20 degrees. Of the 123 local governments, 28 have separate regulations on gradient specially for solar PV power generation facilities, and the majority of these local governments designate 15 degrees as the average gradient of sites in which solar PV may be sited.

〈Table 7. Current Status of Local Governments That Apply Average Gradient Specific to Solar PV Power Generation Facilities〉

Average Gradient	Local Government
Installation possible at gradients below 20 degrees	Jeongseon-gun, Miryang-si, Geumsan-gun, Asan-si, Okcheon-gun
Installation possible at gradients below 15 degrees	Namhae-gun, Sacheon-si, Sancheong-gun, Uiryeong-gun, Changnyeong-gun, Hapcheon-gun, Goryeong-gun, Gimcheon-si, Mungyeong-si, Sangju-si, Seongju-gun, Yecheon-gun, Gangjin-gun, Suncheon-si, Wando-gun, Jindo-gun, Haenam-gun, Jangsu-gun, Nonsan-si, Hongseong-gun, Goesan-gun, Suwon-si, Naju-si

4. Regulations on Installation

The majority of municipalities make specific requirements obligatory, such that those requirements must be satisfied when installing solar PV power generation equipment. The biggest characteristic of regulations on installation is that, when a site satisfying the separation distance standards and the siting regulation standards is found and construction works for solar PV power generation facilities are actually carried out, they prescribe the standards by which such facilities must be installed.

The most commonly appearing regulations on installation include securing a buffer distance from boundary lines of adjacent lands, installing boundary fencing around the project site boundary, installing screens so as not to spoil the scenery, and making it obligatory to plant covering shrubs. Although these regulations are not harsh in terms of severity when compared to the separation distance regulations and the siting regulations, most of them constitute vague standards such as 'harmony with the surrounding scenery,' or unnecessary regulations that force solar PV power generation companies to bear additional costs, such as the requirement to secure a buffer distance, drainage facilities and access roads.

〈Table 8 Current Status of Types of Regulations on Installation Applicable to Solar PV Power Generation Projects〉

Types of Regulations	Examples	Local Governments (number)
Secure Buffer Distance	– Secure buffer distance from adjacent lands (average buffer distance 2.55m)	61
Harmony with Surrounding Scenery	– Install boundary fencing around the power generation facility site boundary(average height of boundary fencing 2.55m) – Install screens and plant covering shrubs around the power generation facility site boundary – Establish plans to prevent or eliminate damage to the surrounding scenery and beauty, environmental pollution, and destruction or creation of harm to the ecosystem, etc. – Install one after another within 100m intervals to minimize any difference with the surrounding scenery	83
Ensure That There Is Access Road	– Ensure that the road providing access to the power generation facility site is no less than 3m wide and paved with concrete – Present countermeasures such as installation of a vehicle evacuation spot	9
Install Drainage Facility Structure	– Install a semi–permanent drainage facility structure on the power generation facility site to prevent natural disasters	7

There are also local governments that permit installation of solar PV power generation facilities above buildings subject to conditions. In seven municipalities, including Gunsan-si in Jeonbuk, solar PV equipment may be installed on a building only if n years (three years on average) have passed since the date of approval of the relevant building for use. In terms of the reason for such a regulation, a conjecture can be made that this is because, under the Renewable Portfolio Standard (RPS) currently in force, where solar PV power generation facilities are installed on existing facilities such as buildings, the Renewable Energy Certificate (REC) weighting is computed at 1.5; this in turn leads to instances where, in order to obtain a high REC weighting, generation companies build buildings unnecessarily and install solar PV equipment above them.[10)]

Accordingly, of the local governments with the relevant regulatory standard, some specify conditions such as 'equipment private use excluded' or 'a building on farmland.'[11)] However, considering the circumstances in Korea that it is difficult to find sites on which to install solar PV power generation facilities due to the small national land area and the prevalence of mountainous districts, a requirement to prove a minimum time period of one to five years from the date of approval of building for use can act as a requirement that restricts the use of buildings that are suitable for installation of solar PV.

10) The Farmers Newspaper. June 24, 2020, Mushroom Cultivation Shed and Cattle Shed?... Expedient 'Solar PV Power Generation' in Reality

11) Attached Table 2 of Yeoju-si Urban Planning Ordinance, Subparagraph 4 of Item G of Article 1 of Standards for Permission for Development Activities (Related to Article 23) In the case of facilities similar to this, such as mushroom cultivation sheds, insect breeding sheds, etc., it shall be limited to facilities that are registered in the building register and used directly in a chain of production processes including cultivation, breeding and sale, and, in these cases, there shall be a sales record of at least 50% (for two years) of the production volume submitted in the initial project plan and, where there is no project plan, there shall be a sales record of at least 50% (for two years) of the standard production volume per unit area generally produced by the agricultural, forestry and fisheries workers, etc.

〈Table 9 Requirements for Permission for Installation on Buildings〉

Requirements for Permission	Local Government
Passage of n years from the date of approval of building for use	Goseong-gun (Gyeongnam), Namhae-gun, Sancheong-gun, Hadong-gun, Sangju-si, Yeongju-si, Gunsan-si
Cannot install on slate roof	Goseong-gun (Gyeongnam), Namhae-gun, Hadong-gun, Jangsu-gun
Designated position (stepped back from the inner side of the balustrade and the edges of the eaves of the sloped roof by at least 50cm, designation of space between the roof and attachment of structure, etc.)	Goseong-gun (Gyeongnam), Namhae-gun, Hadong-gun, Damyang-gun, Jindo-gun, Jangsu-gun, Naju-si
Within 2m of the rooftop and the floor of the roof	Goseong-gun (Gyeongnam), Namhae-gun, Sancheong-gun, Hadong-gun, Gunwi-gun, Bonghwa-gun, Yecheon-gun, Uiseong-gun, Goheung-gun, Buan-gun, Jangsu-gun, Okcheon-gun
Attach a written opinion on safety review obtained from a person who has acquired a national technical qualification, private qualification	Goseong-gun (Gyeongnam) (in excess of 10kW), Namhae-gun (in excess of 10kW), Sancheong-gun, Hadong-gun (10kW or more), Jangsu-gun (in excess of 30kW)
If the height of the building together with the solar PV equipment is 20m or more, install a lightning rod	Goseong-gun (Gyeongnam), Namhae-gun, Hadong-gun, Jangsu-gun, Naju-si
Horizontal projected area of installed structure shall be smaller than the area of the roof	Sancheong-gun, Gunwi-gun, Sangju-si, Uiseong-gun, Gangjin-gun, Goheung-gun, Naju-si, Damyang-gun, Mokpo-si, Wando-gun, Jindo-gun, Okcheon-gun

5. Qualitative Regulations Including Discretionary Authority and Scenery/Beauty

A major issue with the permission for solar PV development activities, other than the restriction on separation distances and regulations on installation, is that the rights of heads of local governments, as the persons granting permission for development activities, are abstract and excessively guaranteed.

The urban planning ordinances of each local government, which specify the standards for the permission for solar PV development activities, have legal validity within the scope delegated or determined by statute in respect of matters delegated for determination by an urban or Gun planning ordinance. Accordingly, heads of Si and Gun may, unless they deviate from or abuse their discretionary authority, lawfully decide whether to grant permissions for solar PV development activities.Therefore, heads of local governments hold a 'discretionary authority' to allow or disallow development activities in accordance with the standards designated in the municipal ordinances.

However, in the urban planning ordinances of the local governments that are currently in force, standards that cannot be legally and reasonably verified through the said discretionary authorities of Si and Gun are put forth as the standards for the permission for development activities. As an example of this, the majority of local governments have a clause in their urban planning ordinances that state 'the head of Si may, if he or she deems that special grounds exist due to the regional conditions or the nature of the project, relax (the standards for the permission for development activities) in their application by going through a deliberation of the urban planning committee.' This guarantees the discretionary authority of the person granting permission through its abstract scope. Furthermore, it is also the case that regulations with vague standards for judgment, such as 'harmony with the surrounding scenery,' are being presented.

Excessive discretion and abstract standards for the permission make it difficult for solar PV power generation companies to predict whether a project would proceed or not, and bring about a result whereby the question of whether a project proceeds or not is determined by an exercise of discretion by the head of local government, irrespective of the time and costs already deployed in going through the process for electricity generation business licensing. The result of this is a rise in the costs and uncertainty of solar PV power generation projects.

In the results of complete survey, 55 places specify a discretionary authority in their municipal ordinances, which constitute approximately 44% of the municipalities that have development activities permits for solar PV power generation facilities.

〈Table 10 Examples of Permission Granter's Discretionary Standards for Granting Permission〉

Local Government	Example of Standard for Granting Permission Relating to Discretionary Authority
Cheorwon-gun, Gangwon	When granting permission for development activities for the purposes of solar PV power generation facilities, the head of Gun may, by taking into consideration matters such as the surrounding scenery, environment, forests and natural disasters, etc. request that a deliberation of the Gun planning committee be obtained.
Yecheon-gun, Gyeongbuk	Notwithstanding paragraphs 1 and 2, the head of Gun may, if he or she deems that special grounds exist due to the regional conditions or the nature of the project, relax this in its application by going through a deliberation of the Gun planning committee.
Muan-gun, Jeonnam	It may not be sited in other areas deemed necessary by the head of Gun.
Taean-gun, Chungnam	The head of Gun may, if he or she deems that special grounds exist due to the regional conditions or the nature of the project, relax this in its application by going through a deliberation of the Gun planning committee.

Furthermore, 45 local governments present abstract standards for granting permission, such as 'it shall not spoil the natural scenery or beauty, etc.', in their municipal ordinances, which constitutes 37% of the total number of local governments.

〈Table 11 Examples of Abstract Standards for Granting Permission〉

Local Government	Examples of Abstract Standards for Granting Permission
Goseong-gun, Gangwon	It shall not be sited in an area the preservation of which is deemed necessary in the public interest due to concerns of damaging the natural ecosystem and spoiling the natural scenery.
Sacheon-gun, Gyeongnam	Area designated and announced by the permission granter, having judged that harm to the natural environment is light and, due to harmony with the surrounding areas, there is no impediment to land use
Andong-gun, Gyeongbuk	Natural scenery, etc. viewed from major roads, including national highways, local highways, Si roads and roads in agricultural and fishing villages, shall not be spoiled

Local Government	Examples of Abstract Standards for Granting Permission
Wando-gun, Jeonnam	Permission may be restricted, through a deliberation of the Gun planning committee, in respect of areas where there is a requirement for protection of important State facilities, preservation of important cultural heritage and regional history, and preservation of the natural scenery in the public interest.
Danyang-gun, Chungbuk	Permission may be granted in cases judged by Danyang-gun as posing no impediment, taking into account conditions such as the residential environment, appearance of roads and surrounding scenery, and recognized as such by the Gun planning committee.

6. Main Issues with Siting Regulations

Contrary to the direction of the central government, which is pushing ahead with the 'Renewable Energy 3020 Implementation Plan' and the Green New Deal, various siting regulations in force in the municipalities, such as separation distances, are becoming a major obstacle by harming the potential of solar PV power generation and by increasing the costs, etc.

In the background to such a spread of siting regulations by the municipalities lies a sharp increase in complaints from the local residents; rather than providing active mediation and conciliation, heads of local governments come to have an incentive to avoid solar PV power generation projects as much as possible through the establishment of separation distances.

That central government departments have, without solving these issues, vested the authority to grant permissions for development activities to heads of municipalities, who would inevitably respond sensitively to complaints, leading to a result that renewable energy investments are reduced in circumstances at present where acceptance by the residents is at a low level. Not only is it difficult to find a site for which a development activities permit can be obtained, considering the time and costs required to be expended in satisfying various regulations such as those on scenery and views, it is difficult to promote smooth investment.

In the below, the issues with the various siting regulations introduced by the municipalities have been summarized into three categories.

1) Lack of Review of Reasonableness and Appropriateness of Introducing Siting Regulations

When introducing solar PV siting regulations, municipalities first need to consider by what logic and on what basis the necessity and the level of regulation are to be set. As can be seen in the example of Cheongsong-gun in Gyeongbuk, which was the first in the country to introduce the relevant regulations, as solar PV power generation rose sharply, in order to prevent complaints from increasing, the relevant local governments proposed urban planning ordinances, without any particular basis, for reasons such as 'prevention of harm to the natural scenery,' 'protection of the scenery' and 'response to complaints from the residents.' In this regard, the relevant local councils are, for the most part, accepting the draft municipal ordinances proposed by the relevant local government, without any particular consideration or review.

〈Table 12 Media Article Relating to Establishment of Separation Distances by Local Governments〉[12)]

> Recently, due to an increase in complaints from the residents, there is a trend whereby separation distance regulations are being tightened. … on such movements, a person familiar with the matter at a regional government explained that, "as residents who are sensitive to solar PV power generation facilities being built in their areas are increasing in number, there is a trend whereby more and more local governments are intensifying the regulations in this regard." … the problem lies in the fact that the standards and the basis for setting separation distances from roads and residential areas are vague. A person familiar with the matter at Miryang-si revealed that "Even when newly establishing the separation distance clause for the first time in December 2017, there was no separate basis for the establishment of the standards." Other municipalities also rely entirely on the discretion of the local government, rather than establishing separation distances in accordance with the scientific evidence. It means that the administrative authorities are responding in a clumsy way to an issue in respect of which the interested parties are in the most acute conflict. One local government gave an unlaughable response that "we established it as 000m on the grounds of fairness with the adjacent local governments."

12) Monthly Joongang, October 30, 2019, Future Energy, Who Is It For

Furthermore, even in the absence of explicit siting regulations, when a complaint is raised, whether or not a permission for development activities is granted can change at the discretion of the head of local government, following a consideration of matters such as 'harmony with the surrounding scenery and beauty.'[13]

〈Table 13. Examples of Content of Discussions Held When Municipalities Introduced Separation Distance Regulations〉[14]

Local Government	Content of Main Discussions in Local Council
Cheongsong-gun, Gyeongbuk	Si council member: within 1,000m of national highways, local highways and Gun roads, then below that, within 500m - if it is done like this, there is nowhere in which to do this in Cheongsong. Person in charge in local government: as solar PV power generation facilities are being built on roadsides, there are a lot of issues with the scenery being spoiled and nature being harmed and so the ordinance has been proposed in the direction of imposing controls... (omitted) … given the regional image, would it not be right not to do it - that is how we are judging it.
Jinju-si, Gyeongnam	Si council member: … if we, Jinju-si, goes for 500m, … if they are set back from roads by 500, how to you go in there carrying the structures?Is installation possible? Chairperson: other Sis have gone for 300m; is there a reason why our Si alone should go with 500m? Person in charge in local government: in reality, it might be difficult to find a precise answer as to whether 300m is right or 500m is right … (omitted) …Natural scenery could be spoiled, and a lot of glare is created. So, we decided internally that it would be good to go with 500m.
Muan-gun, Jeonnam	Si council member: in terms of harm caused by solar PV power generation facilities to the residents, what harm is there? For example, between 100m and 300m, what differences are there? Person in charge in local government: because there are a lot of complaints of opposition from the residents and the conflict is very intense, we felt that, if we were to set it at least at this level, those conflicts might be resolved to some extent, and so, by comparing it with examples of other Sis/Guns…

13) Soyoung Lee, Various Issues Regarding Permission for Development Activities for Solar PV Power Generation Equipment, April 2018, p2.
14) Websites and meeting minutes of local councils at the relevant municipalities, as selected by Solutions for Our Climate

2) Lack of Fairness Compared to Other Facilities Requiring Development Activities Permit

As regulations relating to solar PV power generation projects are being tightened, cases are arising whereby the regulations are being established at a similar level or even higher than that of the existing unpleasant facilities such as resource recirculation facilities, factories and scrap yards.

For example, in the case of Imsil-gun in Jeonbuk, regulations are in place for solar PV power generation equipment that include: (1) separation distances from roads and concentrated residential areas; (2) separation distances from major tourist attractions; (3) separation distances from public facility sites, cultural heritages and traditional temples; (4) no siting on superior farm lands; (5) recommendation that boundary fencing as well as covering shrubs and screens be installed; and (6) specific standards shall be followed when installing on rooftops or roofs. In contrast, in relation to resource recirculation facilities like recycling facilities, junk shops, waste recycling facilities and waste reduction facilities, and factories, scrap yards, graveyards, cattle sheds, etc., no regulations are in place other than the regulations regarding separation distances from roads and concentrated residential areas. When only the level of siting regulation under municipal ordinances are considered, the level of regulation relating to solar PV power generation equipment is actually higher.[15)]

A similar example can be found in Goseong-gun in Gyeongnam. In the relevant municipality, cattle sheds may be sited set back from roads (national expressways, general national highways and local highways) by at least 100m. For solar PV power generation facilities on the other hand, provisions are in place so that such facilities may not be sited within 500m of roads (national expressways, general national highways, local highways and Gun roads) or, within 200m of Myeon roads out of the roads in agricultural and fishing villages. Within Goseong-gun, livestock excrement recycling facilities (separation distance of 500m from national expressways, general national highways, local highways and Gun roads) are in the same position as solar PV power generation facilities as far as separation distance regulations are concerned.[16)]

15) Imsil-gun Planning Ordinance, Article 15-2 (Standards for Permission for Development Activities Relating to Specific Buildings or Structures)

3) Comparison with Overseas Examples

Then, it is necessary to consider whether separation distances are established overseas, where the supply of solar PV is more active than that in Korea. In the case of the state of California in the United States and Germany, where the levels of solar PV supply are high, no instances existed whereby separation distances from roads and housing were established in a uniform manner in order to resolve complaints, as is the case in Korea.

In the case of the state of California in the United States, although separation distances were established, the purpose of their introduction was for fire prevention, and the separation distances are merely at a 50m level at the most. To be specific, regulations require solar PV power generation equipment to be installed 150 feet (45.72m) away from boundary lines of real estate and adjacent buildings, and 25 feet (7.62m) away from road boundaries.

On examining the General Development Standards and, as the subordinate development standards, the Special Use Standards for Solar Systems & Facilities of Sonoma County within the state of California, which is equivalent to a municipality in Korea, it appears that, in relation to separation distances, the standards merely specify a distance of 30ft (9.14m) from land boundary lines for the purposes of preventing fires, and that there is no obligation to be set back from roads or houses. However, they do prescribe the areas in which solar energy cannot fundamentally be sited, such as redeveloped farmlands and ecology, scenery and nature, which can be considered to be at a similar level to the natural environmental conservation areas or the forest conservation areas, etc. specified in Korea.

16) Goseong-gun Planning Ordinance, Article 21-2 (Restrictions on Installation of Specific Buildings and Structures, etc.)

〈Table 14 Special Use Standards for Commercial Solar Energy Facilities of Sonoma County, State of California, United States〉[17]

Main Items	Detailed Particulars
Minimum Setbacks	Set back from land boundary lines by 30ft (9.14m) for the purposes of fire prevention
Height Limits	Height of land-based solar PV limited to within 15ft (4.57m) (can be exceeded if use permit is obtained)
Undergrounding Electrical	Except in special cases, distribution power lines shall be underground
Farmland Protections	Solar PV may not be installed in Mapped Important Farmlands
Scenic and Biotic Resource Protections	Commercial solar PV may not be sited in the following locations: – Sewage purification systems, distribution reservoirs, protected areas – Floodways designated by the Federal Emergency Management Agency – Areas of scenic and biotic resources under primary statute – Safety areas adjacent to airports

Similar to the United States, it is also the case in Germany that no instances exist where uniform separation distances are established in relation to roads and houses, etc. at a municipal level. In the representative case of the state of Mecklenburg, guidelines on 'Open Type Solar PV Power Generation Systems (Freiflächen-Photovoltaikanlagen)' are presented to municipalities within the relevant state. In the relevant guidelines, areas where solar PV power generation facilities may be sited and areas where they may not be sited have been divided into 'exclusive areas' and 'areas requiring special examination.'[18] Exclusive areas include areas of priority specified in the state's power generation plan, nature reserves, and forests under the Forestry Act, and 'areas requiring special examination' include farmlands which, as reservation areas under the state's power generation plan, have a soil score no less than 20, and scenery protection areas, etc.

17) Sonoma County. Ordinance 6064 Exhibit E. 26.88.200 Solar Energy Facilities - Special Use Standards
18) Ministry of Trade, Industry and Energy, 2017. Study for Preparation of Plan to Improve Regulations Relating to New Industries in Energy Sector

As can be seen in the guidelines issued by the state of Mecklenburg, in Germany, by designating the sites on which solar PV can be installed on a regional government level, this can be viewed as mediation, on a regional level, of the situation faced by the municipalities, which decide whether or not to permit development activities in consideration of various interests, including the environmental impact and the surrounding scenery, and the agricultural conditions in the relevant area.[19)]

19)Ministry of Trade, Industry and Energy, 2017. Study for Preparation of Plan to Improve Regulations Relating to New Industries in Energy Sector

Ⅲ. Case Study

SFO°C
Solutions for Our Climate

1. Analysis Methodology and Selection of Subject Areas

In order to examine in detail the impact of separation distance regulations currently in force after their introduction by the municipalities, we selected the cases of three representative municipalities where such regulations are in force and conducted the case study using the Geographic Information System (GIS). In terms of the material utilized, we used the latest data on the National Spatial Data Infrastructure Portal (http://www.nsdi.go.kr/) in the analysis.

〈Figure 11. Analysis Methodology Process〉

In order to analyze the impact of introducing separation distance regulations in detail, as the first step, the areas that remain after excluding non-permissible areas for siting solar PV power generation facilities specified under the primary statute, including the 「National Land Planning and Utilization Act」, are extracted. Non-

permissible areas for siting under the primary statute include agricultural promotion areas, development restriction zones, natural environment conservation areas and non-permissible areas for installation due to the gradient of the forest.

In this process, a distinction was made between Option 1-1, which excludes areas of forests with a gradient equal to or greater than 25 degrees, and Option 1-2, which excludes the entire area of the forests. Under the current statute, it is proper that Option 1-1, which excludes areas with a gradient equal to or greater than 25 degrees, is applied by default. However, due to the application of a REC weighting of 0.7 to solar PV in mountainous districts, economic feasibility is low in practice, with the result that installation of solar PV is difficult in forest areas. For this reason, Option 1-2, which excludes forest areas altogether, was also considered. Below is a table illustrating the non-permissible areas for siting under the primary statute.

〈Table 15 Current Status of Sites Restricting Solar PV under the Statute〉[20)]

Classification of Use	Areas and Zones under the Statute	Relevant Statute
City Areas	Residential Areas	Article 76 (1) and (2) and Article 56 of 「National Land Planning and Utilization Act」
	Commercial Areas	
	Industrial Areas	
	Green Areas	
Control Areas	Conservation and Control Areas	Article 28 of 「Wild Flora and Fauna Protection Act」
	Wetland Protection Areas	Article 13 of 「Wetlands Conservation Act」
Agricultural and Forestry Areas	Agricultural Promotion Areas	Article 32 of 「Farmland Act」
	Quasi-agricultural and Fishing Villages	Article 2 of 「Agricultural and Fishing Villages Improvement Act」

20) Law Information Center (www.law.go.kr), reconstructed by Solutions for Our Climate

Classification of Use	Areas and Zones under the Statute	Relevant Statute
Natural Environment Conservation Areas	Ecology and Scenery Conservation Areas	Article 15 of 「Natural Environment Conservation Act」
	Nature Reservation Areas	Article 22 of 「Natural Environment Conservation Act」
	Special Wild Flora and Fauna Protection Districts	Article 28 of 「Wild Flora and Fauna Protection Act」
	Ecosystem Conservation Areas	Article 15 of 「Natural Environment Conservation Act」
Forest Gradient (gradient equal to or greater than 25 degrees)		-
Forest Conservation Zones		Article 9 of 「Forest Protection Act」
Special Measures Areas		「Framework Act on Environmental Policy」
Land for Erosion Control		Article 14 of 「Erosion Control Work Act」
Conversion of Grassland		Article 21-2 of 「Grassland Act」

Then, in order to analyze the impact of separation distances, the available area was deduced by applying the standards on separation distances relating to roads and houses held by each municipality to the GIS. In the case of roads, attributes relating to road hierarchy were extracted from the road name address system's road sections data, and attribute data of the road centerline data was combined with the road name address system's actual width data and was used in the analysis.

Analysis was conducted on houses by extracting detached houses, multi-one-room houses, multi-family houses, official residences, multi-unit dwellings, apartments, tenement houses and multi-household houses under the road name address system's building data. In the case of regulation of houses, if, in relation to the distance between one dwelling and another, there were standards on distances between houses established by the individual municipality, then the relevant standards were applied and, where no distance standards were established, analysis was conducted by conservatively establishing 50m.

There are also instances where the municipalities have individually established separation distances from areas and facilities other than roads and houses; distances from community areas, tourist attractions, cultural heritages and coasts can be cited as examples. In this analysis, the impact of the three local governments' individualized separation distance regulations was also considered at the final stage.

As the spatial subjects of the above analysis, Gumi-si in Gyeongbuk, Hamyang-gun in Gyeongnam, and Hampyeong-gun in Jeonnam were selected. Jeonnam and Gyeongbuk were selected because those two regional governments have the highest technological potential relating to solar PV power generation.[21] Technological potential means the volume of energy that can potentially be utilized if technological constraints, such as the efficiency of equipment, were to be reflected and the areas where installation is geographically impossible were to be excluded. The technological potential of Jeonnam and Gyeongbuk amount to 388,546GWh/year and 342,030 GWh/year respectively. In other words, we sought to analyze the extent of the impact the municipalities' siting regulations had in areas with the highest technological potential.

Within Gyeongbuk, Gumi-si was selected because the relevant municipality is the most representative mixed urban-rural area, and is at the same time introducing a diverse range of separation distance regulations including roads, houses, tourist attractions and nature community areas; in the case of Hampyeong-gun in Jeonnam, the selection was made because the geographical characteristics (the area of fields, rice paddies, orchards, pastures and forests, etc.) of the relevant municipality was the most similar to Jeonnam's average.[22] To summarize, Gumi-si has the most representative mixed urban-rural areas within Gyeongbuk, and Hampyeong-gun possesses representativeness in that the area, excluding farmlands and forests that pose considerable constraints on the siting of solar PV, is the closest to Jeonnam's average.

21) Ministry of Trade, Industry and Energy, 2018. New & Renewable Energy White Paper
22) Utilized 2019 Si/Gun/Gu data from KOSIS Current Status of Land Use by Administrative District and Land Category

Finally, in order to analyze the impact of siting regulations in a region with the smallest proportion of area in which solar PV power generation projects are possible, Hamyang-gun, which, out of the entire Gyeongnam region, had the highest proportion of areas in which it is difficult to install solar PV (fields, rice paddies, orchards, forests, etc.), was selected.

By applying the current status of separation distance regulations in force in the three municipalities selected above, the outcome was included in the final results of analysis.

〈Table 16 Current Status of Separation Distance Regulations in Municipalities Subject to Analysis〉

Type	Gumi-si	Hamyang-gun	Hampyeong-gun
Roads	Set back by 500m	Set back by 800m	Set back by 500m
Houses	Set back by 500m	Set back by 300m	Set back by 500m
Public Facilities	-	Set back by 500m	Set back by 300m
Tourist Attractions/ Tourist Complexes	Set back by 500m	Set back by 500m	Set back by 500m
Cultural Heritage	Siting not permitted	-	-
Nature Community Areas	Set back by 500m	-	-
Other	-	-	Coasts 300m

2. Results of Siting Regulations Impact Analysis

The results of the analysis, conducted through the GIS in relation to Hampyeong-gun in Jeonnam, Hamyang-gun in Gyeongnam and Gumi-si in Gyeongbuk, on the extent of the siting regulations' impact, showed that the area in which installation of solar PV was possible diminished dramatically as a result of those siting regulations

〈Table 17 (Option 1-1) Results of Analysis of Impact Flowing from Separation Distance Regulations (Unit: 1,000㎡)〉

	Total Area	Area/Proportion Excluded upon Application of Regulations				Aggregated Impact of Separation Distance Regulations	Available Area for Installation
		Application of Primary Statute	Road Separation	House Separation	Other Separation		
	(A)	(B)	(C)	(D)	(E)	(F=C+D+E)	(A-B-F)
Hampyeong-gun, Jeonnam	389,493	162,529	161,555	18,936	391	180,883	46,080
	100%	41.73%	41.48%	4.86%	0.10%	46.44%	11.83%
Hamyang-gun, Gyeongnam	721,122	187,921	279,183	60,387	499	340,070	193,129
	100%	26.06%	38.72%	8.37%	0.07%	47.16%	26.78%
Gumi-si, Gyeongbuk	613,433	153,695	412,546	1,539	250	414,336	45,401
	100%	25.05%	67.25%	0.25%	0.04%	67.54%	7.40%

Basically, under the siting regulations relating to solar PV power generation facilities prescribed in the primary statute, the available area for installation was shown to be reduced by at least 25% in all three municipalities and, in particular, when the separation distance regulations are applied, an area amounting to half of the total area, up to 2/3 at the higher end, was shown to become excluded, with Hampyeong-gun in Jeonnam at 46%, Hamyang-gun in Jeonnam at 47% and Gumi-si in Gyeongbuk at 67%. Accordingly, the available area for installation of solar PV power generation facilities took up a very small proportion of the total area and, particularly in the case of Gumi-si, it was revealed not even to amount to 10% of the total area.

In the case of Option 1-2, unlike Option 1-1, by excluding the regulations on the 25-degree gradient and taking into consideration the low economic feasibility of solar PV in mountainous districts, analysis was conducted by excluding the area of the forests in its entirety. The results of the analysis conducted on the three municipalities in this regard are as follows.

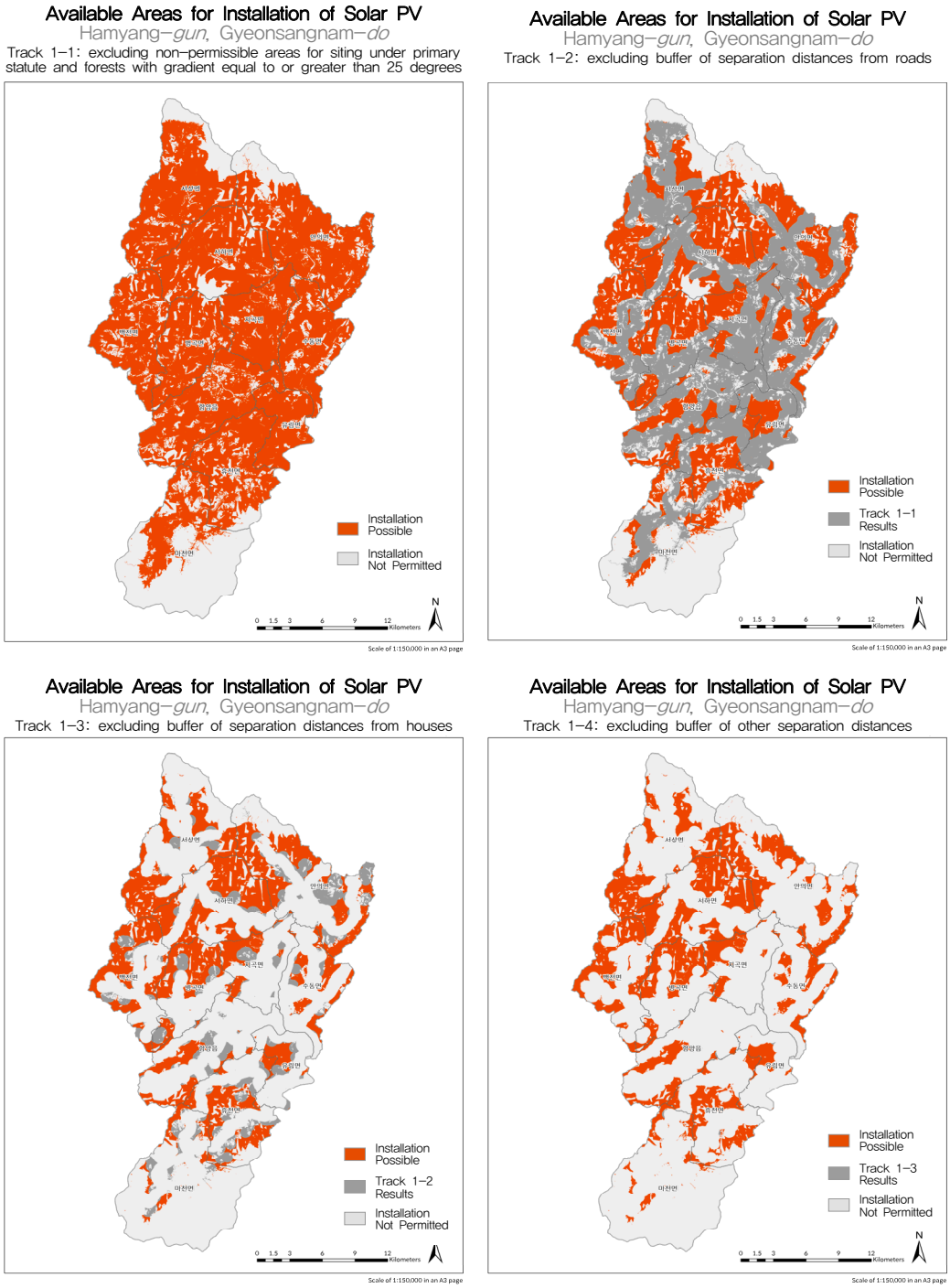
〈Table 18 (Option 1-2) Results of Analysis of Impact Flowing from Separation Distance Regulations (Unit: 1,000㎡)〉

	Total Area	Area/Proportion Excluded upon Application of Regulations				Aggregated Impact of Separation Distance Regulations	Available Area for Installation
		Application of Primary Statute	Road Separation	House Separation	Other Separation		
	(A)	(B)	(C)	(D)	(E)	(F=C+D+E)	(A-B-F)
Hampyeong-gun, Jeonnam	389,493	295,918	81,883	8,626	30	90,540	3,034
	100%	75.98%	21.02%	2.21%	0.01%	23.25%	0.78%
Hamyang-gun, Gyeongnam	721,122	619,773	81,374	15,306	78	96,759	4,589
	100%	85.95%	11.28%	2.12%	0.01%	13.42%	0.64%
Gumi-si, Gyeongbuk	613,433	495,160	117,427	279	8	117,715	556
	100%	80.72%	19.14%	0.05%	0.00%	19.19%	0.09%

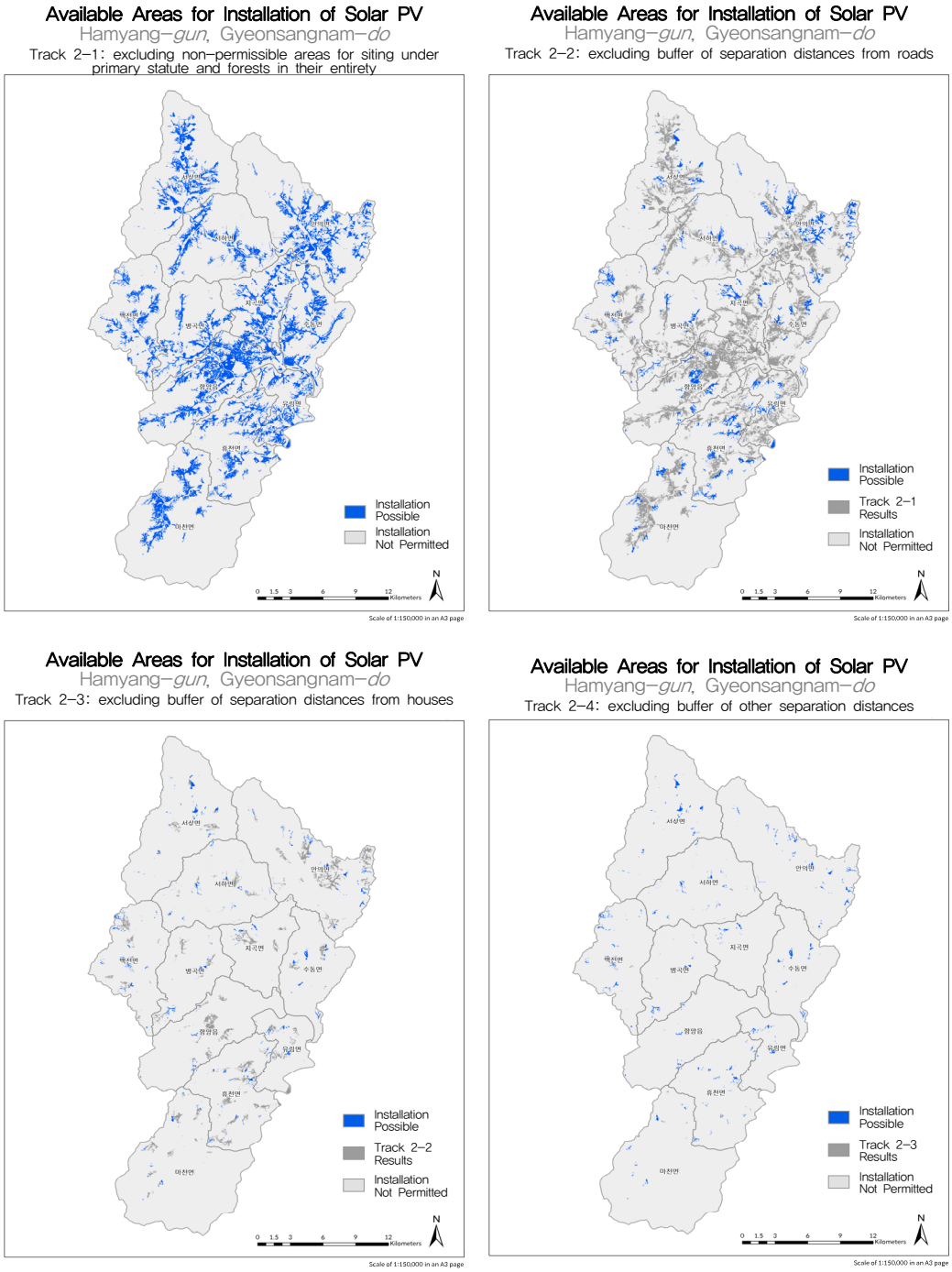
When the area of the forests is excluded, the proportion by which the available area for installation diminished rose dramatically compared to Option 1-1. The available area for installation was shown to be less than 1% for each of the three municipalities and, because the entire area of the forests was excluded, the impact of separation distances is shown to decrease on a relative basis compared to Option 1-1. This can be understood in terms of a considerable degree of overlap between the area of the forests and the regulatory territory of separation distances.

If Options 1-1 and 1-2 were to be combined, it can be ascertained that the impact of separation distance regulations currently in operation, after their introduction by the municipalities in rural areas, is fairly severe; from the position of small and medium-sized solar PV companies, the siting regulations currently in force can be viewed as having the de facto effect of fundamentally blocking the projects in the relevant areas. Furthermore, considering the fact that, even for the available area for installation deduced from Option 1-1, it is realistically difficult to proceed with projects in forest areas due to low economic feasibility, and the fact that, even in areas where installation is possible, the possibility of connecting to KEPCO's grid has to be additionally considered, the reality is that it would be difficult to expect an invigoration of solar PV projects in rural areas in the future.

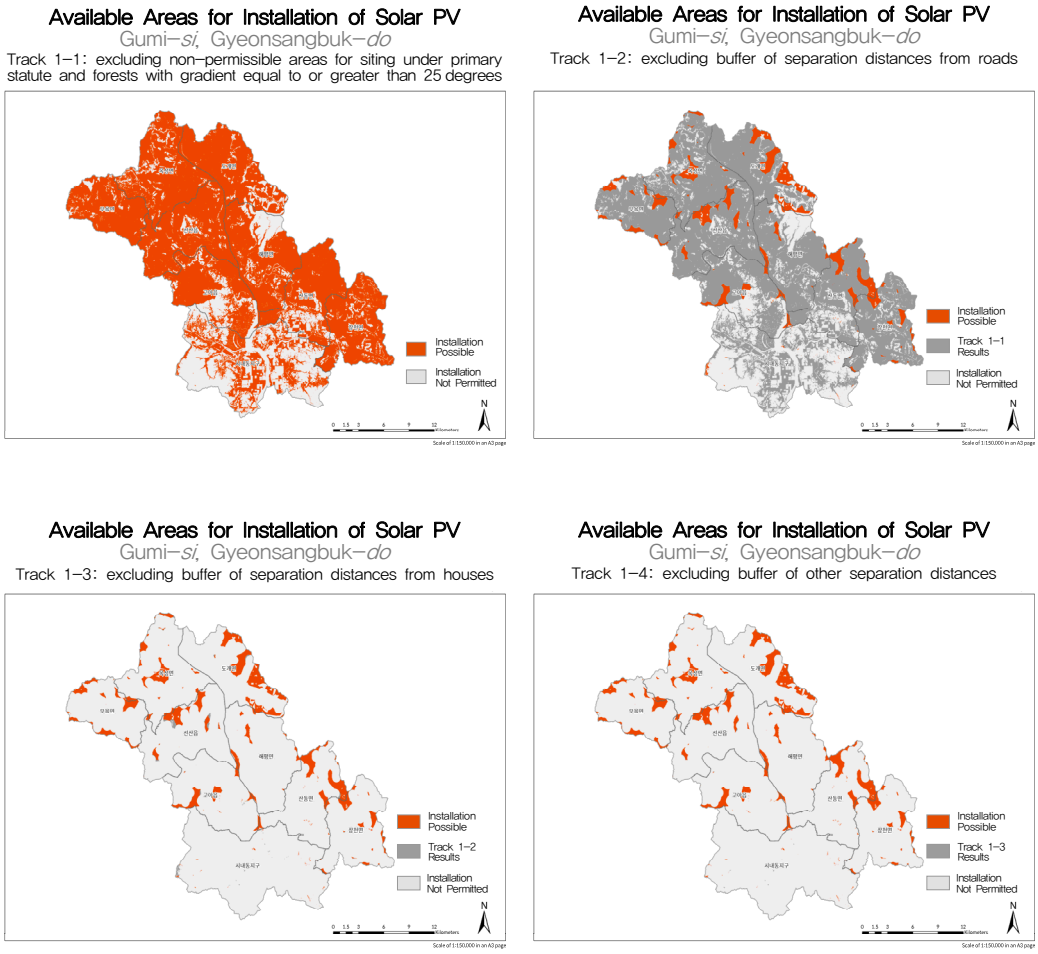
In the below, the results of the analysis of the impact flowing from the three municipalities' separation distance regulations were visualized through the GIS.



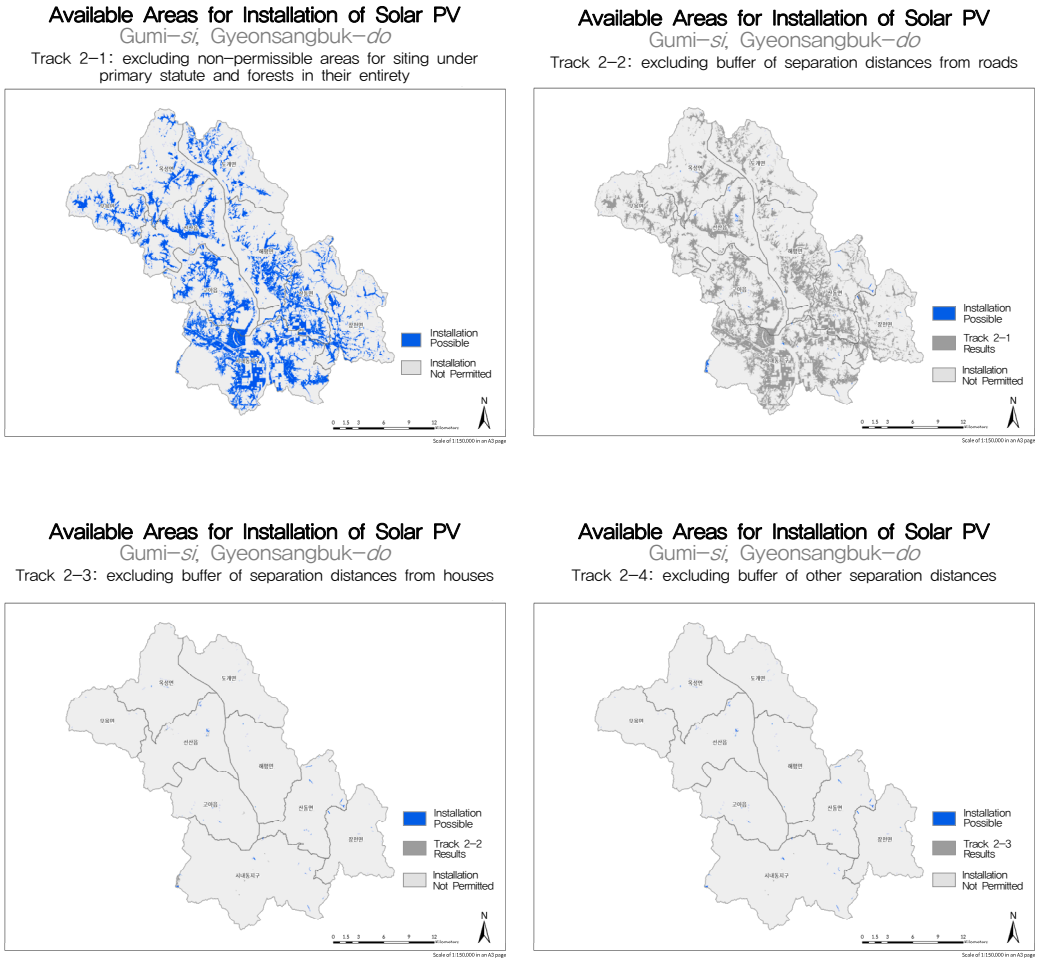
〈Figure 12. (Option 1-1) Results of Analysis of Impact Flowing from Separation Distance Regulations (Hamyang-gun, Gyeongnam)〉



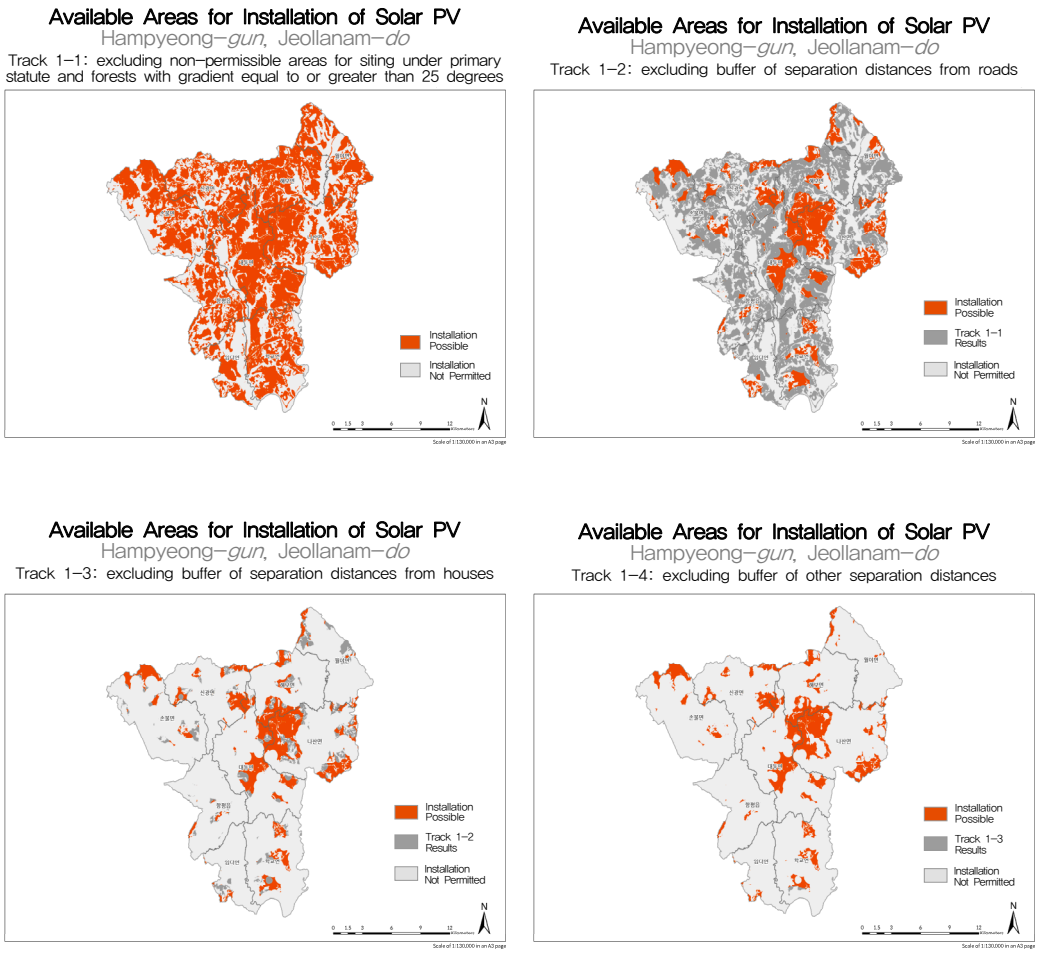
〈Figure 13. (Option 1-2) Results of Analysis of Impact Flowing from Separation Distance Regulations (Hamyang-gun, Gyeongnam)〉



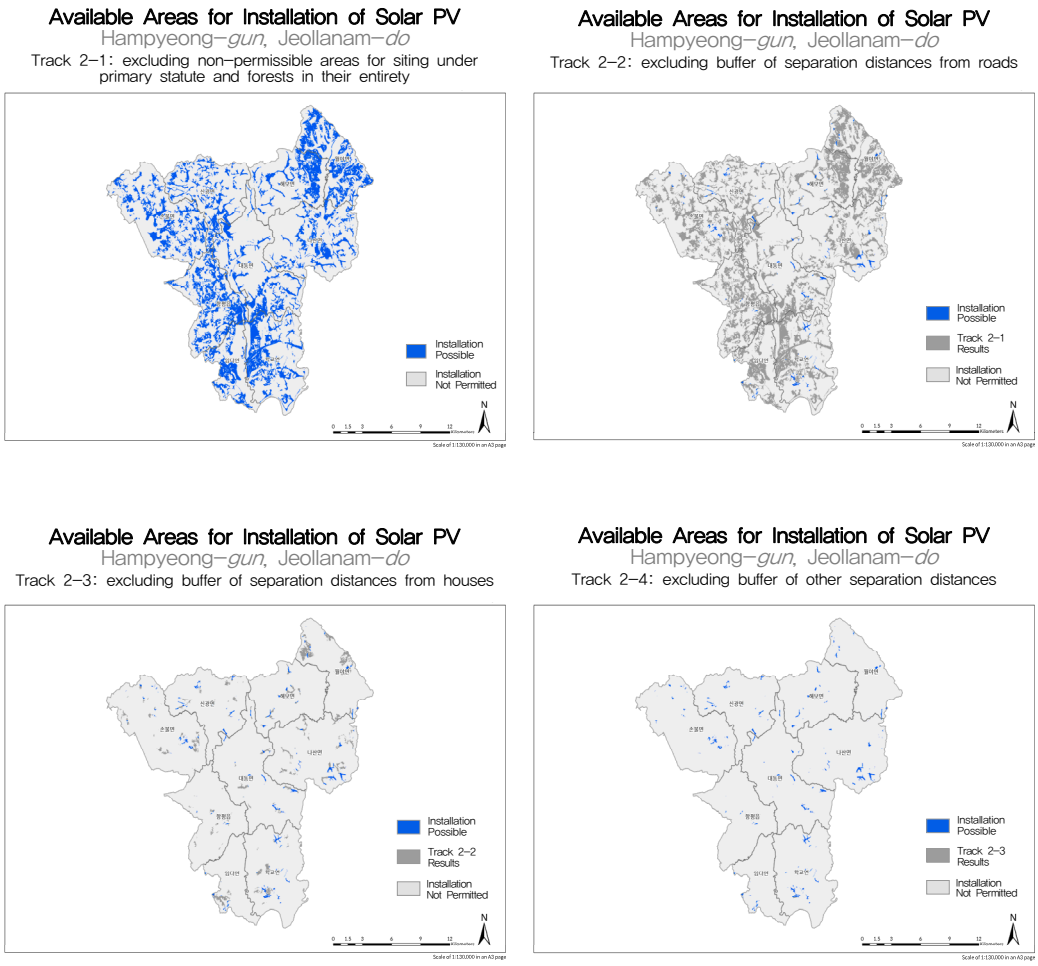
〈Figure 14. (Option 1-1) Results of Analysis of Impact Flowing from Separation Distance Regulations (Gumi-si, Gyeongbuk)〉



〈Figure 15. (Option 1-2) Results of Analysis of Impact Flowing from Separation Distance Regulations (Gumi-si, Gyeongbuk)〉



〈Figure 16. (Option 1-1) Results of Analysis of Impact Flowing from Separation Distance Regulations (Hampyeong-gun, Jeonnam)〉



〈Figure 17. (Option 1-2) Results of Analysis of Impact Flowing from Separation Distance Regulations (Hampyeong-gun, Jeonnam)〉

Ⅳ. Directions for Future Improvement

SFO°C
Solutions for Our Climate

As has been examined earlier, the impact of the municipalities' regulation of separation distances, analyzed through the GIS, is understood to be at a much more serious level than had been expected. As indicated in the matters mentioned in the Background to Examination, this can also be confirmed in part in the statistical data, which shows a gradual decline in the small and medium-scale solar PV power generation projects in rural areas.

The biggest issue with the regulation of separation distances for solar PV lies in the preemptive obstruction of solar PV power generation on the pretext of preventing impairment to the natural scenery and beauty, while in reality the aim is to minimize the number of complaints from the local residents. Furthermore, since separation distance regulations are operated en bloc by reference to roads and houses, in the case of some areas, by restricting installations even in the absence of any complaints, the potential of solar PV power generation projects is being harmed.

Regulation of separation distances relating to solar PV power generation projects constitutes a truly exceptional case even when looking at the overseas examples, and considering that the local governments overseas who introduced separation distance regulations are operating them restrictively for the purposes of fire prevention and safety, it is proper that such separation distance regulations should also be abolished in Korea.

The direction of abolition of separation distance regulations can broadly be presented in terms of two approaches. The first is to impose a restriction, through an amendment of the 「Act on the Promotion of the Development, Use and Diffusion of New and Renewable Energy」, on the limits on the establishment of separation

distances by the municipalities. According to the standards for the permission for development activities in Attached Table 1-2 of the 「Enforcement Decree of the National Land Planning and Utilization Act」 currently in force, in relation to specific buildings that include solar PV power generation projects, it is provided that 'detailed matters are to be determined by urban and Gun planning ordinances; provided that, where they are determined otherwise in another statute, the relevant statute shall apply.'[23] In other words, if a limit were to be set on the establishment of separation distances through an amendment of the 「Act on the Promotion of the Development, Use and Diffusion of New and Renewable Energy」, there would exist a legal room for improving the municipalities' separation distance regulations. Considering that, despite the presentation of the siting guidelines for solar PV power generation facilities by the Ministry of Trade, Industry and Energy in 2017, the guidelines were not actually accepted at a municipal level due to an insufficient binding legal force, when making improvements in the future, a direction that gives rise to binding legal force can be considered on a preferential basis.

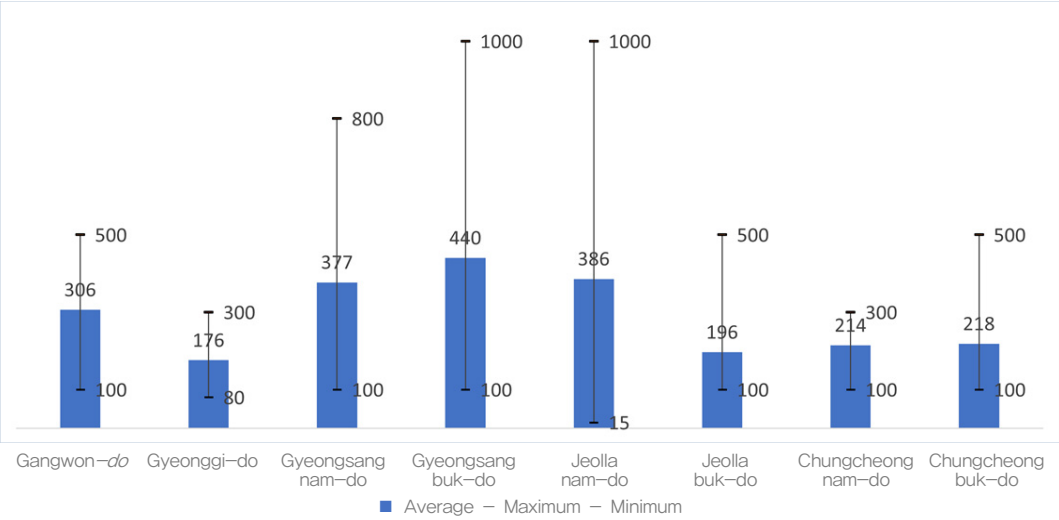
The second approach is to prepare draft standard municipal ordinances, at a central government department level, in relation to the regulation of separation distances. Rather than abolishing separation distances en bloc through an amendment of the law, creating draft standard municipal ordinances to induce participation of the municipalities, in order that the levels of acceptance by the municipalities may be increased, can also be a way forward. Of course, this measure may have a lower level of binding legal force compared to the first measure, but it can be a way to increase the levels of acceptance of solar PV power generation projects by the residents in rural areas, if only by a little.

Regulation of separation distances for solar PV is a product for which responsibility must be borne jointly by the structural issues with local governments, which would

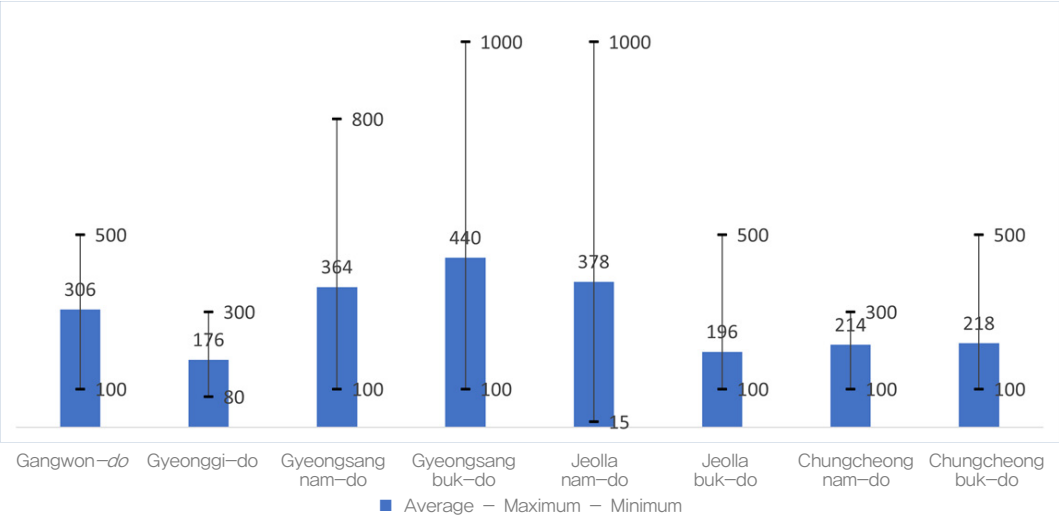
23) 「Enforcement Decree of the National Land Planning and Utilization Act」 [Attached Table 1-2] Standards for Permission for Development Activities, subparagraph 2 (a)(3) Detailed matters relating to the separation distance, height, layout, etc. of specific buildings or structures may be prescribed in urban and Gun planning ordinances; provided that, where matters relating to the separation distance, height, layout, etc. of specific buildings or structures are prescribed differently in another statute, that statute shall apply.

fundamentally and inevitably set minimization of complaints from the local residents as their priority, and central government departments, which, despite the policy direction of expanding 3020 renewable energy, practically neglected the regulation of separation distances. Even now, to resolve the issue of separation distance regulations that are being mass-produced in an indiscriminate manner, separation distances need to be restricted and abolished either through a modification of municipal ordinances via draft standard municipal ordinances, or through an amendment of the 「Act on the Promotion of the Development, Use and Diffusion of New and Renewable Energy」; the central government or regional governments should take action and establish restrictions on the municipalities' right to regulate separation distances

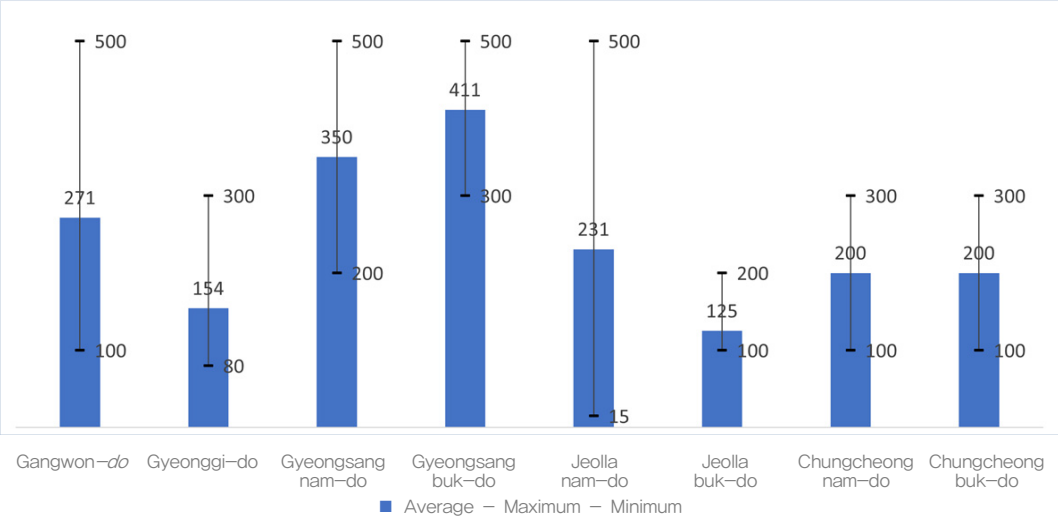
[Reference 1] Current Status of Separation Distances by Road and by Regional Government



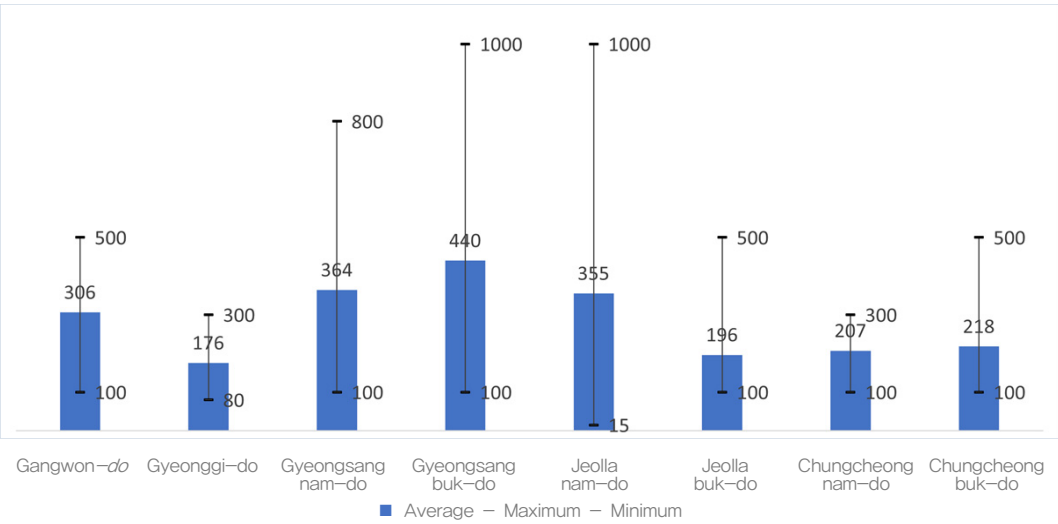
〈Figure 18 Current Status of Separation Distances Relating to Expressways〉



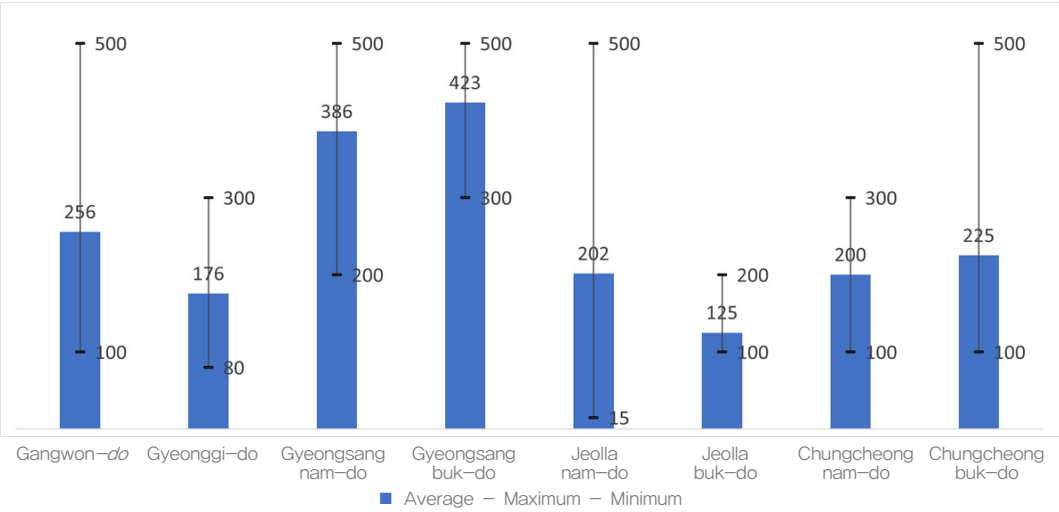
〈Figure 19 Current Status of Separation Distances Relating to General National Highways〉



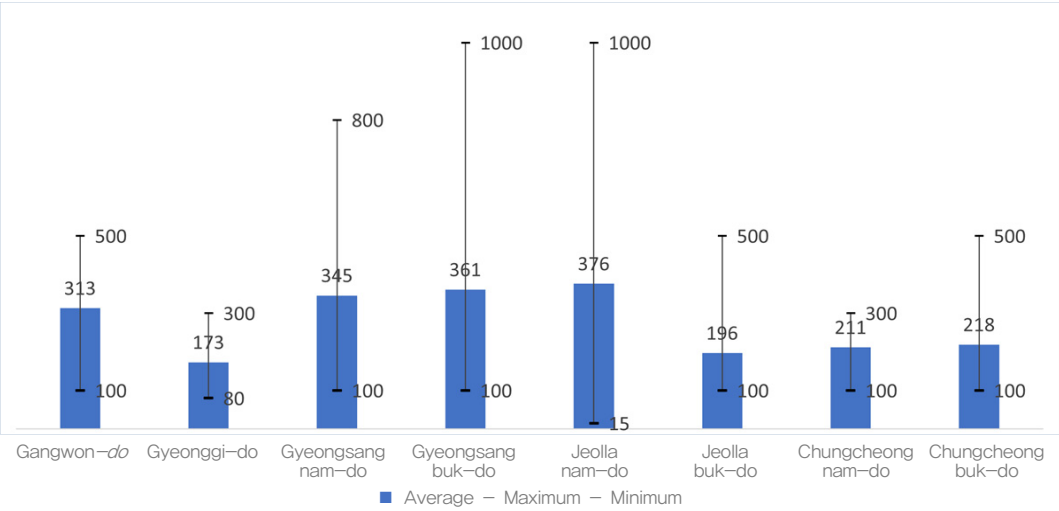
〈Figure 20. Current Status of Separation Distances Relating to Special Metropolitan City and Metropolitan City Roads〉



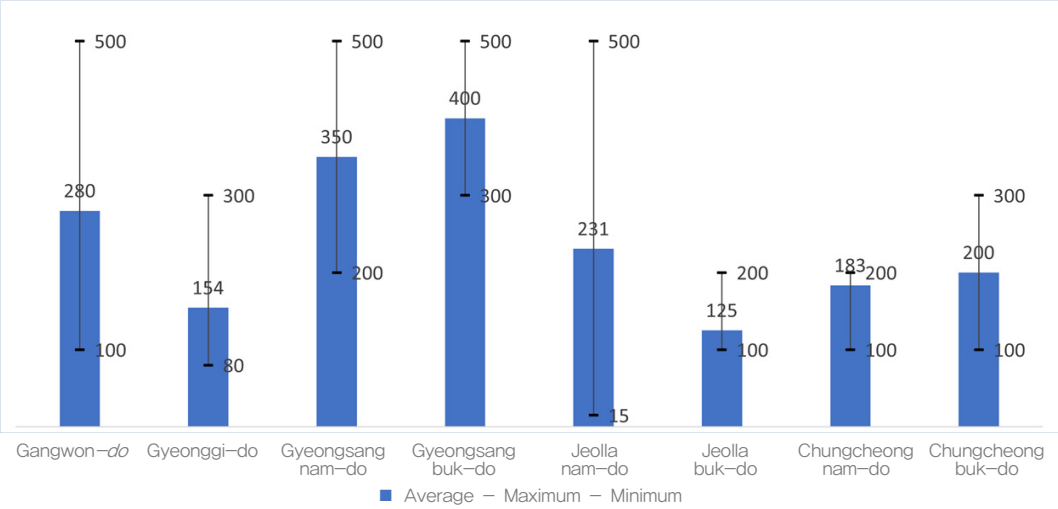
〈Figure 21. Current Status of Separation Distances Relating to Local highways〉



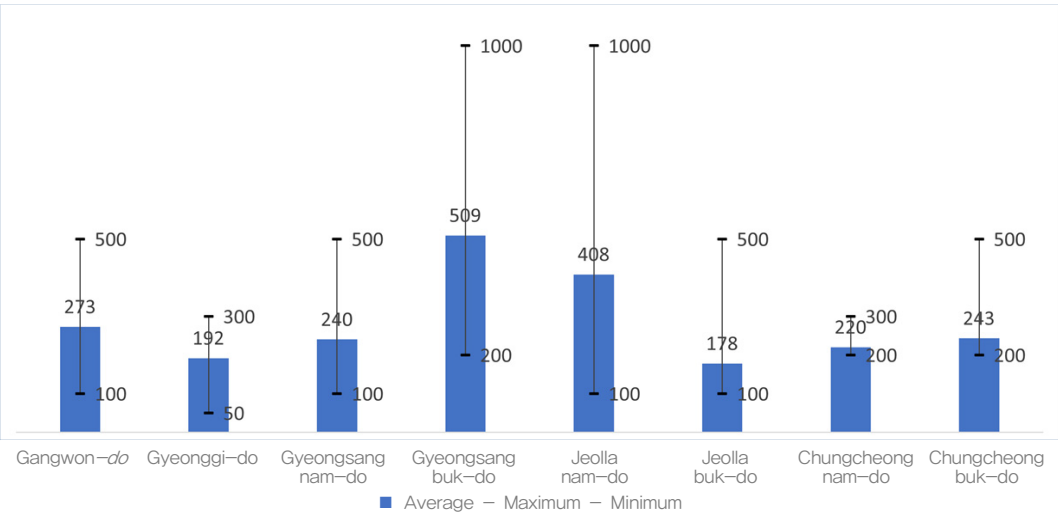
〈Figure 22. Current Status of Separation Distances Relating to Si Roads〉



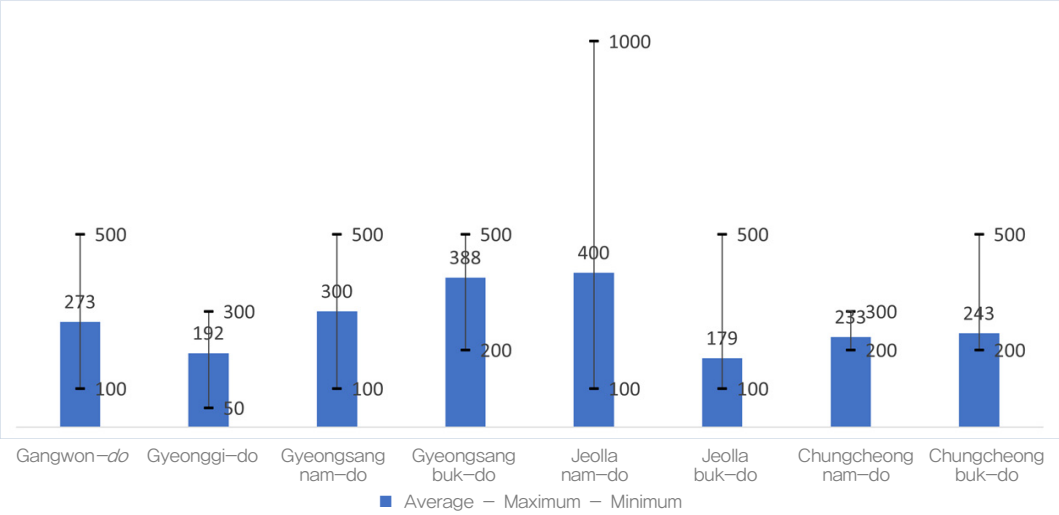
〈Figure 23. Current Status of Separation Distances Relating to Gun Roads〉



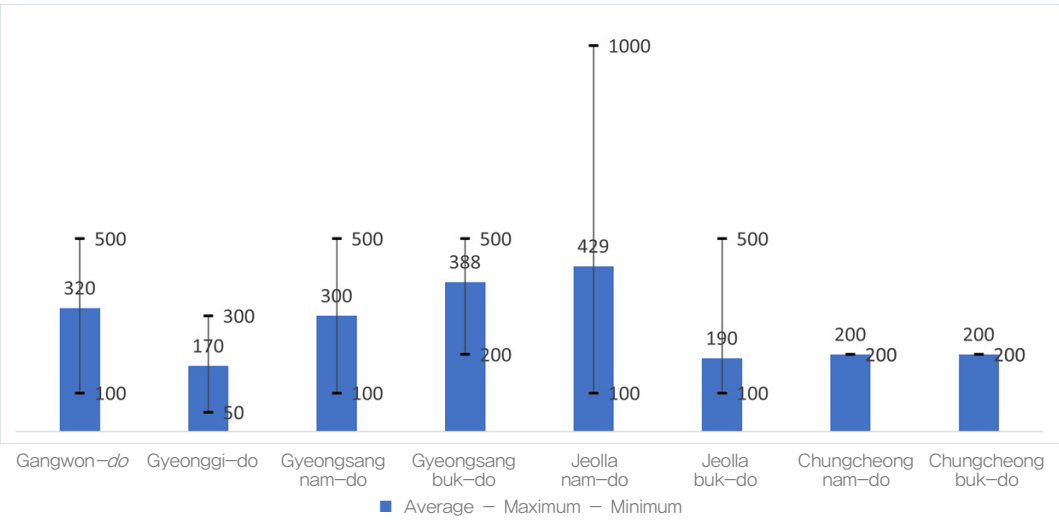
〈Figure 24. Current Status of Separation Distances Relating to Gu Roads〉



〈Figure 25. Current Status of Separation Distances Relating to Myeon Roads〉

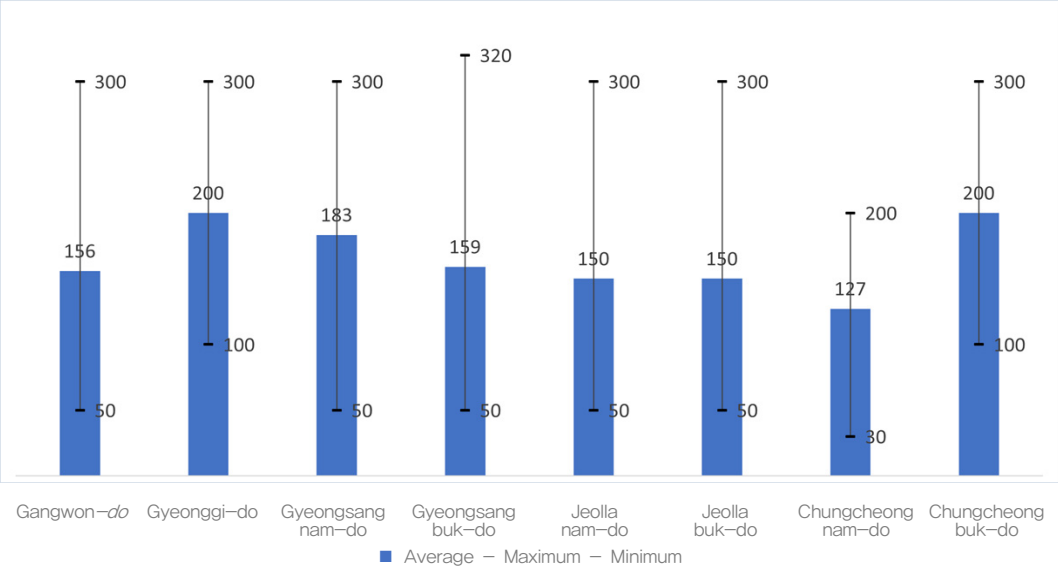


〈Figure 26. Current Status of Separation Distances Relating to Ri Roads〉

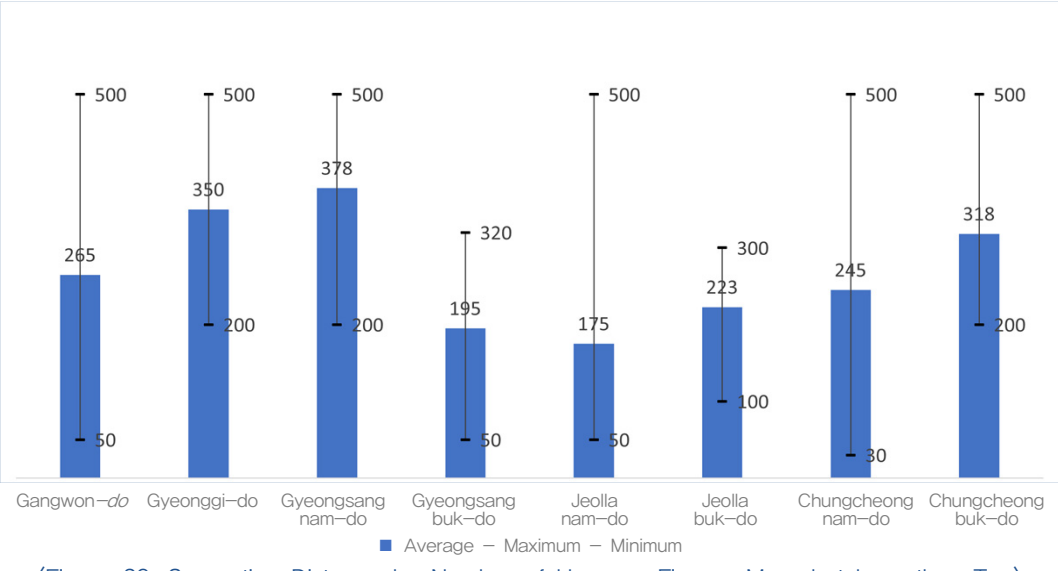


〈Figure 27. Current Status of Separation Distances Relating to Farm Roads〉

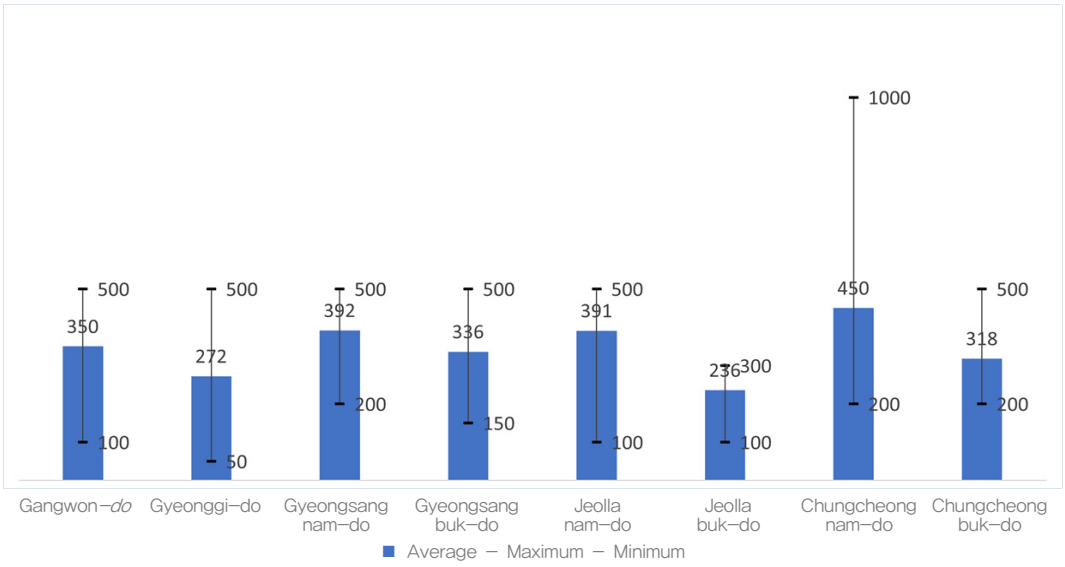
[Reference 2] Current Status of Separation Distances by Housing and by Regional Government



〈Figure 28. Separation Distance by Number of Houses: Less than Five〉

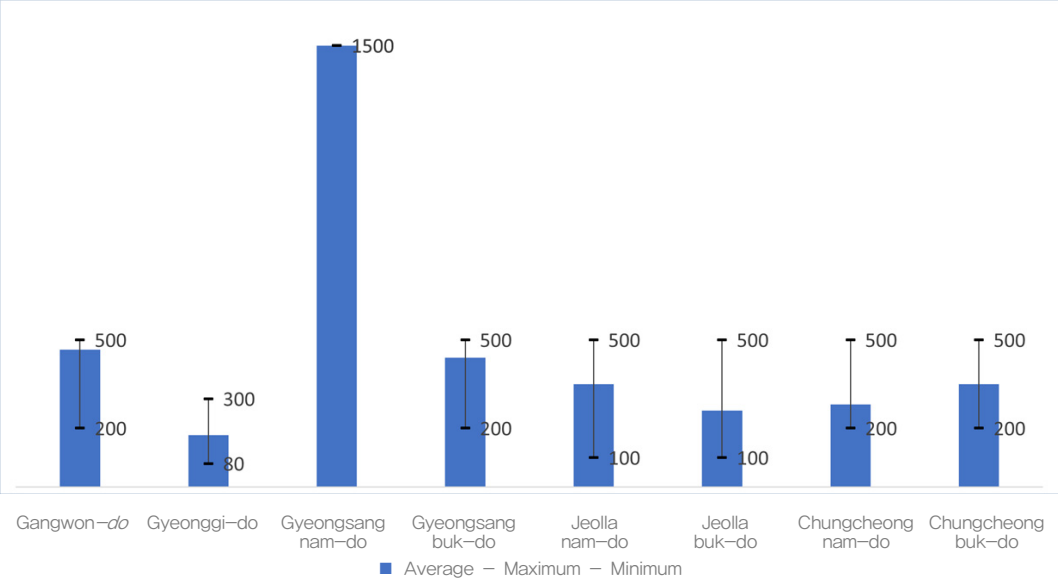


〈Figure 29. Separation Distance by Number of Houses: Five or More but Less than Ten〉

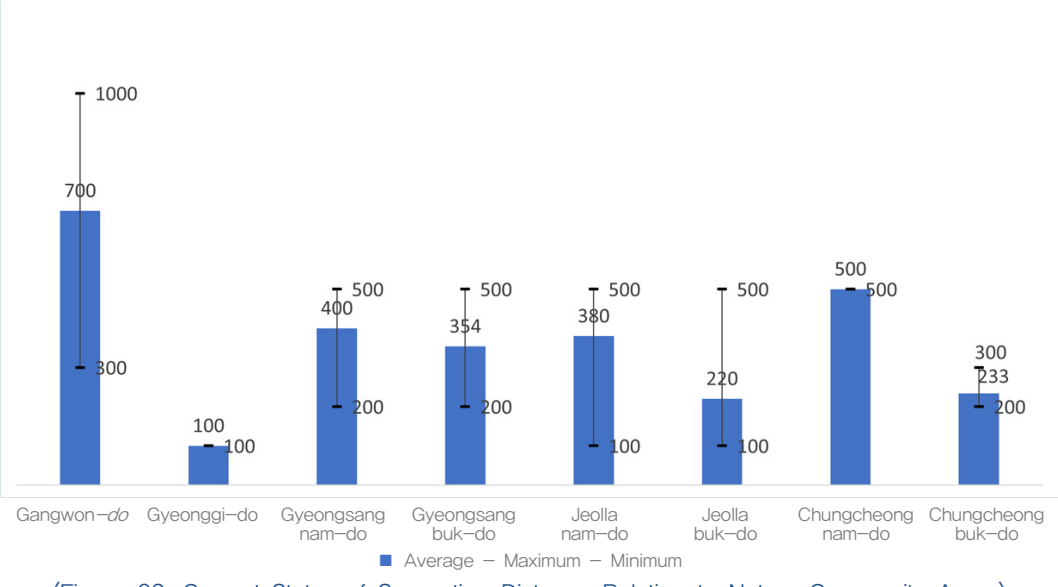


〈Figure 30. Separation Distance by Number of Houses: Ten or More〉

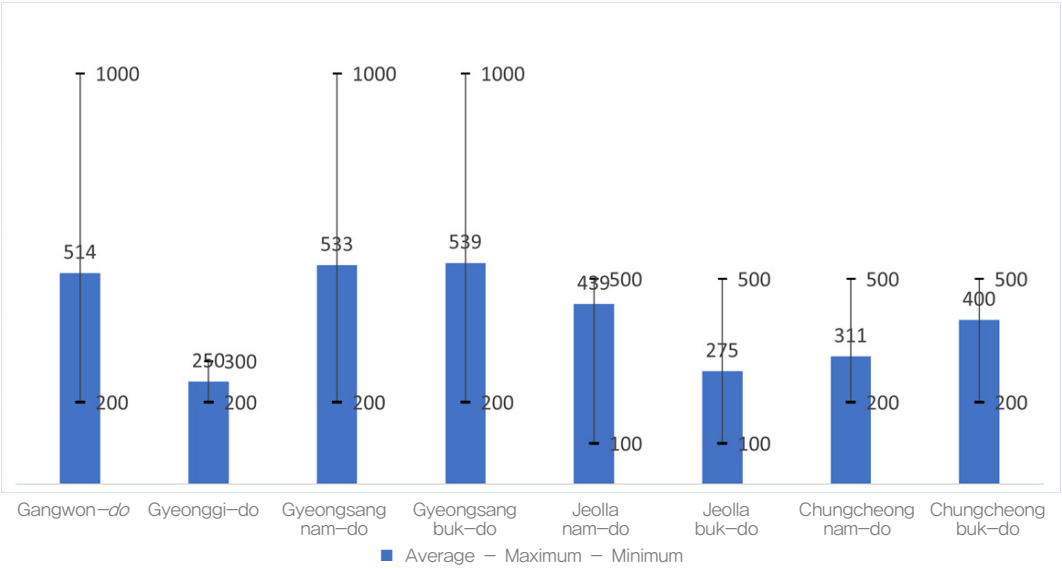
[Reference 3] Current Status of Other Separation Distances by Regional Government



〈Figure 31. Current Status of Separation Distances Relating to Cultural Heritages〉



〈Figure 32. Current Status of Separation Distance Relating to Nature Community Areas〉



〈Figure 33. Current Status of Separation Distance Relating to Tourist Attractions/Tourist Complexes〉

Solutions for Our Climate (SFOC) is
a non-profit corporation based in Korea established
in 2016 in order to advocate for stronger climate and air policies.
SFOC is led by legal, economic, financial, and environmental experts
with experience in energy and climate policy and works closely
with domestic and overseas nonprofit organizations.

www.forourclimate.org

SFO°C
Solutions for Our Climate