



Unlocking Agrivoltaics:

Extending the Temporary Non-Agricultural
Use Permission Period for Farmland

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Author **Daun Kim** | Renewable Energy Permitting Policy Analyst, SFOC

Design **Julissa Urena** | Designer, SFOC

Solutions for Our Climate(SFOC) is an independent policy research and advocacy group that aims to make emissions trajectories across Asia compatible with the Paris Agreement 1.5°C warming target.

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| Introduction

Korea's rural communities face several structural challenges: a rapidly aging farm population, heightened crop price volatility, and stagnant farm income. Farm household income, for example, has remained only slightly above KRW 10 million for more than three decades.¹ For tenant rice farmers, the situation is even more precarious as agricultural revenue leaves little margin after covering production costs and lease payments. Agrivoltaics has gained attention as one possible solution to support rural communities by providing farm households with a long-term, stable revenue source. It can also contribute to climate mitigation and energy security.

However, these benefits cannot be fully realized without secure long-term operation. Under the current Farmland Act, temporary use permission for farmland (hereinafter "temporary use permission") is capped at eight years, making it virtually impossible to recover initial investment, let alone generate meaningful profit. As a result, the widespread deployment of agrivoltaic systems remains limited despite their considerable economic and environmental potential.

Against this backdrop, this paper examines the structure of Korea's temporary use permission system and proposes policy measures to support the wider adoption of agrivoltaics.

Status of domestic agrivoltaics deployment

As of March 2026,¹ Korea had 103 agrivoltaic installations nationwide, including systems that were later dismantled after installation. By capacity, 52 installations were below 50 kW, 39 were between 50 kW and 100 kW, and 12 were 100 kW or larger. Most installations therefore remain small-scale, with an average installed capacity of 74 kW [see Table 1].

[Table 1] Agrivoltaic installations by capacity

Installed capacity	Below 50 kW	50-100 kW	100 kW or larger
No. of installations	52	39	12

By region, South Jeolla Province recorded the highest number of installations with 29 projects, supported by abundant sunlight, available land, and a large farming population. It was followed by North Chungcheong Province with 14 installations, North Gyeongsang Province with 12, and Gyeonggi Province with 11 [see Table 2].

[Table 2] Agrivoltaic installations by region

Region	No. of installations
South Jeolla	29
North Chungcheong	14
North Gyeongsang	12
Gyeonggi	11
South Gyeongsang	10
North Jeolla	10
Gangwon	6
South Chungcheong	4
Ulsan	3
Gwangju	2
Incheon	1
Jeju	1

¹ Source: Data provided by the Office of Rep. Miae Lim, as of March 18, 2026.

Most of the existing deployments are public-led demonstrations and pilot projects, rather than commercially oriented implementations. Their primary purpose is to test and assess how different photovoltaic modules and support structures affect power generation and crop growth. Most operators are public agencies and research institutes in the agriculture and energy sectors, although some private companies are also running demonstrations to enter the agrivoltaics market [see Table 3].

[Table 3] Agrivoltaics demonstrations and pilot projects by implementing agency

Implementing agency	Energy institute	Agricultural institute	Private company	University	Others
No. of operators	48	26	17	11	1

Rice, which accounts for the largest share of Korea's staple crop production, is the most common crop used in agrivoltaic demonstrations. Other crops include beans, garlic, potatoes, sweet potatoes, and corn. Sun-loving crops, which typically require abundant sunlight for growth and photosynthesis, tend to show lower yields under agrivoltaic systems than under conventional open-field cultivation. Reported yield reductions are approximately 15.7% for rice, 22% for potatoes, and 16.4% for beans. For corn, the change is negligible, at around 1%. By contrast, shade-tolerant crops may in fact benefit from the partial shading provided by agrivoltaic systems, showing higher yields compared to conventional open-field cultivation. Compared with non-agrivoltaic cultivation, yields increased by approximately 13.2% for tea plants and 8.1% for barley, which can tolerate shaded conditions [see Table 4].

[Table 4] Agrivoltaic demonstrations by crop type and yield change²

Crop type	Rice	Beans	Red beans	Cabbage	Garlic	Grapes	Potatoes	Rye	Pear	Corn	Green onion	Tea	Barley
No. of installations	18	5	1	2	5	3	2	1	1	2	1	1	1
Yield change (%)	-15.7	-16.4	-10.4	-17.7	-22.4	-24.0	-16.0	-8.3	-6.7	-1.0	-9.7	+13.2	+8.1

² Source: Data provided by the Office of Rep. Miae Lim, as of March 17, 2026.

| The need for agrivoltaics

Agrivoltaics enables the dual use of farmland for farm production and power generation by installing solar panels above crops. It has attracted attention as a new pathway for the energy transition while providing farm households with a more stable source of revenue that can help offset income variability caused by yield and price volatility.

A supplementary revenue source with stable cash flow

For agrivoltaics to be economically viable, it must do more than generate power revenue and recover the initial investment. The revenue it generates must also be sufficient to offset the reduction in agricultural income caused by the installation of solar facilities and cover additional costs such as the farmer's labor and time, land lease payments, and future decommissioning costs, while still providing a meaningful and stable non-agricultural profit. This requires that revenue from electricity sales, after covering operating expenses and debt service, translate into a noticeable increase in net profit. Only when farm households can reliably expect such income growth will more of them be willing to bear the upfront investment costs and risks associated with output and interest rate fluctuations.

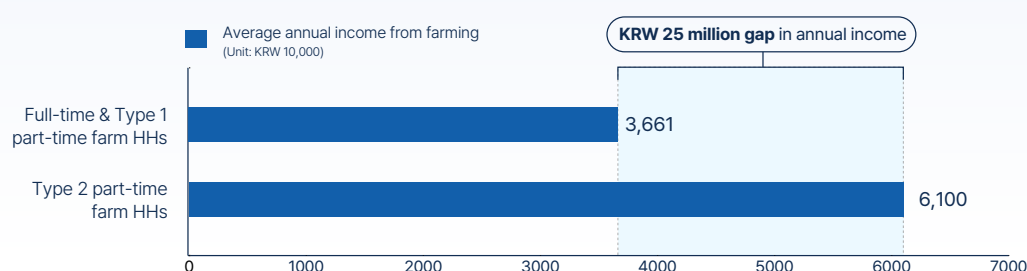
To assess the profitability of agrivoltaic generation after operating expenses and financing costs, this paper conducted a simulation of a 500 kW agrivoltaic system installed on one hectare of rice paddy and operated over a 23-year period [see Appendix 1]. The model assumes that 80% of the initial investment is financed through loans, with repayment made over the same period.

In the base case, the project is estimated to generate approximately KRW 34 million in annual non-agricultural profit, even after accounting for a partial decline in agricultural revenue. The revenue from energy production is high enough to fully offset the reduction in farm production and agricultural income caused by agrivoltaic installation.

In the tenant farmer case, annual non-agricultural profit is projected to reach approximately KRW 30 million. Given that some tenant rice farmers can barely cover lease payments with agricultural revenue alone, this result indicates that income from agrivoltaic power generation could more than offset lease payments,ⁱⁱ even after accounting for lower agricultural revenue caused by reduced crop yields.ⁱⁱⁱ

The simulation further indicates that income gains from agrivoltaics could exceed those from additional off-farm work. For example, rice farming households that do not engage in off-farm work,³ or whose primary income source remains agriculture,⁴ earn an average annual income of KRW 36.61 million. By contrast, farm households whose primary income source is non-agricultural earn an average of KRW 61 million,^{iv} or approximately KRW 25 million more [see Figure 1]. Against this benchmark, the projected profit from agrivoltaic power generation indicates that for some farm households, deploying agrivoltaics could provide greater economic benefits than taking on off-farm work.

[Figure 1] The income gap among rice farming households



A new pathway for the energy transition

Energy transition is essential for reducing greenhouse gas emissions from fossil fuel-based power generation. Korea imports 93.7% of its fossil fuels,^v including oil, natural gas, and coal. Expanding renewable energy is therefore important not only for cutting emissions, but also for reducing this dependence and strengthening the country's energy security.

Solar power offers key advantages for renewable energy expansion, including shorter construction periods compared to other energy sources and the flexibility to be installed in diverse settings such as rooftops, floating structures, and carports. These advantages can partly help Korea overcome the shortage of suitable sites for renewable power generation,

3 Full-time farm household: A farm household with no family member engaged in off-farm work for 30 days or more per year.

4 Part-time farm household: A farm household with one or more family members engaged in off-farm work for 30 days or more per year.

- Type 1 part-time farm household: A part-time farm household whose primary income source remains agriculture.
- Type 2 part-time farm household: a part-time farm household whose primary income source is non-agricultural.

enabling faster deployment across a wider range of locations. Agrivoltaics is particularly useful since solar energy can be deployed while keeping farmland in production, allowing more efficient use of limited land.

As of 2025, Korea had approximately 1.56 million hectares of agricultural land, accounting for about 15% of its total land area. Given that roughly 70% of the country is mountainous, farmland itself represents significant potential for renewable energy deployment. Deploying agrivoltaics on even 5% of this land – approximately 78,000 hectares – would be sufficient to secure 15 GW of installed capacity. Considering that Korea has added about 3 GW of solar capacity per year on average, agrivoltaics could significantly scale renewable energy deployment.

Shortcomings of the temporary non-agricultural use permission system

Because agrivoltaics involves using farmland simultaneously for agricultural and non-agricultural purposes, any agrivoltaic installation requires temporary use permission. Article 36(1) of the Farmland Act defines the scope of allowed non-agricultural uses, while its Enforcement Decree sets out the permitted time periods for granting and extending such permission for each use.

Under the current legal framework, however, agrivoltaics is not listed as a non-agricultural use eligible for temporary use permission, and the Enforcement Decree therefore contains no separate provision governing the permitted duration for agrivoltaic installations. As a result, agrivoltaic systems installed on farmland are subject to the general rules: under Article 38(1)(c) of the Enforcement Decree, permission may be granted for up to five years, and under Article 38(2)(d), it may be extended once for an additional three years, resulting in a maximum permission period of eight years.



Source: Enforcement Decree of the Farmland Act, Article 38 (Permission and reporting periods for temporary use of farmland for non-agricultural purposes)^{vi}

Paragraph 1 For permission, consultation, or reporting under Articles 36(1), 36(2), 36-2(1), and 36-2(2) of the Farmland Act, the period for temporary use of farmland for non-agricultural purposes shall be as follows:

Subparagraph 1 In cases of permission or consultation under Article 36(1) of the Farmland Act:

Item (c) Permission may be granted for up to five years, except in the cases specified in Items (a) and (b).

Paragraph 2 For permission granted under Paragraph 1, except in the cases specified in Subparagraph 3, the head of the relevant local government—namely, the head of a Si, Gun, or autonomous Gu—may extend the permission period before it expires, as follows:

Item (d) Permission may be extended for up to three years, except in the cases specified in Items (a) through (c).

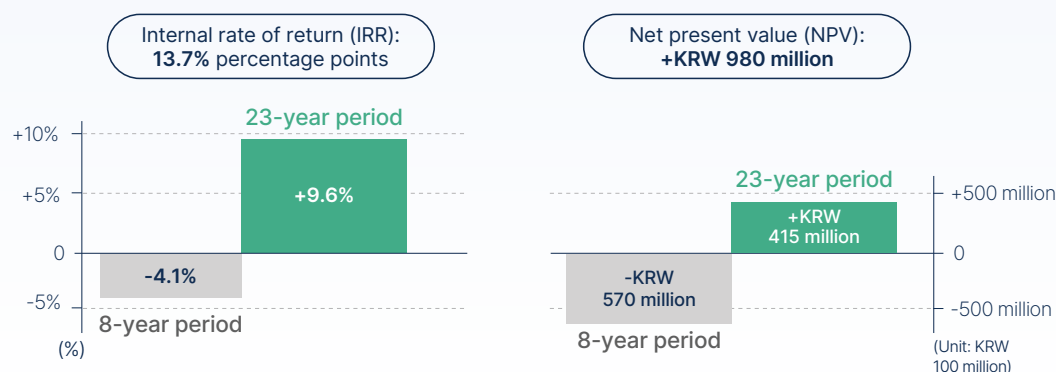
Despite agrivoltaics' potential as a supplementary income source for farm households and a driver of the energy transition, the institutional constraints of the current temporary use permission system essentially undermine its

profitability, discouraging farm households from adopting agrivoltaics in practice. Furthermore, solar modules and support structures cannot be used for their full service life, resulting in wasted resources and creating opportunity costs by forgoing renewable power generation over the remaining service life.

Barriers to financial viability

Solar power generation involves high upfront costs for support structures, solar modules, and electrical infrastructure. Stable long-term operation is therefore necessary to recover the initial investment and turn a profit. However, the current permission period for agrivoltaic installations falls short of the minimum period needed to ensure financial viability and sustained profitability. Given that recovering the initial investment capital alone typically takes eight to ten years, no meaningful profit can be expected within the maximum eight-year operating period. This is the key reason why agrivoltaics deployment has remained stagnant.

To assess how the permitted period affects agrivoltaic profitability, this paper examined how expected returns from a 1 MW agrivoltaic system change under different operating periods, with all other variables held constant. If operated for only eight years, the system is projected to generate an average annual return of negative 5%. By contrast, extending the operating period to 23 years would dramatically improve the average annual return to positive 9.6%. This contrast is also reflected in present-value terms. An eight-year operating period would generate approximately KRW 1.036 billion in total revenue, resulting in a net loss of approximately KRW 570 million after covering an upfront investment of KRW 1.625 billion. By contrast, a 23-year operating period would increase total revenue to KRW 2.06 billion, generating a net profit of approximately KRW 415 million (see Figure 2). These results suggest that agrivoltaic projects require at least 20 years of long-term operation to function as a stable revenue source that can supplement farm household income. Moreover, the net profit will accrue over a longer period with each additional permitted period beyond the current minimum, enhancing the overall financial viability of agrivoltaic deployment.

[Figure 2] Impact of operating period on agrivoltaic profitability⁵

Another factor to consider when extending the temporary use permission period to secure a longer operating timeline is the relationship between the power sales period and associated loan repayment structures. Financial institutions typically provide solar projects with 20-year loans, based on the assumption that stable revenue can be generated through long-term fixed contracts linked to system marginal prices (SMPs) and renewable energy certificates (RECs), or through long-term power purchase agreements (PPAs). A sufficiently long permission period is therefore essential for agrivoltaic operators to meet debt obligations and maintain stable cash flow even after covering debt servicing costs.

Lost opportunities for resource use and power generation

Farmland used under temporary use permission must be restored to its original condition upon expiry. This means that agrivoltaic facilities must also be dismantled at the end of the eight-year permission period, incurring decommissioning costs while the initial investment remains unrecovered.

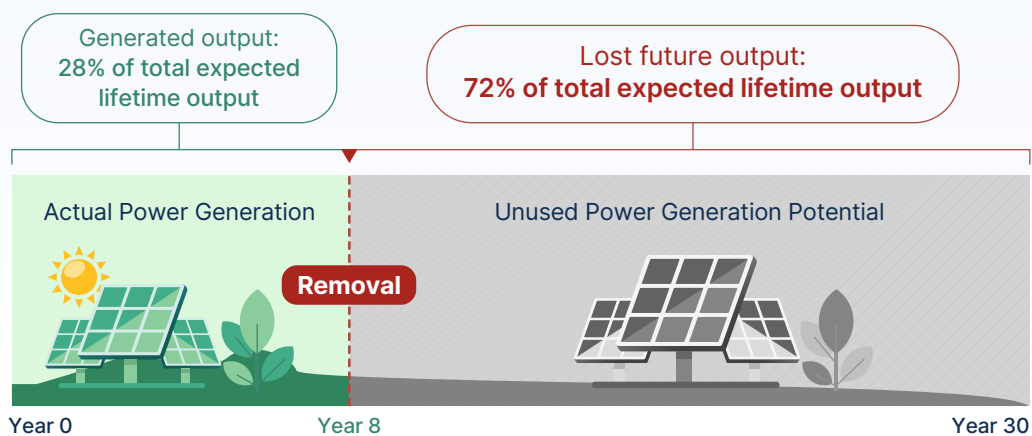
Solar modules typically have an expected service life of 25 to 30 years. Manufacturers generally provide performance warranties that last for 25 to 30 years, guaranteeing that modules will retain 80-90% of their original output over the warranty period (see Appendix 2). Even after the warranty expires, modules can continue to operate as long as they remain functional. However, if modules must be dismantled prematurely at the end of the eight-

⁵ For the assumptions underlying the viability assessment, see Appendix 1; for the definitions of IRR and NPV, see Appendix 4.

year permission period, approximately 60-74% of their expected service life will be left unused.

Limiting the operating period to eight years also creates lost opportunities in the form of lost output which could have been generated over the panels' remaining service life. An eight-year operation captures only about 28-41% of the expected lifetime output of solar modules [see Figure 3]. Considering the warranted service life of 25 to 30 years, if facilities are decommissioned after eight years, approximately 59-72% of potential future output would be lost, far exceeding the actual generated output.

[Figure 3] Potential output loss from eight-year operation



Of Korea's 103 agrivoltaic installations, 23 systems, representing 1.6 MW of capacity, are scheduled for phased dismantling from 2026, excluding exceptional cases where the land has been permanently converted from farmland to another use, or where installations were placed on miscellaneous land, a non-farmland category also eligible for conventional solar installation. Including the eight systems already decommissioned upon the expiry of their permissions, a total of 31 systems are expected to retire before the end of their expected 20- to 30-year service life [see Table 5]. This could strand approximately KRW 2.67 billion in unrecovered investment value⁶ and result

⁶ The residual value after eight years of depreciation is calculated, assuming KRW 1.65 billion in project costs per MW, allocated evenly over a 30-year period.

in the loss of approximately 59 TWh in potential future output.⁷

[Table 5] Agrivoltaic installations with temporary use permission

Installation year	2019	2020	2021	2022	2023	2024	2025	2026
No. of facilities	4	2	5	2	4	4	1	1
Total capacity (kW)	389	149	391	99	247	345	52	10

⁷ Assumes a 30-year operating period, 3.7 hours of daily generation in Year 1, and a 0.5 percentage-point annual decline in generation efficiency.

| Policy recommendations

Extending the temporary non-agricultural use permission period for agrivoltaics

For farm households to make an initial investment in agrivoltaic facilities, agrivoltaics itself must become a viable long-term revenue model. Extending the temporary use permission to at least 20 years is therefore a critical and urgent step toward enabling agrivoltaics to generate a stable, long-term revenue flow. This sustained profitability will provide farm households with a stable non-agricultural income. For some households that currently struggle to make ends meet with agricultural revenue alone, this supplementary income will provide the security needed for them to remain engaged in farming without feeling forced to abandon it due to financial reasons.

A minimum 20-year permission period is also necessary to prevent resource waste and serve the original purpose of agrivoltaics to enable farm production and renewable energy generation in tandem. The current legal framework that requires facilities to be dismantled after just eight years of operation is an inefficient system that hinders the wider deployment of agrivoltaics and only imposes unnecessary costs.

Extending the permission period would require one of the two legal pathways. First, the Farmland Act should be amended to expressly recognize agrivoltaics as a non-agricultural use eligible for temporary use permission, and its Enforcement Decree should be revised to provide a permission period of at least 20 years. The current legal framework does not include agrivoltaics as a non-agricultural use eligible for temporary use permission, capping the permission period at just eight years. Amending the Farmland Act and its Enforcement Decree to extend the permission period to at least 20 years will significantly enhance the financial viability of agrivoltaics. Second, the National Assembly can pass pending agrivoltaics bills to extend the temporary use permission period to at least 20 years for agrivoltaics on farmland outside Agricultural Promotion Area. All of the pending bills⁸ propose extending the permitted operating period of agrivoltaics or the temporary use permission period, ranging from 23 years under three bills to 30 years under six bills [\[see Appendix 3\]](#).

⁸ Figures are based on data available as of April 2026.

Support schemes for agrivoltaics deployment by the Ministry of Agriculture, Food and Rural Affairs

To lower barriers to entry and encourage more farm households to adopt agrivoltaics, support schemes should be provided, including training on agrivoltaics and practical assistance during the initial deployment phase. Technical training on the operating mechanisms of solar systems and key equipment can help farm households unfamiliar with solar power generation to engage in power production, while practical support for overall business operations can help them navigate complex revenue models and permitting procedures.

To reduce the upfront financial burden and unblock wider deployment, farm households could use local-government subsidies to cover their equity portion of the initial investment or take out public loans with reduced interest rates to lower overall financing costs. Where a local government is planning large-scale deployment, it could also coordinate cooperative procurement on behalf of individual households, thereby reducing overall installation costs.

Agrivoltaics can also serve as an incentive within broader rural revitalization initiatives to attract young farmers and new entrants from non-agricultural backgrounds. Beginning farmers need time to build agricultural expertise and establish sales channels for their produce. To help them in this early stage, local governments could develop agrivoltaic smart farms and lease them at affordable rates. The governments should also actively discover ways to link crops grown under agrivoltaic systems to local specialty product programs, helping turn them into high-value-added products.

| Conclusion

Agrivoltaics is an innovative solution that can simultaneously advance two national priorities: income support for farm households and climate action. Korea's farmland, which accounts for 15% of the total land area, holds significant potential for renewable energy adoption. Deploying agrivoltaics on even 5% of this land could provide approximately 15 GW of installed capacity.

However, the current eight-year permission period fundamentally undermines the economic viability of agrivoltaics. Given that recovering the initial investment alone takes eight to ten years, an eight-year permission period leaves no room for farm households to achieve any meaningful income gain. In addition, many facilities must be dismantled before their expected service life is fully utilized, leading to wasted resources and lost generation potential.

Unlocking the full potential of agrivoltaics therefore requires addressing the inefficiencies in the current legal framework. First, the temporary use permission period should be extended to at least 20 years, enabling farm households to secure a stable, long-term revenue source. Second, comprehensive support schemes are needed to lower practical barriers to entry for farm households, encompassing public financing programs to secure upfront investment, cooperative procurement led by local communities, and integrated incentive packages for young and beginning farmers.

Agrivoltaics should be designed not merely as a power production business to generate revenue, but as a system that supplements farm household income while contributing to the energy transition. If backed by concrete business models and appropriate policy support that can keep farm production up and running and contribute to food security, agrivoltaics can become both a new future for rural communities and a key driver of Korea's energy transition.

Appendices

[Appendix 1] Assumptions underlying the viability assessment

Category	Assumptions
Project expenses	- The costs of installing agrivoltaic panels and support structures are estimated at KRW 1.3–1.5 billion per MW, higher than that of conventional solar facilities. Total project expenses for agrivoltaics are estimated at KRW 1.65 billion per MW, including additional costs for grid connection and project development. - Dismantling costs at the end of the permitted operating period are estimated at KRW 114.2 million per MW.⁹
Operating expenses	Under a conservative estimate, annual operating expenses for agrivoltaic facilities are set at KRW 21.2 million per MW,¹⁰ similar to those for conventional solar facilities, even though actual expenses may vary across installed-capacity ranges.
Generation output	- Average daily generation is assumed to be 3.7 hours in Year 1. This is equivalent to an efficiency rate of 15%, which is assumed to decline by 0.5 percentage points each year thereafter. - All generated electricity is assumed to be sold.
Electricity sales	- Based on the maximum bids data in the first half of 2025 from Korea Energy Agency's New and Renewable Energy Center, the system marginal price (SMP) is capped at KRW 86.35 per kWh. The combined price of SMP and one renewable energy certificate (REC) is set at KRW 155.742 per kWh. - The REC weighting is set at 1.019, based on the weighting for conventional onshore solar power.
Financing	20% of the estimated project expenses is covered by the project operator's equity capital, while the remaining 80% is financed through loans. - The annual fixed interest rate is set at 5.9%, with repayment made in equal installments over the entire operating period, without payment deferral.

⁹ The estimated dismantling cost is based on the Korean Society for New and Renewable Energy's Study of Unit Cost Estimation for the Appropriate Treatment of End-of-life Photovoltaic (PV) Modules. The "C – Slope" scenario, which assumes a cost of KRW 1,142 per kg, is applied, reflecting the fact that agrivoltaic panels are typically installed on taller support structures and on agricultural land, unlike conventional solar panels.

¹⁰ The estimated operation and maintenance costs are based on the Korea Energy Economics Institute's study, Establishment and Operation of Long-Term LCOE Forecast System for Expansion of Renewable Energy (5/5), https://www.keei.re.kr/pdfOpen.es?bid=0001&list_no=124918&seq=1.

[Appendix 2] Warranty periods for agrivoltaic modules by manufacturer

Manufacturer	Product warranty (Warranty against manufacturing defects) (years)	Performance warranty (years)
Hanwha Qcells ¹¹	12	25
HD Hyundai Energy Solutions ¹²	12-15	30
Shinsung E&G ¹³	12	30

11 Source: Hanwha Qcells official website, <https://qcells.com/kr/faq?category=%EB%B3%B4%EC%A6%9D>

12 Source: HD Hyundai Energy Solutions official website, <https://www.hd-hyundaies.co.kr/business/module.do>

13 Source: Shinsung E&G official website, <https://www.shinsungeng.com/m31.php?tab=1>

[Appendix 3] Pending bills on agrivoltaic deployment as of April 28, 2026¹⁴

Bill sponsor	Eligible installation areas	Proposed operation and permission period (years)	Eligible project operators	Ongoing eligibility requirements
Rep. Miae Lim	Agricultural Promotion Area	30	Farmers and agricultural corporations, including both landowners and tenant farmers; and community-led cooperatives, including resident-led and local government-led cooperatives	Submit documentation on agricultural production and power generation after five years of operation
Rep. Wangjin Seo	Farmland outside Agricultural Promotion Area	30	Farmers and agricultural corporations, including both landowners and tenant farmers; and community-led cooperatives, including resident-led and local government-led cooperatives	Every three years, submit records demonstrating continued eligibility as a farmer or agricultural corporation
Rep. Joonbyeong Yoon	Farmland outside Agricultural Promotion Area; for community-led cooperatives, farmland and reclaimed land within Agricultural Promotion Area are also eligible	30	Farmers; agricultural corporations, including both landowners and tenants; and community-led cooperatives, including resident-led and local government-led cooperatives	Every two years, submit records demonstrating continued eligibility as a farmer or agricultural corporation.
Rep. Chulhyun Joo	Agricultural Promotion Area, eligible only for community-led projects	30	Farmers; agricultural corporations, including both landowners and tenants; and community-led cooperatives, including resident-led and local government-led cooperatives	Every three years, submit records demonstrating continued eligibility as a farmer or agricultural corporation
Rep. Hyungbae Min	Farmland cultivated with crops or perennial plants for at least three years under Article 2(1) of the Farmland Act	23	Farmers, including both landowners and tenant farmers; and community-led cooperatives, including resident-led and local government-led cooperatives	Every three years, submit records demonstrating continued eligibility as a farmer
Rep. Geumju Mun	Farmland outside Agricultural Promotion Area; Agricultural Promotion Area can be included only for energy clusters located in population-declining areas	30	Farmers residing in or near solar facilities; and agricultural corporations, cooperatives, and community-led cooperatives that include such farmers	Every three years, submit records demonstrating continued eligibility as a farmer
Rep. Sunghwan Kim	Agricultural Promotion Area	30	Farmers; agricultural corporations, including both landowners and tenants; and community-led cooperatives, including resident-led and local government-led cooperatives	Every three years, submit records demonstrating continued eligibility as a farmer or agricultural corporation
Rep. Sohee Kim	Farmland outside Agricultural Promotion Area	23	Farmers, limited to landowners; and community-led cooperatives, including resident-led and local government-led cooperatives	Every three years, submit records demonstrating continued eligibility as a farmer
Rep. Seonggon Wi	Farmland outside Agricultural Promotion Area	23	Farmers residing in or near solar facilities; and agricultural corporations established by such farmers	-

14 Source: Bill Information official website, <https://likms.assembly.go.kr/bill/>

[Appendix 4] Definitions of internal rate of return and net present value**Internal rate of return (IRR)**

- Internal rate of return (IRR) measures the expected profitability of an investment over time, by accounting for all cash inflows and outflows generated over the project's life. Technically, IRR is the discount rate at which a project's net present value (NPV) equals zero. It is commonly used to estimate the compound annual rate of return on an investment.
- IRR can capture a project's inherent profitability based on its expected operating profits and initial investment, excluding financing structures such as borrowings.
- A higher IRR generally indicates a more profitable investment, allowing investors to compare and rank different opportunities.

Net present value (NPV)

$$NPV = \sum_{t=1}^n \frac{CF_t}{(1+r)^t} - C_0$$

- Where:
 - n = project period
 - r = discount rate
 - CF_t = net cash flow in year t
 - C_0 = upfront investment
- Net present value (NPV) measures the value of an investment in today's money by subtracting the initial investment from the present value of expected future net cash flows.
- NPV accounts for the time value of money, offering a key benchmark to assess investment feasibility. A positive NPV means the investment is expected to create value, while a negative NPV means it is expected to fall short of the required return.

References

- i “Agriculture becoming a money pit with agricultural income stuck at KRW 1M for three decades,” Nongupin Newspaper, January 26, 2024, <https://www.nongupin.co.kr/news/articleView.html?idxno=100975>
- ii Korea Rural Community Corporation, 2024 Survey on Farmland Leases, Farmland Portal System, February 9, 2026, <https://njy.mafra.go.kr/nnjy/main/board/pdsDetail.do?boardId=3686>
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- v “Key Energy Statistics: Energy Import Dependence,” Energy GHG Total Information Platform Service (EG-TIPS), accessed April 22, 2026, https://tips.energy.or.kr/statistics/statistics_view0210.do
- vi Enforcement Decree of the Farmland Act, Korean Law Information Center, accessed February 5, 2026, <https://www.law.go.kr/법령/농지법시행령>

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