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Principles for Developing the Content of Environmental Impact Assessment Reports for Solar Power Projects in Vietnam and Recommendations for Improving the Law

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Abstract: Developing the content of an environmental impact assessment report is a complex activity that cannot be performed as a formality, because the report is the informational and legal basis on which competent state authorities decide whether a solar power project may proceed. This article clarifies the concept of solar power projects, identifies three principles that should govern the content of environmental impact assessment reports for such projects in Vietnam, and examines how the Law on Environmental Protection 2020, as most recently amended by Law No. 146/2025/QH15, and its implementing instruments regulate that content. Using legal analysis, synthesis, statistical description and comparative law, the article finds that the statutory content of the report is uniform for all investment projects and does not distinguish projects that discharge practically no waste during operation, such as solar power, from projects with a high risk of pollution; that the report does not disclose the budget for conducting the assessment; and that it does not address compensation, support, resettlement and livelihood restoration beyond the identification of impacts. Drawing on specific provisions of European Union, Japanese, Chinese and Indian law, the article proposes targeted amendments to Articles 32 and 33 of the Law on Environmental Protection and to the related implementing instruments: a differentiated content standard for solar power projects, a mandatory budget estimate with a minimum budget ratio, and an integrated compensation and livelihood restoration component.

Keywords: content of the report; environmental impact assessment report; solar power project; principles; Law on Environmental Protection; Vietnam.

1. Introduction

The content of an environmental impact assessment report is the principal source of information on which competent state authorities rely when deciding whether an investment project, including a solar power project, may be implemented and under which environmental conditions; its development is therefore a complex activity that cannot be carried out as a mere formality. When the content of the report for a solar power project is developed in compliance with sound principles, it raises the effectiveness of environmental impact assessment for investment projects and confirms the significance of environmental impact assessment as a management instrument of the State. Under the Law on Environmental Protection 2020, the provisions governing the content of the report took a substantial step forward in identifying the matters that must be presented for investment projects. Building on earlier legislation, the current provisions require content that is more comprehensive, complete and detailed. They are intended not only to secure the principles that govern the development of the report but also to clarify how a project affects each component of the environment, so that the report reflects the requirements of environmental protection together with the requirements of socio-economic development.

The question is of practical urgency for solar power. Within a few years the installed solar capacity of Vietnam rose from about 0.11 gigawatts at the end of 2018 to 16.66 gigawatts at the end of 2020 and 19.25 gigawatts at the end of 2025, while the revised National Power Development Plan sets a target of 46,459 to 73,416 megawatts of solar power by 2030.[1] Ground-mounted solar farms of this scale occupy tens or hundreds of hectares each, frequently on agricultural land, on water surfaces or on land subject to other planning. The content of the environmental impact assessment report is therefore the point at which the land, ecological and livelihood consequences of the energy transition are either identified and addressed or overlooked.

The legal framework has also changed considerably. Law No. 146/2025/QH15, which took effect on 1 January 2026, amended Articles 28, 30, 31, 34 and 35 of the Law on Environmental Protection; Decree No. 48/2026/ND-CP and Circular No. 09/2026/TT-BNNMT, both effective from 29 January 2026, revised the implementing instruments; and a comprehensive bill amending the Law on Environmental Protection, which

[1]International Renewable Energy Agency, *Renewable Capacity Statistics 2025* (Abu Dhabi, March 2025) and *Renewable Capacity Statistics 2026* (Abu Dhabi, March 2026); Prime Minister, Decision No. 768/QD-TTg of 15 April 2025 approving the adjustment of the National Power Development Plan for the period 2021–2030, with a vision to 2050.

would narrow the scope of environmental impact assessment and simplify the content and appraisal of reports, was presented to the National Assembly on 24 October 2026.[2] Article 32, which lists the content of the report, has nevertheless remained unchanged. The present legislative cycle is therefore the appropriate moment to examine whether that content suits solar power projects.

This article addresses three questions. First, which principles should govern the development of the content of environmental impact assessment reports for solar power projects? Second, how do current law and its implementation give effect to those principles, and where do they fall short? Third, which specific provisions should be amended, and in what direction, so that the content of the report reflects the characteristics of solar power projects? The article uses legal analysis and synthesis to examine the Law on Environmental Protection and its implementing instruments, statistical description to systematise practical data, and comparative legal analysis of selected provisions of European Union, Japanese, Chinese and Indian law. The comparison does not seek to transplant foreign models mechanically; it identifies specific legislative solutions whose design is compatible with the legal system of Vietnam and with international practice. Section 2 sets out the concept of solar power projects and the principles governing the content of the report, Section 3 examines current law and its implementation, Section 4 presents the recommendations, and Section 5 concludes.

2. Overview of Solar Power Projects and Principles for Developing the Content of Environmental Impact Assessment Reports for Solar Power Projects in Vietnam

2.1. The concept of solar power and solar power projects

Many concepts of solar power have been proposed, and most of them approach solar power as a component of renewable energy. Concepts of renewable energy typically describe the objective natural characteristics and the technical operation of renewable energy and treat solar power as one of its parts. The United Nations explains that renewable energy derives from natural sources that are replenished at a higher rate than they are consumed, citing sunlight and wind as sources that are constantly renewed and plentiful around us, and it identifies solar energy as the most abundant of all energy resources, which can be harnessed even in cloudy weather.[3] Hayat and his co-authors regard the sun as an inexhaustible source of energy capable of meeting all the energy needs of humankind; solar energy may be converted into electricity or used directly, electricity being generated either directly through photovoltaic cells or indirectly through concentrating solar power technology, and the authors expect solar energy to develop strongly owing to technological progress and its environmentally friendly nature.[4] Ellabban, Abu-Rub and Blaabjerg adopt an enumerative concept: renewable energy is energy continuously replenished by nature that originates directly from the sun (as thermal, photochemical and photoelectric energy), indirectly from the sun (as wind, hydropower and the photosynthetic energy stored in biomass) or from other natural movements and mechanisms of the environment (such as geothermal and tidal energy); this concept reveals the common origin of the various forms of renewable energy.[5] In her doctoral dissertation at the University of Kentucky, Davis describes renewable energy as energy that is generated from nature and replenished from natural resources, such as solar and wind energy, and explains that solar photovoltaics convert sunlight into electricity, usually through solar panels, whereas concentrating solar power uses mirrors to reflect sunlight, which is then captured and converted into heat used to generate electricity.[6] From a technical perspective, Hoang Thi Xuan, in her doctoral thesis in economics at the Graduate Academy of Social Sciences, defines solar energy as the radiant energy and heat produced by the sun in the form of electrical or thermal energy, obtained by capturing solar radiation and converting it into heat, electricity

[2]National Assembly, Law No. 146/2025/QH15 of 11 December 2025 amending and supplementing a number of articles of fifteen laws in the field of agriculture and environment (effective 1 January 2026), Article 1; Government, Decree No. 48/2026/ND-CP of 29 January 2026; Minister of Agriculture and Environment, Circular No. 09/2026/TT-BNNMT of 29 January 2026; "Narrowing the scope of environmental impact assessment while strictly controlling large emission sources", *Dai bieu Nhan dan Newspaper*, 22 September 2026; "Stronger decentralisation, tighter environmental control", *Dai bieu Nhan dan Newspaper*, report on the plenary session of 24 October 2026.

[3]United Nations, "What is renewable energy?", United Nations Climate Action, https://www.un.org/en/climatechange/what-is-renewable-energy (accessed 1 June 2024).

[4]Muhammad Badar Hayat, Danish Ali, Keitumetse Cathrine Monyake, Lana Alagha and Niaz Ahmed, "Solar energy—A look into power generation, challenges, and a solar-powered future" (2019) 43(3) *International Journal of Energy Research* 1049–1067.

[5]Omar Ellabban, Haitham Abu-Rub and Frede Blaabjerg, "Renewable energy resources: Current status, future prospects and their enabling technology" (2014) 39 *Renewable and Sustainable Energy Reviews* 748–764.

[6]Whitney Michelle Davis, *The Decision to Decentralize Good Provision in the United States: A Study in Clean Energy Policy* (Doctoral dissertation, University of Kentucky, 2019).

or hot water, most commonly through photovoltaic systems in which solar panels collect sunlight and convert it directly into electricity.[7]

These concepts share three common positions. *In the first place,* solar power is a clean form of energy of natural origin that does not cause environmental degradation or pollution and may therefore be regarded as environmentally friendly. *In the second place,* it is regularly renewable and suitable for use by many countries pursuing the goal of sustainable development. *In the third place,* current concepts of renewable energy treat solar power as one of the forms of renewable energy; technically, solar power comprises electricity generated from solar radiation (light energy) or from solar heat (thermal energy).

Vietnamese law now provides a legal basis for these concepts. The Law on Electricity 2024 defines renewable energy electricity as electricity produced from renewable energy sources, expressly including solar energy (Article 4, clause 14), and contains a separate provision on the dismantling of works belonging to renewable energy and new energy power projects (Article 25); Decree No. 58/2025/ND-CP, as amended by Decree No. 243/2026/ND-CP, defines rooftop solar power as electricity produced by photovoltaic panels installed on the roofs of construction works. On this basis, a solar power project may be understood as an electricity investment project that converts solar radiation into electricity through photovoltaic or concentrating technology for supply to the national power system or for self-consumption. For the purposes of environmental impact assessment, the decisive feature of such projects is not their emissions during operation, which are negligible, but the large area of land or water surface that they occupy: the revised National Power Development Plan estimates the technical solar potential of Vietnam at about 963,000 megawatts, of which 837,400 megawatts is ground-mounted, 77,400 megawatts is on water surfaces and 48,200 megawatts is on rooftops.[8]

2.2. The law on environmental impact assessment for solar power projects

Vietnamese law on environmental impact assessment for investment projects, including solar power projects, is an important part of environmental protection law. It is built on theoretical foundations and practical requirements so as to promote its role, significance and effectiveness, contributing to economic development while meeting the requirements of environmental protection, and it operates today as a constituent part of environmental protection law. The Law on Environmental Protection No. 72/2020/QH14, as amended by Laws No. 11/2022/QH15, No. 16/2023/QH15, No. 18/2023/QH15, No. 47/2024/QH15, No. 54/2024/QH15 and No. 146/2025/QH15, is the foundational legal basis for the mechanisms of environmental impact assessment.[9] To give effect to that Law, the Government issued Decree No. 08/2022/ND-CP detailing a number of its articles, as amended by Decree No. 05/2025/ND-CP and Decree No. 48/2026/ND-CP, and the minister responsible for the environment issued Circular No. 02/2022/TT-BTNMT, as amended by Circular No. 07/2025/TT-BTNMT and Circular No. 09/2026/TT-BNNMT; since 2025 these functions have been exercised by the Minister of Agriculture and Environment.[10] To ensure that environmental impact assessment is conducted scientifically and effectively in accordance with its legislative purpose, a mechanism for holding the actors concerned liable, administratively in particular, was established by Decree No. 45/2022/ND-CP on administrative sanctions in the field of environmental protection, which remains in force while a replacement decree is being drafted. The allocation of appraisal competence has also been reorganised under the two-tier model of local government,

[7]Hoang Thi Xuan, *Developing Renewable Energy for Sustainable Economic Development in Selected Asian Countries and Lessons for Vietnam* (Doctoral thesis in Economics, Graduate Academy of Social Sciences, 2022) (in Vietnamese).

[8]National Assembly, Law on Electricity No. 61/2024/QH15 of 30 November 2024 (effective 1 February 2025), Article 4, clause 14 and Article 25; Government, Decree No. 58/2025/ND-CP of 3 March 2025 detailing a number of articles of the Law on Electricity on the development of renewable energy and new energy power, as amended by Decree No. 243/2026/ND-CP of 26 June 2026; Decision No. 768/QD-TTg (note 1).

[9]National Assembly, Law on Environmental Protection No. 72/2020/QH14 of 17 November 2020 (effective 1 January 2022), as amended by Law No. 11/2022/QH15, Law No. 16/2023/QH15, Law No. 18/2023/QH15, Law No. 47/2024/QH15, Law No. 54/2024/QH15 and Law No. 146/2025/QH15. Unless otherwise indicated, the articles cited in this article are articles of this Law.

[10]Government, Decree No. 08/2022/ND-CP of 10 January 2022 detailing a number of articles of the Law on Environmental Protection, as amended by Decree No. 05/2025/ND-CP of 6 January 2025 and Decree No. 48/2026/ND-CP of 29 January 2026; Minister of Natural Resources and Environment, Circular No. 02/2022/TT-BTNMT of 10 January 2022, as amended by Circular No. 07/2025/TT-BTNMT of 28 February 2025 and by Circular No. 09/2026/TT-BNNMT of the Minister of Agriculture and Environment of 29 January 2026.

most recently by Resolution No. 66.19/2026/NQ-CP, which delegated part of the appraisal competence of the Ministry of Agriculture and Environment to the chairpersons of provincial People's Committees.[11]

All of these instruments pursue a single objective: to establish a solid, scientific and effective legal foundation for organising the process of reviewing, analysing, forecasting and assessing the environmental impacts of investment projects, so as to secure a reasonable balance between economic development and environmental protection. The Law defines environmental impact assessment as the process of analysing, assessing, identifying and forecasting the environmental impacts of an investment project and proposing measures to minimise its adverse impacts on the environment (Article 3, clause 7). From these approaches, the law on environmental impact assessment for solar power projects may be defined as the system of legal norms and legal principles, issued or recognised by the State and guaranteed by State coercion, that regulates the social relations arising in the exploitation and use of the components of the ecological environment during the formation and operation of investment and development projects, with the aim of creating a balance and harmony between economic interests and environmental interests.

2.3. Principles for developing the content of environmental impact assessment reports for solar power projects

In ordinary understanding, the content of an environmental impact assessment report consists of the matters set out in concrete form in order to describe accurately and completely the issues relating to the project proposed for implementation. The law must therefore guarantee the accuracy of the information on the project, and the report serves both as the basis on which the competent state authority decides whether the project may be built and as the basis for determining the responsibilities of the parties concerned from the commencement to the termination of the project. The law on the content of reports for solar power projects is accordingly built on the following principles.

First, the content of the report must describe the proposed project accurately and completely, provide specific information on the current state of the environment likely to be affected, and establish that the project location conforms to the socio-economic development planning framework and to the environmental protection objectives associated with overall planning. *In the first place,* an accurate and complete description requires the report to set out the origin of the project, its legal and technical bases and the technology, work items and activities that may adversely affect the environment (Article 32, clause 1, points a and c); for a solar power project, this means the area and type of land or water surface used, the layout of the panel arrays, the access roads, substations and transmission lines, and any battery storage system. *In the second place,* the report must provide specific information on the natural, socio-economic and biodiversity conditions, the current environmental status and the environmentally sensitive factors at the project site (Article 32, clause 1, point d). *In the third place,* the report must explain the conformity of the project with the National Environmental Protection Planning, regional planning, provincial planning and the law (Article 32, clause 1, point b); for solar power, this conformity is examined against the National Environmental Protection Planning approved by Decision No. 611/QD-TTg and the revised National Power Development Plan approved by Decision No. 768/QD-TTg.[12] This principle gives effect to the requirement that environmental protection be linked to economic development and resource management and be considered and assessed in the course of development activities (Article 4, clause 2). It helps to ensure that the programmes and management plans of state authorities are implemented accurately and suitably in each location, area and territory affected by the project, so that the development of the report is synchronised, unified and interdisciplinary. The content of the report must be an important source of information that clarifies the impacts of the project on the natural environment and on the economic and social issues of the nation as they relate to each locality, and it must constitute a scientific and legal basis on which the state management authority decides on the approval of investment projects in general and solar power projects in particular.

Second, the content of the report must meet the requirement of forecasting the potential impacts of the project at present and in the future. This principle derives from the characteristics of each project: depending on the type identified and on the scale and capacity of resource exploitation, production and consumption, the report must identify and forecast the intensity and scale of the possible or latent impacts of the project on

[11]Government, Decree No. 45/2022/ND-CP of 7 July 2022 on administrative sanctions for violations in the field of environmental protection; Ministry of Agriculture and Environment, draft decree replacing Decree No. 45/2022/ND-CP (consultation report published on 29 May 2026); Government, Resolution No. 66.19/2026/NQ-CP of 18 May 2026 on reducing, decentralising and simplifying administrative procedures and business conditions within the management scope of the Ministry of Agriculture and Environment.

[12]Prime Minister, Decision No. 611/QD-TTg of 8 July 2024 approving the National Environmental Protection Planning for the period 2021–2030, with a vision to 2050.

economic development, social needs and the environment. The essence of the report is to forecast, assess and examine the trends that may affect the ecological environment, the economy and society, to consider the impacts of the project from different perspectives, and on that basis to propose both urgent and long-term solutions that are effective during project investment. The statutory definition places forecasting at the centre of environmental impact assessment (Article 3, clause 7), and the Law gives priority to forecasting and preventing pollution, incidents and environmental degradation (Article 4, clause 4). *In the first place*, the forecast must cover every phase of the project, since the report must identify, assess and forecast the main environmental impacts and wastes by phase and identify the environmental incidents that may occur (Article 32, clause 1, point dd); for solar power, the decisive phases are site preparation and construction, when vegetation clearance, earthworks and runoff occur, and decommissioning, when panels, inverters and batteries become waste. The Law on Electricity 2024 now regulates the dismantling of renewable energy works (Article 25), and the recycling responsibility of producers and importers under Article 54 of the Law on Environmental Protection is detailed by Decree No. 110/2026/ND-CP,[13] so the forecast of the end-of-life management of photovoltaic panels is a legally relevant element of the report. *In the second place*, the methods used must be appropriate: the content of the report for solar power projects should apply rigour, focus and cost-effectiveness in assessment, have a high scientific and empirical character, and use research methods and techniques suited to the issues surrounding the project, which the report must state (Article 32, clause 1, point a).

Third, the content of the report must determine the responsibilities of the parties concerned and the measures to mitigate negative impacts on the environment and on related matters arising from investment in and construction of solar power projects, so as to give effect to the preventive principle of environmental law. *In the first place*, besides prevention and the protection of the environment, the report must propose and analyse alternatives that minimise adverse impacts on the environment and ensure that the management options and technological solutions for resource exploitation, production, business and the treatment of emissions are feasible and effective in practice, limiting adverse effects on the living environment of humans and other organisms; this corresponds to the works and measures for waste collection and treatment, the other mitigation measures, the environmental restoration and biodiversity offset plans, and the environmental management and monitoring programme required by Article 32, clause 1, points e, g and h. *In the second place*, the content of the report must be developed on an interdisciplinary basis with the participation of stakeholders and of the residential communities affected by the project; the Law requires consultation of the residential communities and individuals directly affected and of the agencies and organisations directly related to the project (Article 33, clause 1), and the report must present the results of that consultation (Article 32, clause 1, point i). *In the third place*, the report must bind the responsibilities of the project owner, the competent state management authority and the other stakeholders throughout implementation until the termination of the project, so as to prevent evasion, buck-passing and avoidance of responsibility when the project has negative impacts on the economy, society and the living environment. This element rests on the conclusions, recommendations and commitments of the project owner (Article 32, clause 1, point k), on the responsibilities of the project owner after the approval of the appraisal results (Article 37) and on the principle that those who cause pollution, incidents or environmental degradation must pay, compensate for damage and bear other liability (Article 4, clause 6). It helps to determine the rights and obligations of each individual and organisation related to the project and to apply sanctions effectively when violations occur.

3. Practice of the Law on Developing the Content of Environmental Impact Assessment Reports for Solar Power Projects in Vietnam

3.1. Current provisions on the content of environmental impact assessment reports applicable to solar power projects

Under Article 31 of the Law on Environmental Protection, as amended by Law No. 146/2025/QH15, environmental impact assessment is organised by the investment project owner and is carried out simultaneously with the preparation of the feasibility study report or an equivalent document; its results are presented in a report, and each investment project prepares one report, the Government detailing the case of component projects and phased investment. In practice, project owners usually engage consulting organisations to prepare the report. The provisions on the content of the report are laid down for investment projects in general in Article 32 of the Law and apply to all investment projects, including solar power projects. Solar power is not a type of production with a risk of causing environmental pollution; a solar power project becomes subject to environmental impact assessment mainly because of the scale of the land, water surface or sea area that it uses

[13]Government, Decree No. 110/2026/ND-CP of 1 April 2026 detailing a number of articles of the Law on Environmental Protection on the responsibilities of producers and importers for recycling products and packaging and for treating waste (effective 25 May 2026).

and the presence of environmentally sensitive factors under Article 28 of the Law and Appendices III and IV to Decree No. 08/2022/ND-CP, as amended. Law No. 146/2025/QH15 also removed wet-rice land cultivated with two or more crops from the environmentally sensitive factors listed in Article 28, clause 1, point c, a change of direct relevance because many solar farms are built on agricultural land. Table 1 systematises the main content of the report under Article 32, clause 1 and the principle that each item mainly serves.

Table 1: Main content of the environmental impact assessment report under Article 32, clause 1 of the Law on Environmental Protection

Point	Required content	Principle mainly served
a	Origin of the investment project, the project owner and the authority competent to approve the project; legal and technical bases; environmental impact assessment methods and other methods used (if any)	First and Second
b	Conformity of the project with the National Environmental Protection Planning, regional planning, provincial planning, environmental protection law and other relevant law	First
c	Assessment of the selection of technology, work items and activities of the project likely to adversely affect the environment	First
d	Natural, socio-economic and biodiversity conditions; current environmental status; affected objects and environmentally sensitive factors; explanation of the suitability of the selected location	First
dd	Identification, assessment and forecast of the main environmental impacts and wastes by project phase; scale and nature of wastes; impacts on biodiversity, natural heritage, historical and cultural relics and other sensitive factors; impacts caused by site clearance, migration and resettlement (if any); possible environmental incidents	Second
e	Works and measures for collecting, storing and treating waste	Third
g	Measures to minimise other negative impacts; environmental restoration plan (if any); biodiversity offset plan (if any); plan for preventing and responding to environmental incidents	Third
h	Environmental management and monitoring programme	Third
i	Consultation results	Third
k	Conclusions, recommendations and commitments of the project owner	Third

Source: compiled by the author from Article 32, clause 1 of the Law on Environmental Protection 2020, as amended.

The detailed content and form of the report are prescribed by the minister responsible for the environment. Article 12 of Circular No. 02/2022/TT-BTNMT governs the content of the report and the minutes of consultation meetings; Circular No. 09/2026/TT-BNNMT replaced the reporting form (Form No. 04 in Appendix II) and added Article 13a on the content of appraisal. Consultation is detailed by Article 26 of Decree No. 08/2022/ND-CP, and under Article 33, clause 3 of the Law it covers the location of the project, its environmental impacts, the measures to minimise adverse impacts, the environmental management and monitoring programme together with the incident prevention and response plan, and other matters related to the project.

3.2. Development of solar power in practice and its implications for the content of the report

Practical data show why the content of the report matters for solar power. The installed solar capacity of Vietnam grew from 0.11 gigawatts at the end of 2018 to 4.99 gigawatts at the end of 2019 and 16.66 gigawatts at the end of 2020, when solar power represented about a quarter of the installed capacity of the national power system. Growth then slowed: capacity reached 18.67 gigawatts at the end of 2024, about 22 percent of national installed capacity, and 19.25 gigawatts at the end of 2025 (Table 2 and Figure 1).[14] Solar power generated

[14]Vietnam Electricity, press release on the development of rooftop solar power as at 31 December 2020 (January 2021); International Renewable Energy Agency, *Energy Profile: Viet Nam* (updated 22 September 2025).

27,776 million kilowatt-hours in 2024 and 28,272 million kilowatt-hours in 2025.[15] The revised National Power Development Plan foresees an expansion to between about 2.4 and 3.8 times the capacity installed at the end of 2025 by 2030 (Table 3), most of which will require new ground-mounted or floating installations and therefore new environmental impact assessments.

Table 2: Installed solar power capacity in Vietnam, 2018–2025 (gigawatts, end of year)

Year	2018	2019	2020	2021	2022	2023	2024	2025
Installed capacity	0.11	4.99	16.66	16.66	16.70	18.59	18.67	19.25

Source: International Renewable Energy Agency, Renewable Capacity Statistics 2025 (data for 2018–2024) and Renewable Capacity Statistics 2026 (data for 2025).

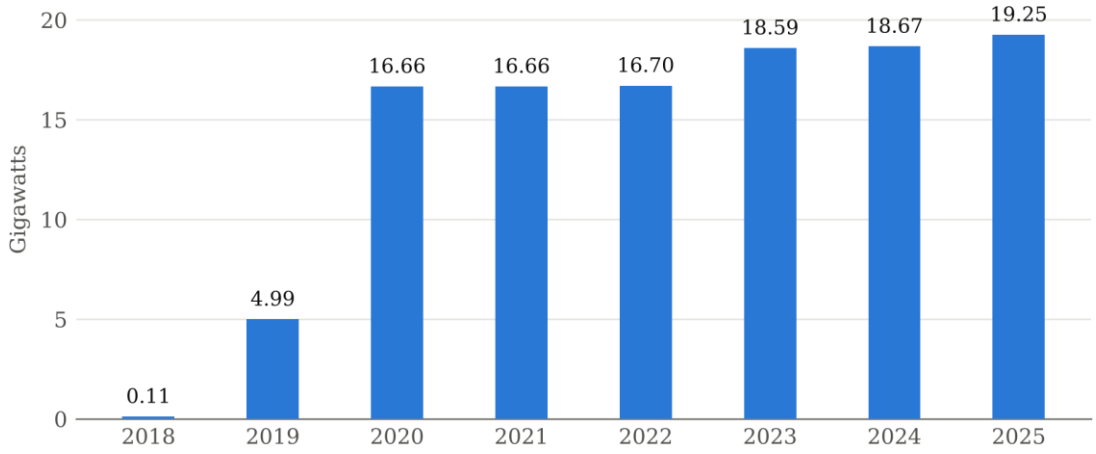


Figure 1: Installed solar power capacity in Vietnam, 2018–2025 (gigawatts)
Source: drawn by the author from the data in Table 2.

Table 3: Solar power potential and planning targets in Vietnam (megawatts)

Indicator	Value	Note
Technical potential	about 963,000	Ground-mounted 837,400; water surface 77,400; rooftop 48,200
Installed capacity at the end of 2025	19,252	All solar photovoltaic installations, including rooftop systems
Planning target for 2030	46,459 – 73,416	25.3–31.1 percent of total installed capacity, excluding solar sources under Article 10, clause 5 of the Law on Electricity 2024
Orientation for 2050	293,088 – 295,646	Concentrated and rooftop solar power

Source: Decision No. 768/QD-TTg of 15 April 2025; International Renewable Energy Agency, Renewable Capacity Statistics 2026.

In practice, the content of reports for solar power projects has concentrated mainly on forecasting the risks arising from the treatment of solar panels for environmental protection, so the content must be accurate and comprehensive. Practice nevertheless reveals several limitations in the content of reports for solar power projects that need to be reassessed. Box 1 illustrates how incomplete information on location, planning conformity and land use translates into legal and social consequences.

[15]Ministry of Industry and Trade, Electricity Department, *Vietnam's Strategy for the Development of Renewable Energy by 2030, Vision 2050: Report on the Implementation Status for 2025* (January 2026), Table 2.

Box 1. Typical case: solar power projects examined in Government Inspectorate Conclusion No. 1027/KL-TTCP of 28 April 2023

In its conclusion on the management and implementation of the Seventh National Power Development Plan and its revised version, the Government Inspectorate found that 154 of the 168 solar power projects added to the planning system had no legal basis in planning. It also identified serious land-use conflicts (provincial names as at the time of the inspection). In Binh Thuan province, 13 solar and wind power projects were built on land reserved for national mineral reserves and in areas zoned for titanium ore exploration and processing, contrary to Decision No. 645/QD-TTg of the Prime Minister, the Land Law and a circular of the Ministry of Industry and Trade. In Ninh Thuan province, four solar power projects overlapping irrigation planning were approved without the opinion of the Ministry of Agriculture and Rural Development, contrary to the Law on Irrigation and the Land Law. In Dak Lak province, the Long Thanh 1 solar power project, on 60 hectares of leased land, overlapped the irrigation zone planning of the Ia Mor reservoir, and in Dak Nong province 174 hectares were leased to two solar and five wind power projects without converting the land to land for energy works.[16]

The Government subsequently adopted Resolution No. 233/NQ-CP of 10 December 2024 to remove obstacles facing renewable energy projects, and the Prime Minister's Official Dispatch No. 118/CD-TTg of 22 July 2025 required the localities concerned to settle outstanding cases, including the overlap between the Long Thanh 1 project and the Ia Mor irrigation planning.[17]

Lesson for the content of the report: the description of the project site, the explanation of its conformity with planning and the identification of land and livelihood impacts are not technical formalities. Where these items are incomplete, the report cannot serve as a reliable basis for approval, and the resulting legal uncertainty is borne by investors, local communities and the State alike.

3.3. Limitations in the content of environmental impact assessment reports for solar power projects

First, there is no standard for developing environmental impact assessment reports for solar power projects. In the first place, given its nature of forecasting environmental impacts and proposing solutions to prevent pollution, the content of the report currently concentrates on assessing the construction of projects in the "brown environment" sector, that is, production and business activities that adversely affect the environment, cause pollution and degradation, and discharge emissions during construction, production and operation. Solar power plants, however, do not discharge polluting waste while generating electricity, so the standards for developing the content of reports for projects in the "brown environment" sector cannot be equated with the particular characteristics of projects in the "green environment" sector, that is, production and business activities with little or no adverse impact on the environment that cause no pollution or degradation. In the second place, the law prescribes a common content of the report for all investment projects (Table 1) without distinguishing the standards applicable to projects in the "brown environment" sector from those applicable to projects in the "green environment" sector. Items designed for polluting facilities, such as works for treating waste, are required of solar power projects in the same form, while matters specific to solar power, such as land-cover change, glare, the cumulative effect of several solar farms in one area, the risks of battery storage and the decommissioning of panels, have no dedicated place in the statutory list. As a result, reports for solar power projects struggle to describe accurately the information and specific characteristics of this form of energy, and appraisal and post-appraisal work cannot evaluate them accurately or ensure the principles of appraisal.

Second, the content of reports for solar power projects, and for investment projects in general, does not disclose the estimated budget for conducting environmental impact assessment within the total investment of the project. In the first place, investors often do not yet recognise the importance of the report or, in order to optimise initial investment costs, do not invest adequately in its preparation; since Article 31, as amended, entrusts the organisation of the assessment to the project owner, the budget for the assessment appears only in the agreement between the investor and the third party engaged to conduct it. In the second place, no provision specifies the proportion of the total investment that should be allocated to environmental impact assessment, and Article 32, clause 1 contains no item on the budget, which limits the determination of the budget estimate for

[16]Government Inspectorate, Conclusion No. 1027/KL-TTCP of 28 April 2023 on compliance with policies and laws in the management and implementation of the Seventh National Power Development Plan and the revised Seventh Plan, as reported in "Series of violations by the Ministry of Industry and Trade in implementing solar power planning", *Thanh tra Newspaper*, 26 December 2023, and "Distorted land planning for the deployment of renewable power", *The Leader*, 26 December 2023.

[17]Government, Resolution No. 233/NQ-CP of 10 December 2024 on removing difficulties and obstacles for renewable energy power projects; Prime Minister, Official Dispatch No. 118/CD-TTg of 22 July 2025 on accelerating the implementation of Resolution No. 233/NQ-CP.

assessment of investment projects in general and solar power projects in particular. From a cost-benefit perspective, clearly identifying the costs borne by the investor would help to evaluate the quality of the report; this factor is currently overlooked and is not disclosed in the report, which makes it difficult to raise project owners' awareness of environmental impact assessment.

Third, practice shows that the content of the report does not clarify the plan and the level of compensation for damage to those directly affected by solar power projects. In the first place, one of the bottlenecks that delay projects and cause frustration among affected persons is the determination of an appropriate plan and level of compensation for site clearance. Site clearance and compensation are complex matters with direct and immediate effects that arise as early as the pre-feasibility study of the project. Many affected persons may not yet perceive the latent damage that may arise in the future, but the damage incurred when they are required to clear sites and hand over residential and productive land for the construction of a project directly concerns their rights. In the second place, the compensation plan is not a main item of the report: Article 32, clause 1, point dd stops at identifying and assessing the impacts caused by site clearance, migration and resettlement, and even the consultation sections of reports usually record only a general commitment to compensate residents properly and not to affect their lives, because Article 33, clause 3 does not expressly include compensation and livelihoods among the matters to be consulted. Compensation, support and resettlement are governed separately by the Land Law 2024, and where an investor obtains land through an agreement on receiving land use rights under Article 127 of that Law, no State compensation plan exists at all;[18] the report therefore remains silent on the livelihood consequences of the project. *In the third place,* the compensation plan should be linked to conformity with regional development planning, environmental protection planning and the policy on migration and resettlement, and should secure the livelihoods of people who lose residential or productive land, rather than stopping at the amount of money paid for the value of the plot on which they live and work. There have been many cases in which, besides inadequate compensation, the livelihoods, living needs and work of residents were adversely affected during site clearance and land handover, causing frustration among those affected; moreover, solar power projects built as solar farms require very large areas of up to tens or hundreds of hectares, affecting not only residential land but also the cultivated land of residents (Box 1).

4. Recommendations for Improving the Law on Developing the Content of Environmental Impact Assessment Reports for Solar Power Projects in Vietnam

The following recommendations concentrate on specific amendments. They are framed so that they can be incorporated into the bill amending the Law on Environmental Protection now before the National Assembly and into the implementing instruments that will follow it, and they do not repeat requirements that current law already contains.

First, a content standard for environmental impact assessment reports of solar power projects should be established in Article 32 of the Law on Environmental Protection.

In the first place, as to legislative technique, a new clause should be inserted in Article 32, with the current final clause renumbered, to the following effect: "For renewable energy power projects, including solar power projects, the environmental impact assessment report shall meet the content standard issued by the Minister of Agriculture and Environment, which distinguishes projects that do not discharge waste during operation from projects of a type of production with a risk of causing environmental pollution." On that basis, Circular No. 02/2022/TT-BTNMT should be supplemented with a separate reporting form for solar power projects alongside the general form replaced by Circular No. 09/2026/TT-BNNMT, and the appraisal content in Article 13a of that Circular should be supplemented with criteria specific to such projects. The standard should require dedicated treatment of land-use and land-cover change, erosion and surface runoff, habitat fragmentation and biodiversity, landscape and glare, water use for cleaning panels, the risks of battery energy storage systems, transmission lines and the cumulative effects of several solar farms in one area, as well as the dismantling of *works under Article 25 of the Law on Electricity 2024 and the end-of-life management of panels; items designed for polluting facilities, such as the waste treatment works required by Article 32, clause 1, point e, would be applied in proportion to the actual characteristics of the project.*

In the second place, as to substance, environmental impact assessment for solar power projects is not intended as a negative control that prevents their implementation. On the contrary, as a management instrument of the State that improves the effectiveness of the construction and development of solar power projects, it must serve both socio-economic development objectives and environmental protection. As the development trend of

[18]National Assembly, Land Law No. 31/2024/QH15 of 18 January 2024 (effective 1 August 2024), as amended, Articles 87, 91, 108, 109, 111 and 127.

the world and of Vietnam moves towards sustainable development and investment in the green economy, the standard must suit the present development direction of Vietnam. Prescribing such a standard would contribute to a detailed and accurate evaluation of the content of reports and would create a scientific and legal basis for effective state management; it would also be an important basis on which project owners, or the third parties they engage, improve the quality of reports and their awareness of the importance of environmental impact assessment for construction investment projects in general and solar power projects in particular. The standard should separate the content of reports for projects in the "brown environment" sector from that for projects in the "green environment" sector, which accurately reflects the objectives of each type of project, the requirements of economic development and environmental protection in each period, and the requirements of national and local planning and strategy. It should rest on three basic issues: (1) conformity with the trend and requirements of the economic development of the country in each period; (2) conformity with the trend and requirements of population development and social needs; and (3) conformity with the trend and requirements of the future environmental protection objectives of the nation and of each locality. This would improve the capacity of the report to forecast the degree of impact of investment projects on socio-economic development and environmental protection. In particular, the standard should set environmental protection requirements at a higher level than economic development objectives, because solar power projects are green energy with low emissions and are representative of production and business in the "green environment" sector; this is consistent with the principle of not trading the environment for economic growth affirmed in the National Environmental Protection Planning. The standards should also be unified and mutually supportive and must not cancel each other out or force a choice between objectives: environmental protection should not negate economic development, and economic development creates the momentum and resources for environmental protection. A standard on the quality of the content of reports for solar power projects, distinguishing projects in the "brown environment" sector from those in the "green environment" sector, should therefore be issued promptly.

In the third place, as to foreign experience, Article 5, paragraph 1, point f of Directive 2011/92/EU, as amended by Directive 2014/52/EU, requires the report to include the additional information specified in Annex IV that is relevant to the specific characteristics of a particular project or type of project and to the environmental features likely to be affected; Annex IV in turn requires a description of the land-use requirements during the construction and operational phases (point 1, letter b) and of the effects arising from the use of natural resources, in particular land, soil, water and biodiversity (point 5, letter b).[19] The Renewable Energy Directive goes further: under Article 15c, Member States designate renewables acceleration areas through plans that are subject to strategic environmental assessment and that lay down mitigation rules, and under Article 16a projects located in those areas and complying with those rules are exempted from a dedicated environmental impact assessment and are subject instead to a screening procedure for significant unforeseen effects.[20] Japan has taken a complementary step by creating solar-specific thresholds: under the Enforcement Order of the Environmental Impact Assessment Act, solar power plants of 40 megawatts or more became Class 1 projects and those of 30 megawatts or more became Class 2 projects subject to screening from 1 April 2020, and Cabinet Order No. 230 of 2026, promulgated on 23 July 2026, lowers these thresholds to 20 megawatts and 15 megawatts from 1 April 2027.[21] These provisions show that differentiating the content of the report by type of project is consistent with international practice, provided that the differentiation adjusts the focus of the report to the real impacts of solar power, above all land use, rather than lowering the level of environmental protection.

Second, provisions on the budget estimate and a minimum budget ratio for environmental impact assessment of solar power projects should be added to Article 32 of the Law on Environmental Protection.

In the first place, as to legislative technique, a new point l should be added to Article 32, clause 1 requiring "the budget estimate for conducting the environmental impact assessment and for the environmental

[19]Directive 2011/92/EU of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment, as amended by Directive 2014/52/EU of 16 April 2014, Article 5 and Annex IV.

[20]Directive (EU) 2018/2001 of the European Parliament and of the Council of 11 December 2018 on the promotion of the use of energy from renewable sources, as amended by Directive (EU) 2023/2413 of 18 October 2023, Articles 15c and 16a.

[21]Environmental Impact Assessment Act (Act No. 81 of 1997) and Enforcement Order of the Environmental Impact Assessment Act (Cabinet Order No. 346 of 1997), as amended; Cabinet Order No. 230 of 2026; Orrick, Herrington and Sutcliffe, "Japan Renewables Alert 73" (October 2026).

protection works and measures and the environmental management and monitoring programme of the project, and its proportion of the total investment of the project", and a new clause should authorise the Government to prescribe the minimum budget ratio by type of project. For solar power projects, the minimum ratio that investors are obliged to allocate should be set at about 5 to 10 percent of total investment, with no upper limit on higher spending, so as to improve the effectiveness of the report; the ratio should be understood as covering field surveys, sampling and monitoring, modelling, consultation and the preparation of the report together with the environmental protection works and measures that the report proposes. The appraisal content in Article 13a of Circular No. 02/2022/TT-BTNMT, as supplemented by Circular No. 09/2026/TT-BNNMT, should correspondingly require the appraisal council to assess whether the budget is adequate for the measures proposed.

In the second place, as to purpose and determination, the budget estimate makes the cost of developing the report transparent and improves the evaluation of its quality. Because no detailed rule exists on the share of investment funds to be used for the assessment, investors tend to treat it lightly, as an "administrative procedure" to be completed so that the project may proceed. Specifying the budget would raise investors' awareness and the responsibility of the third party engaged to conduct the assessment, so that the report is genuinely objective, describes and reflects the information on the project accurately, forecasts the impacts of the project on related matters, and serves as a basis on which state management authorities determine the responsibilities of the parties concerned. The ratio and the estimate should be determined consistently with the law on investment, in particular the rules on total investment capital, and should take into account the financial capacity and construction investment experience of the project owner and the financial leverage used in the investment, so that the budget for environmental impact assessment is determined accurately.

In the third place, as to foreign experience, Article 17 of the Environmental Impact Assessment Law of the People's Republic of China requires the report on a construction project to include the environmental protection measures together with their technical and economic justification (item 4) and an analysis of the economic losses and gains resulting from the environmental impacts of the project (item 5).[22] Article 16 of the Regulations on the Administration of Environmental Protection of Construction Projects requires the preliminary design to contain an environmental protection chapter with an investment estimate for environmental protection facilities and requires the construction unit to include those facilities in its construction contracts and to guarantee their schedule and funding, while Article 15 requires those facilities to be designed, built and put into operation simultaneously with the main works. In the European Union, Article 5, paragraph 3, point a of Directive 2011/92/EU, as amended, requires the developer to ensure that the report is prepared by competent experts. A budget requirement in the Vietnamese report would combine these approaches: it would link the economic justification of the measures with their financing and strengthen the accountability of the experts who prepare the report.

Third, the content of the report should include the plan and the level of compensation, support, resettlement and livelihood restoration for persons directly affected by solar power projects.

In the first place, as to legislative technique, Article 32, clause 1, point dd should be amended so that, after the words on impacts caused by site clearance, migration and resettlement, the report must also present "a summary of the compensation, support and resettlement plan or of the agreements on receiving land use rights, the livelihood restoration measures for households whose agricultural land is recovered or transferred, and the conformity of these measures with socio-economic development planning and environmental protection planning". Article 33, clause 3 should be supplemented with a corresponding item on compensation, support, resettlement and livelihoods among the matters to be consulted. To avoid duplication with land law, the report should integrate rather than repeat the compensation, support and resettlement plan prepared under Article 87 and Articles 91, 108, 109 and 111 of the Land Law 2024, including the data on income from the land and on the resettlement and career-change wishes collected in that procedure, and, where land is obtained by agreement under Article 127, the main terms on which households transferred their land.

In the second place, as to substance, site clearance directly concerns the rights and interests of the persons affected, specifically the residents directly affected by the project. Clarifying the plan and the level of compensation in the report would protect the lawful rights and interests of affected persons and improve the effectiveness of project construction by avoiding deadlocks in which residents refuse to hand over land because no agreement on adequate compensation has been reached. The compensation plan should not stop at the

[22]Environmental Impact Assessment Law of the People's Republic of China (adopted on 28 October 2002, amended in 2016 and 2018), Article 17; Regulations on the Administration of Environmental Protection of Construction Projects (State Council Decree No. 253 of 1998, as amended by State Council Decree No. 682 of 2017), Articles 15 and 16.

amount of money corresponding to the value of the land and related assets; it should be approached more broadly, in connection with conformity with national and local development planning and environmental protection planning, social security, and the living needs and livelihoods of affected residents, so as to minimise frustration among those affected. This requires consistency between the Law on Environmental Protection and related laws, such as the Land Law, the Law on Housing and the Law on Real Estate Business, under which the actual value of land and assets attached to land is determined so that compensation corresponds to the real value of the land. Responsibility for compensation should be coordinated and borne jointly by higher-level state authorities, local governments and the project owner, and the content should be assessed comprehensively against socio-economic development planning and national and local environmental protection planning, so as to guarantee social security, livelihoods, housing and employment, use land for the right purpose and efficiently, and avoid the loss and waste of land as a means of production.

In the third place, as to foreign experience, India's Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013 requires a social impact assessment covering, among other matters, the number of affected and displaced families and the social costs of the project relative to its benefits (section 4, sub-section 4), the impact on livelihoods and community assets (section 4, sub-section 5) and a social impact management plan listing ameliorative measures (section 4, sub-section 6); any environmental impact assessment must be carried out simultaneously (proviso to section 4, sub-section 4), and the social impact assessment report must be made available to the authority conducting the environmental impact assessment (section 6, sub-section 2).[23] The Land Administration Law of China, as amended in 2019, requires a social stability risk assessment and the public announcement of compensation standards, resettlement arrangements and social security for at least thirty days before land is expropriated (Article 47), and requires fair and reasonable compensation that ensures that the original living standards of land-expropriated farmers are not reduced and that their long-term livelihoods are guaranteed (Article 48).[24] These provisions confirm that integrating compensation and livelihood considerations into impact assessment is compatible with international practice and with Article 91 of the Land Law 2024, which seeks to ensure stable living and production conditions for persons whose land is recovered.

5. Conclusion

This article has identified three principles that should govern the content of environmental impact assessment reports for investment projects in general and solar power projects in particular: accurate and complete description together with conformity with planning, the forecasting of present and future impacts, and the determination of responsibility combined with preventive mitigation and participation. The law on the content of reports for solar power projects has not yet distinguished these projects from other construction investment projects. Although Law No. 146/2025/QH15 and its implementing instruments have reorganised the procedure and competence for environmental impact assessment, Article 32 still prescribes a uniform content. The law on the content of reports for this specific form of energy should therefore be improved promptly through a differentiated content standard, a mandatory budget estimate with a minimum budget ratio, and an integrated compensation and livelihood restoration component, so that the report becomes a reliable basis for decision-making. Doing so would help to give concrete effect to the development of solar power in Vietnam in line with the goals of the Paris Agreement, whose implementing rules were adopted at Katowice, and with the commitment of Vietnam to achieve net-zero emissions by 2050.[25]

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