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# OPINION

**by Assoc. Prof. Dr. Eng. Veselina Gospodinova**
**the University of Mining and Geology "St. Ivan Rilski", Sofia**

on the materials submitted for the award of the educational and scientific degree "Doctor" in the field of higher education 5. Technical Sciences, professional field 5.7. Architecture, Civil Engineering and Geodesy, scientific specialty "Land Management and Protection of Agricultural Lands (including Property Management)" at the Department of Sustainable Land Use and Property Management.

**Author of the dissertation:**
M.Eng. Bisera [redacted] Ivanova, part-time PhD student at the Department of Sustainable Land Use and Property Management, Faculty of Geodesy, University of Architecture, Civil Engineering and Geodesy (UACEG), Sofia.

**Title of the dissertation thesis:** "Ecological Approach to Spatial Planning for Renewable Energy Projects"

**Member of the Scientific Jury:** Assoc. Prof. Dr. Eng. Veselina Gospodinova, University of Mining and Geology "St. Ivan Rilski" (field of higher education 5. Technical Sciences, professional field 5.7. Architecture, Civil Engineering and Geodesy, scientific specialty "General, Higher and Applied Geodesy"), appointed as a member of the Scientific Jury by Order No. 506 /10.07.2026 issued by the Rector of UACEG.

**Brief biographical information about the PhD candidate**

Bisera Ivanova graduated from Secondary School No. 164 "Miguel de Cervantes," a Spanish-language secondary school. She continued her higher education at the University of Architecture, Civil Engineering and Geodesy (UACEG), Sofia. In 2020, she obtained a Master's degree in Geodesy, with specialization at the Department of Sustainable Land Use and Property Management.

Following the completion of her Master's degree, Eng. Bisera Ivanova continued her professional and academic development. As of 1 March 2021, pursuant to Rector's Order No. 164 of 26 February 2021, she was enrolled as a part-time PhD student in the Department of Sustainable Land Use and Property Management at the Faculty of Geodesy, UACEG. Her academic supervisor is Prof. Dr. Eng. Margarita Mondeshka–Nedyalkova, while her academic consultant is Assoc. Prof. Dr. Eng. Nadezhda Yarlovska.

In the following year, she was appointed as an Assistant in the Department of Sustainable Land Use and Property Management at the same university. As part of her teaching duties, she conducts practical classes in the following disciplines: "Agricultural Land Management," "Protected Area Management," "Property Management," "Ecology," "Geodesy," and "Spatial Planning."

In addition to her active teaching and research activities, she has participated in the academic life of the University, serving on the Academic Council of the University of Architecture,

Civil Engineering and Geodesy (UACEG). She has also been involved in the development of spatial planning projects, including the preparation of General and Detailed Spatial Development Plans.

This practical experience, combined with the strong academic knowledge acquired during her university education, has contributed to the systematization of her research and to the preparation of her doctoral dissertation. The research is closely related to her professional interests, which focus on the sustainable development of territories, spatial development and planning, land and property management, and the integration of investment processes with environmental protection requirements. M.Eng. Bisera Ivanova was discharged from the doctoral programme with the right to defend her dissertation pursuant to Rector's Order No. 296 of 1 April 2025.

The doctoral dissertation comprises 167 pages and is structured into six chapters. It includes lists of figures, tables and abbreviations, a bibliography, appendices, a list of publications related to the dissertation, and guidelines for future research. The dissertation contains 10 figures, 12 tables, 6 appendices, and 135 bibliographic references.

Based on the above, I consider that the doctoral candidate meets the formal requirements stipulated by the Academic Staff Development Act in the Republic of Bulgaria and the Regulations for its Implementation for the acquisition of the educational and scientific degree "Doctor."

**Relevance and Timeliness of the Problem**

The development of renewable energy sources (RES) in recent years has been associated with the intensive construction of energy facilities, which, in turn, has a direct impact on environmental protection. The development of photovoltaic parks may have a significant impact on biodiversity and the functioning of ecosystems as a whole. In this context, the development and implementation of an environmentally sound approach to the spatial planning of renewable energy projects could help mitigate potential conflicts arising from the need to balance the development of renewable energy, the protection of agricultural land, and the sustainable use of territory. This issue is of particular relevance to Bulgaria, where more than 54.5% of the country's territory is agricultural land, thereby necessitating the integration of sustainable models for the use and protection of territories. Consequently, the development of an environmentally sound approach to spatial planning is of particular scientific and practical significance in the context of the dynamic development of renewable energy and the growing need for sustainable land use.

**Degree of Knowledge of the State of the Problem and Creative Interpretation of the Literature Review**

The doctoral dissertation, and particularly Chapter I, demonstrates that the author has a thorough knowledge of international practices in other European countries related to the planning of photovoltaic power plants (PVPPs). The chapter also presents real-life cases from Bulgaria, demonstrating that the doctoral candidate has a sound understanding of the current state of the problem, based on her direct practical experience in spatial planning and in the practical application and validation of the proposed methodology.

**Contributions of the Dissertation**

The stated contributions are consistent with the results achieved through the research conducted by M.Eng. Bisera Ivanova. I recognize the contributions presented in the dissertation, which are of a scientific, scientific-applied, and applied nature, as follows:

1. The conflict between the accelerated development of photovoltaic power plants (PVPPs), the protection of agricultural land, and the existing spatial planning instruments has been identified and systematized, and the role of the General Spatial Development Plan (GSDP) in mitigating this conflict has been substantiated.
2. An integrated environmental approach to spatial planning has been developed, combining the ecosystem approach, the concept of ecosystem services, the DPSIR framework, and multicriteria assessment using the Analytic Hierarchy Process (AHP) within a unified logical framework to support spatial planning decisions.
3. A methodology for the assessment and selection of spatial alternatives for photovoltaic power plants (PVPPs) has been developed, incorporating spatial constraints, a hierarchy of criteria and sub-criteria, indicators, assessment scales, value normalization, and an author-developed Integrated Environmental Sustainability Index (ESI).
4. The applicability of the developed methodology for the assessment, comparison, and selection of spatial alternatives at the level of a General Spatial Development Plan (GSDP) has been demonstrated. The methodology serves as an analytical tool for substantiating and supporting the spatial planning decision-making process and has been validated through its application in two municipalities with different territorial characteristics.
5. A specific type of production spatial planning zone for the generation and storage of electricity from renewable energy sources (RES), designated as Ppe, has been proposed, together with corresponding spatial planning rules and standards defining conditions for limiting soil sealing, preserving soil functions, and ensuring the dismantling of facilities and subsequent land reclamation following the termination of activities.

**Publication Activity**

The principal research findings and contributions of the doctoral dissertation of M.Eng. Bisera Ivanova have been presented in three papers published in established specialized scientific journals. Two of these publications are single-authored, while one is co-authored. The doctoral candidate has also participated in scientific conferences and other academic forums.

The submitted extended abstract provides an objective and accurate representation of the structure and content of the doctoral dissertation.

**Opinions and Recommendations**

The doctoral dissertation is well structured and well substantiated, addressing a current and significant research problem through the application of an integrated scientific approach and practical validation.

The research tasks have been successfully completed, thereby achieving the aim of the study. The contributions formulated in the dissertation have been systematically derived from the results obtained, which have also been presented at scientific forums.

The proposals developed in the dissertation, including those concerning the regulatory establishment of spatial planning rules and standards for the development of photovoltaic power plants on agricultural land, enhance the practical orientation and applicability of the doctoral dissertation and outline opportunities for further research.

Therefore, I recommend that M.Eng. Bisera Ivanova continue her research in this scientific field and pursue the further development of her research ideas. I hope that her future work will contribute to the advancement and regulatory establishment of a sustainable approach to spatial planning for renewable energy projects and will help mitigate potential conflicts arising from the need to balance the development of renewable energy, the protection of agricultural land, and the sustainable use of territory.

**Conclusion**

Based on the proposed approach, the research studies and practical validations carried out, as well as the resulting generalizations, conclusions, and proposals, I consider that the submitted doctoral dissertation meets the requirements of the Academic Staff Development Act in the Republic of Bulgaria and the Regulations of the University of Architecture, Civil Engineering and Geodesy for its implementation, which provides sufficient grounds for me to give the dissertation a **POSITIVE** assessment.

I therefore respectfully recommend that the esteemed Scientific Jury also vote positively and award M.Eng. Bisera Ivanova the educational and scientific degree "Doctor" in the scientific specialty "Land Management and Protection of Agricultural Land (including Property Management)".

25 August 2026

Sofia

Prepared by: .

(Assoc. Prof. Dr. Eng. Veselina Gospodinova)