R E V I E W

by Assoc. Prof. Dr. Eng. Iva Chavdarova Petrinska, Technical University - Sofia
of the materials submitted for participation in a competition
for the academic position of "PROFESSOR" in
field of higher education - 5. Technical sciences ,
professional field - 5.2. Electrical engineering , electronics and automation ,
specialty - " Electrical supply and electrical equipment " (Lighting and installation technology)

In the competition for "Professor", announced in the State Newspaper, issue 48/13.06.2025 and on the website of TU-Gabrovo for the needs of the Department of "Electrical Supply and Electrical Equipment" at the Faculty of "Electrical Engineering and Electronics", Assoc. Prof. Dr. Eng. Plamen Tsenkov Tsankov participated as a candidate.

1. Brief biographical data

The candidate for for the academic position of "Professor", Plamen Tsenkov Tsankov, graduated from the Technical University of Gabrovo in 1995 as a Master of Electrical Engineering in the specialty "Power Supply and Electrical Equipment" in 1997. Two years later, in 1997, he was appointed as an assistant, in 2001 he became a senior assistant, and in 2011 - chief assistant in the Department of "Power Supply and Electrical Equipment" of the Technical University of Gabrovo, where he works to this day. He received the educational and scientific degree "Doctor" in the scientific field of "Lighting Technology and Sources of Light " in 2013. In January 2015, Plamen Tsankov received, on the basis of a competition, the academic position of "Associate professor" in the field of higher education 5. Technical Sciences, professional field 5.2. Electrical Engineering, Electronics and Automation, specialty "Power Supply and Electrical Equipment". In 2016, Assoc. Prof. Tsankov was elected Head of the Department of Electrical Supply and Electrical Equipment, in 2020. – Vice-Rector, responsible for the Scientific Research, and in 2024. for Vice-Rector for Academic Affairs, a position he holds to this day. In the period 1998 to 2025. Assoc. Prof. Tsankov has undergone eight postgraduate qualification trainings in the field of lighting technology, energy efficiency and renewable energy sources.
Assoc. Prof. Plamen Tsankov is a member of the International Commission on Illumination (CIE) and representative for Bulgaria of Division 2 "Physical measurement of light and radiation". He is a member of the board of directors of the National Committee on Illumination (NCI), a member of IEEE; chairman of the EFTA Professional Section in the Regional College - Gabrovo of the KIIP; chairman of the Territorial Organization of the NTS - Gabrovo; member of the board of directors of the Federation of Scientific and Technical Unions in Bulgaria; member of the board of directors of the Union of Electronics, Electrical Engineering and Communications; member of the Bulgarian National Committee on Illumination (BNKO), member of the Union of Physicists in Bulgaria.

2. General description of the materials presented

In the competition, the candidate Assoc. Prof. Plamen Tsankov participated with ten refereed and indexed publications in world-renowned databases of scientific information from group B.4., which are equivalent to a habilitation thesis, two of which are with SJR= 0.173 , one with IF=7.1 and one with IF=2.5. From the group of indicators D.7. "Scientific publications in publications that are refereed and indexed in world-renowned databases of scientific information", the candidate has indicated three publications with SJR=0.173, IF=3.2 and IF=0.7. From the group of indicators D.8. "Scientific publications in non-refereed journals with scientific review or in edited collective

volumes", the candidate participated with 21 publications, and under indicator E.23. "Published university textbook or textbook used in the school network", the candidate presented two books published in 2024 and 2025, respectively. Under indicator E "Citations or reviews in scientific publications, referenced and indexed in world-renowned databases with scientific information or in monographs and collective volumes", the candidate presented 31 citations and 6 reviews. Under indicator E.17. "Supervision of a successfully defended doctoral student" - the candidate has two successfully defended doctoral students. Under indicator E.20. "Supervision of a national scientific or educational project" - 8 projects. Under indicator E.25. " Published patent application" has one published application, and under indicator E.26., the applicant has two recognized utility model applications.
The summarized comparison of the required minimum number of points according to the minimum national requirements by group of indicators for the academic position "Professor" in Filed 5. Technical Sciences, Professional Direction - 5.2. Electrical Engineering, Electronics and Automation and theses realized by the candidate in the competition Assoc. Prof. Dr. Eng. Plamen Tsenkov Tsankov are given in Table 1:

Table 1

Group from indicators	**Min . requirements for AD Professor**	**Assoc. Prof. Dr. Eng . Plamen Tsankov**
A	50	**50**
B	-	-
In	100	**260.57**
G	200	**244.02**
D	100	**370**
E	150	**380**

In each of the indicated groups of indicators, the points achieved by the candidate exceed at least twice the minimum national requirements.
According to the requirements of the regulations of the Technical University of Gabrovo for the acquisition of academic positions, the requirements for the acquisition of the academic position of "Professor" are again being met and exceeded, as can be seen in Table 2:

Table 2

Criterion	**Professor**	**Assoc. Prof. Dr. Eng . Plamen Tsankov**
General number publications (articles and reports)	30, from which at least 5 independent and 3 with IF (WoS)	**34, from which 6 independent and 4 with IF (WoS)**
Number famous citations from others authors	20	**31**
Issued textbooks	2	**2**
Issued educational tools	-	**-**
Number successfully protected doctoral students	1	**2**
Guide on projects and/ or contracts for attracted means	3	**8**

In addition to all necessary and described documents and references with relevant evidentiary material certifying the above-mentioned points by groups of indicators, the candidate has also provided: an application to the Rector for admission to the competition; an announcement in the State Gazette - issue 48 12.06.2025; a higher education diploma; a diploma for the ONS "Doctor"; a CV, a list of publications in the competition; a list of publications for the ONS "Doctor"; a list of publications for AD "Doctor"; a list of citations and reviews; information on the impact factor of the journals in which the author has published; an author's reference for contributions in scientific works; summaries of works by thematic areas; scientometric data according to National requirements; scientometric data according to the requirements of TU - Gabrovo; summaries of the reviewed publications in Bulgarian and English; a declaration of the reliability of the information provided; a patent application and two utility models implemented. In addition, official notes are presented for: professional experience; project and contract management; developed curricula; built laboratories, title of academic disciplines and classroom employment.

3. Impact of the candidate's scientific publications in the scientific community (known citations)

The known citations of publications with which the candidate Assoc. Prof. Plamen Tsankov participated in the competition are 31 in total, with the cited publications of the author being 7. Three of them have 3 citations each, one has been cited 4 times, one – 5, one – 6 and one 7 times respectively. The required number of citations according to the regulations of TU – Gabrovo is 20. In addition, the candidate is the author of 6 reviews in scientific publications, referenced and indexed in world-renowned databases with scientific information, for which he has attached evidentiary material.

4. Overview of the content and results in the presented papers

The papers with which the candidate Assoc. Prof. Tsankov participated in the competition investigated an extremely broad topic, namely the use of the optical spectrum of electromagnetic radiation, and two major subtopics were addressed - lighting from natural and artificial light sources and the possibility of generating electrical energy through the use of solar radiation.

The publications that concern the use of solar radiation for generating electrical energy cover general aspects of photovoltaic conversion of solar energy, silicon and other solar cells, solar modules, energy storage devices, charge controllers, inverters, urban and rural application of solar cells, photovoltaic solar power plants, dependence of the efficiency of solar modules on their orientation and tilt angle, pollution of solar modules, smart systems and mini-grids, economics of photovoltaic systems and sustainability of the green economy. The candidate's works also contain detailed information about the geographical location, climate, solar radiation, renewable energy policy and solar energy research centers in Bulgaria. Analytical studies have been carried out, supported by significant experimental data on the potential and possibilities for using natural light and solar radiation for generating electrical energy and the various factors that influence this process not only in Bulgaria, but also in neighboring Serbia. Based on regression analysis, models have been developed to predict the yield of photovoltaic power plants. Attention has also been paid to the systems for storing the electrical energy of photovoltaic power plants, their economic suitability and the cybersecurity aspects of remote control. The possibilities for using coherent radiation for industrial applications such as copper marking have also been considered. The candidate has also paid attention to related issues such as electricity supply, energy efficiency and quality of electrical energy.

A significant part of Assoc. Prof. Tsankov's publications is dedicated to artificial lighting, and he has not omitted the basic information on the development of electric lighting, as well as the problems related to modern lighting and its various applications in particular - in public buildings, street lighting, household lighting, industrial lighting and natural lighting in Bulgaria. In his works, he works extremely in-depth on the problems of modern lighting technologies, namely LEDs, by showing a detailed analysis of all scientific and practical aspects concerning their development - from the construction and design of optical systems and luminaires and the assessment of their efficiency for various applications, through electrical, thermal, photometric, spectral and colorimetric studies and studies of quality indicators such as glare and emission of harmful blue light, design and implementation of LED lighting systems for indoor and outdoor lighting. Studies of the transmission and reflection coefficients of various lighting materials and their suitability for making optical systems for LED luminaires with regard to aging and the influence of ultraviolet and infrared radiation on them have been examined. The possibilities for realizing savings in electrical energy for lighting have been assessed, an economic analysis has been made for the specific implementations of the candidate and a summary of their general application has been made. In his work, Assoc. Prof. Plamen Tsankov shows in-depth knowledge and ease in using specialized software products for lighting calculations and design of lighting and photovoltaic systems.

The works presented by the candidate are extremely detailed, comprehensive and meaningful, not limited to visible light, but also cover the ultraviolet and infrared parts of the optical spectrum and its importance in lighting and electricity production, which is an advantage of the developments and shows in-depth knowledge and interests in the field.

5. General characteristics of the candidate's activities

According to the documents provided by Assoc. Prof. Plamen Tsankov, related to the competition and concerning his educational and pedagogical, scientific and applied and implementation activities, he has the following achievements:

5.1. Educational and pedagogical activities (work with students and doctoral students)

Assoc. Prof. Dr. Eng. Plamen Tsenkov Tsankov has approximately 28 years of work experience at TU - Gabrovo and is the holder of four disciplines included in the curriculum of the specialty "Electrical Power Engineering and Electrical Equipment" for the "bachelor" degree, full-time and part-time form of study, namely "Power Supply"; "Lighting and Installation Equipment"; "Industrial Power Supply Systems" and "Automated Design in Power Supply and Electrical Equipment", as well as three disciplines included in the curriculum of the specialty "Electrical Power Engineering and Electrical Equipment" for the "master" degree, full-time and part-time form of study - "Automatic Devices in the Power Industry"; "Optimization and Management of Power Supply Systems" and a course project on "Automated Design in the Power Industry".

Assoc. Prof. Tsankov has developed a total of 14 curricula in the disciplines "Power Supply"; "Lighting and Installation Equipment"; "Industrial Power Supply Systems"; "Power Supply" - course project; "Design of Lighting Systems"; "Automated Design in Power Supply and Electrical Equipment"; "Power Plants with Renewable Energy Sources"; "Technical Operation of Electrical Systems"; "Relay Protection"; "Optimization and Management of Power Supply Systems"; "Control and Measurement in Power Supply Systems"; Automatic Devices in the Power Industry"; "Automated Design in the Power Industry" - course project; "Technical and Economic Assessment of Power Facilities".

Assoc. Prof. Tsankov also has significant classroom workload over the last four academic years, namely: 2021/2022 - 574 hours; 2022/2023 - 437 hours; 2023/2024 - 522 hours; 2024/2025 - 614 hours.
Assoc. Prof. Tsankov is the supervisor of two successfully defended doctoral students , one of whom currently holds the academic position of "associate professor", as well as three currently active doctoral students , one in the scientific field of "Power Supply and Electrical Equipment" and two in the scientific field of "Lighting Technology and Light Sources".
To participate in the competition, he provided two textbooks, respectively on "Lighting and Installation Equipment" and "Industrial Power Supply Systems", published in 2024 and 2025.
Assoc. Prof. Tsankov has participated in the construction of two training laboratories - in "Electrical Equipment" - 2704 and in "Operation of Automatic Devices and Systems" -2610.
Over the years, Assoc. Prof. Tsankov has supervised 186 successfully defended their thesis by students from the University of Applied Sciences, both Bachelor's and Master's. He has been a reviewer of more than 150 thesis.

5.2. Scientific and applied scientific activities

Assoc. Prof. Tsankov has participated in the construction of two research laboratories: a specialized laboratory "Power Supply and Lighting Equipment" and a specialized laboratory "Renewable Energy Sources and Energy Efficiency". He is a participant, coordinator or manager of numerous projects: international - 19, national and with an external client for TU-Gabrovo - 34, university - 16. For the purposes of this competition, the candidate has provided an official note for:

- Contract E1506 on the topic "Research on autonomous power supply of consumers from renewable energy sources", 2015;
- Contract D1621E on the topic "Design and optimization of innovative LED luminaires", 2016;
- Contract 1809E on the topic "Increasing the energy efficiency of lighting systems through the introduction of LED luminaires", 2018;
- Contract 2408E on the topic "Simulations, modeling and research of modern objects and systems in the electric power industry", 2024;
- Contract NIP2025-20 on the topic "Research and analysis of the electricity balance of buildings with photovoltaic systems", 2025;
- "Survey of the street lighting system of Pavlikeni Municipality", 2016;
- "Construction of an effective street lighting system in the "Stoyan Zaimov" district - north, city of Sliven", 2016.
- "Survey of the street lighting system of the city of Gabrovo", 2016.

As mentioned above in the review statement, Assoc. Prof. Tsankov is a member of eight professional organizations and is a designer with full design qualification in the EFTA professional section of the Chamber of Engineers in Investment Design, identification number 05785.

5.3. Implementation activity

In the competition for AD "Professor", Assoc. Prof. Plamen Tsankov participated and provided evidence for three inventions, including a patent application for "Automated system for controlling the lighting system of road tunnels" and two utility models for "Automated system for controlling the lighting system of road tunnels" and "LED street lighting fixture", respectively.

6. **Contributions** (scientific, applied science, applied).

I believe that the contributions described by the candidate in the competition are correctly defined and classified by thematic areas and reflect the essence of the results obtained in his scientific,

scientific-applied and applied activities. The contributions are correctly arranged in the generally accepted methodological groups. I fully accept the reference presented by the candidate, and what makes a positive impression is that the contributions of Assoc. Prof. Tsankov are derived and refined, and the specific publications from which they are extracted and in which their fundamental developments are described are also indicated.

7. Assessment of the candidate's personal contribution.

I have known Assoc. Prof. Tsankov since 2007 and have been closely following his scientific and applied activities, due to our similar interests in some areas. In the materials submitted to me for review, I find his personal creative approach clearly expressed, as well as the specific organization of his experimental research. In addition, his active work on scientific research and practical projects and his long-term teaching activity in the field of the competition's topic are clearly and indisputably reflected in his publications. I accept and am fully convinced that the obtained scientific results, specific developments and citations are largely due to the personal efforts, ideas, expertise, organizational qualities and skills of Assoc. Prof. Tsankov.

8. Critical notes and recommendations

The above-mentioned merits of the materials presented by Assoc. Prof. Tsankov, his undisputed scientific and practical achievements and his work in international teams dominate categorically in my entirely positive assessment. The materials submitted for review do not give grounds to formulate critical remarks, but rather positive recommendations. I recommend that the candidate continue his active publication and scientific activity, his joint work with students and doctoral candidates and his contribution to international projects . The high level of the achieved scientific results and his participation in remarkable scientific teams give me the basis for these recommendations.

11. Personal impressions

I have personally known the candidate for the competition for the position of Professor, Associate Professor Plamen Tsankov, for nearly 20 years, when I started working on my doctoral dissertation in the field of "Lighting Technology and Light Sources". He is a highly erudite specialist, an extremely open colleague for joint work, always giving and showing his developments and openly sharing his ideas. I highly appreciate and admire the perseverance, responsibility, consistency in science and teaching activities of Associate Professor Tsankov, as well as his tireless work and talent for awakening the interest of young people - students and doctoral candidates in the field of his competences, as well as his colleagues in his scientific ideas.

12. Conclusion:

Considering the above, I propose Assoc. Prof. Dr. Eng. Plamen Tsenkov Tsankov to be elected as a "Professor" in field of higher education - 5. Technical sciences , professional field - 5.2. Electrical engineering , electronics and automation , specialty - "Electrical supply and electrical equipment" (Lighting and installation technology)

10/27/2025 Reviewer:

/assoc. prof. Iva Petrinska/