Committee on Electrical Engineering in 2012–2021

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The Committee on Electrical Engineering of the Polish Academy of Sciences was under the direction of the following people listed according to term of office between 2011 and 2022.

Term of office 2011–2015

Professor Andrzej Demenko	Chairman
Professor Tadeusz Citko	Vice Chairman
Professor Stanisław Bolkowski	Vice Chairman
Professor Romuald Włodek	Vice Chairman
Professor Tadeusz Skoczkowski	Scientific Secretary

Term of office 2016–2019

Professor Andrzej Demenko	Chairman
Professor Adam Szeląg	Vice Chairman
Professor Stanisław Bolkowski	Vice Chairman
Professor Tadeusz Skoczkowski	Scientific Secretary

Current term of office – 2020–2023

Professor Marian Łukaniszyn	Chairman
Professor Andrzej Demenko	Vice Chairman
Professor Lech Grzesiak	Vice Chairman
Professor Rafał Wojciechowski	Scientific Secretary

The Committee on Electrical Engineering of the Polish Academy of Sciences (PAN) was established by the No. 82 Resolution of the Scientific Secretariat of the PAN on 2.12.1952 [1–4]. The Committee on Electrical Engineering of the Polish Academy of Sciences has repeatedly, during its 69 years of existence, expressed its opinion about the developmental trends of the discipline in a global, as well as national context, presenting specific studies for the purpose of decision-making centers in the entire country [1]. It is important to note a valuable document developed in 1994 under the direction of former Chairman Professor Dr. Eng. Tadeusz Śliwiński and an elaborated report, which was created under the direction of the next chairman, Professor Dr. Hab. Eng. Zbigniew Ciok: "The challenges faced by electrical engineering in the twenty-first century", published in 1999 [2–5].

Electrical engineering, which emerged from physical and chemical studies, is based on Maxwell's laws and inventions of T.A. Edison and others. It was developed more than two hundred years ago. The following questions presented by Professor K. Zakrzewski, a former chairman [5], in the reports of the Committee on Electrical Engineering, are up to date:

- Do cognitive elements still remain within the discipline?
- Is it still developing in line with the scientific outlook?
- Does it still perform the same role in the development of society as it did at the beginning of the twentieth century?
- Does it contribute to the achievement of higher economic and cultural levels of societies?

The last question is the crucial one. The importance of electrical engineering at the current level of civilization is very huge and at the same time not fully appreciated. Its significance can be seen from a number of reports or one's own experience with system failures and natural disasters. The answer to the previously asked question is obvious. An important indicator of the role of electricity in society is energy consumption per capita [5].

In recent years, a completely new challenge was created and another factor came to the foreground, becoming the stimulator for further electrical engineering development, which is the global trend of sustainable development of society through the rational use of energy.

To ensure economic growth and social development, care must be taken to provide the required amount of power (taking into account energy efficient solutions) while at the same time ensuring that the devastation of the environment as well as pollution are kept to a minimum [5].

The structural changes after Poland joined the European Union (EU) have weighed heavily on the condition of the state of higher education (including technical education), which brings together the vast majority of competent researchers. This is a problem faced by most disciplines in Poland, including electrical engineering. The labor market in the electrical engineering as well as the apparatus industry were significantly reduced, and thus the attractiveness of studying electrical engineering began to decline in favor of computer studies, management, law, etc. This problem was also considered by the Electrical Engineering Committee, which repeatedly signaled this dangerous phenomenon, keeping in mind the loss of generational continuity. Without well-organized educational activity, many problems related to the political and economic transformation in Poland cannot be resolved [5].

Between 2011 and 2019, the Committee was chaired by Professor A. Demenko, whose work was marked by an implementation of new initiatives as well as his highly active approach. Currently, the Committee is chaired by Professor M. Łukaniszyn [7]. The structure of the Committee in the period 2020–2023 includes the following sections:

1. Section of Materials and Electrical Engineering Technology,
   Chairman – Professor Henryka D. Stryczewska,
2. Section of Power Electronics and Electrical Drives,
   Chairman – Professor Lech M. Grzesiak,
3. Section of Electrical Machines and Transformers,
   Chairmans – Professor Marian Łukaniszyn and Professor J. Zawilak (Vice Chairman),
4. Section of Electrical Power Systems,
   Chairman – Professor Zbigniew Lubośny,
5. Section of Field Theory and Electrical Circuit,
   Chairman – Professor Marian Pasko.

Previously, in 2011–2015, there were also other sections within the Committee: a) Section of Electroheat and Lighting Technique, b) Section of Great Power and High Voltage, c) Section of Electric Traction. In 2016–2019, the Section of Electroheat and Lighting Technique was included in the Section of Materials and Electrical Engineering Technology. The Section of Great Power and High Voltage has been included in the latter section and in the Section of Electrical Power Systems. Recently, after 2019, it was decided to transfer the activities of the Section of Electric Traction to two sections, the Section of Power Electronics and Electrical Drives as well as the Section of Electrical Machines and Transformers. The Section of Field Theory and Electrical Circuit was created from the Section of Electrical Engineering Theory, which had been operating for many years.

According to the Statute of the Scientific Committees of the Polish Academy of Sciences, sections of the PAN integrate professionals working in Higher Education, Scientific Research Institutes and industry. This made it possible to organize a number of conferences under the auspices of the Committee, both of a domestic as well as international character. Since 1952, the "Archives of Electrical Engineering" (AEE) quarterly has been published under the auspices of the Committee.

The **AEE journal**, previously Archiwum Elektrotechniki, is a quarterly open access journal of the Polish Academy of Sciences (**PAN Electronic Library**), publishing original scientific articles and short communiques from all branches of Electrical Power Engineering exclusively in English. The Editorial Office is located at Poznan University of Technology, at the Faculty of Control, Robotics and Electrical Engineering. Professor A. Demenko is its present Editor-in-Chief.

Currently, AEE is published both in print and online. It is linked to the most important databases, for example, Elsevier's Scopus or Web of Science by Clarivate Analytics, through Abstracting and Indexing services.

The Committee on Electrical Engineering of the Polish Academy of Sciences has been closely and successfully cooperating with the Association of Polish Electrical Engineers for many years. Together with the Association and the Power Engineering Problems Committee, it has organized seminars, e.g. the seminar "Regional and World Trends in Power Engineering", Warsaw, 2015. Representatives of the Electrical Engineering Committee repeatedly advocated on the forum of the IV Division of the Polish Academy of Sciences, and in the letters directed to the Ministry of Economy and the Ministry of Higher Education for the need to ensure energy security in Poland, as well as the necessity to focus on the development of sustainable energy.

Nevertheless, so far the efforts have not met with a positive response. In order to integrate the activities of Polish research and academic centers, the Committee on Electrical Engineering organized meetings at universities and institutes thematically related to electrical engineering.

In the last 10 years, the meetings were held at technical universities in Łódź, Szczecin, Kielce, Opole, Lublin, Gdańsk and Warsaw as well as in the Institute of Electrical Engineering in Warsaw, the Institute of Power Engineering in Warsaw, the ABB Corporate Research Centre in Krakow, the Centre for Energy Conversion and Renewable Resources of the Polish Academy of Sciences in Jabłonna.

In 2011–2013, the Committee on Electrical Engineering elaborated the study titled "The development map of electrical engineering in Poland" [6]. In the following years, the map was updated and its successive versions are saved on the Committee's website [7]. An important part of the study is the chapter on the distribution of electrical energy, concerning the issues of modernization and the expansion of electrical energy networks in Poland, taking into account the broader aspects of so-called distributed energy. In 2018, on the initiative of Professor Andrzej Demenko, the Committee on Electrical Engineering developed lists of textbooks in the field of Electrical Engineering. The lists were posted on the section's websites [7].

On the initiative of the Committee on Electrical Engineering, European research centres organise the renowned Symposium on Electromagnetic Phenomena in Nonlinear Circuits (EPNC).

During the last 10 years, the EPNC Symposium was organized by Universities in: Dortmund (2010), Rijeka (2012), Pilsen (2014), Helsinki (2016), Arras (2018) and Torino (2021). The works presented at the Symposium have been published in COMPEL and AEE journals.

Many prestigious international and national conferences that take place in Poland are run under the patronage of the Committee on Electrical Engineering. For example, it held the patronage of: (a) Conference on Fundamentals of Electrotechnics and Circuit Theory (SPETO), (b) International Interdisciplinary PHD Workshop (IIPHDW), (c) Conference on Computer Applications in Electrical Engineering (ZKwE), (d) International Conference on Electrical Machines (SME), (e) "Design and Exploitation of Electric Machines and Drives" (PEMINE) conference, (f) scientific conference on "Advances in Power Engineering" (APE), (g) "Innovative Materials and Technologies in Electrical Engineering" (i-MITEL) conference, (h) international conference on "Modern Electrified Traction" (MET), (i) national conference on "Control in Power Electronics and Electric Drives" (SENE), (j) Symposium of Magnetic Measurements and Modelling (SMMM). In 2010–2021, over a dozen monographs important for the development of electrical engineering were published under its patronage. The Committee's websites have become an important forum for disseminating information on electrical engineering, see Fig. 1. The websites contain regulations for providing patronage to conferences and publications, also news about the most important world conferences in electrical engineering, as well as publications and successes of scientists related to this field. The subpages related to the sections contain information on their activities. The Section of Electrical Machines and Transformers, for example, places there its Bulletins. Currently, the subpages of this Section contain 33 issues of the Bulletin, prepared between February 2012 and May 2021.

There is also a list of useful links on the committee's subpages, e.g. links to scientific and academic units related to electrical engineering.

The representatives of the Committee on Electrical Engineering are active in scientific and technical environments. They were part of the Committees of the III Congress of Polish Electricity,

Fig. 1. Home website of the Committee on Electrical Engineering

organized through the efforts of the Polish Electrical Engineers Association held on 2–3 April 2019 in Warsaw. Professor A. Demenko was a member of the Honorary Committee of this Congress. During the sessions of the Congress, the participants discussed a wide spectrum of modern electrical engineering, namely power engineering, electronics, computer science and related disciplines, including new technologies in industry.

In 2020, the Committee on Electrical Engineering discussed and presented the study by Professor Bolesław Zaporowski on the construction of a nuclear power plant in Poland. The Committee on Electrical Engineering of the Polish Academy of Sciences directed letters to the Ministry of Climate and Environment, M. Kurtyka, and the Government Plenipotentiary for Strategic Energy Infrastructure, P. Naimski, with the expertise titled “Construction of a safe and

zero-emission power system with nuclear power plants in Poland". The opinion formulates criteria for sustainable development of generation sources in the National Power System:

- ensuring safe operation of the National Power System,
- ensuring the availability of cheap electricity, conducive to the economic development of the country,
- ensuring optimal use of primary energy resources,
- ensuring environmental protection and counteracting climate change.

There is no doubt that the implementation of nuclear energy in Poland will contribute to ensuring the energy security of the National Power System and thus increase the energy security of the country. In addition, it will also increase the diversification of the production sector of the Polish energy industry, as well as in the long term will stabilize production costs and, therefore, electricity prices for consumers.

Moreover, the implementation of nuclear energy will significantly contribute to lower CO_2 emissions and simultaneously bring our country closer to achieving the target of building a safe and emission-free power system. This target is in line with the Paris Agreement as it relates to climate neutrality.

We consider the issue raised in this opinion to be important for the long-term strategy of ensuring the country's power security, in connection with the ongoing work on the document "**Poland's Energy Policy until 2040**" and the choice of directions for energy transformation in Poland's path towards climate neutrality.

These plans, during the difficult time of the so-called global and covid crisis, will have to be carefully selected. We hope that the further actions of the Committee on Electrical Engineering of an expert nature and integrative environment will be able to count on the support from the management of the Polish Academy of Sciences.

References

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