

Criteria for evaluating offers in tender procedures for the purchase of new rolling stock

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The article presents the currently used criteria for evaluating offers in tender procedures for the purchase of new rolling stock. A literature review and the results of the analysis of tender procedures in three segments of rolling stock are presented: passenger cars, traction units and locomotives. The summary shows that the most important evaluation criterion remains the price criterion, which is in line with legal and formal requirements.

KEYWORDS

Railways
Rolling stock
Rail vehicles
Tender procedures
Criteria

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1. Introduction

Public procurement is a key form of public sector participation in the economy. According to data from the European Commission, expenditure on public procurement accounts for as much as 19% of the European Union's GDP, which amounts to EUR 2.3 trillion per year. In the Polish economy, the share of public procurement in GDP is at least 10%, and the amount is approximately PLN 200 billion.

Sustainable transport is one of the assumptions of the European Green Deal, which is a comprehensive strategy of the European Union concerning environmental protection and combating climate change. The main goals for the transport sector are to significantly reduce greenhouse gas emissions and achieve more sustainable development. The development of railways is in line with the assumptions of the European Green Deal. Railways are the most ecological means of public transport. They are characterized by more than 3 times lower CO₂ emissions than road transport and more than 8 times lower CO₂ emissions than air transport [13]. The rolling stock industry in Poland,

after the crisis at the turn of the 20th and 21st centuries resulting from, among other things, the country's economic transformation processes, began to develop again. This was largely influenced by Poland's accession to the EU and the financing of rolling stock projects from aid funds. Due to the fact that public funds are spent, the purchase of rolling stock must be carried out in accordance with specific formal and legal frameworks.

Public procurement is formalized, as both the ordering party and the contractor must act in a specific manner and meet the requirements defined in the regulations. Since January 1, 2021, the main pillar of the public procurement system in Poland is the Act of September 11, 2019 – Public Procurement Law (hereinafter referred to as PZP) [14], which replaced the Act of January 29, 2004 – Public Procurement Law. The provisions of PZP specify, among others, the principles and procedure for awarding public procurement contracts, legal remedies, principles of control over the award of public procurement contracts, principles regarding the contract concluded as a result of the conducted procedure. The provisions contained

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in the new PZP regarding the manner of shaping the criteria for evaluating offers for the purposes of the procedure conducted reflect the provisions of Article 67 of Directive 2014/24/EU and Article 82 of Directive 2014/25/EU. According to these provisions, in the process of selecting an offer, the contracting authority must be guided by the criteria specified in the procurement documents, with the most advantageous offer having the best quality-price-or-cost ratio or the most advantageous offer having the lowest price or cost (Article 239, paragraph 2 of the new PZP). Consequently, in accordance with Article 242, paragraph 1 of the new PZP, the most advantageous offer may be selected on the basis of:

- quality criteria and price or cost
- price or cost.

In accordance with these provisions, the new regulations significantly emphasize non-price, i.e. qualitative evaluation criteria. The inclusion of the criteria for evaluating offers directly reflects the fundamental guidelines contained in Article 90 of Directive 2014/24/EU, which states that it should be clearly stated that the most economically advantageous offer should be evaluated on the basis of the best quality-price ratio.

As before, the ordering party has the possibility to choose the cost criterion as a criterion for evaluating offers using an approach based on cost effectiveness, such as life cycle cost. This calculation includes all costs related to the life cycle, understood in accordance with its definition contained in art. 2 item 1a of the PZP and art. 7 item 2 of the new PZP. In the light of this definition, the life cycle is all possible or subsequent related phases of the existence of the subject of supply, service or construction work, in particular research, development, industrial design, testing, production, transport, use, repair, modernisation, change, maintenance throughout the period of existence, logistics, training, consumption, demolition, withdrawal and disposal.

In the currently applicable Public Procurement Law, the quality criterion is an independent criterion used alongside price or cost (Article 242, paragraph 2) and may refer in particular to:

- quality, including technical parameters, aesthetic and functional properties such as accessibility for disabled people or taking into account the needs of users
- social aspects, including the professional and social integration of socially marginalized persons referred to in Article 94 paragraph 1
- environmental aspects, including energy efficiency of the subject of the contract
- innovative aspects
- organization, professional qualifications and experience of persons assigned to execute the order, if

they may have a significant impact on the quality of execution of the order

- after-sales service, technical assistance, delivery conditions such as date, method or time of delivery, and the implementation period.

The use of qualitative criteria has always been permissible, but the inclusion of a broad catalogue of example criteria for evaluating offers is intended to increase the popularity of their use by contracting authorities.

During the public procurement process, contracting authorities have a variety of tools at their disposal that allow them to select a supplier or contractor without harming the natural environment, and even contributing to its improvement. Unlike social issues, environmental aspects are more closely related to the nature of the contract itself than social aspects. Contracting authorities can take these issues into account by defining appropriate technical and functional standards for the product, building or service, as well as by requirements regarding the method of their implementation. They can also strengthen these requirements by applying criteria for evaluating offers or including them within these criteria. Within the framework of environmental criteria, additional rewards can be given to aspects such as:

- efficient use of resources (such as electricity, heat, water, etc.) by the rail vehicles offered
- use of recycled or recyclable products
- performing services, deliveries or works in an environmentally friendly manner, for example by using energy-saving machines and technologies, rail vehicles that emit less pollutants.

When environmental criteria are used, it is often justified to include a cost criterion based on life cycle cost (LCC). Although this type of criterion focuses mainly on the costs associated with a given product, it also takes into account the costs of its use, which are often related to the consumption of resources (such as water, electricity and heat), which can lead to greater efficiency in their use and reduction of environmental pollution. In addition, the cost criterion may also take into account external costs related to the ecological impacts of the product's life cycle, such as pollutant emissions or climate change mitigation efforts.

It should be noted that the European Commission is also actively involved in promoting Green Public Procurement (GPP), as it considers it an effective tool for promoting the least polluting products and services. This can help achieve more sustainable consumption and support innovation, which in turn affects the competitiveness of the EU economy. The Commission invites the Member States, the European Parliament and the European Council to:

- to adopt a suggested strategy and method for setting common standards for green public procurement, policy objectives and recommended tools to promote and improve green public procurement
- implementing the above-mentioned elements by developing strategies for green public procurement and increasing cooperation, especially in the context of implementing EU funding mechanisms
- supporting ongoing activities aimed at proposing additional measures to achieve a coherent development of green public procurement criteria and objectives and to optimise political support for green public procurement.

It should be noted, however, that Article 246 of the new PZP expresses the right of contracting authorities to use the price criterion as the sole criterion or with a weight exceeding 60%, provided that the description of the subject of the contract specifies quality standards relating to all significant features of the subject of the contract and demonstrates the manner in which life cycle costs were taken into account in the description of the subject of the contract.

The aim of the article is to review the literature on tender procedures for the purchase of new railway rolling stock and to analyze the criteria for selecting offers depending on the type of rolling stock.

2. A review of the literature on the preparation and evaluation of tender offers

The award of public contracts in Poland is regulated by the above-mentioned Public Procurement Law implementing EU directives. The strict regulation by law of the conclusion of contracts within the framework of public procurement is aimed at protecting both the ordering party and the contractor. The quality of the tender documentation determines not only the correctness, ease of problems and speed of the tender procedure. The content of the tender documents also influences the determination of the group of contractors who may apply for the contract, specifies the procedure for selecting the most advantageous offer and defines the principles of performing the contract regarding the order. The subject of tender procedures and criteria for evaluating offers was dealt with by domestic and foreign authors.

In 2007, Raczyński [15] presented an analysis of decision-making factors that companies must take into account when planning future purchases of rolling stock. The author considered investment criteria in both technical and economic aspects and drew attention to the issue of maintaining the rolling stock during the 30-year period of vehicle operation. The paper also describes energy and fuel consumption and such operational factors as: the need for a traction and con-

ductor team to service trains, the costs of access to the railway infrastructure and the availability of vehicles. The author also drew attention to the time perspective, which should also be taken into account when making decisions on the purchase of rolling stock.

In 2011, under the editorship of Sadowy, the Public Procurement Office published a study [17] which is a collection of practical examples and applications of bid evaluation criteria in public procurement procedures. It was created based on the experience of contractors associated in industry organizations. It shows that contracting authorities still do not see the benefits of using non-price bid evaluation criteria to a large extent, because using them requires greater knowledge and experience. Moreover, the proper formulation of criteria also takes more time both at the stage of preparation and conducting the public procurement procedure. The author indicates that the use of non-price bid evaluation criteria can help in achieving the basic objectives of the public procurement system, i.e. ensuring contractors non-discriminatory access to public procurement and achieving the effect of obtaining the most advantageous offer resulting from the competition between contractors.

The Public Procurement Office in its 2020 study [21] presented a catalogue of good practices in the field of non-price criteria for the selection of offers. This is the second version of this document taking into account the provisions of the Act of 11 September 2019 – Public Procurement Law (Journal of Laws of 2019, item 2019). It was noted there that the Public Procurement Law serves the effective spending of public funds and prevention of possible negative phenomena that may appear at the interface between the public and private sectors. The implementation of the above objectives is achieved by, among others, the following principles of awarding contracts: equal treatment of contractors, fair competition, proportionality, efficiency, transparency and impartiality. The study in the form of a guide has been divided into two parts. The first part outlines the principles of evaluation of offers in public procurement and collects ten basic tips facilitating the proper selection of criteria, methods of their evaluation and their weighting. The second part of the guide presents a catalogue of several dozen good practices in defining non-price criteria – practices that take into account the assumptions presented in the first part. In the area of transport services, the authors drew attention to such a criterion for evaluating offers as ecology. It was indicated that a sample offer form may require the specification of: type and fuel consumption, CO₂ emission level or total pollutant emission level in this respect.

In 2022, the Minister of Funds and Regional Policy published [9] guidelines specifying unified conditions

and procedures for the eligibility of expenditure in the years 2021–2027. These guidelines apply to expenditure incurred by ordering entities for rolling stock as part of national co-financing from the state budget, EU funding and own contribution. The study draws attention to the need for them to comply with the principles of competitiveness at the stage of the procurement procedure. In practice, this means formulating the criteria for evaluating offers in a way that ensures fair competition and equal treatment of contractors. It was noted that all criteria for evaluating offers must be related to the subject of the procurement, each criterion and description of its application must be formulated in an unambiguous and understandable manner, and that the weights of individual criteria should be determined in a way that allows for the selection of the most advantageous offer. In addition to price or cost, the evaluation criteria for offers may include aspects such as: quality (including technical parameters), aesthetic and functional properties, accessibility, design for all users, social, environmental and innovative aspects and the organisation, professional qualifications and experience of persons designated to execute the order, as well as after-sales service and technical assistance, delivery conditions such as delivery date, delivery method and delivery time or implementation period.

Gawrońska in 2016 [6] described a multi-criteria model for the evaluation of public procurement offers concerning means of transport. The paper presents the structure of criteria for the evaluation of public procurement offers for low-floor buses and discusses two models for the evaluation of offers: in the conditions of determining the actual values of the evaluations and taking into account the uncertainty regarding the evaluations of the members of the tender committee. In terms of the hierarchical structure of criteria for the evaluation of low-floor buses, three groups of criteria were distinguished: bus price, technical and operational properties (e.g. the structure of the body frame and the external skin of the bus, the method of obtaining the exhaust emission standard, engine power and capacity, or the minimum recommended bus service interval during and after the warranty period) and warranty and service conditions.

In the materials published in 2018 by Raczyński [16], an important issue of the total life cycle cost as a criterion for purchasing rolling stock was raised. The key parameter in assessing the economic profitability of purchasing and operating rolling stock is the total cost incurred by the ordering party, starting from the preparation of the rolling stock purchase plan until the end of its operation, including its liquidation. The author defines the life cycle costs (LCC) of a vehicle as:

$$K = K_i + K_m + K_u$$

where: K – vehicle life cycle costs, K_i – vehicle purchase investment costs, K_m – vehicle maintenance technical costs, K_u – vehicle operating costs.

Therefore, the main factors to be taken into account when evaluating the offers are: the cost of the rolling stock (40–50% of the life cycle costs); the cost of maintaining the rolling stock for at least 15 years (40–50% of the value) and energy consumption (15–20%).

In 2018, the Asian Development Bank (ADB) published a report on the evaluation of bids for goods, construction works, services other than consulting and advisory [1], which is a guideline for both procurers and contractors on the proper preparation of tender procedures in terms of form and content. To date, in many cases, ADB procurement rules and procedures have not been fully complied with, or in some cases, have been violated. In such a situation, it becomes necessary for ADB to obtain additional information or request clarifications and additional analyses. Given the difficulties associated with the evaluation process and the preparation of complete, accurate and concise bid evaluation reports, a report has been prepared to provide all participants in tender procedures with guidance on bid evaluation procedures. The report consists of two parts. Part 1 sets out a systematic, step-by-step bid evaluation procedure covering all relevant factors to be considered in determining the lowest-scoring bid, in accordance with the terms of the tender document. It also shows how to prepare a report to the ADB using the analysis tables prepared in the assessment process.

In 2019, Stoilova [19] described the results of research on the development of rail transport in twelve different rail transport markets in the Balkan region. She described the methodology based on multi-criteria assessment of the level of railway development. This methodology includes three steps. In the first step, quantitative and qualitative criteria for assessing the social, economic, infrastructural and technological impact on the development of rail transport were determined. In the second step, the weights of the criteria were determined using an objective and subjective approach. The third step presents the ranking of 12 Balkan countries by using three multi-criteria methods. The results show that the following criteria are of great importance in the ranking: maximum technical speed of the train – 13%, the level of implemented ERTMS (European Rail Traffic Management System) – 10%, the annual number of kilometers traveled by the train – 9%. Based on research, it was found that the most developed rail transport in the Balkans is found in the following countries: Türkiye, Croatia, Slovenia and Romania.

In 2020, the team of authors under the auspices of the Railway Institute published a report [7] which is a guideline for those ordering passenger rolling stock. The report organizes the basic definitions and classifications of rolling stock, legal requirements, recommended technical standards for individual vehicle components. It also describes a summary of operational requirements and guidelines for operational conditions and functional requirements for passenger rolling stock depending on the type of transport. It also addresses the important issue of guidelines for organizing the ordering process, including the criteria for evaluating offers. The authors point out that in procedures for the purchase of rolling stock, the most frequently used criterion is the price criterion. However, more and more often, in addition to the purchase price itself, ordering parties also compare the operating costs of the rolling stock, in particular energy consumption, maintenance and repair costs. The warranty period is also a popular criterion among those ordering rolling stock. However, ordering parties relatively rarely try to take into account other quality criteria, such as functionality or innovation. The report presents examples of tender provisions that refer to evaluation criteria such as: vehicle warranty, technical reliability coefficient, total wagon weight, periodic repair price. The summary emphasizes that developing bid evaluation criteria requires the cooperation of many people – public procurement specialists, lawyers and technical experts. Additionally, the completeness, detail and clarity of the description of bid evaluation criteria are important, so that there is no need to pursue rights before the National Chamber of Appeals (KIO), an institution established to hear appeals filed during public procurement procedures.

Čarný published an article in 2020 [4] that presents the nature of the services offered by these companies and presents the multi-criteria methods of evaluating offers used in this market, as well as the criteria themselves that are evaluated. In summary, attention was drawn to the need to use many criteria, which allows the ordering party to select the offer that is optimal for them.

In 2020, Yannis [22] described a review of the current knowledge in the field of multi-criteria decision-making (MCDM) in the transport sector. The analysis shows that the most commonly used method in the transport sector is the hierarchical analysis of the process (AHP). The author describes the currently widely used MCDM techniques and indicates their advantages and benefits, i.e.: transparency and transparency of decisions, the ability to manage a large amount of technical information and data, the process can be fully controlled (results and weights are given based on established parameters), and the possibility

of modification at a later stage is ensured. The article describes and compares the most commonly used multi-criteria decision-making methods in the aspect of the transport sector.

Ćwil et al [5] in 2021 presented rail transport as the basis for modern sustainable transport systems. In the article, the authors describe the differences in energy consumption between different types of rail vehicles. Additionally, the aspect of energy consumption was analyzed as a criterion for selecting offers in tender procedures for rolling stock, especially in relation to the life cycle costs of vehicles. Based on the energy consumption of different types of rail vehicles, their efficiency was compared and the possibility of using this parameter to improve the procurement process was indicated in order to ensure that companies operating trains purchase vehicles that consume less energy. Such steps are necessary for the railway to become more sustainable and reduce emissions, which will become critical when CO₂ emission permits become more expensive.

In the symposium materials published in 2021, Brockmeyer [3] addresses the concept of the most economically advantageous offer (MEAT) popularized by the EU Directive 2014/24/EU. Many current methods of selecting offers in rolling stock procurement procedures evaluate not only the total life cycle cost (LCC) of the rolling stock, but also the technical quality and compliance with the technical specification. According to the author, the weights of the criteria for technical quality weigh more than the weights for the entire life cycle cost. Quality-related criteria are usually multiplied by 60% to 70%, while the life cycle cost criteria are multiplied only by 30% to 40%. This means that the quality of the proposed product is more important than its price. It follows that bidders should focus on the technical quality of their product.

Stoilova and Martinov in their 2022 study [20] analyzed four types of rail freight transport for the transport of semi-trailers. The paper developed a methodology for assessing these technologies based on multi-criteria analysis. In the first step, quantitative and qualitative criteria for assessing the technologies under study were defined. The criteria were grouped into three main groups – technical, technological and economic. In the second stage, one of the methods for determining objective criteria weights was used to assess the criteria – the Shannon entropy method. In the third stage, the importance of the technology was assessed using the multi-criteria PRO-METHEE method (a discrete optimization method in which variants are compared with each other, which leads to determining the preferences of each criterion). The results show that the greatest impact is exerted by economic (50%) and technological (45%) criteria, while technical criteria are the least important (5%).

In an article from 2020, Jaworska [8] described the current state and the new Public Procurement Law (PZP) in terms of bid evaluation criteria. The study emphasized that the main problem in the public procurement system is choosing the cheapest solutions instead of the most effective ones. The update of the PZP Act from 2019 introduced significant changes in several points in the scope of bid evaluation criteria. The provisions contained in the new PZP in relation to the method of shaping the bid evaluation criteria for the purposes of the conducted procedure reflect the provisions of Directive 2014/24/EU and Directive 2014/25/EU. The author presents provisions regarding the selection of the most advantageous offer, the principle of efficiency, the cost and quality criterion, as well as the relationship of the criteria with the subject of the contract, the method of describing the criteria and the case of using price as the only criterion for bid evaluation.

In the study edited by Nowak and Winiarz [11] from 2021, an entire chapter was devoted to commenting on the articles of the Public Procurement Law [14] concerning the selection of the most advantageous offer. Chapter 7, section (Art. 239–253) II of the Public Procurement Law specifies the rules for selecting the most advantageous offer, in particular the rules for applying the criteria for evaluating offers, as well as the rules of conduct in situations where offers have been submitted with the same balance of price or cost and other criteria for evaluating offers, or offers with the same price or cost. It also specifies the rules for submitting additional offers, the deadline for selecting the most advantageous offer and the information obligations of the contracting authority related to the selection of the most advantageous offer. Selection of the most advantageous offer is the last stage of the evaluation of offers. This evaluation is carried out in terms of the criteria established by the contracting authority and specified as a rule in the contract notice and in the contract documents.

In the materials published by the Public Procurement Office (UZP) in 2023 [2, 12, 18], the authors, in addition to discussing the relevant legal bases for the evaluation criteria of offers resulting from the Public Procurement Law, presenting case law, including the case law of the National Chamber of Appeal, regarding the admissibility of formulating specific criteria in contract award procedures, included numerous examples illustrating the possibilities of taking into account social or environmental aspects in public procurement.

In the 2023 report [10], Nowak raised a number of issues related to the legal aspects of the functioning of the public procurement system in Poland. The author characterized the public procurement market in detail and discussed statistical data on the public procure-

ment market. Aspects related to the institutional functioning of the procurement system in Poland were also discussed. The summary also presented conclusions and recommendations aimed at attracting entrepreneurs, in particular from the small and medium-sized enterprise sector, to the public procurement market.

3. Analysis of criteria for selecting offers in tender procedures for the purchase of rolling stock

3.1. Passenger cars

The criteria for selecting offers and their weights were analyzed in three procedures for the purchase of new passenger cars. The first one concerned the procedure (No. 22/01/TUT/2017) for awarding an order for the delivery of 55 passenger cars together with the performance of a level 3 maintenance inspection. The ordering party – PKP INTERCITY S.A. defined the following criteria for selecting offers (Fig. 1):

- unit price of delivery of a passenger car – weight 70%
- unit price of performing a 3rd level maintenance inspection – weight 10%
- warranty – weight 10%
- total weight of a 1st class compartment passenger car in service condition – weight 2%
- total weight of a 2nd class non-compartment passenger car in service condition – weight 2%
- total weight of a 2nd class compartment passenger car in service condition – weight 2%
- total weight of a 2nd class non-compartment passenger car equipped with eight bicycle racks in service condition – weight 2%

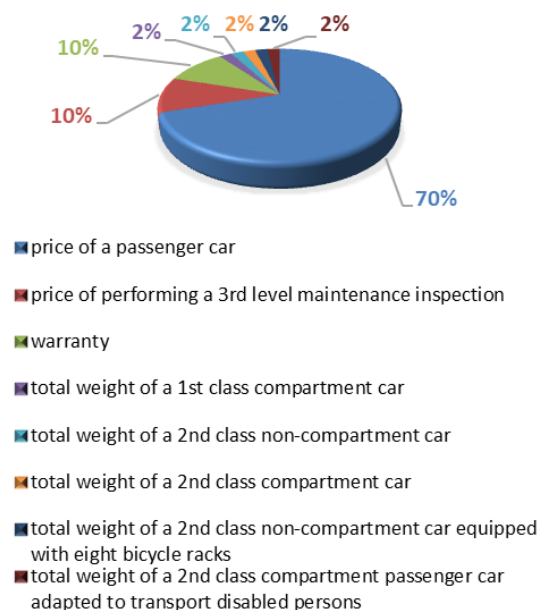


Fig. 1. Criteria for evaluation of offers and their weighting – PKP IC tender for 55 wagons

- total weight of a 2nd class compartment passenger car adapted to transport disabled persons in service condition – weight 2%.

Another tender subject to analysis was the procedure no. 15/10/TUT/2017 for the award of an order for the delivery of 8 special passenger cars for the transport of people for the needs of the Polish Armed Forces. In this procedure, the ordering party – PKP INTERCITY S.A. was guided by the following criteria when selecting the offers (Fig. 2):

- price for the execution of the subject of the order – weight 90%
- warranty and guarantee period – weight 10%.

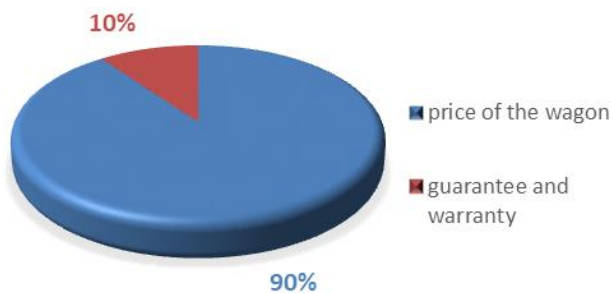


Fig. 2. Criteria for evaluation of offers and their weighting – PKP IC tender for 8 wagons

The third of the analyzed tenders was the procedure (No. 21/WNP-010356/TUT) for the award of an order for the delivery of 300 passenger cars together with the performance of an inspection at the 3rd maintenance level. The ordering party – PKP INTERCITY S.A. defined the following criteria for the evaluation of offers (Fig. 3):

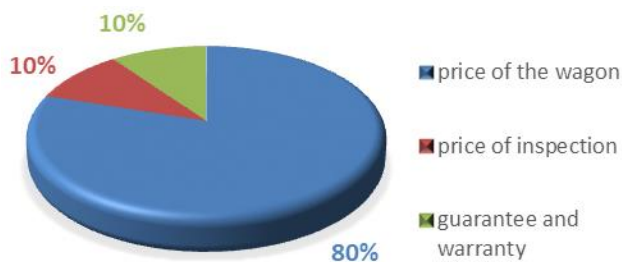


Fig. 3. Criteria for evaluating offers and their weighting – PKP IC tender for 300 wagons

- unit price of passenger car delivery – weight 80%
- unit price for performing a 3rd level maintenance inspection – weight 10%
- warranty and guarantee period for the delivered wagons, software made for them, as well as wagon documentation – weight 10%.

The analysis shows that in all the procedures, price was the most important criterion for evaluating the offers and was characterized by a weight of at least 70%. In addition to price, in each of the analysed pro-

cedures, there was a criterion of the offered guarantee for the ordered wagons. In all cases, this criterion had a weight of 10%. In one of the tenders, there was also a criterion of the maximum weight of the wagons and it was characterized by a weight of 2%.

3.2. Traction units

An analysis of the criteria for selecting offers in three procurement procedures for the purchase of traction units was carried out. In the Specification of the Terms of the Order in the procurement procedure called "Conclusion of a framework agreement for the delivery of brand new electric multiply units for passenger rail transport" (proceeding no. PZP1.240.51.2022). The Ordering Party – Polregio S.A. defined the criteria that guided it in selecting offers:

- price – weight 90%
- boogie design – weight 5%
- material for supporting structure – weight 5%.

The criteria for evaluating offers in this procedure are presented in Fig. 4.

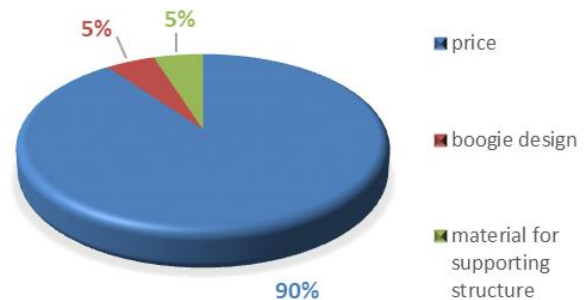


Fig. 4. Criteria for evaluation of offers and their weighting – Polregio tender for EMU – framework agreement

The second of the analysed proceedings was the procurement procedure called "Improvement of spatial mobility of residents of Wielkopolska in public collective transport through the purchase of new rolling stock", the subject of which is the delivery of 8 brand new electric traction units to serve electrified routes as part of provincial regional rail transport (along with the provision of technical instructions in the scope of vehicle operation and maintenance to persons indicated by the Ordering Party; granting a guarantee and extended warranty for the delivered vehicles; development and transfer of technical documentation; granting a license for technical documentation and software (proceeding no. DT II.272.2.2023). The Ordering Party – Wielkopolska Province with the seat of the Marshal's Office of the Wielkopolska Province in Poznań defined the criteria which were followed when selecting the offers:

- price – weight 60%
- guarantee and warranty – weight 30%
- operating mass – weight 10%.

The distribution of the weights of the offer selection criteria in the procedure described above is presented in Fig. 5.

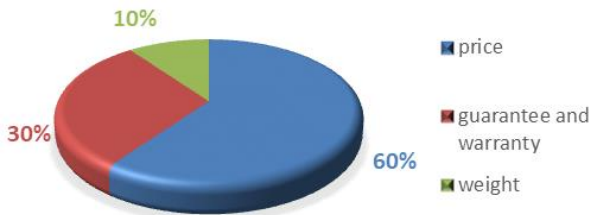


Fig. 5. Criteria for evaluation of offers and their weighting – tender of the Wielkopolska Province for 8 EZTs

In the procedure for awarding the contract for the delivery of 10 four-unit brand new electric multiple units together with the delivery of equipment intended for the modernisation of the rolling stock maintenance facilities (procedure no. SKMMU.086.26.22), the ordering party – PKP Szybka Kolej Miejska w Trójmieście sp. z o.o. defined the following criteria for selecting offers:

- price – weight 95%
- ratio of the number of driven axles to the number of all axles in each vehicle – weight 2.5%
- total clearance of external passenger doors in each vehicle – weight 2.5%.

The above criteria are presented in Fig. 6.

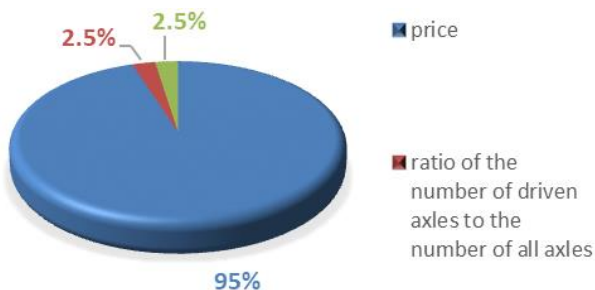


Fig. 6. Criteria for evaluation of offers and their weighting – PKP SKM tender for 10 EMU

The analysis of the procedures for awarding orders for the purchase of traction units shows that, similarly to orders for wagons, the decisive criterion for selecting offers is price (weight of at least 60%). The remaining criteria defined by the ordering parties concern technical issues and the construction of the vehicle and result from their individual needs.

3.3. Locomotives

Three tenders for the purchase of locomotives were also analysed. The first one concerned the award of a tender for the delivery of 18 light shunting diesel locomotives (tender no. 23/WNP-018177/TUT). The ordering party – PKP INTERCITY S.A. was guided by the following criteria when selecting the offers:

- price – weight 80%
- guarantee and warranty – weight 15%
- vehicle availability factor – weight 5%.

The weight distribution of these criteria is presented in Fig. 7.

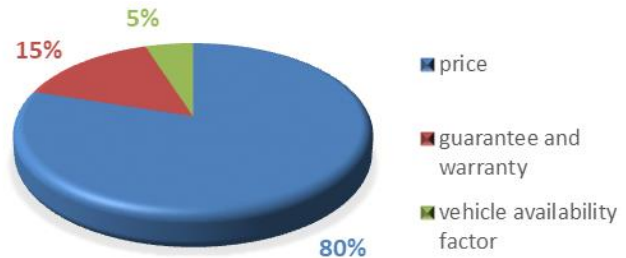


Fig. 7. Criteria for evaluation of offers and their weighting – PKP IC tender for 18 locomotives

In the Specification of the Terms of Reference for the contract award procedure entitled “Delivery of 63 multi-system electric locomotives with a speed of not less than 200 km/h together with the provision of maintenance services” (proceeding no. 20/WNP-006234/TUT), the ordering party – PKP INTER-CITY S.A. defined the criteria it followed when selecting the offers:

- price – weight 45%
- rate for providing maintenance services – 35%
- vehicle warranty of at least 36 months – 7%
- maximum number of events causing loss of essential operating characteristics in a cycle of 250 thousand km at a level not greater than 3–6%
- technical readiness factor of at least 95% – 4%
- technical reliability coefficient of the rolling stock at a level of at least 95% – 3%.

Figure 8 shows a chart of the criteria and their share in the selection of offers.

In the second of the analysed proceedings concerning the award of the contract entitled "Delivery of 38 seven-car push-pull double-deck trains together with 45 multi-system locomotives and the provision of multi-system locomotive maintenance services" (procedure no. 23/WNP-018007/TUT), the ordering party – PKP INTERCITY S.A. defined the following criteria which it followed when selecting the offers:

- price – weight 60%
- rate for providing maintenance services per 1 km of locomotive mileage – weight 13%
- warranty period for the bogie frames and the structure of the vehicle body and frame – weight 5%
- maximum number of events causing loss of essential operational features in the annual mileage of locomotives – weight 5%
- locomotive readiness factor – weight 5%
- locomotive reliability factor – weight 5%

- indicator of the number of permanent seats per linear metre of the total length of a seven-car train – weight 5%
- maximum speed of vehicles – weight 2%.

The distribution of weights of these criteria is presented in the graph below (Fig. 9).

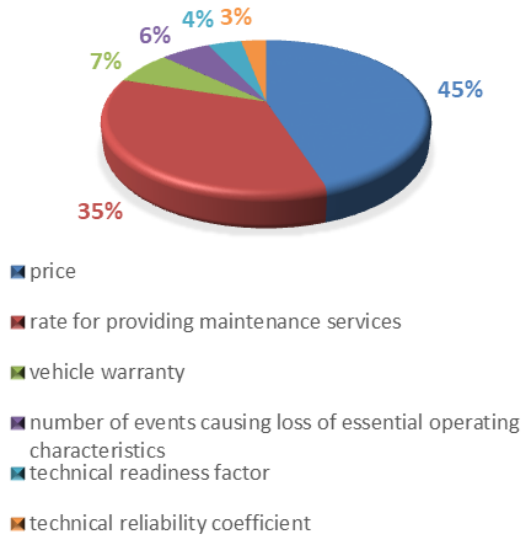


Fig. 8. Criteria for evaluation of offers and their weighting – PKP IC tender for 63 locomotives

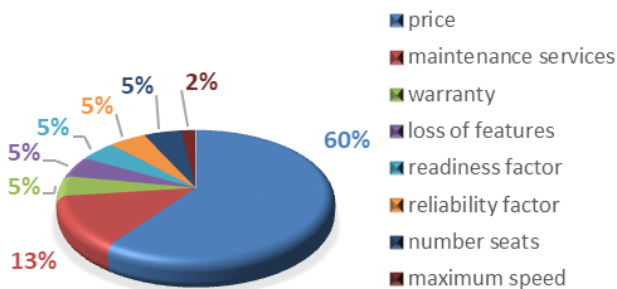


Fig. 9. Criteria for evaluation of offers and their weighting – PKP IC tender for push-pull and locomotives

The analysis of the criteria for selecting offers in locomotive purchase procedures shows that ordering parties focus mainly on the price of the vehicle, which is characterized by a weight of at least 45%. In the case of locomotives, ordering parties also pay attention to the issue of the offered warranty period and rolling stock maintenance. In the above-analyzed procedures, the criterion of ensuring the required locomotive availability coefficient also appeared.

4. Summary and conclusions

The analysis of the criteria for selecting offers in procedures for the purchase of rolling stock shows that in all the tender procedures examined, the price criterion has the highest weight (from 45% to 95%, on average: 74% – Fig. 10).

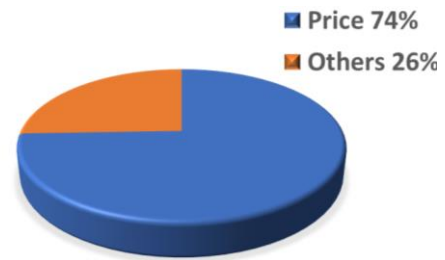


Fig. 10. Criteria for evaluation of offers – summary

Based on the analyses conducted, it can be stated that effective criteria for evaluating offers in tender procedures for the purchase of new rolling stock play a key role in ensuring optimal technological, economic and environmental solutions. In an era of growing requirements related to energy efficiency, durability and reduction of operating costs, the selection of appropriate evaluation parameters, including both financial and non-financial aspects, is essential for achieving high quality of transport services provided.

The analysis of the criteria for evaluating offers should therefore take into account not only the costs of acquisition and operation, but also indicators related to the innovativeness of technological solutions, service availability and environmental impact. Effective implementation of criteria developed in this way can increase the competitiveness of rail carriers and support the sustainable development of the public transport sector.

It is therefore recommended to conduct further research on the improvement and standardization of tender processes, which would take into account the specificity of the Polish rail market and current trends in technological innovation and environmental policy. Furthermore, the development of more precise and multi-faceted assessment criteria can contribute to the selection of rolling stock that not only meets operational requirements, but also responds to the challenges of modern transport, such as reducing greenhouse gas emissions and improving energy efficiency.

The price criterion is the most important regardless of the type of rolling stock that is the subject of the procedure. The criteria for offers in the procedures examined are consistent with the guidelines of the Public Procurement Office, the case law of the National Appeal Chamber and the requirements of the Public Procurement Law. Ordering parties select the most advantageous offer not only based on the purchase cost criterion. Other non-price criteria such as quality, efficiency or availability are also widely used. Importantly, the total life cycle cost of rolling stock (LCC) is commonly taken into account, and not only the purchase costs.

Nomenclature

AHP	analytic hierarchy process	MCDM	multi criteria decision making
ERTMS	European Rail Traffic Management System	MEAT	most economically advantageous tender
GPP	Green Public Procurement	PZP	Public Procurement Law
KIO	National Chamber of Appeals	UZP	Public Procurement Office
LCC	life cycle cost		

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