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Postgraduate Dissertation

“Enhancing the Sustainability of Public Procurement
through Process Optimization and Risk Management”

Case Study in a Greek Public Enterprise STASY

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Abstract

Public procurement is a critical function of governments and public entities, encompassing the acquisition of goods, services, and works to fulfill public needs. In the European Union, public procurement is guided by a robust legal framework designed to ensure transparency, fairness, and efficiency. In Greece, the regulatory framework is largely shaped by EU Directives, such as Directive 2014/24/EU and 2014/25/EU, transposed into national law through Legislative Decree 4412/2016. These regulations aim to harmonize procedures, foster competition, and achieve optimal value for public resources.

In recent years, the concept of sustainability has gained prominence in public procurement. Sustainable public procurement (SPP) integrates environmental, social, and economic considerations into procurement decisions. By prioritizing sustainability, public entities can contribute to reducing carbon footprints, promoting social equity, and ensuring long-term economic benefits. In Greece, the adoption of sustainability in public procurement remains a challenge, requiring effective strategies to align legal compliance with broader sustainability goals.

The optimization of procurement processes in public entities such as STASY A.E. (Athens Urban Transport Organization) is pivotal to achieving these objectives. Optimization involves streamlining workflows, implementing digital tools, and fostering a culture of continuous improvement. By reducing inefficiencies and enhancing decision-making, public organizations can better allocate resources while ensuring adherence to legal and sustainability standards.

Risk management plays a vital role in this context, as it helps identify, assess, and mitigate potential risks throughout the procurement lifecycle. Effective risk management ensures that procurement activities are resilient to challenges such as supply chain disruptions, non-compliance with regulations, and financial uncertainties. In organizations like STASY A.E., adopting a structured approach to risk management can enhance operational reliability and public trust.

This dissertation explores the intersection of sustainability, process optimization, and risk management in public procurement, focusing on STASY A.E. as a case study. It aims to demonstrate how these elements can collectively enhance the efficiency, transparency, and sustainability of procurement processes in the Greek public sector.

Abstract in Greek

Οι δημόσιες συμβάσεις είναι κρίσιμες για τη λειτουργία των κυβερνήσεων και των δημόσιων φορέων, για την κάλυψη των δημοσίων αναγκών μέσω της απόκτησης αγαθών, υπηρεσιών και έργων. Στην Ευρωπαϊκή Ένωση, οι δημόσιες συμβάσεις ορίζονται από ένα ισχυρό νομικό πλαίσιο που έχει σχεδιαστεί για να διασφαλίζει τη διαφάνεια, τη δικαιοσύνη και την αποτελεσματικότητα. Στην Ελλάδα, το ρυθμιστικό πλαίσιο διαμορφώνεται σε μεγάλο βαθμό σύμφωνα Οδηγίες της ΕΕ, όπως οι Οδηγίες 2014/24/ΕΕ και 2014/25/ΕΕ, που ενσωματώθηκαν στο εθνικό δίκαιο μέσω του Νόμου 4412/2016. Οι Ευρωπαϊκές οδηγίες και ο Ελληνικός Νόμος Δημοσίων Προμηθειών, αποσκοπούν στην εναρμόνιση των διαδικασιών, στην ενίσχυση του ανταγωνισμού και στην επίτευξη της βέλτιστης αξίας για τους δημόσιους πόρους.

Τα τελευταία χρόνια, η έννοια της βιωσιμότητας έχει αποκτήσει έμφαση στις δημόσιες συμβάσεις. Οι βιώσιμες δημόσιες προμήθειες ενσωματώνουν περιβαλλοντικούς, κοινωνικούς και οικονομικούς παράγοντες στις αποφάσεις προμηθειών. Δίνοντας προτεραιότητα στη βιωσιμότητα, οι δημόσιοι φορείς μπορούν να συμβάλουν στη μείωση του αποτυπώματος άνθρακα, στην προώθηση της κοινωνικής ισότητας και στη διασφάλιση μακροπρόθεσμων οικονομικών οφελών. Στην Ελλάδα, η υιοθέτηση της βιωσιμότητας στις δημόσιες συμβάσεις παραμένει πρόκληση, καθώς απαιτείται αποτελεσματικές στρατηγικές για την ευθυγράμμιση της νομικής συμμόρφωσης με ευρύτερους στόχους βιωσιμότητας.

Η βελτιστοποίηση των διαδικασιών προμηθειών σε δημόσιους φορείς όπως η ΣΤΑ.ΣΥ Μον. Α.Ε. (ΣΤΑΘΕΡΕΣ ΣΥΓΚΟΙΝΩΝΙΕΣ) είναι καθοριστικής σημασίας για την επίτευξη αυτών των στόχων. Η βελτιστοποίηση περιλαμβάνει τον εξορθολογισμό των ροών εργασίας, την εφαρμογή ψηφιακών εργαλείων και την προώθηση μιας κουλτούρας συνεχούς βελτίωσης. Με τη μείωση της αναποτελεσματικότητας και την ενίσχυση της λήψης αποφάσεων, οι δημόσιοι οργανισμοί μπορούν να κατανέμουν καλύτερα τους πόρους διασφαλίζοντας παράλληλα τη συμμόρφωση με τα νομικά πρότυπα και τα πρότυπα βιωσιμότητας.

Η διαχείριση κινδύνου στις δημόσιες προμήθειες, διαδραματίζει ζωτικό ρόλο σε αυτό το πλαίσιο, καθώς βοηθά στον εντοπισμό, την αξιολόγηση και τον μετριασμό των πιθανών κινδύνων καθ' όλη τη διάρκεια του κύκλου ζωής της προμήθειας. Η αποτελεσματική διαχείριση κινδύνου διασφαλίζει ότι οι δραστηριότητες προμηθειών είναι ανθεκτικές σε προκλήσεις όπως διαταραχές της εφοδιαστικής αλυσίδας, μη συμμόρφωση με κανονισμούς και χρηματοοικονομικές αβεβαιότητες. Σε οργανισμούς όπως η ΣΤΑ.ΣΥ, η υιοθέτηση μιας δομημένης προσέγγισης στη διαχείριση

κινδύνου και η επικοινωνία αυτής, μπορεί να ενισχύσει τη λειτουργική αξιοπιστία και την εμπιστοσύνη του κοινού.

Αυτή η διατριβή διερευνά τη διασταύρωση της βιωσιμότητας, της βελτιστοποίησης της διαδικασίας και της διαχείρισης κινδύνου στις δημόσιες συμβάσεις, εστιάζοντας στη ΣΤΑ.ΣΥ ως μελέτη περίπτωσης. Στόχος είναι να καταδείξει πώς αυτά τα στοιχεία μπορούν συλλογικά να ενισχύσουν την αποτελεσματικότητα, τη διαφάνεια και τη βιωσιμότητα των διαδικασιών προμηθειών στον ελληνικό δημόσιο τομέα.

Keywords

Public Procurement, Sustainability, Risk management, Process Optimization, Public Tendering Procedures, Directive 2014/24/EU, Directive 2014/25/EU, Law 4412/2016, STASY.

Declaration by the Author

“As the author of this dissertation, which presents a case study on the procurement processes of STASY, I hereby declare according to the article 8 of Law 1559/1986, this dissertation is solely the product of my personal work and also that my references are based on the company's officially published organizational structures, as defined by Law ΦΕΚ 85/τ.ΠΠΑ.Δ.Ι.Τ./15.06.2021, along with statistical data derived from decisions and published tenders. Additionally, references have been made to the approval workflow processes within the Procurement Department and the company's procurement regulations. The data used in this case study aim to analyze STASY's procurement practices and optimize the process through the implementation of recommendations to achieve sustainability goals. The use of these data has been conducted with the consent of STASY's Chief Executive Officer, ensuring the proper and responsible handling of the company's information”.

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1. Introduction

1.1 Definition and significance of public procurement

Procurement is a critical link in the supply chain, encompassing all activities related to acquiring goods, services, works, or technical studies necessary to meet an organization's needs. Effective procurement management is essential to ensure the smooth operation of the supply chain, as it impacts both the cost and quality of final products and services.

Procurement plays a strategic role in the overall functioning of the supply chain and involves the following key aspects:

- Ensuring availability: Timely procurement of raw materials and services ensures the smooth functioning of production and other supply chain components.
- Cost reduction: Effective negotiation and supplier selection help reduce overall production and distribution costs.
- Quality assurance: Choosing suppliers that meet quality standards directly affects the final product or service quality.
- Risk management: Strategic procurement helps manage risks associated with delays, shortages, or disruptions in the supply chain.
- Strategic collaboration: Developing relationships with suppliers creates competitive advantages and fosters innovation.

Considering only the legal status of businesses and the procedures that govern them, we could separate procurement into private and public. For a private company, procurement is defined as the strategic process of acquiring products, services, and works to maximize return on investment and competitiveness in the market.

Private companies focus on:

- Cost-efficiency: Successful negotiations to lower costs.
- Speed and flexibility: Minimizing procurement lead times to maintain a competitive edge.
- Quality and innovation: Selecting suppliers that enhance product and service quality.

On the other hand, public procurement is a vital function of the public sector, supporting service delivery, economic growth and public trust. Its importance lies not only in acquiring goods and services, but also in shaping governance, promoting justice and promoting social and environmental progress. In order for the public sector to fully exploit the potential of procurement, continuous efforts are necessary to improve efficiency, transparency and adaptability.

Public Procurement It is characterized by:

- Legal compliance: Adhering to national and European legislation (e.g., Directives 2014/24/EU, 2014/25/EU).
- Transparency and equal opportunities: Tendering processes that ensure equal opportunities for all suppliers.
- Public interest focus: Meeting citizens' needs and promoting sustainable practices.
- Lengthy processes: Strict procedures requiring thorough scrutiny at all stages.

The following table presents the main differences between private and public contracts.

Criterion	Private Sector	Public Sector
Objective	Optimize cost, quality, and speed	Satisfy public interest, ensure transparency, and comply with regulations
Legislation	Limited and tailored to the company's needs	Strict legal framework based on national and European standards
Processes	Flexible and fast	Time-consuming and highly regulated
Purpose	Focused on return on investment	Oriented towards addressing social needs
Transparency	Internal transparency	Mandatory public transparency

Table 1: Differences Between Private and Public Sector Procurement

As we well know, procurement in private companies serves as a dynamic mechanism that quickly adapts to market fluctuations and customer demands. This flexibility allows private companies to maintain a competitive advantage by adapting their procurement strategies in response to emerging trends, technological developments and economic changes. For example, a private company in Greece can quickly change suppliers during product shortages, ensuring consistent supply and stable pricing for consumers. A public company does not have this flexibility, as it is not only governed by internal time-consuming bureaucratic procedures but is also faced with a rigid legislative framework that is designed to ensure transparency, equal opportunities and fair competition, but at the same time leads to enormous delays. The complexity and rigidity of public procurement laws often leads to delays, particularly in Greece, where major projects and tenders often face legal disputes.

As can be ascertained from the table below, Public procurement is a vital function of the public sector, supporting service delivery, economic growth and public trust. Its importance lies not only in acquiring goods and services, but also in shaping governance, promoting justice and promoting social and environmental progress. In order for the public sector to fully exploit the potential of procurement, continuous efforts to improve efficiency, transparency and adaptability are necessary.

Aspect	Description	Example
Efficient Resource Allocation	Ensures effective use of public funds, minimizing waste and maximizing impact.	Cost-effective materials for infrastructure projects free up budgets for additional initiatives.
Economic Development	Boosts GDP, creates jobs, and fosters innovation by awarding contracts to local businesses.	Supporting SMEs in Greece strengthens regional economies.
Transparency & Fair Competition	Builds public trust through laws ensuring fairness and accountability, promoting equal opportunities for businesses.	Transparent tendering enables diverse companies to compete for contracts.
Service Delivery	Facilitates essential services like healthcare, education, and infrastructure.	Quick procurement of medical supplies during COVID-19 safeguarded public health.

Policy Implementation	Aligns procurement with broader goals, such as sustainability and inclusivity.	Green procurement in Greece integrates renewable energy solutions in public projects.
Public Trust & Accountability	Transparent and ethical processes reduce corruption and enhance citizen trust in institutions.	ESIDIS and the National Transparency Authority ensure public oversight in Greece.
Challenges & Opportunities	Bureaucratic inefficiencies, legal disputes, and corruption risks require streamlined processes, technology, and capacity building.	ESIDIS has improved efficiency but needs enhancements for dispute management.

Table 2: Key Aspects of Public Procurement's Significance

Despite its importance, public procurement faces challenges such as bureaucratic inefficiencies, protracted legal disputes and the potential for corruption. Addressing these challenges requires investment in capacity building, technology and streamlined processes. For example, digital procurement platforms such as ESIDIS in Greece have improved efficiency, but still require improvements to manage disputes and speed up decision-making.

1.2 The role of Public procurement in Greece and Europe

Public procurement is a crucial element of economic and social governance in Greece and Europe, acting as a strategic tool to promote growth and achieve policy objectives.

Public procurement represents around 14% of EU GDP and is a significant part of economic activity in Greece. Through public procurement, new jobs are created in all sectors of the economy, such as in the development of infrastructure (Engineering Works), in the provision of public services, they contribute to the development of small and medium-sized enterprises (SMEs) by boosting local economies and promoting innovation.

Public procurement is fundamental in sectors such as healthcare, education and transport. In Greece during the COVID-19 pandemic, procurement facilitated the delivery of medical equipment, ensuring the protection of public health. Also, large-scale technical projects, such as highway construction and urban development, rely heavily on procurement processes to achieve economic growth and improve the quality of life of citizens, being part of social policy.

Public procurement is aligned with the EU Green Deal by integrating environmental concerns into purchasing decisions. Green Public Procurement (GPP) in Greece promotes renewable energy projects and sustainable construction. Procurement procedures in Europe emphasize addressing issues such as gender equality and opportunities for disadvantaged groups, set anti-corruption measures, prioritize transparency, and ensure accountability in the spending of public funds. Procurement procedures also allow businesses across the EU to compete for contracts, boosting cross-border trade and innovation.

However, public procurement faces enormous challenges in Greece and Europe. Bureaucracy and legal disputes often lead to delays in project implementation, even for years, undermining economic and social benefits. Another major challenge is the limited know-how in managing large procurement projects, which poses challenges for both Greece and other EU Member States. The modernisation and digitalisation of tendering procedures, using platforms such as the National Electronic Public Procurement System of Greece (ESIDIS), are enhancing efficiency and transparency in tendering processes.

1.3 Overview of the importance of sustainability in public procurement.

Public procurement in Greece and Europe is a powerful mechanism for economic development, policy implementation and service delivery. While it leads to progress in key areas, overcoming challenges such as bureaucracy and legal delays is essential to exploit its full potential. Continuous modernization and alignment with EU directives are crucial to ensure efficiency, transparency and sustainable development.

Sustainability in public procurement is increasingly recognized as a key mechanism for addressing environmental, social, and economic challenges. By incorporating sustainability criteria into procurement processes, public authorities can leverage their purchasing power to promote green growth, social equity, and long-term economic resilience.

In order to better understand the connection between the concept of sustainability and public procurement, the table below provides a concise description of the aspects of sustainability, along with a brief explanation and examples

Aspect	Description	Examples
Environmental Importance		
Reducing Environmental Impact	Eco-friendly goods and services reduce emissions, waste, and resource use.	Renewable energy systems for public buildings in Greece.
Promoting Circular Economy	Encourages recyclable and durable materials, fostering resource reuse.	Procurement of reusable construction materials.
Compliance with Climate Goals	Aligns with EU Green Deal and Paris Agreement targets.	Investments in low-carbon technologies.
Social Importance		
Promoting Social Inclusion	Requires inclusive hiring or support for disadvantaged groups.	Tenders with clauses for underrepresented communities.
Enhancing Worker Welfare	Ensures fair wages, safe conditions, and human rights compliance.	Contracts mandating compliance with international labor standards.
Building Community Resilience	Supports local economies and reduces reliance on global supply chains.	Local sourcing of agricultural products.
Economic Importance		
Cost Efficiency	Long-term savings through life-cycle costing.	Energy-efficient public lighting reducing maintenance costs.
Driving Innovation	Encourages development of green technology and innovative products.	Green tech startups competing in procurement markets.
Supporting SMEs	Promotes participation of smaller, local businesses in procurement.	Prioritizing regional SME contracts.
Policy and Legal Framework		

European Directives	EU regulations mandate integration of sustainability in procurement.	Directive 2014/24/EU emphasizing green procurement.
National Strategies	National plans align public procurement with sustainability goals.	Greece's National Plan for Green Public Procurement.
Alignment with Global Goals	Supports UN SDG 12 for responsible consumption and production.	Policies promoting renewable energy procurement.
Challenges		
Lack of Expertise	Limited knowledge and training on sustainable procurement.	Need for education and capacity building in public agencies.
Higher Upfront Costs	Initial expense of sustainable products can deter adoption.	High cost of energy-efficient equipment for municipalities.
Complex Evaluation	Difficulty in assessing sustainability criteria across suppliers and projects.	Multi-criteria analysis for green suppliers.
Opportunities		
EU Funding	Access to funding for green and sustainable initiatives.	EU grants for renewable energy integration in public projects.
Market Growth	Expansion of markets for sustainable goods and services.	Increased demand for eco-friendly products.
Public Trust	Transparent and ethical procurement fosters public confidence.	Greece's ESIDIS system ensuring transparency.

Table 3: Overview of the Importance of Sustainability in Public Procurement

1.4 Risk Management in Procurement

Procurement risk management refers to the systematic process of identifying, assessing and mitigating potential risks that could negatively affect the procurement tendering process and contract performance, i.e. unproductive tenders, poorly designed tenders resulting in appeals and cancellations, selection criteria, technical specifications, delivery schedules, cost or quality of goods, services or works. It ensures that procurement activities achieve their objectives by minimizing uncertainties and disruptions.

In the context of procurement contracts, risk management is applied throughout the contract life cycle, from the design and tendering stages to contract execution and closure. Effective risk management ensures compliance, enhances efficiency and protects public or organizational interests.

Practice	Description	Applicability in Greek and EU Public Procurement
Risk Identification	Mapping potential risks such as supplier failure, budget overruns, or delays.	Highly applicable: Risk assessment is integrated into EU and Greek tendering requirements.
Supplier Evaluation	Pre-qualifying suppliers based on financial stability, compliance, and track record.	Fully applicable: Greece and EU mandate stringent criteria for supplier selection.
Contractual Safeguards	Including clauses for penalties, warranties, and performance guarantees.	Fully applicable: Common in Greek and EU contracts to ensure accountability.
Diversification of Suppliers	Avoiding over-reliance on a single supplier to mitigate disruptions.	Partially applicable: More emphasis is needed in Greek public procurement.
Contingency Planning	Preparing backup plans for critical procurements.	Partially applicable: Limited application in Greece but growing importance under EU directives.
Lifecycle Costing (LCC)	Considering the total cost of ownership, including maintenance and disposal.	Fully applicable: Aligned with EU sustainability goals and Greek procurement strategies.
Digital Tools for Risk Monitoring	Using e-procurement platforms to monitor risks, track progress, and enhance transparency.	Fully applicable: ESIDIS (Greece) and EU systems promote digital monitoring.

Table 4: Management Practices in Procurement

Strategy	Description	Applicability in Greek Public Sector
Risk Avoidance	Designing procurement processes to eliminate specific risks (e.g., stringent supplier criteria).	Fully applicable: Common in Greek tenders to comply with EU standards.
Risk Mitigation	Reducing the impact of risks through proactive measures, such as supplier diversification or robust contracts.	Fully applicable: Essential in large-scale Greek infrastructure projects.
Risk Transfer	Shifting risk to third parties through insurance or performance bonds.	Fully applicable: Frequently used in construction and public-private partnerships (PPPs).
Risk Sharing	Collaborating with suppliers to jointly manage risks.	Partially applicable: Growing adoption, but more alignment with EU best practices needed.
Risk Acceptance	Acknowledging and planning for low-probability, low-impact risks.	Partially applicable: Often used in smaller-scale Greek procurements.
Scenario Analysis	Evaluating potential outcomes of identified risks and preparing responses.	Partially applicable: Limited use in Greece; EU encourages broader application.
Strategic Partnerships	Building long-term relationships with reliable suppliers to reduce uncertainty.	Partially applicable: Potential to improve in Greece with EU encouragement.

Table 5: Risk Management Strategies

Above are the tables of Procurement Risk Management Practices and Strategies. While both Risk Management Practices and Risk Management Strategies aim to mitigate procurement risks, they differ in their scope and application.

Risk Management Practices refer to specific actions, tools and methodologies implemented to manage risks during procurement processes, while Risk Management Strategies refer to high-level approaches or frameworks adopted to plan and manage risks over time.

Risk management practices are tactical and focus on the “how” of risk management by implementing specific measures at various stages of the procurement process, for example, using digital tools such as to monitor supplier performance, implementing contractual safeguards such as performance bonds or penalty clauses.

Risk Management Strategies are broader and focus on the “what” and “why” of risk management, aligned with organizational goals and long-term objectives. For example, avoiding risks by designing robust procurement frameworks, transferring risk through insurance or third-party guarantees, sharing risk with suppliers in collaborative, long-term partnerships.

The key differences between Risk Management Practices and Risk Management Strategies are that practices focus on tactical, operational-level actions, while strategies are about long-term planning. The former have "day-to-day" application to specific procurement activities, while strategies are the broader framework that shapes risk management policies.

For example, supplier evaluation, digital monitoring, life cycle costing are part of the practice, while risk transfer, avoidance, sharing or acceptance, are about strategic choice. The goal of the «practice» is to address specific, immediate risks. While the «strategy» is to establish a general risk management framework.

The following tables assist in understanding the challenges and opportunities of risk management, as well as proposals and decisions that, through risk management, can strengthen the position of public procurement.

Challenges	Opportunities
Bureaucracy: Lengthy procurement processes delay implementation of risk management strategies.	Digitalization: Platforms like ESIDIS streamline processes and enable better risk tracking.
Legal Disputes: Frequent legal challenges stall projects and increase costs.	Contractual Improvements: Clearer contracts with robust risk clauses reduce litigation risks.
Limited Expertise: Lack of specialized knowledge in risk management in public procurement.	Training Programs: EU-funded capacity-building initiatives improve risk management skills.
Overreliance on Single Suppliers: Creates vulnerabilities in critical supply chains.	Supplier Diversification: Encouraging participation of SMEs and regional suppliers in tenders.

Table 6: Challenges and Opportunities in Applying Risk Management Practices in Greece

Recommendation	Description
Enhance Supplier Evaluation	Develop more robust criteria and monitoring mechanisms.
Promote Lifecycle Costing	Broader adoption of LCC ensures long-term sustainability.
Expand Digital Risk Monitoring	Utilize ESIDIS and other digital tools to track risks in real-time.
Foster Strategic Partnerships	Build long-term collaborations with reliable suppliers to ensure stability.
Encourage Risk Sharing	Adopt joint risk management frameworks in large-scale projects.

Table 7: Recommendations

1.5 Objectives of the case study

The objective of this dissertation is to assess the achievement of sustainability in public procurement by examining the integration of the three pillars of sustainability within procurement processes, the role of risk management in achieving sustainability objectives, and the impact of process optimization on procurement efficiency and sustainability outcomes.

Sustainability has become a strategic priority for public enterprises worldwide, including those operating in Greece. However, public enterprises frequently encounter complex bureaucratic challenges, including internal procedural constraints (such as approval workflows and internal regulations) and legal and regulatory barriers imposed by national legislation. These factors often lead to inefficiencies, extended procurement timelines, and obstacles in implementing sustainability principles effectively. Nevertheless, through process optimization and structured risk management, Greek public enterprises can enhance procurement efficiency, reduce waste, mitigate risks, and better align procurement activities with environmental, social, and economic sustainability goals.

Optimizing procurement processes involves streamlining workflows, improving resource allocation, and enhancing decision-making within supply chain management. In the context of a Greek public enterprise, this entails cost reduction, enhanced procedural efficiency, and the minimization of social inequalities and environmental externalities. Addressing bureaucratic complexities is crucial, as excessive administrative burdens can hinder timely and effective procurement decisions.

As a case study, this dissertation conducts an in-depth analysis of the procurement framework within the Hellenic Public Enterprise STASY. The study focuses on the impact of internal and legal bureaucratic constraints on the sustainability of procurement processes. Additionally, it examines whether systematic monitoring of procurement timelines and the complexity of tendering procedures can generate data-driven insights for optimizing internal procurement mechanisms. By evaluating these factors, this study aims to demonstrate how enhanced monitoring, risk mitigation strategies, and procedural improvements can drive greater transparency, efficiency, and alignment with sustainability objectives in Greek public procurement.

2. Greek Public Procurement Law

2.1 European Union Directives and EU Principles

Public procurement in Greece is carried out in accordance with Greek Law 4412/2016, entitled “Public Procurement of Works, Supplies and Services”. Law 4412/16 establishes a comprehensive framework for public procurement, aligning national legislation with European Union Directives 2014/24/EU and 2014/25/EU. This law defines the types of procurement, procurement thresholds, procedures, selection criteria and the roles of the various committees involved in the procurement process.

The European Directive EU 2014/24/EU focuses on public procurement in general sectors such as health, education, infrastructure and other public service sectors, providing guidelines for the award of public contracts in a fair, transparent and competitive manner (Book1, Law 4412/16).

The European Directive EU 2014/25/EU governs procurement in specific sectors such as water, energy, transport and postal services, where competition may be limited due to market structures, ensuring fair competition even in these regulated markets (Book2, Law 4412/16).

With the Greek Law 4412/2016, the above directives are implemented in national law, ensuring that Greece complies with the requirements of the EU. Law 4412/16 provides additional clarity and rules adapted to Greek law, in the public sector, ensuring the parallel support of the primary principles of the EU.

The primary principles of the EU being the Transparency, Equal Treatment, Non-Discrimination, Proportionality, Mutual Recognition and Competition. With transparency, the EU and Law 4412/16 ensure that the procurement process is open and accessible to all interested parties, providing clear and sufficient information on opportunities, criteria and procurement procedures. To achieve the goal of transparency, public authorities must publish widely and provide clear terms and detailed specifications. The results and decisions of contracts must be publicly accessible, ensuring accountability. For this reason, the operation and use of the National Electronic System for Public Procurement (ESIDIS) was established and its mandatory use by public bodies for open and some closed procedures. The use of the ESIDIS system guarantees transparency by publishing public tenders on the Internet.

Another crucial principle of the EU is equal treatment, which requires that all economic operators (suppliers, contractors) are given the same opportunities to participate in tenders, without discrimination based on nationality or other factors. According to the principle of equal treatment,

contracts cannot include criteria that favor certain companies or countries, and all candidates must have access to the same information at the same time. For example, a public tender in Greece cannot impose conditions that indirectly exclude foreign companies or favor local ones without valid justification.

The control of discrimination, or otherwise the principle of "non-discrimination", in turn ensures that no company is treated differently based on factors such as nationality, location or ownership structure. In this case, the selection criteria must be objective and not aimed at unfairly excluding certain participants, and products and services cannot be identified by brand or origin, unless absolutely necessary. For example, a spare part for a supply cannot be specified in a tender that favors a specific supplier and must be described as equivalent, unless it is a unique patented construction and must always be justified by technical requirements.

An important principle is the principle of proportionality, which is called upon to ensure that the criteria and requirements of the supply are reasonable, appropriate and necessary to achieve the objectives of the contract. The requirements of a tender should be proportionate to the scope and complexity of the project, for this reason, contracting authorities must avoid excessively burdensome conditions that could prevent participation. A small supply contract cannot require bidders to have, for example, excessive financial guarantees.

A very important EU principle is Mutual Recognition, which guarantees that qualifications, certifications and standards accepted in one EU Member State are recognized in others.

According to this principle, candidates can use certifications from their home country to prove compliance with technical standards. Public authorities cannot require additional certifications if existing ones meet EU standards. If an economic operator bids for a procurement project in another country in a tender, it can submit its national certifications to prove compliance, for example, with EU safety standards.

Competition add another crucial principle for the EU. Promoting competition ensures that public procurement is open to as many economic operators as possible, preventing monopolies and ensuring value for money. Contracting authorities should design tenders in such a way as to encourage the participation of a wide range of companies. Competitive procedures, such as framework agreements and restrictive clauses, should be used judiciously to avoid restricting competition. All the above principles, in addition to achieving transparency, also aim to strengthen competition.

2.2 Procurement Categorization

Law 4412/2016 categorizes procurement into distinct types based on the nature of the object. Each category has specific characteristics, procedures and requirements that determine their management and execution. The categories are Supply of Goods, Services, Public Technical Works / Technical Studies / Technical Support Services and Mixed Contracts (*table 8*).

The supply of tangible goods concerns the supply of equipment, materials or consumables. The supply of goods focuses on technical specifications, quality standards and life cycle costing (LCC), with the evaluation criteria often based on the most economically advantageous offer, taking into account cost and quality. Services concern the supply of intangible services provided by individuals or companies, such as consulting, maintenance or IT support. This type of procurement includes professional services (consulting, legal advice), technical services (engineering, IT solutions), operational services (cleaning, security) and equipment maintenance.

As for the tender specifications, emphasis is placed on know-how, qualifications and methodologies. The evaluation criteria for services are based on low price, but give significant weight to the quality and experience of the service provider. The intangible nature makes the definition of deliverables and results difficult. It requires specific criteria for monitoring and evaluating performance.

Technical Public Works concern the procurement of construction or civil engineering works, including new buildings, infrastructure development and large-scale renovations. Such works are road works, bridges, schools, hospitals and public utilities. In the procurement of technical works, great emphasis is placed on compliance with building codes, environmental standards and detailed project schedules. The Evaluation Criteria concern the lowest price, with the choice of the discount rate in the project groups prevailing. The criteria focus on cost, quality and efficiency of project delivery. In technical works, extensive monitoring is required during the process of execution and acceptance of the project, both for compliance and for safety and quality.

Finally, there are Mixed Contracts, i.e. procurements that include a combination of supplies, services and/or works in a single contract. Mixed contracts require clarity in determining the dominant procurement category for regulatory purposes. Complexity arises in managing multiple deliverables and ensuring coordination between contractors.

Category	Nature of Procurement	Key Focus	Complexity	Typical Use Cases
Supplies	Tangible goods	Technical specifications, quality	Moderate	Office supplies, medical equipment
Services	Intangible services	Expertise, methodology, performance	High	Consulting, IT support, maintenance
Works	Construction and engineering projects	Compliance, timelines, safety	Very High	Infrastructure projects, public buildings
Technical Studies	Professional technical analyses and plans	Accuracy, feasibility, compliance	High	Feasibility studies, environmental impact assessments
Technical Services	Specialized technical expertise	Implementation, oversight, quality	High	Project supervision, engineering consultancy
Mixed Contracts	Mixed Contracts	Mixed Contracts	Mixed Contracts	Mixed Contracts

Table 8: Key Differentiators Among Procurement Categories

2.3 Challenges of the EU's 2014 Procurement Reform

As already mentioned, public procurement in Greece represents a significant part of government spending, approximately 12-14% of annual GDP. In recent years, there has been remarkable progress in the digitalization of procurement processes, in addition to the national platform (ESIDIS), there are many public organizations that also use private platforms to monitor and plan their tendering procedures, however, due to the lack of technological know-how in managing complex procurement procedures, the large bureaucracy, specialized and experienced personnel, but also the complexity created by the current legislation and the internal procedures of the contracting authorities, challenges still exist. The result is limited competition, delays in tendering and awarding contracts, difficulties in ensuring transparency and accountability, fruitless tenders, long delays with tenders ending up in appeals and courts, events that hinder the effectiveness of the system.

Although initiatives such as Greece's National Transparency Authority aim to reduce corruption and improve oversight, fragmented actions and incomplete data sets limit the ability to comprehensively address systemic barriers.

The 2014 reform introduced directives to streamline procurement procedures, increase transparency and promote the participation of SMEs (Small and Medium-sized Enterprises). However, these reforms have faced criticism for not fully achieving their objectives:

- **Complex implementation and transposition of the directives into national law.** This results in delays in implementation and frequent amendments, creating uncertainty for market participants.
- **Limited use of data,** the EU and Member States collect extensive data on public procurement, but lack systematic approaches to using it to identify bottlenecks and inform policy and reform initiatives.
- **Barriers to SME participation,** while the directives aimed to increase SMEs' access to public procurement, bureaucratic obstacles and high administrative costs remain significant obstacles.

To address the above challenges, a coordinated strategy is needed at both EU and national level. Recommendations should include:

- **Clarifying and prioritizing objectives,** through the alignment of EU and Member State procurement policies, to balance efficiency with
- **achieving simplicity, transparency and creating competition.**
- **Improving the collection, monitoring and processing of the “right” information.** The collection and processing of the “right” information is crucial for identifying trends, understanding dysfunctions and designing targeted interventions.
- **Capacity building,** Member States should invest in creating trained staff, through training programs for procurement officers to improve know-how.
- **Inclusion of SMEs in tender procedures,** through mechanisms to reduce the administrative burden for SMEs' participation in tenders, reduction of compensation time, reduction of financial guarantees and bank commission, are actions that can encourage wider participation.
- **Transparency and accountability,** by strengthening institutions such as the National Transparency Authority, Greece can improve monitoring and reduce corruption risks.

2.4 Challenges in EU Public Procurement and Greece's Position

The main directives 2014/24/EU, 2014/25/EU and 2014/23/EU aimed to simplify procurement, facilitate access for SMEs and facilitate strategic public contracts. The European directives emphasized transparency, integrity and safeguards against corruption. However, the implementation of these reforms was uneven across Member States, leading to disparities in procurement efficiency and competition. In the table below, we will examine how Greece and the EU countries respond to the challenges of procurement.

Challenges	Aspect	EU Position	Greece's Position
1. Declining Competition			
	Single Bidding	Increased from 23.5% (2011) to 41.8% (2021).	Peaked at 66.5% in regional areas, e.g., Peloponnese.
	Direct Awards	Account for 15.8% of contracts.	Greece reported only 3.1% (2021), the lowest rate in the EU.
2. Transparency and Data Gaps			
	Publication on TED	Low publication rates and 30% of contracts missing key data fields.	Publication rate below 5%, aligned with many EU member states.
	Data Completeness	Data gaps prevent proper monitoring and analysis.	Persistent issues with incomplete contract details.
3. SME Participation			
	Barriers	High procedural costs and administrative burdens hinder SMEs.	Greek SMEs face similar hurdles and lack sufficient administrative support.
	Participation Levels	SME involvement stagnates or declines across the EU.	Limited SME participation due to procedural complexity.
4. Cross-Border Procurement			
	Contract Share	Direct cross-border procurement accounts for only 5% of total contracts.	Minimal participation due to language barriers and identification issues.

	Barriers	Language compatibility and lack of unique operator identifiers.	Similar challenges persist, limiting cross-border activity.
5. Strategic Procurement			
	Usage	Underutilized; most contracts awarded based on the lowest price.	Limited adoption, with cost being the dominant criterion.
	Focus Areas	Limited integration of social, environmental, and innovative criteria.	Strategic procurement goals remain secondary.
6. Administrative Complexity			
	Expertise Deficit	Many member states face capacity limitations in managing procurement.	Administrative complexity causes delays and inefficiencies in Greece.
	Process Management	Fragmented approaches hinder effective process execution.	Authorities lack the expertise to manage complex procurement.
7. Corruption Risks			
	Integrity Challenges	EU-level initiatives face weak enforcement in some member states.	Despite the National Transparency Authority, corruption risks persist.
	Systemic Issues	Reforms remain fragmented and inconsistently applied.	Weak enforcement limits systemic improvements.

Table 9: Comparative Table: Challenges in EU Public Procurement and Greece's Position

Indicator	Greece	EU Average
Direct Awards	3.1%	15.8%
Single Bidding	66.5% (highest region)	41.8%
Transparency	<5% (Publication Rate)	<5% (in most states)
Cross-Border Awards	Below 5%	5%
SME Access	Low	Stagnant/Declining

Table 10: Comparative Analysis: Greece vs. EU Averages(2022)

Comparative table¹⁰ and bar chart¹ showing Greece's averages against the EU for key public procurement indicators. Greece's performance reflects both commendable practices, such as the low rate of direct awards, and critical shortcomings, including high rates of single-bid tenders, as well as limited access for SMEs.

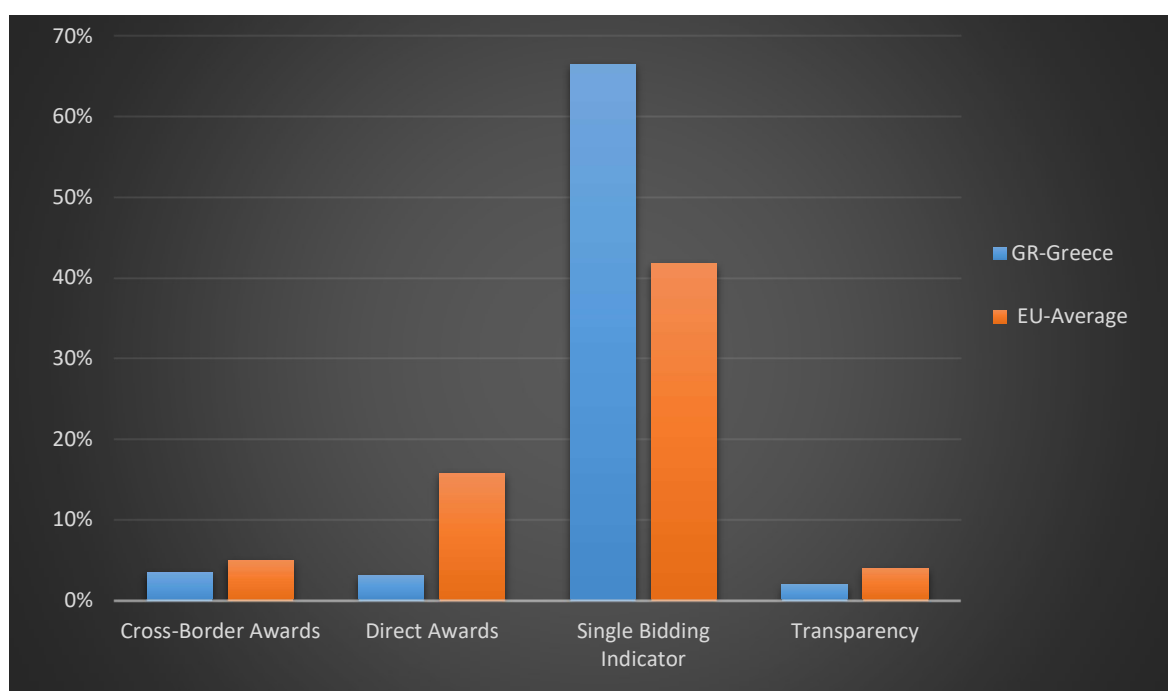


Chart1: Competitive Tenders analysis Greece vs EU (2022)

To address these challenges and align with best practices across the EU, Greece should consider the following:

- **Strengthen Administrative Capacity:** Invest in training for procurement officials and streamline procedures through digital platforms like "ESIDIS."
- **Enhance SME Participation:** Reduce administrative burdens and introduce financial guarantees to support SME access to contracts.
- **Promote Cross-Border Procurement:** Facilitate cross-border exchanges by improving language compatibility and adopting unique economic operator identifiers.
- **Boost Strategic Procurement:** Encourage contracting authorities to adopt Most Economically Advantageous Tender (MEAT) criteria to prioritize value over cost.

- **Improve Transparency:** Enhance data quality and completeness in TED entries to facilitate robust monitoring and public accountability.

Greece's public procurement system, while demonstrating strengths in some areas like direct awards, faces significant barriers to competition, transparency, and SME inclusion. By leveraging the lessons learned from the EU's broader experience and implementing targeted reforms, Greece can enhance the efficiency and impact of its public procurement processes, contributing to both national development and the integration of the EU single market.

2.5 Tendering Procedures of Greek Public Procurement

Law 4412/2016 provides a flexible framework that balances the complexity and benefits of modern procurement, ensuring legality. While the procedures involve varying degrees of administrative, legal and technical challenges, they offer significant potential for achieving cost-effectiveness, innovation and sustainability. Strategic implementation, supported by technological know-how, strong governance and capacity building, can transform public procurement into a powerful tool for promoting the economic and social development of Greece. The National Procurement Law offers many options in the tendering process. The options have to do with the planning of needs (on an annual or even longer basis), in emergency situations, in cases of tenders for patented goods, in negotiation procedures, for materials whose quantitative needs cannot be determined from the outset, etc. Below table encapsulates the trade-offs between complexity and benefits for each procurement procedure, helping contracting authorities select the most appropriate approach for their needs.

Procedure	Key Features	Complexities	Benefits
Open Procedure	- Open to all interested bidders.	<ul style="list-style-type: none"> - High administrative workload due to a large number of tenders. - Risk of non-compliant bids. - Price-centric evaluation risks quality. 	<ul style="list-style-type: none"> - Promotes transparency and competition. - Provides insights into market conditions. - Strict compliance with EU laws.

Restricted Procedure	<ul style="list-style-type: none"> - Two-stage process: pre-selection of candidates followed by tender submission. 	<ul style="list-style-type: none"> - Time-consuming pre-selection process. - Risk of reduced competition by limiting bidders. 	<ul style="list-style-type: none"> - Streamlined evaluation phase. - Ensures participation of technically and financially capable bidders.
Competitive Procedure with Negotiation	<ul style="list-style-type: none"> - Allows negotiation with bidders after initial proposals. 	<ul style="list-style-type: none"> - Requires significant time for multiple negotiation rounds. - May involve additional costs for legal and technical support. - Risk of bias. 	<ul style="list-style-type: none"> - Tailored solutions for specific needs. - Optimization of value and quality. - Flexibility in contract terms.
Competitive Dialogue	<ul style="list-style-type: none"> - Engages suppliers in dialogue to refine solutions for complex projects. 	<ul style="list-style-type: none"> - High resource requirements for conducting dialogues. - Prolonged procurement timelines. - Complex evaluation of diverse solutions. 	<ul style="list-style-type: none"> - Encourages innovation and creativity. - Collaborative approach ensures practical and effective outcomes.
Innovation Partnership	<ul style="list-style-type: none"> - Facilitates R&D for products/services not available on the market. 	<ul style="list-style-type: none"> - High risk due to uncertainties in outcomes. - Potential for cost overruns. - Legal challenges regarding IP and compliance. 	<ul style="list-style-type: none"> - Drives innovation and technological advancements. - Delivers long-term strategic value. - Enhances public service delivery.
Negotiated Procedure Without Prior Publication	<ul style="list-style-type: none"> - Used for emergencies or when no suitable tenders are received. 	<ul style="list-style-type: none"> - Limited competition may lead to higher costs. - Justification must be robust to avoid legal disputes. - Potential for reduced transparency. 	<ul style="list-style-type: none"> - Quick procurement in urgent scenarios. - Flexibility to negotiate directly with suppliers.

Direct Award	<ul style="list-style-type: none"> - Simplified procurement for low-value contracts. 	<ul style="list-style-type: none"> - Risk of favoritism or perceptions of unfairness. - May compromise quality due to lack of competition. 	<ul style="list-style-type: none"> - Administrative simplicity for small purchases. - Ideal for urgent or routine procurements.
Framework Agreement	<ul style="list-style-type: none"> - Long-term arrangement for recurring needs. 	<ul style="list-style-type: none"> - Initial setup requires thorough planning. - Terms may not accommodate future changes in needs. 	<ul style="list-style-type: none"> - Reduces administrative burden for repetitive procurement. - Offers flexibility and predictability over time.
Dynamic Purchasing System	<ul style="list-style-type: none"> - Electronic system open to suppliers throughout its validity. 	<ul style="list-style-type: none"> - Requires robust IT infrastructure. - Initial complexity in setup and maintenance. 	<ul style="list-style-type: none"> - Ensures continuous competition. - Suitable for commonly used goods and services. - Allows supplier inclusivity.

Table 11: Tendering Procedures

The Award Criteria of the above tender procedures, according to Law 4412/2016 are two (2), the most economically advantageous tender - price-quality ratio and the lowest price.

The award criterion, the most economically advantageous tender (MEAT) focuses on identifying the best overall value and not simply the lowest price. It may include, in addition to the lowest price, the life cycle cost (LCC) of the supply, which evaluates not only the purchase price but also the cost of operation, maintenance and disposal during the product's life cycle. There are also qualitative factors, such as compliance with technical specifications, durability and performance, environmental issues, i.e. environmental friendliness, energy efficiency or use of sustainable materials, as well as social impacts, i.e. employment of disadvantaged groups or compliance with labor standards. Other scoring factors are delivery and after-sales service, warranty and maintenance.

For many types of procurement, which are standardized or simple goods, the award criterion is cost, the lowest price.

Criterion	Features	Complexities	Benefits
Lowest Price	- Awarded to the tenderer with the lowest bid.	- May prioritize cost over quality. - Risk of receiving substandard products or services.	- Ensures cost-efficiency for straightforward procurement needs.
Most Economically Advantageous Tender (MEAT)	- Combines price with qualitative criteria like quality, sustainability, etc.	- Requires clear and robust evaluation criteria. - Potential subjectivity in qualitative assessments.	- Balances cost, quality, and value. - Promotes sustainability and innovation.

Table 12: Comparison of Selection Criteria

2.6 Tender Committees

According to Law 4412/2016, public bodies are responsible for establishing specific committees to oversee and manage the public procurement process, ensuring compliance with the principles of transparency, fairness and efficiency. The two main committees are the Tender Conducting Committee (Tender Evaluation Committee) and the Contract Monitoring and Receiving Committee.

The Tender Conducting Committee is responsible for conducting the procurement process, including evaluating the tenders and ensuring compliance with the terms and conditions described in the tender documents.

It consists of three to five members, depending on the complexity and value of the procurement. The members are usually appointed by the contracting authority's staff. Typically, members have expertise relevant to the subject matter of the tender, such as technical, legal or financial knowledge. At least one member should be an expert in the technical field related to procurement.

The role and responsibility of these committees is to check that tenders are submitted within the specified deadline and to check compliance with the submission requirements.

The committee also evaluates the technical and financial aspects of the tenders based on the predefined criteria (e.g. meat or lowest price). The responsibilities of the committee are to draw up a tender evaluation report, to recommend the award of the contract to the most suitable bidder, to contact the tenderers for clarifications or additional information, if necessary. It is introduced, extensions and clarifications of questions that arose during the tender process.

The Receiving Committee oversees the delivery and acceptance of goods, services or works, ensuring that they meet the terms and specifications described in the contract. It consists of three members, with these members being selected based on their expertise and familiarity with the technical, operational or administrative aspects of the contract. At least one member should have technical expertise in the field of the item or service being delivered.

The role of the committee is to control and verify the deliverables. It inspects goods, services or works upon delivery to confirm compliance with the terms of the contract. It carries out detailed checks to ensure quality, quantity and adherence to technical specifications. It accepts or rejects deliverables based on the results of the inspection.

It documents any deviations or defects and notifies the contractor for corrective actions. Prepares and signs a detailed handover report, which serves as an official acceptance record. Works with the contracting authority and the contractor to resolve disputes or disagreements during the handover process.

Committee members must act without bias and avoid conflicts of interest. All decisions and actions must be documented and available for audit or review. Committees are responsible for ensuring compliance with procurement laws and procedures and may be subject to administrative review in the event of disputes. The Tendering Committee ensures the integrity and fairness of the procurement process, while the Receiving Committee guarantees that the deliverables meet contractual obligations. Together, these committees play a critical role in maintaining transparency, efficiency and accountability in public procurement in accordance with Law 4412/2016.

Committee	Role	Complexities	Benefits
Tender Evaluation Committee	- Evaluates bids against established criteria and recommends awards.	- Subjectivity risks if criteria are vague. - Increased workload for complex tenders.	- Ensures adherence to transparency and fairness. - Provides structured evaluation processes.
Acceptance Committee	- Verifies contract deliverables meet specifications.	- Delays in evaluation may disrupt timelines. - Potential disagreements over compliance with specifications.	- Ensures quality and compliance. - Acts as a safeguard against contract breaches.

Table 13: Comparison of Committees

2.7 Procurement Thresholds LAW 4412/16

Law 4412/2016 governs public procurement in Greece, setting thresholds for different types of contracts and specifying the minimum publication periods for tender notices accordingly. The tables of Book I (Public Contracts) and Book II (Contracts in Former Excluded Sectors), which describe the procurement thresholds, follow. A table detailing the required publication periods based on the value of the contract and the type of procedure follows.

Type of Public Contract	Central Government Authorities (Excluding VAT)	Non-Central Contracting Authorities (Excluding VAT)
Public Works Contracts	€5,538,000	€5,538,000
Technical Studies Contracts	€143,000	€221,000
Supply and Service Contracts	€143,000	€221,000
Contracts for Social and Other Specific Services (listed in Annex XIV of Appendix A)	€750,000	€750,000
Supply Contracts Awarded by Central Government Authorities Operating in the Field of Defense (for products listed in Annex III of Appendix A)	€143,000	-
Supply Contracts Awarded by Central Government Authorities Operating in the Field of Defense (for products not listed in Annex III of Appendix A)	€221,000	-

Table 14: Book I – Public Contracts

Type of Contract	Threshold (Excluding VAT)
Works Contracts	€5,538,000
Supply Contracts	€443,000
Service Contracts	€443,000
Design Contests	€443,000
Contracts for Social and Other Specific Services (listed in Annex XIV of Appendix A)	€1,000,000

Table 15: Book II – Contracts in Former Excluded Sectors

To facilitate Public Organizations, in terms of the immediate coverage of emergency needs, Law 4412/16 in Articles 118 and 328, defines the limits of Direct Award. Although direct awards are permitted within these limits, contracting authorities must ensure compliance with the principles of transparency, equal treatment and competition. The decision to proceed with direct award must be adequately justified and documented, detailing the reasons for the specific procedure and the choice of the contractor. These limits are designed to streamline procurement procedures, while maintaining fairness and accountability.

Following the latest revision of Articles 118 and 328 of Law 4412/2016, the thresholds for direct awards are set as follows:

Contract Type	Direct Award Threshold (Excluding VAT)
Supplies	Up to €30,000
Services	Up to €30,000
Technical Studies	Up to €30,000
Special Categories of Services (scope of Articles 107 to 110 L.4412/16)	Up to €60,000
Works	Up to €60,000

Table 16: Direct award threshold

3. Case Study

3.1 STASY Organization

STASY is a public transport company operating in the Athens metropolitan area, responsible for the management and operation of fixed-route transport modes, including the Metro (Lines 1, 2 and 3) and the Tram. STASY's mission is to provide safe, reliable and comfortable transport services, focusing on the needs of passengers and respecting the environment. The company aims to be the preferred choice for residents and visitors to Attica for their transport needs. STASY is responsible for the operation and maintenance of Metro Line 1 with 24 stations, Metro Lines 2 and 3 with 20 and 23 stations respectively, serving key urban and suburban areas. STASY also owns the Tram Network, which also connects the center of Athens with the coastal suburbs with a total of 55 stations.

STASY is a subsidiary of the OASA group together with OSY. The OASA group develops and oversees the public transport network, including bus, trolleybus (OSY) and metro, tram (STASY) and suburban railway services. These companies are supervised by HCAP (Hellenic Assets and Holdings Company), also known as the “Super Fund”. HCAP aims to enhance the efficiency, effectiveness and value of public transport services. It oversees the strategic planning, performance monitoring and financing of OASA and its subsidiaries.

STASY integrates Corporate Social Responsibility (CSR) into its strategy, focusing on society, collaborating with cultural institutions. The company also cares for the environment, implementing environmentally friendly practices to reduce the environmental impact of its operations. But one of its main goals is to maintain transparency and ethical standards in all its business transactions. STASY plays a crucial role in the public transportation system of Athens, striving to offer efficient and sustainable transportation solutions. Through continuous improvements and a commitment to corporate responsibility, the company aims to respond to the evolving needs of its passengers and to contribute positively to the community.

3.2 STASY Organization Structure

Starting the case study on Procurement at STASY, we will make a reference to the organizational and functional structure of this Greek public enterprise, which is responsible for the management of fixed-route public transport services in Greece. The company operates under the regulatory framework of public enterprises and complies with the relevant national legislation and specifically for public procurement Law 4412/2016. The company is managed by the Board of Directors, which oversees strategic decisions, supervises the management of resources and determines development policies. The CEO acts as the executive head, managing the daily operations and implementing the decisions of the board of directors.

The organization is divided into General Directorates, Directorates, Sub-Directorates and Departments, ensuring specialized focus and clear responsibility at all levels.

The four main general directorates include:

- Strategy and Development: Focuses on long-term growth and compliance with strategic objectives.
- Operations: Ensures effective management of transportation services.
- Maintenance: Manages the maintenance of rolling stock, infrastructure, and electromechanical systems.
- Corporate Support: Includes procurement, legal, financial, and human resources functions.

The company's organizational structure allows for the creation of temporary working groups or committees to handle specific projects or urgent requirements, adding a degree of flexibility to the otherwise rigid hierarchy.

3.3 STASY Procurement Department

The Procurement Directorate is under the supervision of the General Directorate of Corporate Support. The Procurement Directorate, in order to ensure the effective procurement of goods, services and works required for the operational needs of the company, is organizationally composed of three (3) Procurement departments and also the Administrative Support Department and the Certification and Payment Monitoring Department.

The Procurement Administrative Support Department filters and allocates the procurement requests accordingly, makes the necessary postings in DIAVGEIA and KIMDIS, monitors and develops the internal procurement procedures, and provides general supervision of the progress of the tender committees.

The three procurement departments are divided as follows:

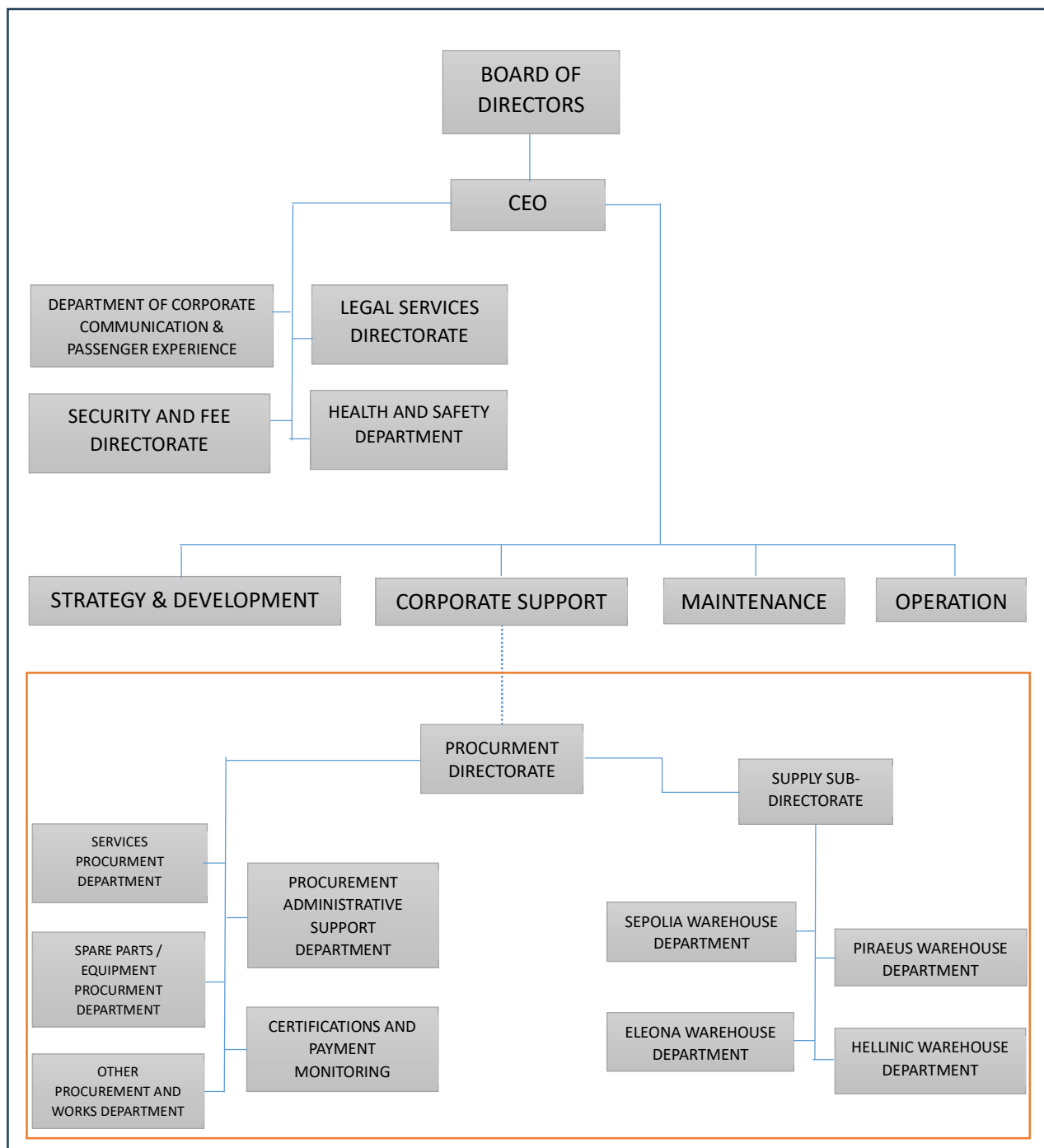
- Spare Parts/Equipment Procurement: Manages contracts for coded items and equipment, which mainly concern the needs of the maintenance departments. Requests and stock monitoring for equipment items are carried out by the Supply Sub-Directorate.
- Service Procurement: Oversees service contracts (security, cleaning, etc.), including maintenance, consulting and IT support.
- Other Procurement and Works: Manages various procurement needs that do not concern items in replenishment stock, such as furniture, patents, mixed contracts (Supply and Service), land and equipment upgrades. It also carries out tenders for technical public Projects related to infrastructure, technical studies and Technical Consultant services.

Finally, the Certifications and Payment Monitoring Department ensures that the contract deliverables are certified and that payments are processed effectively.

The Procurement Directorate includes the Sub-Directorate of Supply and the departments - warehouses based in Piraeus, Eleonas, Sepolia and Hellinikon, focusing on the management and replenishment of equipment stocks.

Having studied the Organization Chart and the structure of the Procurement Directorate, we conclude that the company demonstrates a well-defined organizational structure with a strong focus on procurement and supply chain management. The alignment of the Organization with regulatory requirements, including Law 4412/2016, underlines its commitment to transparency, competition and efficiency. It facilitates transparent and competitive tendering in accordance with Law 4412/2016. Aligns procurement processes with sustainability and cost-effectiveness goals.

With the Procurement Directorate making a decisive contribution to supporting the company's operational and strategic goals, while ensuring compliance with public procurement standards.



Flowchart 1 - Procurement Directorate Structure

3.4 Internal purchase request approval process

In order to meet the needs (regular or extraordinary) for the procurement of goods, services or works and studies, STASY has defined and periodically updates the internal procedure for approving the request for a new procurement. According to the procedure updated on 1/7/2024, all organizational units of STASY, in order to meet the needs (extraordinary or not) for the procurement of goods, services or work, must complete the procurement feasibility form. Each procurement request (feasibility form) has a unique number with the initials MR and a six-digit number that follows them. The first two digits of MR identify the service of the procurement request. Procurement requests are completed by an employee of the requesting service and are approved by the Directorate and the General Directorate of the service that registers the request and the final approval is given by the CEO.

From the approval of the request by the competent General Director of the applicant to the final approval by the CEO, a control process is carried out by the Procurement Departments. The requests are forwarded by the General Directorates to the Procurement Directorate and the first control is carried out by the Procurement Administrative Support Department. The first stage of control concerns the appropriate completion of the request, i.e. whether there is the appropriate documentation, whether it is accompanied by technical specifications, whether the appropriate CPV number is indicated, whether there is the documentation of the budget, etc. Depending on the nature of the request, it is charged accordingly to one of the three (3) Tender Departments. The Heads of Departments, due to their experience, may return the requests to the competent services for correction or additional clarification. The Tender Departments check the items to be procured and their budget, in order to draw up the procurement notices. After the draft tender notice has been drawn up and checked, the requests are forwarded for budget control. After checking for available budget, the requests are forwarded for approval by the CEO or the Board of Directors, depending on the amount of their budget.

Purchase request

As mentioned above, a purchase request has certain basic characteristics. The table below lists all the elements that should accompany a procurement request, according to the internal regulations of STASY and the current procurement legislation, law 4412/16.

Requested Fields	Description
the unique MR number (6 digits of numbers)	Identifies the service originating the request.
the applicant	the officer responsible for the application
the nature of the supply (description and details of the request)	the type, the unit, the quantities of the object of the supply, whether it concerns a service, supply or technical Work / Study
the unique STASY id number	regarding the coded materials in stock in the company's warehouses
the documentation of the need	basic information about the project, including its feasibility
the identification of the CPV of the supply	This number characterizes the procurement type group, for segmentation control, determination of budget commitment accounts, etc.
the proposed procurement procedure (Market research or Direct Award)	This option characterizes the process. Whether it is proposed as open or closed for the type of procurement.
the budget source (NSRF or own resources)	characterizes the source of the project's financial resources
the justification for (direct award)	Appropriate documentation of the choice of the direct award process is required.
the feasibility comments	General comments on the nature of the project, delivery location, delivery time, etc.
the technical specifications and descriptions, drawings, etc	Reference and addition of additional documents required, such as technical specifications and descriptions, drawings, etc.
justification of the indicative budget	reference or reference to financial offers or previous data that adequately justify the budget amount.
the approvals	the signatures of the competent bodies for approval
accompanying documents	photographs, official notes, etc.

Table 17: Purchase request data

Origin of Purchase Requests

All Material Requisitions (MRs) are directed to the Procurement Department. These requests originate from two main sources: the organizational units of STASY and the Central Warehouses of STASY. The distinction between these sources lies in the nature of the requests. Organizational unit requests predominantly pertain to goods and services, accounting for approximately 90% of product requests, where no stock is maintained. Conversely, requests from

Central Warehouses are the outcome of annual planning conducted by the General Maintenance Directorate. These requests are closely linked to the monitoring and management of spare parts and consumables inventory within Central Warehouses.

The inventory levels maintained in the Central Warehouses play a crucial role in supporting the maintenance of the rolling stock and ensuring the operational readiness of the company's facilities and equipment.

Approval Process for Purchase Requests

As previously mentioned, a purchase request (MR) must include specific required information and follow the procedures outlined by the relevant departments. Furthermore, the competent administrative body for approving the purchase request and initiating the proposed tendering process may vary, depending on the budget in accordance with the internal regulations of STASY.

The approval of tenders is determined in accordance with the internal procedures of STASY and the delegation of powers by the Board of Directors to the Chief Executive Officer (CEO).

Specifically:

- For tenders with a budget of up to 60,000 euros, the competent authority for approval is the Chief Executive Officer.
- For tenders above 60,000 euros, the responsibility lies with the Board of Directors.

This approach aims to ensure the efficient handling of procurement procedures and to protect the interests of the organization.

As mentioned, the purchase request process encompasses several key aspects, including the individuals or departments initiating the requests, the nature of the requests, their purpose, and the authorities responsible for approval. This process is of particular importance for a public organization like STASY, where the annual volume of supply requests—including goods, services, and works—exceeds 1,600.

Effective planning and coordination of these requests are vital for ensuring the sustainability of the organization's operations. In the subsequent sections, we will analyze the internal approval process,

emphasizing the critical role of timely approvals. Additionally, we will explore the tendering process that follows, focusing on its importance for maintaining a reliable supply chain.

3.5 Sustainability Key Factors in STASY Procurement Process

Sustainability, as a broader concept, refers to the ability to meet the needs of the present without compromising the ability of future generations to meet their own. It encompasses environmental, social and economic dimensions, aiming to balance resource use, social well-being and economic growth in the long term. However, the term sustainability is present in everything in our lives, as well as in business.

Sustainability in an organization's procurement involves integrating environmental, social and economic parameters into purchasing decisions to minimize negative impacts and create value throughout the supply chain. This approach ensures that procurement activities are aligned with the organization's long-term goals and ethical responsibilities.

Sustainability in procurement is critical for organizations, especially public entities such as STASY for the following reasons:

- **Operational Efficiency:** Sustainable procurement ensures the consistent availability of high-quality goods and services, supporting the smooth running of the organization's operations.
- **Cost-Effectiveness:** By focusing on long-term value rather than short-term savings, organizations can reduce waste, optimize resource use, and achieve better financial outcomes.
- **Risk Mitigation:** Sustainable practices help mitigate risks associated with supply chain disruptions, regulatory non-compliance, and reputational damage.
- **Environmental Responsibility:** Procuring environmentally friendly products and services reduces the organization's ecological footprint and aligns with global sustainability goals.

- **Social Impact:** By partnering with socially responsible suppliers, organizations contribute to community development and promote ethical work practices.

For an organization like STASY, where procurement activities are extensive and critical to its operations, sustainability is not merely an option but a fundamental necessity. Sustainable procurement practices enhance organizational resilience, support long-term business objectives, and reinforce STASY's commitment to broader social and environmental goals. This study specifically examines how STASY integrates sustainability into its procurement processes through commitments and criteria embedded in its contracts, aimed at ensuring economic, social, and environmental sustainability. Additionally, the role of risk management in strengthening procurement sustainability will be explored, along with the importance of the timely completion of tender procedures. Finally, the study highlights the significance of reducing bureaucracy and streamlining internal processes as essential steps toward achieving STASY's overarching sustainability objectives.

Beyond the theoretical framework of sustainability in procurement, STASY has already implemented practical initiatives that have delivered measurable results. One of the key achievements in this direction has been the optimization of procurement processes, leading to substantial financial savings.

According to data from the Procurement Directorate, the initial interventions in STASY's procurement procedures resulted in a 16.9% cost reduction in the total budget of tenders for 2023. This reduction highlights the effectiveness of the newly implemented strategies and underscores the importance of procurement optimization. By enhancing the competitiveness of tenders, reducing administrative delays, and improving decision-making efficiency, STASY has demonstrated that procurement process improvements can generate significant financial savings while maintaining compliance with regulations and sustainability objectives, as will also be evident from the findings of the case study in Chapter 4.

Furthermore, in line with its commitment to environmental sustainability, STASY has taken a major step toward energy efficiency by finalizing an NSRF contract in August 2024 for the implementation of an innovative and environmentally friendly project within the Greek railway sector. This initiative involves the "Renovation of two substations on Metro Line 1, along with the

installation of an energy recovery system from train braking." This groundbreaking system, introduced for the first time in Greece's railway network, is expected to recover 4,500 MWh of energy per year, amounting to 12.5% of the total annual energy consumption on Metro Line 1 (Piraeus – Kifisia).

This project marks a significant advancement in sustainable energy management, contributing to electricity savings, improved energy efficiency, and a reduced environmental footprint for STASY's operations. These developments reinforce the strategic role of sustainable procurement as a lever for financial efficiency and environmental responsibility, proving that well-structured procurement policies can support both economic and ecological goals. With continued investment in process optimization, risk management, and green initiatives, STASY is actively shaping a more sustainable and cost-effective procurement framework for the future.

3.6 How STASY ensuring sustainability via Contracts

It is important to recall that STASY is a public transportation organization, operates under the provisions of Law 4412/16, and specifically Book II, which governs the procurement process. As detailed in Chapter 2, Law 4412/16 offers significant possibilities and flexibility to contracting authorities in the procurement of goods and services.

The Hellenic Single Public Procurement Authority (HSPPA) plays a crucial role in supporting public organizations like STASY. Beyond providing opinions, examining objections, and approving contracts, the Authority supplies standardized announcement templates for all types of procurement and tendering procedures. These templates include detailed descriptions of the tendering process and explicit references to the corresponding articles of Law 4412/16.

Law 4412/16 itself is grounded in European Directives, which aim to ensure sustainability, transparency, and risk mitigation in public procurement processes. The articles of this law are specifically designed to promote these principles and to safeguard the long-term viability of public organizations like STASY.

The utilization of tools such as the ESIDIS Public ERP platform or the standard tender documents provided by the Independent Public Procurement Authority, form the basis for sustainable procurement practices. These practices, when implemented effectively, contribute significantly to the operational efficiency, financial viability and long-term sustainability of the organization.

However, the successful implementation of these tools is not guaranteed if the appropriate infrastructure, expertise, and systems are not in place to support them.

Law 4412/2016 ensuring that economic, social, and environmental sustainability considerations are integrated into procurement processes. Below, there is a table with the three pillars of sustainability—economic, social, and environmental—are analyzed with references to specific articles of the law and how the Procurement Department of STASY includes them in its declaration's documents.

Sustainability Category	Article of Law 4412/16	Description	Declaration Articles
Economic	Article 18 – Principles of Public Procurement	Emphasizes cost-effectiveness and responsible use of public funds, ensuring that procurement aligns with economic efficiency.	1.2 Financing of the contract, 2.4.6 Reasons for rejecting tenders
	Article 53 – Contract Documentation	Requires detailed reference to the budget and financial commitments in contract documents.	1.2 Financing of the contract
	Article 72 – Guarantees	Requires financial guarantees to ensure contract performance, safeguarding public resources against non-compliance or project failures.	2.1.5 Guarantees, 2.2.2 Participation guarantee, 2.4.3.1 Supporting documents, 4.1.1 Execution guarantees
	Article 86 – Award Criteria	Establishes that the "most economically advantageous tender" (MEAT) should be used, considering price, cost-effectiveness, and other economic factors.	2.3 Award Criteria
	Article 87 – Life-Cycle Costing (LCC)	Introduces methodologies for evaluating the total cost of ownership, including acquisition, operation, maintenance, and disposal, to maximize long-term economic benefits.	2.3.2 Evaluation and ranking of tenders
	Article 88-89 – Abnormally Low Tenders	Mandates that contracting authorities request explanations for abnormally low tenders. If bidders fail to justify their prices, their tenders may be rejected.	3.1.2.1 Evaluation of tenders

Article 95 – Submission of Financial Offers	– Ensures transparent and competitive financial offers, which uphold economic sustainability in the procurement process.	2.4.4 Contents of Financial Offers File, Submission methods
Article 97 – Financial Offer	– Ensures the financial offer is valid within the required period.	2.4.5 Offer validity period
Article 98 – Financial and Economic Capacity	– Requires bidders to demonstrate adequate financial capacity and stability, minimizing the risk of project disruptions.	2.2.5 Financial and economic capacity, 2.2.9.2 Supporting documents
Article 104 – Variations and Amendments	– Regulates changes to contract terms to ensure economic sustainability is maintained throughout the project lifecycle.	3.3.2 Contract award and signing
Article 312 – Life-Cycle Analysis in Utilities Contracts	– Extends the principles of life-cycle costing to utilities contracts, ensuring long-term cost-efficiency and sustainability.	
Article 328–330 – Direct Award Thresholds	– Defines thresholds for direct awards, balancing administrative efficiency with competitive principles.	

Table 18: Economic Sustainability in Law 4412/16 & Declaration Document

Social	Article of Law 4412/16	Description	Declaration Articles
	Article 18 – Principles of Public Procurement	Includes social considerations as fundamental principles in procurement, emphasizing equality, inclusion, and respect for labor rights.	2.2.3.4 Exclusion grounds
	Article 38 – Transparency in Public Procurement (KIMDIS)	Mandates publication of procurement details on KIMDIS to ensure transparency and equal treatment of bidders.	1.6 Publicity
	Articles 43, 62, 65, 66 – Publications and Communications	Ensures clear communication and access to contract documents for all participants.	1.6 Publicity, 2.1.2 Communication – Access to contract documents, 2.1.3 Clarifications
	Article 53, 59 – Division into Lots	Encourages the division of contracts into smaller lots, enabling participation by SMEs, strengthening local economies, and enhancing competition.	1.3 Summary description of the contract's physical and economic scope
	Article 86 – Award Criteria	Allows for the inclusion of social criteria in awarding contracts, such as promoting employment opportunities for disadvantaged groups.	1.3 Summary description of the contract's physical and economic scope
	Article 130 – Social and Environmental Conditions	Permits imposing conditions addressing social aspects, such as fair working conditions or support for vulnerable populations.	2.2.3 Exclusion grounds, 4.3.3 Contract execution terms
	Article 309 – Standards for Social Management	Encourages adherence to social responsibility standards during the execution of contracts.	4.3 Contract execution terms
	Article 317 – Contract Performance Conditions for Social Aspects	Allows specific social obligations, such as employment for marginalized groups or promoting gender equality, to be incorporated into contracts.	1.7 Principles applied in the contracting process, 4.3.3 Contractor commitments
	Article 73–74 – Exclusion Grounds	Prohibits participation of bidders involved in criminal activities such as fraud, corruption, terrorism, or child labor.	2.2.3 Exclusion grounds
	Article 75–77 – Selection Criteria	Establishes economic and professional capacity as key criteria for selecting bidders.	2.2.4 Professional activity suitability, 2.2.5 Financial capacity, 2.2.9.2 Supporting documents

Table 19: Social Sustainability in Law 4412/16 & Declaration Document

Environmental	Article of Law 4412/16	Description	Declaration Articles
	Article 18 – Principles of Public Procurement	Establishes transparency and sustainability as core principles of public procurement.	1.4 Legal framework, 1.7 Principles applied in the contracting process
	Article 86 – Award Criteria	Specifies that award criteria can include environmental benefits, focusing on life-cycle costing.	2.3.1 Award Criteria
	Article 87 – Technical Specifications	Allows for the inclusion of environmental requirements in technical specifications to promote green practices.	2.3.1 Award Criteria
	Article 88 – Use of Environmental Labels	Authorizes contracting authorities to require environmental certifications (e.g., EU EcoLabel) for compliance.	2.2.7 Quality assurance and environmental management standards
	Article 98 – Environmental Management Systems	Highlights the use of systems like ISO 14001 and EMAS during procurement to ensure sustainability.	2.2.7 Quality assurance and environmental management standards
	Article 309 – Environmental Management Standards	Introduces standards for environmental management systems in contracts.	
	Article 311 – Life-Cycle Costing for Environmental Impact	Promotes assessing the environmental impact of goods, services, or works using life-cycle costing.	

Table 20: Environmental Sustainability in Law 4412/16 & Declaration Document

We conclude that the European directive and Law 4412/16 place significant emphasis on ensuring the sustainability of public contracts. The table above highlights the legislator's provisions for safeguarding the three pillars of sustainability—economic, social, and environmental—and how STASY incorporates these provisions into its contracts. However, these measures alone are not sufficient to guarantee the viability of STASY's procurement processes. The inclusion of sustainability provisions in declaration texts serves as the foundation for achieving sustainability, but additional critical factors are required. These include the selection of the appropriate procurement process, effective procurement planning, flexibility, and timely decision-making when circumstances demand it. In essence, risk management emerges as a key element in achieving the overarching goal of sustainability in organizational procurement.

3.7 Risk Management in STASY Procurement

In Section 1.4 of Chapter 1, we discussed the importance of risk management in the procurement processes of an organization. The risk management process for STASY, a public company, is a highly complex procedure with significant challenges. Factors influencing risk management include the strict legislative framework, bureaucracy, and the time required for approvals and decisions. However, other critical factors that reduce procurement risks pertain to administrative actions, such as procurement planning.

3.7.1 Purchase Requests – Procurement Planning

Given that STASY processes more than 1.300 purchase requests annually for goods, services, and projects, this volume alone increases the risk associated with procurement cases. The high number of tenders raises the difficulty of monitoring and completing requests effectively. As noted in Section 3.4, purchase requests originate from STASY's services (Departments, Divisions, General Directorates) and Central Warehouses. Each case will be analyzed separately below.

Requests from Central Warehouses

A prerequisite for the planning of purchase requests from Central Warehouses is the continuous monitoring of inventory levels, updating item codes, prices, technical specifications, and quantities. This ensures a representative forecast for procuring spare parts and consumables for the next 2–3 years. Information on the quantities of spare parts and consumables is derived from the data recorded in the information system by maintenance services, as well as the annual maintenance schedule.

If this information is inaccurate or delayed, the procurement risk increases significantly. The same applies when the technical description of an item has not been updated or when its price is outdated. Accurate information on the procurement of goods is crucial for inventory and tender planning.

Requests from Other Services

Apart from coded materials, which are managed and monitored by the Central Warehouses, purchase requests are also submitted by all organizational units of STASY. This often results in

requests for similar goods being submitted at irregular intervals within the same year. Procurement planning requires consolidating purchase requests from specific organizational units at specific times and with a clear forecast horizon.

This requires services to anticipate and plan for their needs based on a well-organized schedule of their operations. It is important to differentiate between emergency procurement—covered by legislated extraordinary procedures—and poor planning. The latter undermines procurement efficiency and increases risk.

Below is the diagram that presents the number of purchase requests (468 in total) in one of the three procurement departments of STASY for the year 2023. The diagram illustrates the comparison between the total quantity of purchase requests and the number of unique services required for each category. This visual representation highlights key insights into procurement trends and priorities within STASY.

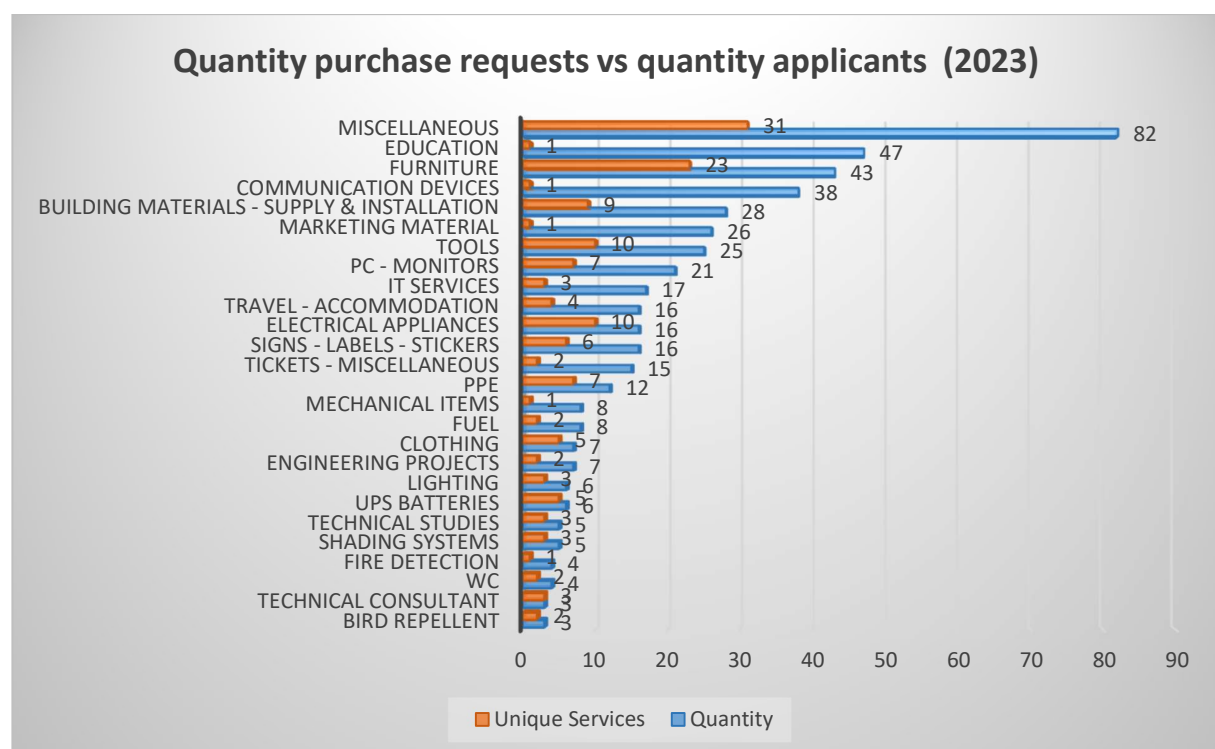


Chart2: Quantity of request vs applicants

We observe categories such as "Furniture", "Education", "Communication Devices" presenting significantly higher quantities of requests, however this does not necessarily indicate their critical role in operational needs, in contrast to the criticality of requests for "Works", "Fuel",

"Construction Materials" etc. Requests for "Education" which concern, for example, seminars or familiarization with platforms, legislation etc., are requirements which cannot be budgeted from the beginning of the year. Furthermore, categories such as "Furniture", "Electrical Appliances" and "Tools" not only have high quantities, but also include a significant number of unique services, reflecting the complexity of their procurement requirements. On the other hand, categories with fewer unique services, such as "Communication Devices" and "Marketing Material", suggest opportunities for simplified planning and tendering processes.

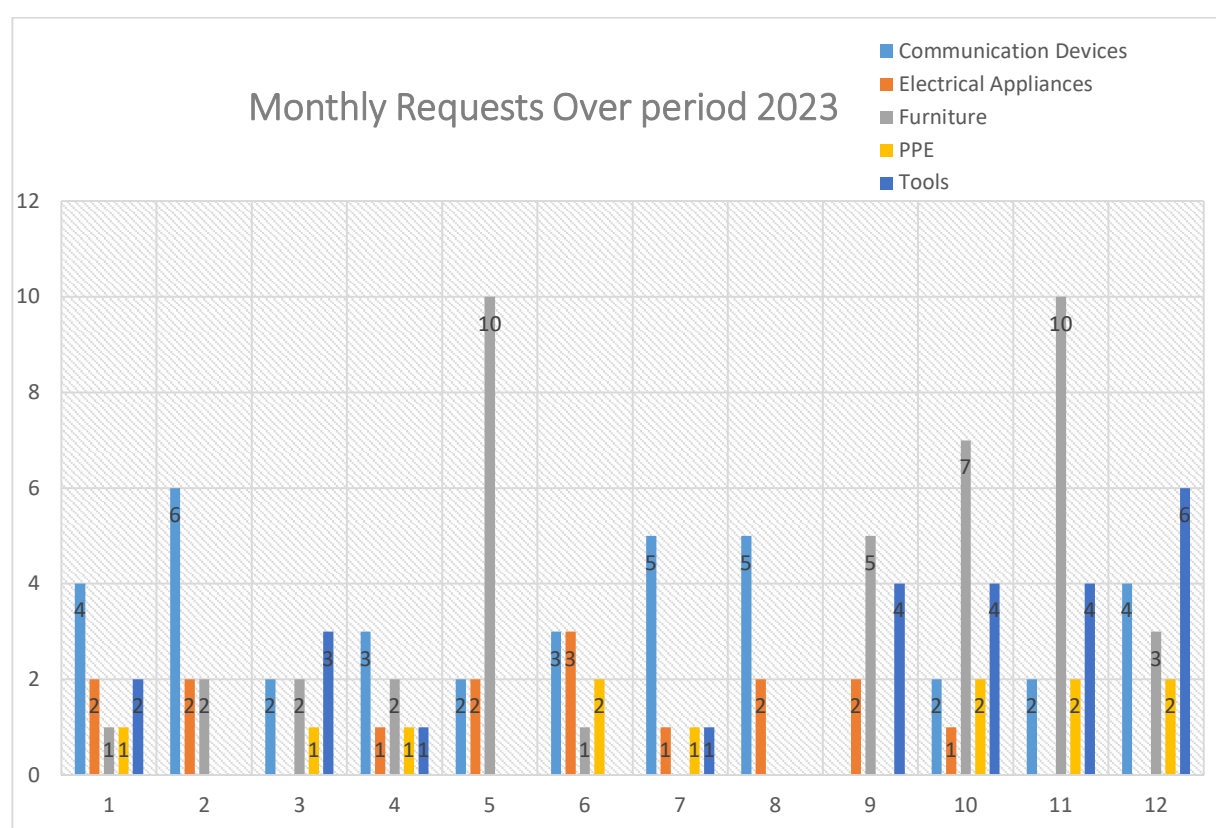


Chart3: Spread of requests within a year

The uneven distribution of purchase requisition quantities and the quantities of the organizational services requesting them highlights the need for balanced procurement strategies that take into account both volume and diversity. This analysis highlights the importance of effectively grouping and prioritizing purchase requisitions. By understanding these trends, STASY can better align procurement strategies with business objectives, enhance efficiency and ensure cost-effective procurement practices. For example, centralizing all requisitions in one service, for requests for electrical appliances on an annual basis, as well as PPE, tools, etc., and choosing competitive

procedures such as long time framework agreements, could be a strategic move towards achieving more cost-effectiveness.

Building on the previous analysis of purchase requests for supply items that are not kept in stock, we now present the indicative needs for spare parts (Warehouses) and their respective budgets for the years 2023 and 2024. Given that the total number of spare parts required exceeds 4,500, these items were categorized based on their Common Procurement Vocabulary (CPV) codes, resulting in 75 distinct categories. To streamline the analysis, these 75 CPV categories were further consolidated into 13 broader general categories.

The table below provides an overview of these general categories, detailing the number of CPVs each category encompasses, the corresponding number of spare parts, the percentage of each category relative to the total needs, and the allocated annual budget. This breakdown offers a clear and concise representation of the organization's procurement requirements and financial planning.

General Groups	Number of CPV categories	Number of Spare parts codes	Percentage of spare parts Codes(%)	Budget 2023 (€)	Budget 2024 (€)
Electrical Materials - Cables - Lamps	16	1034	21,33%	1.302.566,41 €	1.185.065,28 €
Electronic, Electromechanical, Electrotechnical Materials	5	590	6,67%	3.244.549,66 €	2.476.183,83 €
Cleaning Supplies	3	60	4,00%	44.720,32 €	44.340,75 €
Vehicle Parts, Engines, and Spare Parts	11	1050	14,67%	10.213.431,95 €	8.372.809,13 €
Wheels and Wheel Parts	1	2	1,33%	8.255,05 €	8.255,05 €
Mechanical Equipment	8	491	10,67%	1.211.883,34 €	1.138.870,42 €
Tools - Digital Instruments	7	164	9,33%	86.759,72 €	82.636,14 €
Control and Communication Systems	3	76	4,00%	1.337.173,41 €	510.429,41 €
Insulators and Insulation Components	2	403	2,67%	228.165,65 €	185.996,59 €

Construction Materials	3	34	4,00%	28.558,94 €	27.339,74 €
Plumbing Materials	1	205	1,33%	90.636,33 €	83.140,42 €
Paints, Solvents, Surface Preparation Materials	5	72	6,67%	13.416,79 €	12.450,02 €
Screws, Washers, Components, and Locks	10	805	13,33%	807.470,25 €	656.019,24 €
Total	75	4986	100,00%	18.617.587,82 €	14.783.536,02 €

Table 21: Spare parts Requests Budget 2023/2024

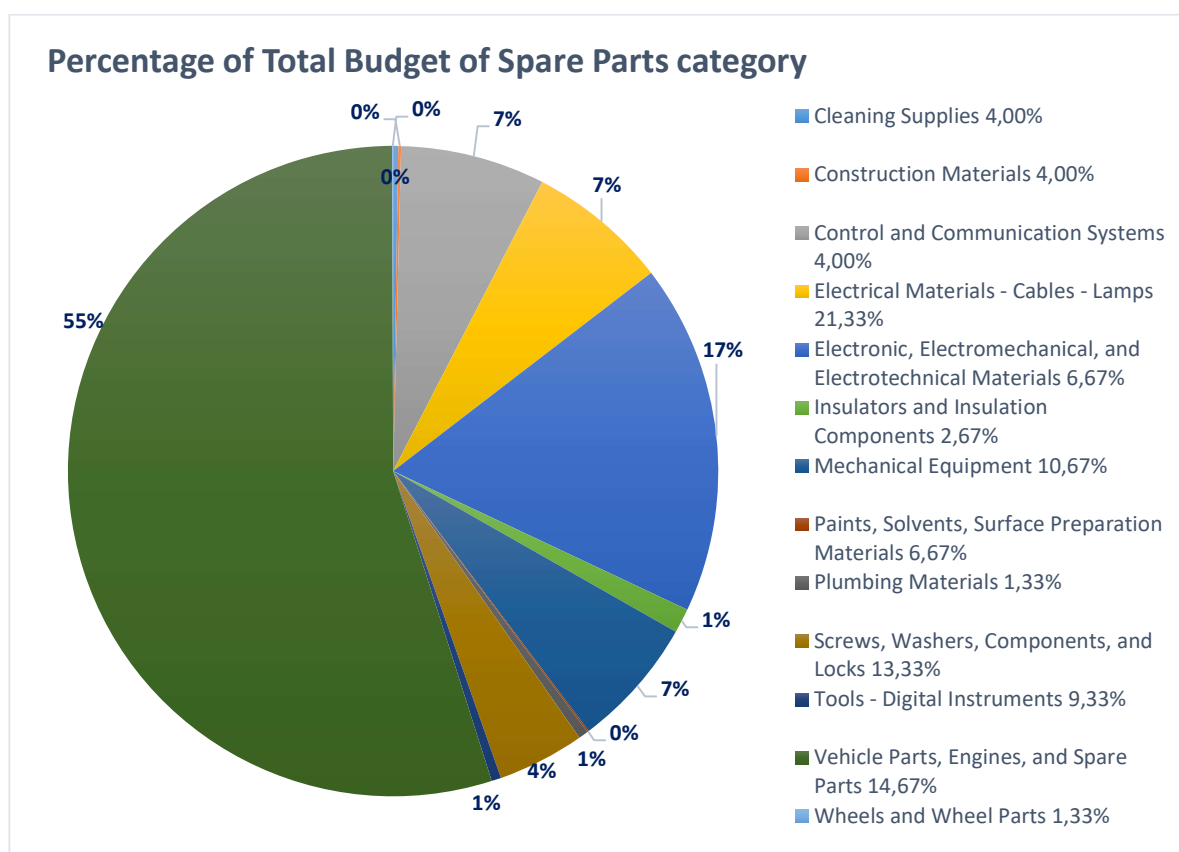


Chart 4: percentage proportion of the budget for spare parts (2023)

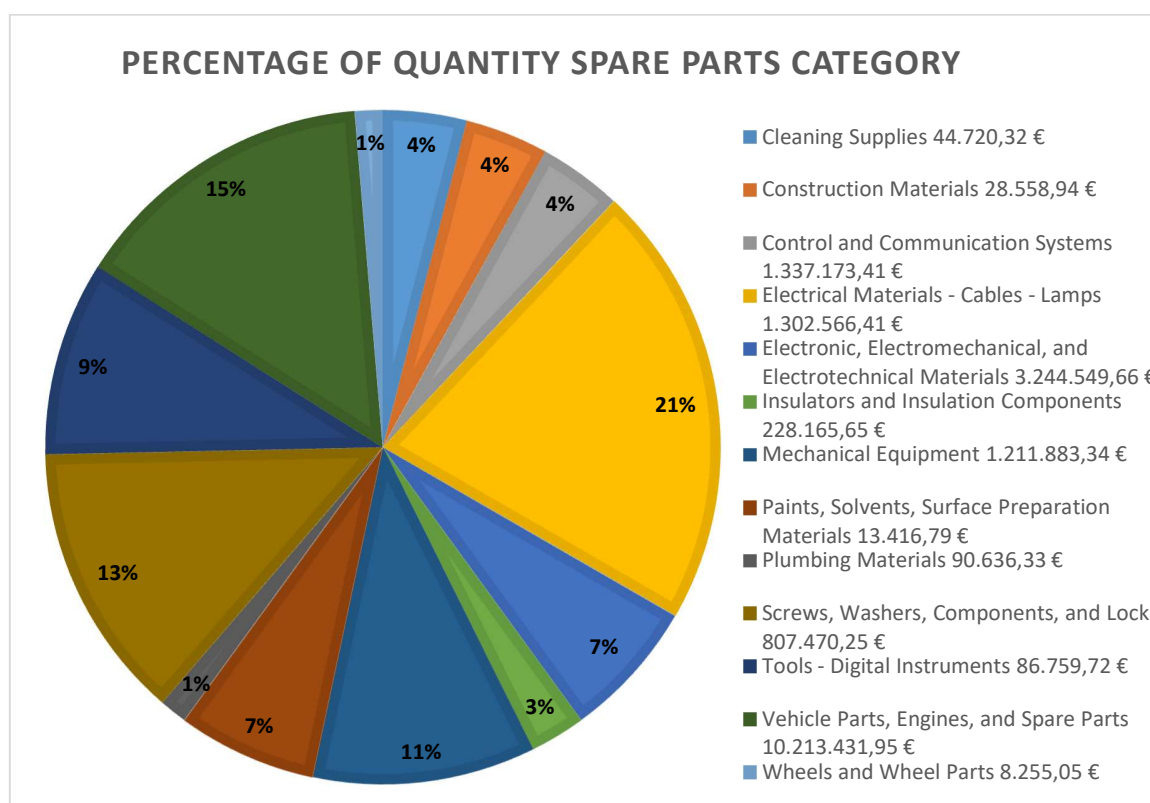


Chart 5: percentage proportion of the quantity for spare parts category (2023)

The table and accompanying charts clearly illustrate the critical importance of vehicle spare parts, as they constitute approximately 60% of the total procurement budget. The vehicle spare parts category includes 1,050 distinct types, and despite having a comparable number of item codes to the "Electrical, Lamps, and Cables" category, it commands a significantly higher budget allocation. Additionally, the charts reveal the significance of mechanical equipment spare parts, which, although accounting for only 6.67% of the total item codes, represent the second-largest budget allocation. These insights emphasize the prioritization of specific categories in the procurement strategy and the financial planning required to meet operational needs effectively.

Below is the table with the requests from warehouses by general category of spare parts, to meet their stock needs, in accordance with the requirements of the maintenance departments for the year 2024. The following data are derived from approximately 340 requests submitted to the Spare Parts and Equipment Procurement Department.

Request Category (2024) for Spare Parts	Quantity of CPV	Budget
Lubricants	12	581.706,41 €
Construction Materials	14	92.576,35 €
Salt	1	3.442,50 €
PPE	6	3.483,75 €
Fabrics - Bags - Sacks	5	87.986,30 €
Resins - Chemicals	5	30.073,88 €
Signs - Stickers - Inscriptions	3	22.000,00 €
Tools - Digital Instruments	42	486.004,74 €
Various Liquids Under Pressure	2	5.680,00 €
Pc - Monitors - Parts	10	28.867,47 €
Electrical Materials - Cables - Lamps	75	2.637.219,36 €
Electronic, Electromechanical, And Electrotechnical Materials	4	38.799,00 €
Control And Communication Systems	25	711.024,82 €
Cleaning Supplies	5	147.247,04 €
Vehicle Parts, Engines, And Spare Parts	19	3.269.096,35 €
Rails - Railway Materials	5	3.923.491,44 €
Mechanical Equipment	37	985.943,72 €
Insulators And Insulation Components	5	69.726,41 €
Plumbing Materials	13	111.584,80 €
Screws, Washers, Components, And Locks	21	135.111,90 €
Paints, Solvents, Surface Preparation Materials	10	57.177,20 €
Total	319	13.428.243,44 €

Table 22: Categorization of spare parts Requests

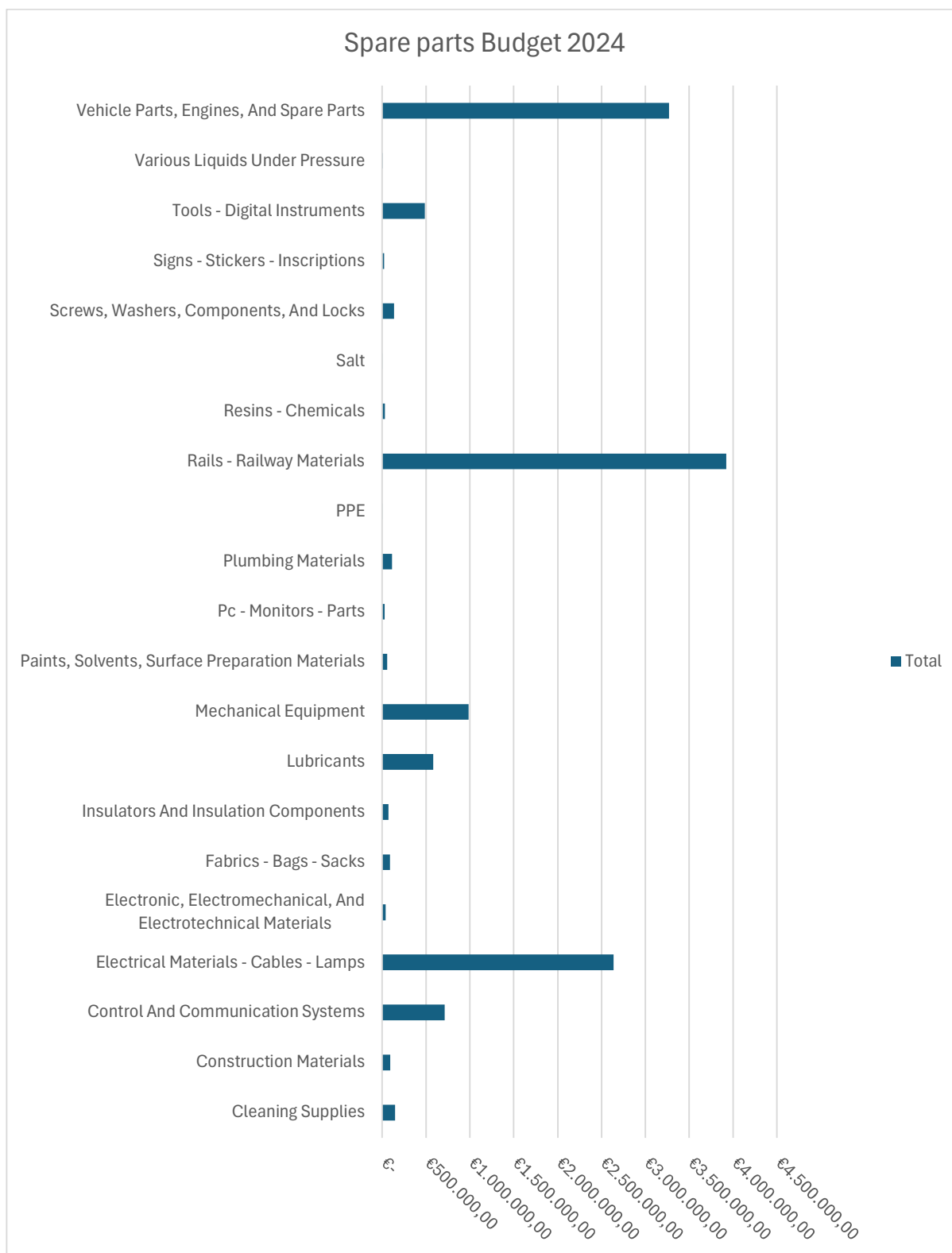


Chart 6: Spare parts indicative budget (2024)

In this paragraph, we described and analyzed indicative procurement requests made annually at STASY by its organizational units. We observe the diversity of requests by type of procurement, which often leads to complexities during tender processes, especially in cases where the goods to be procured involve monopolistic markets, have strict specifications, or when many of these spare parts are obsolete or not readily available in the market.

Procurement planning is not just important; it is a strategic necessity for ensuring operational continuity and efficiency. Effective planning minimizes the risks associated with supply shortages, cost overruns, and delays. Factors such as emergency needs, wear and tear of systems or facilities due to aging, unforeseen events (e.g., COVID-19, hostilities, piracy, etc.), production and delivery times, technological changes, monopolies, and materials with expiration dates must be carefully managed to mitigate risks. Additionally, planning enables the organization to forecast demand accurately, allocate resources more efficiently, and achieve better economies of scale through bulk procurement or long-term supplier agreements.

For spare parts, in particular, planning takes on a critical role, as these components often directly impact the maintenance and operational reliability of the systems they support. Ensuring an adequate inventory of critical spare parts reduces downtime, enhances the lifespan of infrastructure, and supports uninterrupted service delivery. It is equally important to incorporate market trends and technological advancements into the planning process to avoid obsolescence and maintain compatibility with evolving systems.

A key challenge that further complicates procurement planning is the strict legal framework governing public procurement. While designed to ensure transparency, accountability, and fair competition, this framework often leads to significant delays in the tendering process. Extended timelines for approvals, extensive documentation requirements, and mandatory procedural steps can hinder the timely execution of procurement, particularly in cases where urgent needs arise. These delays can exacerbate the risks associated with supply shortages and disrupt the operational flow, making it even more critical to account for such constraints during the planning phase.

Furthermore, the internal approval processes and procedures within the contracting authority, STASY, also require significant time and resources. These internal steps, which include approvals from various departments, alignment with budgetary constraints, and compliance checks, often add further delays to the procurement timeline. While these procedures are essential for ensuring adherence to organizational policies and legal requirements, they can become a bottleneck, particularly in the context of urgent or high-priority procurements.

In the following sections, we will analyze these internal procedures in greater detail, exploring their impact on procurement timelines and identifying potential areas for streamlining to improve efficiency and reduce delays. For planning purposes, particularly for spare parts, these risk factors—including legislative delays and internal approval times—must be taken into account when designing inventory plans. The procurement strategy should involve thorough market research, collaboration with suppliers, and proactive measures to mitigate delays, ensuring the successful and timely completion of procurement activities while maintaining cost efficiency and reliability.

3.7.2 Internal approval processes – Flowcharts

The Procurement Departments of STASY, in addition to their mandatory compliance with Law 4412/16, also implements internal procurement procedures. These procedures, as described in section 3.4, include the approval process for purchase requests, the internal process for conducting tenders with a procurement budget of up to €30,000, and the internal approval and procurement process for goods exceeding €30,000.

To better describe, understand, and present the workflows and the complexities of approvals and tendering, in accordance with internal procedures and Law 4412/16, we will use flowcharts to illustrate the tendering process for cases with a budget of up to €30,000 and the process for an open tender with a larger budget.

These flowcharts will provide a clear visualization of the approval stages, the roles and responsibilities involved, and the specific steps required for compliance with both legal and internal organizational requirements. By presenting this information visually, we aim to clarify the

procedural flow, highlight potential bottlenecks, and facilitate a more efficient understanding of the procurement processes within STASY

3.7.3 Tender Process in the Limit of Direct Award

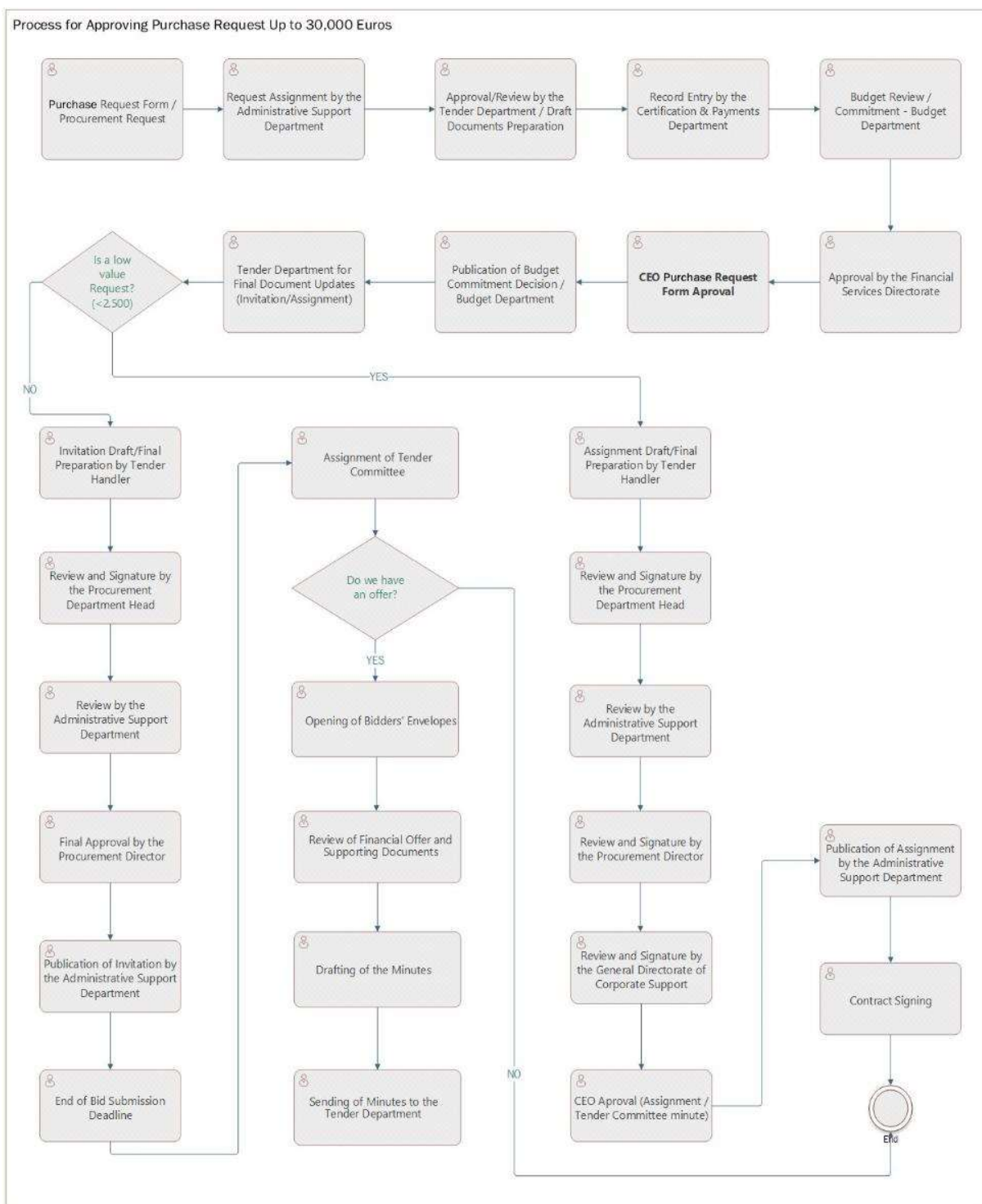
In this section, we will describe the approval and tendering process (open or closed) for purchase requests with a budget up to 30,000.00 €. For a clearer analysis of the tender process, a flowchart will follow.

By breaking down the stages of the process, we have:

- The assignment, review, and preparation of tender documents.
- The forwarding of the purchase request for budget review, approval by the hierarchy, and budget commitment.
- The check to determine if the purchase is a low-cost procurement (up to 2,500 euros), in which case a direct award procedure will follow for the procurement of the goods.
- The approval and publication of the invitation to submit bids.
- The opening of the financial offers and the tender committee's recommendation for the lowest bidder.
- The approval process for the assignment and the minutes of the tender committee, by the hierarchy.
- The posting of the assignment and signing of the contract.

For each of these stages, the internal procedures will be described. A sample tender analysis and comparative results will follow, to identify if any improvements are needed in the process.

A brief diagram of the process flow follows:



Flowchart 2 – Process approval for tenders up to Direct Award threshold

The Assignment, Review, and Preparation of Tender Documents

The procurement request approval process begins with the assignment of the request to the Administrative Support Department for Procurement. At this stage, an initial review is conducted, ensuring that the request form is completed correctly, all necessary documents are attached, the request is properly categorized, and it is assigned to the relevant Tender Department.

At the Tender Department, the request undergoes a comprehensive review, which includes verifying the budget, assessing the requester's requirements, determining the procedural steps to be followed, and ensuring that all necessary documentation (technical specifications, budget justification, official memos, etc.) is in place. Following this review, the appropriate draft for the tender procedure is prepared.

After preparing the draft invitation to tender or assignment, the procurement request is forwarded for approval.

Approval of Purchase Request and Budget Commitment

The approval process begins when the Tender Department forwards the request to the Certification and Payments Department, where the request is recorded (financial data). It is then forwarded to the Budget Department and the Financial Directorate for verification of available funds. The Budget Department subsequently forwards the purchase request and financial commitment documents for approval by the Managing Director. Upon approval of the tender and the budget commitment, the request is returned to the Tender Department.

Preparation of Tender Documents and Publication

This stage involves updating the drafts of the Invitation or Assignment with the decisions related to the budget commitments. These updates are made by the responsible employee at the Tender Department (tender handler). The Head of the Tender Department reviews and forwards the documents for publication, seeking signatures from the relevant hierarchy.

If the process requires an invitation for bids, the final version of the document is signed by the Procurement Director, in accordance with the internal procedure amendments made after July 2024. Prior to this date, the final documents required approval from the Procurement Department

Head, the Procurement Director, the General Directorate of Corporate Support, and the Managing Director.

Following the expiration of the bid submission deadline, the financial offers are opened by the tender committee, and a report recommending the lowest bidder is drafted.

The Tender Department then drafts the assignment text based on the committee's report and forwards both documents for final approval. The approval process includes authorization from the Procurement Director, the General Directorate of Corporate Support, and the final approval from the Managing Director. The process concludes with the posting of the assignment and the signing of the contract.

In cases where the budget of the request is less than or equal to 2,500.00 euros (low-cost procurement) and the procurement of corresponding goods does not exceed 2,500.00 euros annually, no invitation is required, and the process is completed solely with the assignment of the goods.

Monitoring and Development of Tenders

The monitoring and development of tenders with a budget up to the limit of direct award transitioned to a digital format in the final months of 2023. Until the end of 2023, tender cases were handled in paper form. The monitoring of the progress of requests was carried out through tender-related spreadsheets. With over seven different standard tender documents, it became challenging to track the progress of each request, and errors frequently occurred in the selection or preparation of documents.

Initiated by the Tender Department in 2021, a standardized automatic multi-document template was designed, which converts the text of the invitation or assignment with the data entered by the case handler. The data is entered once and automatically repeated wherever required. The text does not need to be manually filled in but provides the option to add or remove relevant details as necessary.

With the implementation of the template, the creation of invitation and assignment drafts became more user-friendly, minimized repetitive errors in published documents, and paved the way for the digitalization of the process. In 2022, the IT Department began configuring an electronic mailing

software system, transforming it into a digital tool for monitoring tenders. With the cooperation of the Tender Departments and the necessary involvement of the IT Department, an in-house software solution was developed for managing tender cases up to 30,000.00 euros.

The software has been fully operational across all Tender Departments since January 2024. The data related to the process, which will be analyzed in Chapter 4.1, has been sourced from the company's software for the year 2024.

3.7.4 Open Tender Flowchart

In the following flowchart, we observe the process of preparing the draft of an open tender announcement, the internal procedure for approving the tender process, the publication of the tender, and the procedure for unsealing the bids.

To effectively analyze these stages, it is appropriate to separate them and address each one individually. This approach allows for a more detailed understanding of the specific actions and requirements involved at each stage of the process.

By breaking down the stages, we aim to provide clarity regarding the steps required for:

- The preparation and drafting of the tender announcement, ensuring compliance with internal and legal frameworks.
- The internal approval process, involving the necessary reviews and authorizations by the awarding authority.
- The public announcement and publication of the tender, adhering to transparency and accessibility regulations.
- Bid Submission period, during this stage, economic operators are granted the right to, within specific deadlines, visit facilities, receive samples, and submit questions related to the tender. The tender evaluation committee actively monitors developments, collects questions, and recommends clarifications or possible deadline extensions to the CEO.

A. Preparation and Drafting of the Tender Notice:

The preparation and drafting of the tender notice represent the first and perhaps most critical stage in the process of an open tender. At this stage, all key parameters and requirements that determine the successful completion of the process are established.

Specifically, the process includes:

1. Specification of goods or services requirements: The drafting of technical specifications is conducted by the relevant departments and specialized units. Clarity and precision in the specifications are extremely important, as they ensure that the subject of the tender is fully understood by potential bidders.
2. Definition of the terms and conditions of the tender: The financial, legal, and administrative terms of the notice must comply with the legislative framework of Law 4412/16, ensuring the legality and transparency of the process. The participation requirements, qualification criteria, and selection criteria must be clearly stated, aiming to increase participation, ensure the sustainability of procurement, and promote equal treatment.
3. Budgeting and funding: Justification and determination of an appropriate budget for the tender by the requesting organizational unit are crucial as they form the basis for conducting the process. Before the final recommendation for tender approval, the procurement department, in collaboration with the Budget Department of the Finance Division, performs an initial review to ensure resource availability. Additionally, funding must be approved and secured before publishing the tender notice.
4. Contract timeline: A timeline for the contract, including its implementation period, delivery deadlines, and payment schedules, is critical to the planning process.
5. Ensuring legality and internal approvals: The draft tender notice is submitted for legal review and approval to the competent services of STASY. At this stage, the process may require modifications to ensure compliance with the applicable legal framework and internal procedures.

Careful and methodical preparation of the tender notice is fundamental to avoiding issues and delays in subsequent stages, as well as ensuring transparency, competition, and the successful completion of the tender.

B. The Internal Approval Process (recommendation for tender execution) encompasses a comprehensive set of actions and documentation required to ensure compliance and readiness for the tender's publication phase. Specifically, this process includes:

- **Recommendation Document:** A detailed recommendation outlining the tender's scope, its criticality, the budget, justification of the need, and the required authorizations for approval. This document is accompanied by all relevant tender documents such as clarification notes, committee reports, the tender notice, and any correspondence or documentation related to the process.
- **Approval Hierarchy:** The recommendation is signed and reviewed by multiple levels of authority, including:
 1. The staff member preparing the recommendation (author).
 2. The Head of the Tender Department.
 3. The Directorate of Procurement and Supply.
 4. The requesting Directorate or Sub-Directorate.
 5. The General Directorate of the requesting unit.
 6. The General Directorate of Corporate Support.
 7. The Legal Services Directorate.
 8. The CEO.
 9. Board of Directors (For tenders with a budget exceeding €60,000).

These approvals are essential for transitioning to the publication phase and minimizing risks related to procedural non-compliance or potential legal challenges later in the process. By establishing a thorough and multi-level approval mechanism, the awarding authority ensures that all aspects of the tender align with internal policies and external legal requirements, safeguarding the integrity and success of the procurement procedure.

C. The Budget Commitment Process

The budget commitment process is a critical step that involves verifying the availability of resources, matching items with the appropriate CPV codes, and assigning them to the correct

accounts. This step ensures that the financial foundation of the procurement is solid and compliant with regulations.

Key aspects of this process include:

1. **Resource Availability Check:** The process begins with confirming the availability of budgetary resources to fund the procurement.
2. **CPV and Account Alignment:** The items in question are matched with the correct Common Procurement Vocabulary (CPV) codes and assigned to the appropriate budget accounts.
3. **Approval Requirements:** The budget commitment requires prior approval of the purchase request by the CEO to proceed further.
4. **Collaboration of Organizational Units:** The preparation for budget commitment involves cooperation among several organizational units in the following order:
 - The **Certification and Payments Department** of the Procurement Directorate.
 - The **Budget and Results Department** of the Financial Directorate.
 - The **Financial Directorate**.
 - The **CEO**, who provides final approval for the commitment.
 - **Multi-Year Budget Commitments:** For requests that involve resource commitments exceeding the current fiscal year, the process escalates to the Ministry for approval of multi-year commitments.

This meticulous approach ensures that budgetary allocations are properly planned and managed, reducing financial risks and ensuring compliance with statutory requirements. By aligning organizational collaboration with approval mechanisms, the process secures the necessary financial framework for successful procurement execution.

D. The Public Announcement and Publication of the Tender

After securing the budget, the tender notice and tender documents are updated by the responsible officer from the procurement department to include details about the budget allocation, the approval decision, and critical deadlines for the submission of bids and bid opening. The final documents are submitted sequentially for approval to:

- The Head of the Procurement Department,

- The Procurement Directorate,
- The General Directorate of Corporate Support,
- The CEO.

Following the necessary approvals, the tender is published to ensure transparency, fairness, and broad accessibility for potential bidders. This stage adheres to strict regulatory requirements to uphold the principles of equal opportunity and non-discrimination.

Key aspects include:

Transparency and Accessibility

The tender notice is designed to provide all relevant details about the tender in a clear and accessible manner. This ensures that all eligible suppliers have equal opportunities to participate.

Publication Platforms

The tender is published on appropriate public platforms, such as:

- **DIAVGEIA:** Where national-level tender notices are published.
- **KIMDIS:** The National System for Public Contracts in Greece for announcements at the national level.
- **TED (Tenders Electronic Daily):** The European Union's platform for tenders exceeding EU thresholds.
- **ESIDIS:** The national platform for publishing and managing public procurement tenders.
- **The company website:** For broader outreach.
- **Press Publications:** When required by the regulations.

Key Principles

The focus is on ensuring transparency, accessibility, and fairness to provide a strong foundation for the integrity and success of the procurement process. By adhering to these principles, the public announcement and publication phase plays a pivotal role in fostering competition, ensuring compliance with regulations, and achieving the desired outcomes of the procurement.

E. Waiting Period for Bid Submission

During this stage, economic operators are granted the right to, within specific deadlines, visit facilities, receive samples, and submit questions related to the tender. The tender evaluation committee actively monitors developments, collects questions, and recommends clarifications or possible deadline extensions to the CEO.

If questions or extension requests are submitted during this stage, the tender committee collaborates with the relevant departments that initiated the procurement request, the Procurement Directorate, and the Legal Department to prepare recommendations for approval of the clarification document or the possible extension of the bid submission deadline.

Approval Process for Clarifications and Extensions:

- **Collection of Questions or Requests:** All questions and requests for extensions must be submitted within the specified deadlines.
- **Preparation of Responses:** The relevant departments of STASY prepare answers to the collected questions.
- **Drafting of the Committee's Minutes:** The tender committee drafts an official record detailing the questions, responses, and recommendations for clarifications or deadline extensions.
- **Review by the Procurement Directorate and Legal Department:** The draft record, along with the proposed clarification document and the decision on deadline extension, undergoes a thorough review by the Procurement Directorate and the Legal Department.
- **Submission for Approval:** The final record, accompanied by the clarification document and the decision on deadline extension, is submitted for sequential approval by:
 - a) The Tender Department,
 - b) The Procurement Directorate,
 - c) The General Directorate of Corporate Support,
 - d) The CEO.

- **Publication of Documents:** Once approved, the clarification documents and deadline extension notices are published on all platforms where the original tender was announced, ensuring that all potential bidders are informed promptly and transparently.

This stage ensures that all economic operators have the necessary information and ample opportunity to submit well-prepared bids. By addressing any concerns and providing clarifications promptly, the process fosters transparency, fairness, and adherence to regulatory requirements, ultimately supporting the successful completion of the procurement process.

F. Tender Opening and Evaluation Process

The following is a flow chart of the final stage of bid unsealing, which aims to ensure integrity, fairness and compliance in the evaluation process. This detailed analysis facilitates a full understanding of the overall process, while highlighting critical points where challenges or delays may arise, up to the signing of the contract or the cancellation of the process.

The tender opening process flow combines the requirements of Law 4412/16 with the internal procedures of the organization.

Step 1

For tenders evaluated on the best value for money:

- Participation documents are verified first, followed by the unsealing of technical offers.
- The technical offers are evaluated and scored based on predefined criteria.
- A report is prepared by the Tender Committee, which is submitted for approval by the contracting authority.
- In the second stage, the financial offers are unsealed on a specified date, evaluated, and the provisional contractor is identified.

For tenders evaluated on the lowest price:

- The Tender Committee verifies the completeness of participation documents in accordance with the tender announcement.
- Technical specifications are assessed.

- The provisional contractor is the economic operator offering the lowest price while meeting the technical specifications.
- A provisional contractor report is prepared and submitted for approval.
- Approvals and Decision-Making
- Approval Process

The Tender Committee's report is forwarded for approval to the CEO or the Administrative Council, depending on the procurement budget. The approval process requires sign-off by:

- The Procurement Department,
- The General Directorate of Corporate Support,
- The CEO, and, if applicable,
- The Administrative Council.

Step 2

Request for Supporting Documents

A formal letter is sent to the provisional contractor, requesting submission of selection criteria documents and the European Single Procurement Document (ESPD) within a specified timeframe. After submission, the Tender Committee reviews the documents. A final award report is prepared and submitted for approval, following the same hierarchical approval process as the provisional contractor report.

The award decision is communicated to all participants of the tender. The process includes the following steps:

1. **Notification of Participants** about the award decision.
2. **Opening of Offers and Documents of the Provisional Contractor**, the financial offers and the documents of the provisional contractor and the committee's minutes are opened to all participants.
3. **Participants have the right to appeal** against the award decision within a specific timeframe as defined by the law.

4. If **no appeals** are filed, or any appeals have been resolved, the procurement officer sends an official letter to the awarded contractor, with the contractor to be invited to sign the contract.
5. **Submission of Performance Guarantee**, the awarded contractor must submit a performance guarantee before signing the contract, as stipulated in the tender announcement.

Step 3 (optional)

Preliminary Audit Procedure (before Contract signature)

If the contract requires review by the Court of Audit, the preliminary audit procedure is initiated:

- **Preparation of the Full Case File:** The Procurement Department gathers all relevant documents, including the minutes of the Tender Committee, the award decision, and performance guarantees.
- **Collaboration with the Legal Department:** The full case file is submitted to the Legal Department for review and finalization.
- **Submission to the Court of Audit:** The Legal Department forwards the complete file to the Court of Audit for a preliminary contractual review.
- **Awaiting Approval:** After approval by the Court of Audit, the process proceeds with the contract signing.

The scope of this structured process is to ensure compliance with the regulatory framework, transparency, and fairness, while minimizing risks and maintaining the integrity of the tender procedure.

Analysis of the Workflow for Open Tendering Procedures

Analyzing the workflow of an open tender process, we observe the significant bureaucracy that prevails within the organization. This bureaucracy arises not only from legal requirements but also from internal processes. The process of an open tender involves several documents, each of which requires approval from the directly related organizational units, tender departments, and their hierarchy before the contract can be signed. The key documents include the initiation of the tender, budget approval, draft offer, extension of submission deadlines, clarifications, and the final contract.

In the table below, we can see the necessary documents for an open simple tender, which would not include the exclusion of economic operators, appeals, the Court of Auditors, contract modifications, or stages that could increase bureaucracy and the time required for signing the contract. As we can observe, the process requires at least 87 approvals from multiple levels of the hierarchy, which reasonably delays the progress of the contract.

Documents for Approval	Procurement Department	Procurement Directorate	Corporate Support Directorate	Legal Department	Financial Services Directorate	Applicant Directorate	Applicant General Directorate	CEO	Board of Directors
Tender Approval Proposal	v	v	v	v		v	v	v	v*
Decision for Tender Execution								v	v*
Budget Approval					v			v	
Draft Tender Proposal	v	v	v					v	
Draft Tender Notice	v	v	v					v	
Transfer of Minutes (Clarifications - Extension of Submission Date)	v	v	v	v				v	v*
Clarifications Document	v	v	v	v				v	
Extension Decision	v	v	v	v				v	
Participation Guarantee Check Letter	v	v	v						

Transfer of Technical Minutes - Eligibility Documents	v	v	v					v	v*
Transfer of Provisional Contractor Minutes	v	v	v					v	v*
Provisional Contractor Decision	v	v	v					v	v*
Provisional Contractor Information Letter	v	v	v					v	
Extension or Clarification Letter on Documents	v	v	v					v	
Transfer of Award Minutes	v	v	v					v	
Award Decision	v	v	v					v	v*
Award Information Letter	v	v	v					v	
Tender Award	v	v	v					v	
Performance Guarantee Check	v	v	v						
Contract	v	v	v	v				v	

Table 23: Basic Documents of Open Tender and Approvals

Suggestions for Reducing Signature Approvals:

1. **Streamline the Approval Process:** Reduce the number of levels involved. For example, once the decision for execution has been made and the draft tender document has been approved during the purchase request phase, the requirement for the signature of the tender and the call for tenders by all members could be eliminated.
2. **Letter Approvals:** Letters to contractors for document clarifications could be sent with the approval of the Procurement Directorate, reducing the need for further signatures.
3. **Award Decision and Notification:** When the award decision is made, the letters for informing the contractors or inviting them to sign the contract could be handled by the Procurement Directorate directly, streamlining the process.
4. **Automated Documents:** Implement automated document generation to reduce manual processing times and human error in document creation.
5. **Automated Systems for Notification:** Apply automated systems that notify relevant parties when documents are ready for approval or signature, ensuring faster processing and minimal delays.

6. **Staff Training:** Provide training to staff to improve the speed and accuracy of document handling. This will lead to fewer delays and smoother workflow across departments.
7. **Unified Platform:** Create a unified platform where all involved departments can easily access the necessary documents, minimizing delays and ensuring that everyone is on the same page throughout the process.

These suggestions aim to simplify and expedite the tendering process while ensuring that all necessary approvals are met, reducing bureaucracy, and enabling faster contract signing.

4. Tenders Study

4.1 Study of Tenders Up to the Threshold of Direct Award

For the analysis that follows, data was collected from purchase requests, which led to the execution of 483 tenders in 2024. Below is an analytical table presenting the procurement categories.

Specifically, there were 203 requests for the purchase of spare parts and equipment, 130 requests for the supply of services and 150 requests for other supplies and works. The term “tenders up to the direct award threshold” refers to all budget cases up to 30,000.00 euros, which were not carried out within the framework of the National Electronic Public Procurement System (ESIDIS). On the contrary, the market was informed through the DIAVGEIA platform and KIMDIS, with invitations to submit tenders.

This process aims to accelerate the procurement of goods, services and works, while at the same time encouraging cooperation with smaller businesses. The invitations are not necessarily addressed to a specific economic operator, but are addressed to the broader market.

Below, with the analysis of the data, we will explain how the integration of technology can speed up the tendering process, improving case tracking and strengthening the company’s internal processes. The introduction of digital tools not only simplifies the procurement workflow, but also reduces human errors and inefficiencies, ultimately accelerating decision-making and expediting the tendering process.

Through the use of tender monitoring software, we gathered data regarding the tendering process. In this study of these cases, we will focus on the times and decisions made throughout the process. We will identify the most time-consuming points of the process, discuss the actions taken, the results achieved, and how we can reach better outcomes. The methodology followed for this process involves isolating the approval stages, the intermediate stages, the outcomes, and evaluating the completion time for each approval step.

The approval stages are as follows:

- 1) First Approval of Request by the General Directorate of the requesting service
 - Creation of Request

- Forwarding the Request to Procurement
- Review of Completeness of Request
- Assignment to the Relevant Tender Department
- Creation of Invitation Draft

2) Approval of the Request by CEO

- Completion of Financial Data for Items
- Identification of Funding Source
- Forwarding Request for Approval by CEO
- Posting of Budget Commitment on DIAVGEIA

3) Approval of the Invitation for Bids

- Updating the Invitation Draft
- Forwarding for Signatures from Relevant Authorities
- Publication of the Invitation
- Waiting for Bids

4) Approval of Assignment

- Opening of Bidders' Envelopes by the Tender Committee / Tender Committee Report
- Drafting of Assignment Document
- Forwarding for Approval to Relevant Authorities
- Publication of Assignment
- Signing of Contract

Approvals	Tender ≤ €30.000 Procedure & Approvals	Total Time in DAYS	Approval Time in DAYS	Procurement Departmen Time in DAYS	Procurement Total Time	Procurement Total Time After 1/9/2024
First Approval	Request 1st Approval GD	9,70	9,70			
	Request Check ASD-PD	1,16		1,16	1,16	1,16
	Invitation 1st Draft Time	2,25		2,25	2,25	2,25
Second Approval						
	Budget Time	1,70			1,70	1,70
	Request Fianl Approval	3,38	3,38		3,38	3,38
Third Approval						
	Invitation 2nd Draft Time	0,82		0,82	0,82	0,82
	Invitation Approval (OLD) GD/CEO	9,72	9,72		9,72	
	Invitation Approval (NEW) PD *	0,81	0,81			0,81
	Publication Time	0,80		0,80	0,80	0,80
	Days Open for Bids	10,00			10,00	10,00
	Committee Time	7,01			7,01	7,01
Final Assignment						
	Offer Review / Assignment Draft	2,20		2,20	2,20	2,20
	GE Assigmaent Approval	7,60	7,60		7,60	7,60
	CEO Assignmaent Approval					
	Publication Assignment	0,61		0,61	0,61	0,61
	Contract Signing	1,12		1,12	1,12	1,12
Total		58,08	30,40/21,49	8,97	48,99	39,46

Table 24: Basic Documents of Open Tender and Approvals

The above data was collected by measuring the time intervals for each phase separately. After isolating the time for each stage, descriptive statistics were applied to the data of each time period. When significant discrepancies were found between the mean and the median values, an outlier check was conducted using the first and third quartiles. By excluding the extreme values, a further review of the descriptive statistics was carried out, and the choice between using the mean or median was evaluated. The method for assessing outliers is explained in detail in the following section (4.2).

The table below presents the results of the average completion time for a tender with an invitation for bids. The first column shows the average duration of the process from start to finish. The second column presents the average time spent on the approval phases. The third column displays the duration, in days, that the tender remains at the Procurement Department for activities such as document drafting, review, entering financial data, and posting of the invitation, assignment, and contract. The fourth column shows the time related to the procurement of goods, that is, the time

from when the tender is definitively assigned to the Procurement Department until the contract is signed. The final column illustrates the improved procurement time after modifications were made to the approval process of the invitation for bids.

Initially, the approval process required signatures from the Procurement Director, the General Directorate of Corporate Support, and the CEO. However, with the intervention implemented in September 2024, the approval and signature of the final invitation document are now handled exclusively by the Procurement Director.

For the calculations, the average time for review and preparation of the minutes by the tender committees was at average 7,01 days, while the average time for the posting of the invitation was estimated at an average of 10 days.

Below, we present comparative charts illustrating the significance of the intervention in the approval process. Additionally, there is a diagram that highlights the importance of each stage in the tendering process, along with a table showing the percentage of intervention in the approval process.

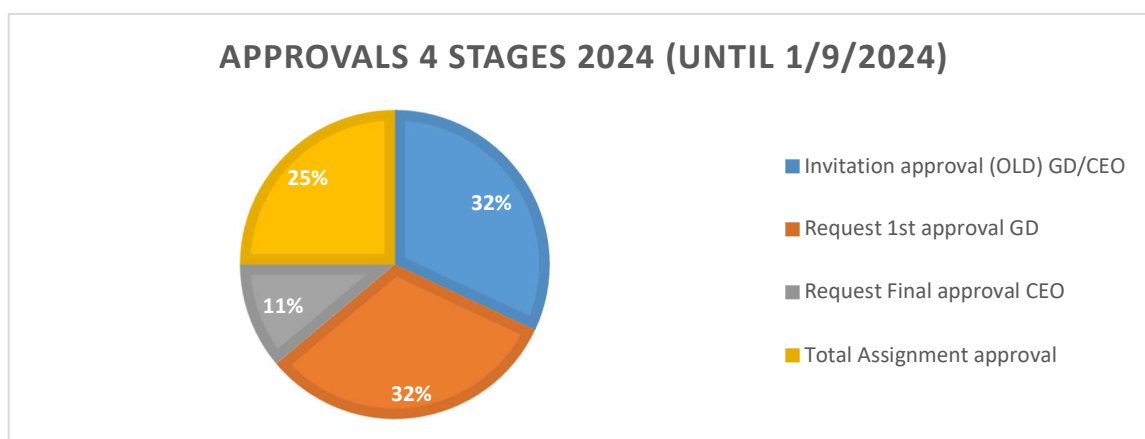


Chart 7: 4 stages of internal approval (until 1/9/2024)

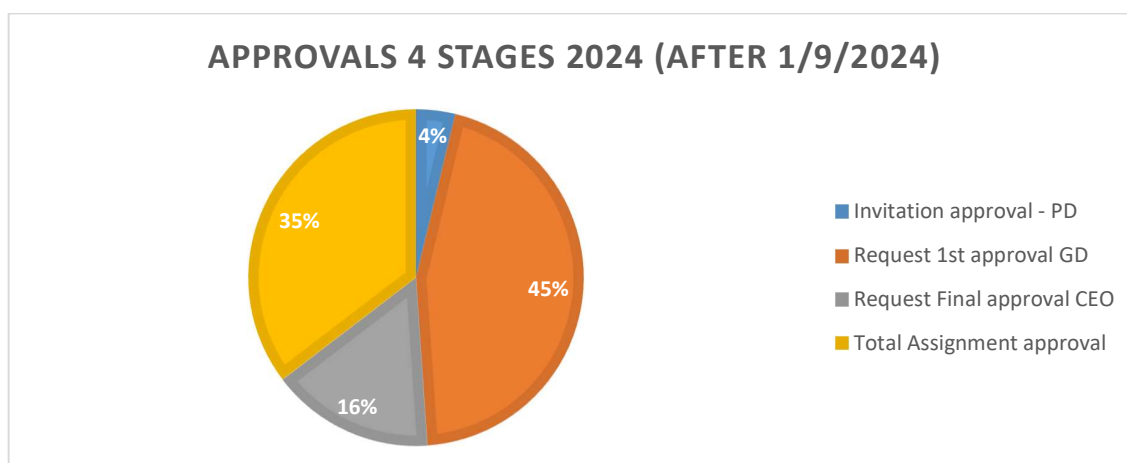


Chart 8: 4 stages of internal approval (after 1/9/2024)

The diagrams above illustrate the importance of intervention in the approval stage of the invitation for bids. This intervention resulted in a 29.31% improvement in the approval time, leading to an overall improvement of approximately 15% in the total duration of the tender process.

The following chart clearly demonstrates how critical the approval stage is within the tendering process, as it accounts for 50% of the total time required for the tender.

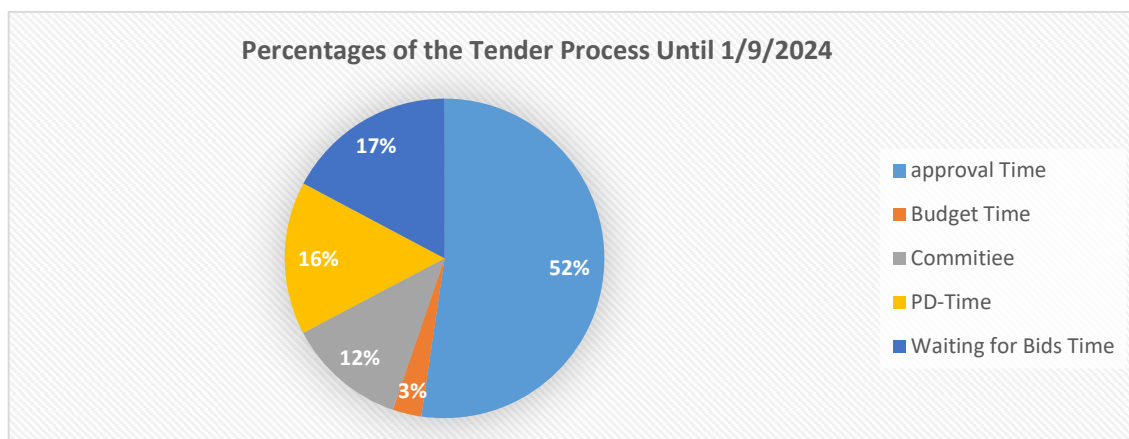


Chart 9: duration of tender stages in percentage (until 1/9/2024)

We observe the necessity of technology in the field of public procurement, as it provides the opportunity to use tools that not only monitor and track the progress of tender cases but also generate valuable data. This data includes time metrics, product information, supplier details, costs, consumables, inventory levels, and stock management. These insights can be effectively utilized for the design and planning of an organization's procurement activities. Moreover, they can generate performance monitoring indicators and comparative models that help identify areas of complexity, delays, and other issues. This allows for timely interventions aimed at optimizing the performance of procurement processes and improving the overall efficiency of the organization.

Before 2019, at STASY, where the electronic routing of procurement requests with a complete history was implemented for the first time, it was nearly impossible, due to the volume and frequency of requests, to immediately identify the current stage of a tender and the responsible person. With the full implementation of the tender file tracking system, gradually starting in the end of 2023, the monitoring and processing of procurement requests have become much easier for the tender handlers. This has also made it simpler to identify critical points in the process, leading to the development of proposals and interventions for improvement.

A random sample check was conducted on 60 tender cases, the data of which were collected from cases of the year 2023. The approval process for these cases, regarding the approval of the invitation for tenders, the approval of the award, and the contract, was carried out through the transmission of paper files.

From these cases, the following average times were derived:

Tender Process	2023	2024 (Until 1/9/2024)	2024 (After 1/9/2024)
Invitation Draft Approval	9,2	9,72	0,81
Total Time From Request	70,2	58,08	49,16
Clear Procurement Time	50,7	48,99	39,46
Committee	9,8	7,01	7,01

Table 25: Comparative tender period timetable

It is observed that the difference in the approval time of the invitation draft procedure is negative (**-0.06%**) between columns 1 and 2 for the years 2023 and 2024, and although the 2023 sample is small, it indicates that there was some difficulty in the transition and management of approvals from paper to digital processes. However, the change in the procurement approval process resulted in a **90.11%** reduction in the time for approving the invitation, column 3. This leads us to the conclusion that the use of technology does not necessarily lead to a reduction in times, but rather to the identification of the complexity of the process and, ultimately, its rationalization. We can also observe this from the results of the clear procurement time, as the average evaluation time of bids by the committees was almost 3 days longer in 2023 compared to 2024, therefore, the net completion times of procurement requests in 2023, if we consider the sample representative, are slightly the same as the competitions times of the year 2024. However, monitoring led to an intervention in the approval process of the invitation draft, which resulted in a reduction of approximately 22% in the net procurement process.

Below is the comparative chart depicting the results of the table for the years 2023 and 2024.

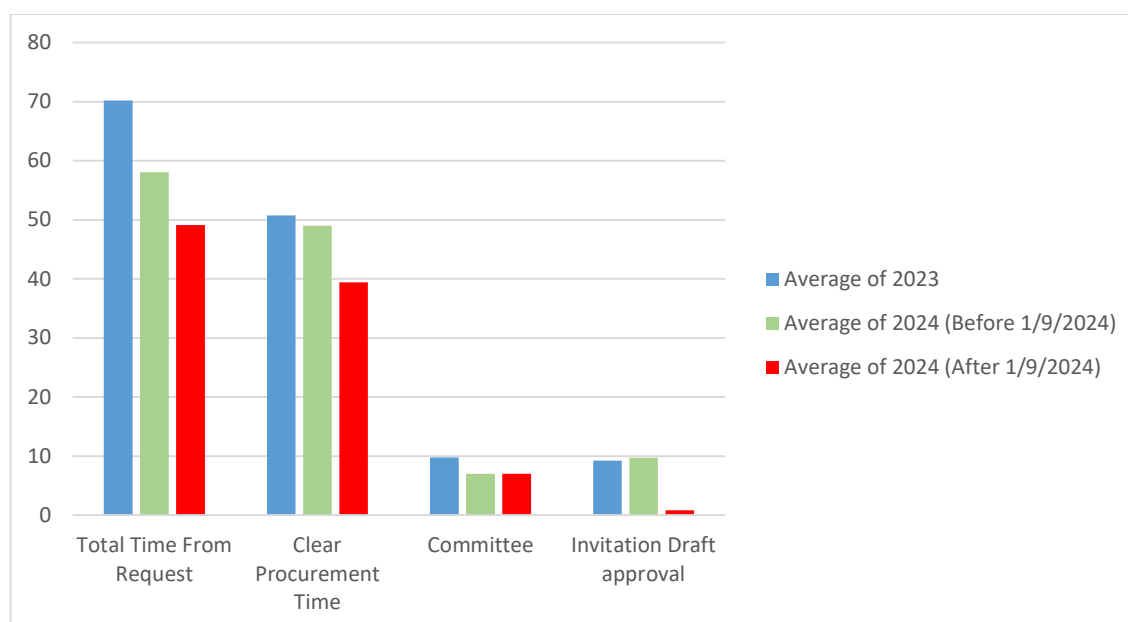


Chart 10: Average days of tender crucial stages (until and after 1/9/2024)

For these results, 483 tenders up to €30,000.00 for the year 2024 were analyzed. Of these tenders, 333 were separately examined for the approval process of the invitation, covering the period until 1/9/2024. For comparison purposes, a separate analysis of the invitation approval process was conducted for 150 tender cases, after the implementation of the new approval process from 1/9/2024 to the end of the year. Indicative data for the year 2023 were gathered from the paper file of tenders.

4.2 Study of Tenders Exceeding the Threshold of Direct Award

For the analysis that follows, data were collected from purchase requests, resulting in the execution of 549 tenders from 2020 to 2024. Below is a detailed table presenting the procurement categories.

Category	2020	2021	2022	2023	2024	Total
Spare Parts	44	39	44	34	47	208
Insurance	2	4	4	3	2	15
Vouchers	-	1	9	4	7	21
Repairs	2	-	-	-	-	2
Works	2	3	1	3	3	12
NSRF Projects	-	2	2	2	-	6
Cleaning Services	15	14	4	1	-	34
PPE	3	4	-	-	-	7
Studies Technical	-	1	-	-	-	1
Leases	-	-	1	4	4	9
Supplies	12	11	19	21	23	86
Maintenance	11	3	-	-	-	14
Maintenance and Repairs	7	17	10	16	18	68
Services	8	8	10	11	6	43
Security Services	11	7	-	4	1	23
Grand Total	117	114	104	103	111	549

Table 26: Tender categorization over years 2020-2024

To analyze the tenders and draw meaningful conclusions, we will divide the tenders into six (6) temporal periods. For each period, we will exhaust all available data from all cases.

The methodology for each stage of the study will involve the exclusion of data using quartiles and the method for identifying and removing outliers.

We are going to describe the steps in order to Determine Outliers

2. Calculate the Quartiles:

- Q_1 (First Quartile): The 25th percentile (the value below which 25% of the data falls).
- Q_3 (Third Quartile): The 75th percentile (the value below which 75% of the data falls).

3. Compute the Interquartile Range (IQR):

$$IQR = Q_3 - Q_1$$

4. Determine the Lower and Upper Limits:

$$\text{Lower Limit} = Q_1 - 1,5 \times (IQR)$$

$$\text{Upper Limit} = Q_3 + 1,5 \times (IQR)$$

5. Identify Outliers:

Any data point below the Lower Limit or above the Upper Limit is considered an outlier.

The following temporal periods will be defined for our analysis:

- Time from request submission to tender approval.
- Time from tender approval to publication.
- Time from publication to bid opening.
- Time from bid opening to the provisional contractor decision.
- Time from provisional contractor decision to tender award.
- Time from tender award to contract signing.

4.2.1 Timeframe Until Tender Approval

This timeframe concerns the period of initiation, discussion, and design of the tender, including the review of specifications, safety terms, legal checks, drafting of safety conditions, insurance contracts, and the collection of approvals from the hierarchy.

This maturation and design phase of the tender is critical, as any potential error can lead to delays, additional bureaucracy, objections, cancellations, or failed tenders.

For this first stage of the study, data from 549 cases were used. After excluding outliers, the dataset was reduced to 536 cases.

The results, presented in the table below, refer to cases from 2022 to 2024.

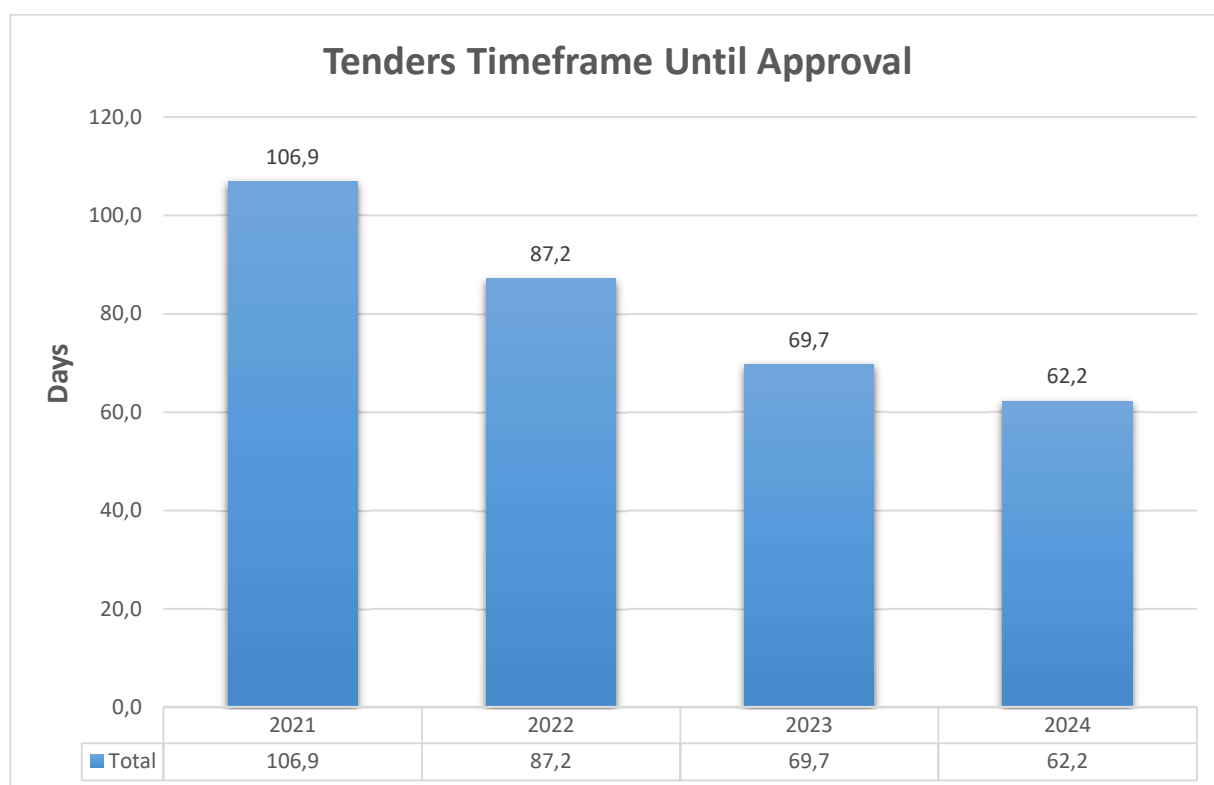


Chart 11: Average days of tenders timeframe until approval

The table above shows the variation in the time required for tender preparation up to its approval. A noticeable improvement is observed in open tenders and in the negotiation process without prior publication during 2023 and 2024. However, there is an increase in preparation time for international tenders between 2023 and 2024.

The overall performance of tender cases during the maturation phase is depicted in the chart below. It can be observed that during the pandemic years of 2020 and 2021, there was an increase in the maturation time of tenders.

4.2.2 Time from tender approval to publication.

The above time frame refers to the period from the approval of conducting the tender to its publication. During this time, the procurement departments are on standby for the budget commitment and the signing of the final documents for publication by the hierarchy, as well as the publication of the tender notice and announcement.

For tenders with a contractual period exceeding one year, multiannual commitment from the ministry is required, and this process takes at least 20 days.

The following chart shows the average waiting time for budget commitment and publication for the years 2021 to 2024.

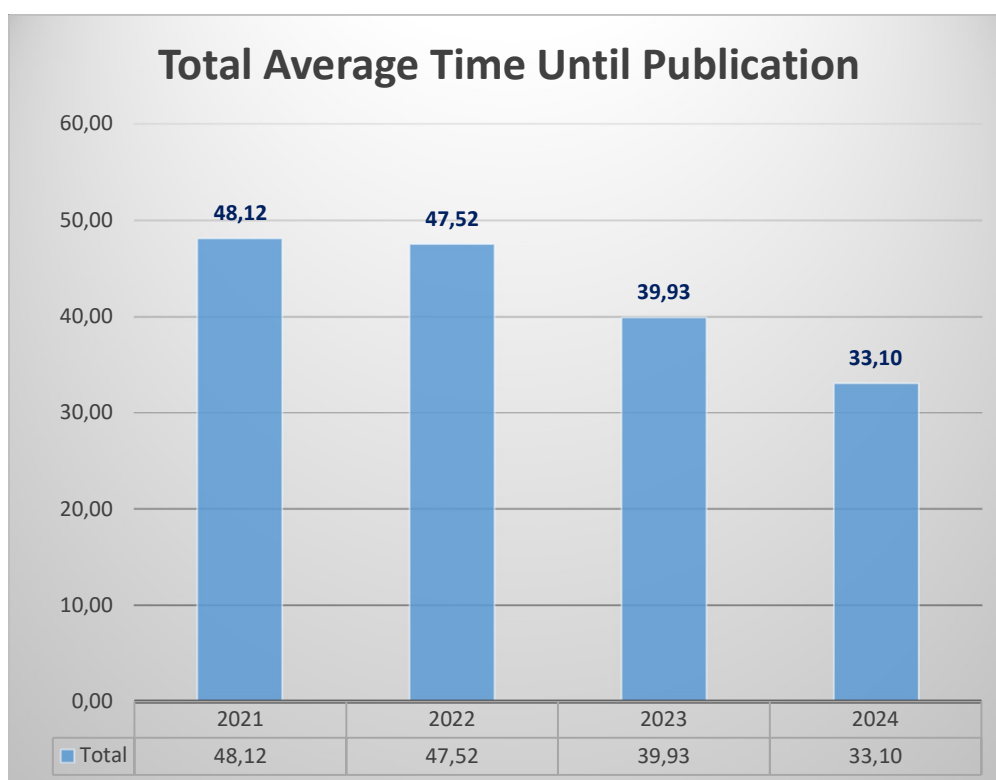


Chart 12: Average days of tenders timeframe until publication

The following chart illustrates the average waiting times for budget commitment and tender posting, focusing exclusively on open tenders above and below thresholds and tenders conducted through negotiation.

We observe an improvement in the time required year by year. However, in the negotiation procedure, the decrease in waiting time is significant. This notable difference is due to the invocation of Article 269 of Law 4412/16 (negotiation procedure), which also applies to cases of failed tenders following open procedures. Therefore, the time required for budget commitment in such cases is zero.

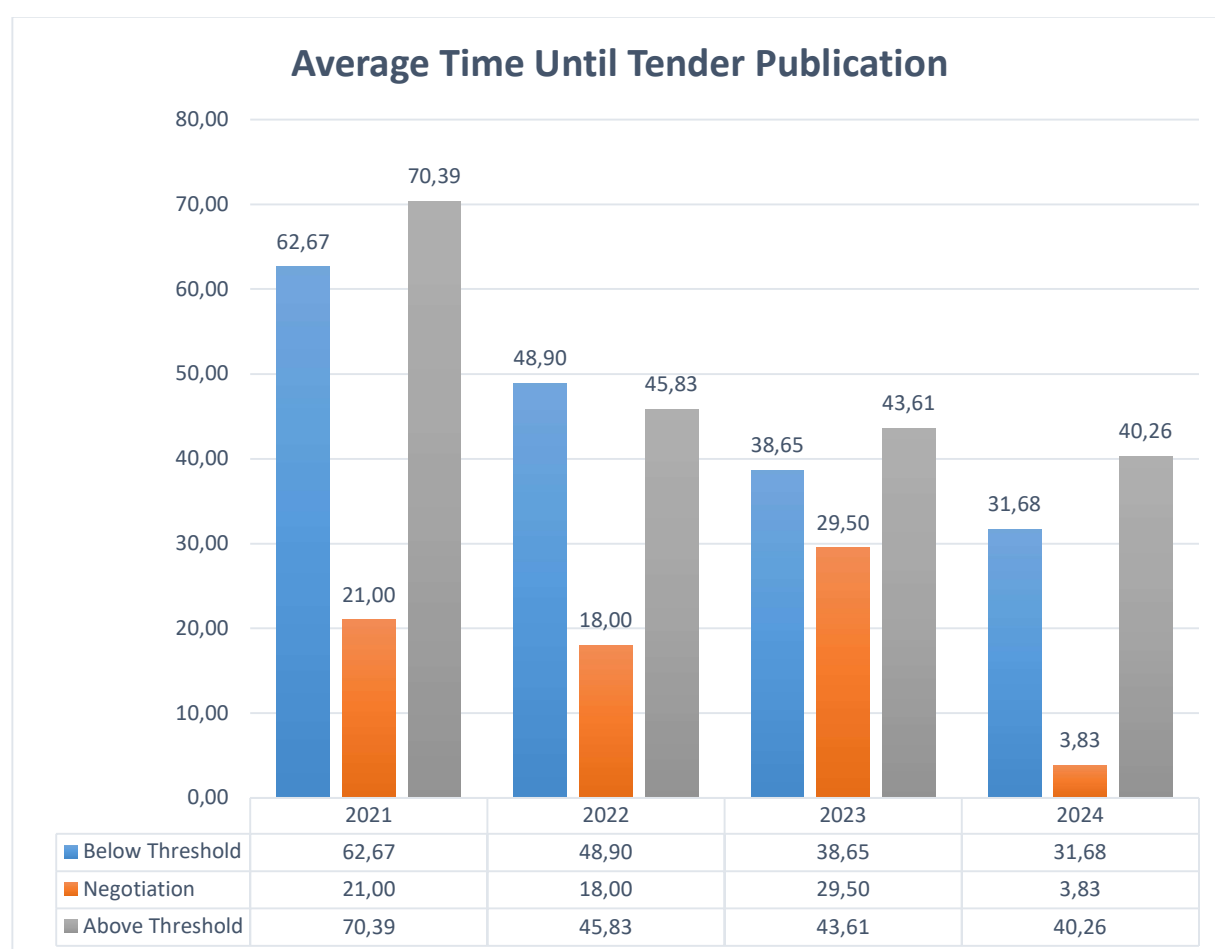


Chart 13: Average days by tender category until publication

4.2.3 Time from publication to bid opening.

This time frame begins from the date of the first publication until the opening of the tender. This period is critical for the tendering process, as it may involve appeals, questions from economic operators, clarifications from the tender committee to the economic operators, extensions, disqualifications of participants, and unsuccessful procedures.

At this point, it is important to highlight that open procedures below the thresholds have publication deadlines starting from 15 days and above, while international tenders (above the thresholds) require at least 35 days of publication. However, there are cases such as shortened timeframes due to emergencies, where below-threshold tenders must be posted for a minimum of 10 days, and above-threshold tenders for at least 15 days. For negotiation procedures, there are no fixed deadlines as they are used in special circumstances.

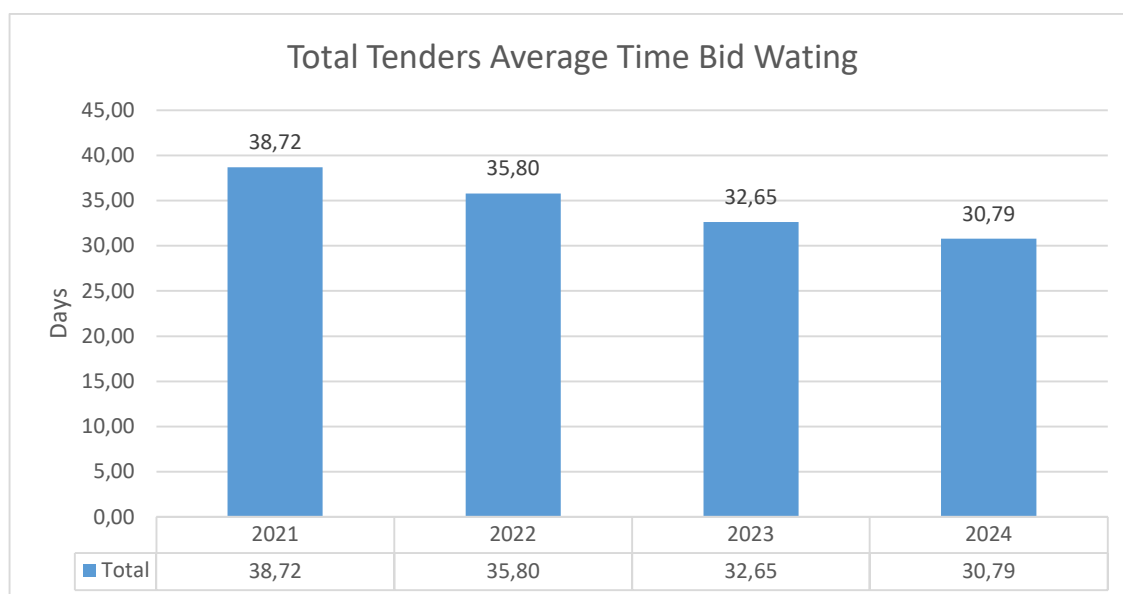


Chart 14: Average days of tenders timeframe waiting for bids

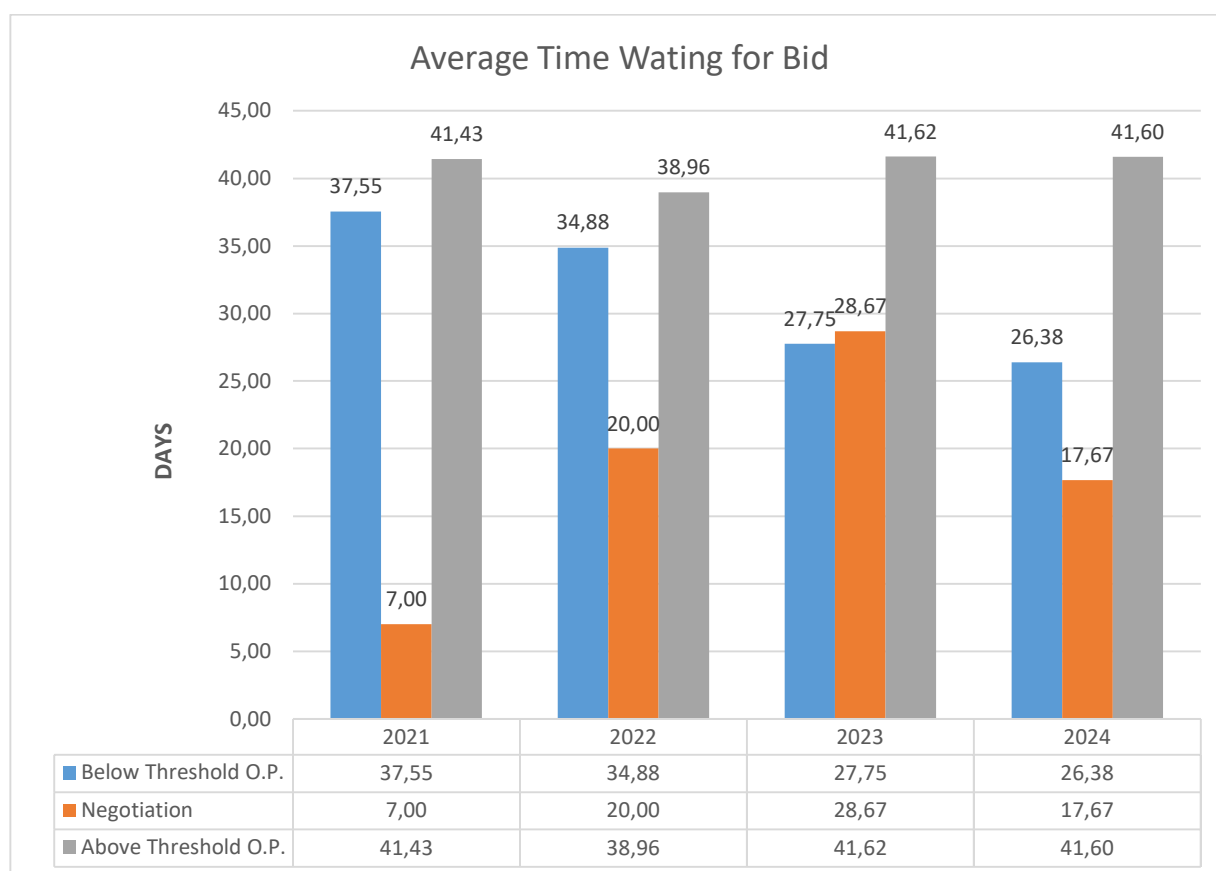


Chart 15: Average days of tenders timeframe waiting for bids, by tender category

From the above diagram, we observe a decrease in the average waiting times for bids in below-threshold tenders between 2021 and 2024. The negotiation procedure generally exhibits reduced waiting times for bids, except in 2023. In contrast, above-threshold tenders show significantly higher average waiting times, exceeding 41 days, with a slight exception in 2022.

Taking into account our reference regarding the mandatory publication periods for tenders, it is evident that both below-threshold and above-threshold tenders exceed the mandatory posting periods of 15 and 35 days, respectively. The high average bid waiting times are attributed to inquiries from economic operators and potential extensions of bid submission deadlines.

Below, we will examine diagrams of posted tenders. The first concerns open tenders below the thresholds, and the second relates to open tenders above the thresholds. We notice several cases with extensions during the bid submission period.

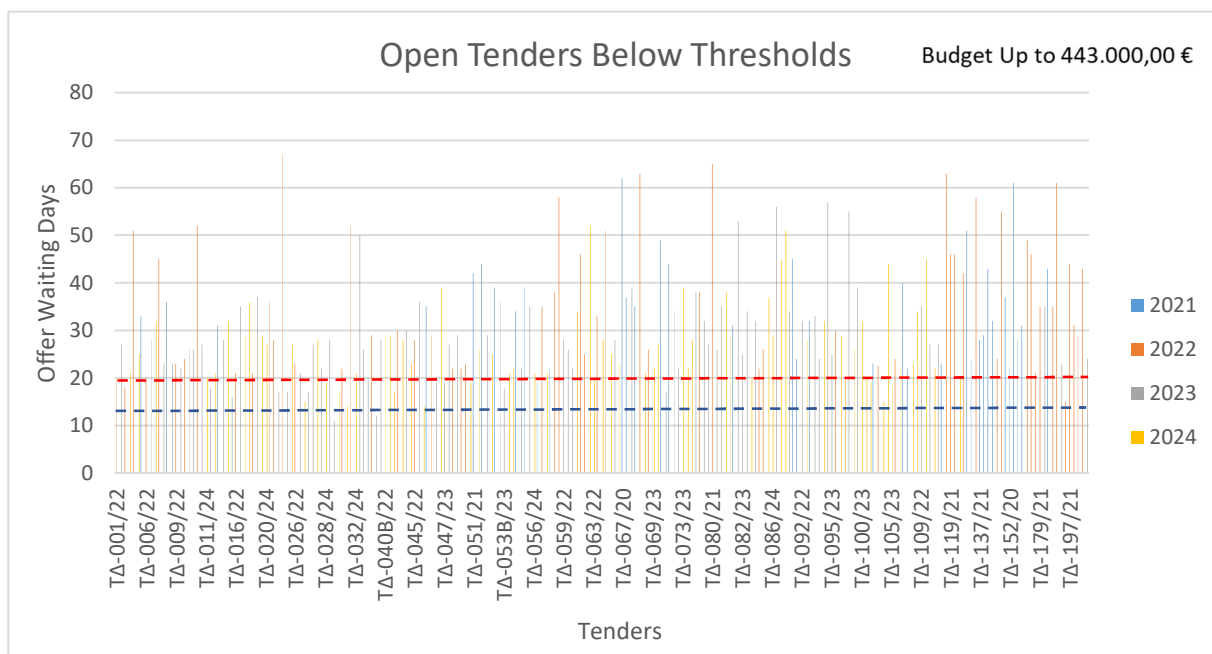


Chart 16: Open Tenders Below Thresholds - Competition deadline extension

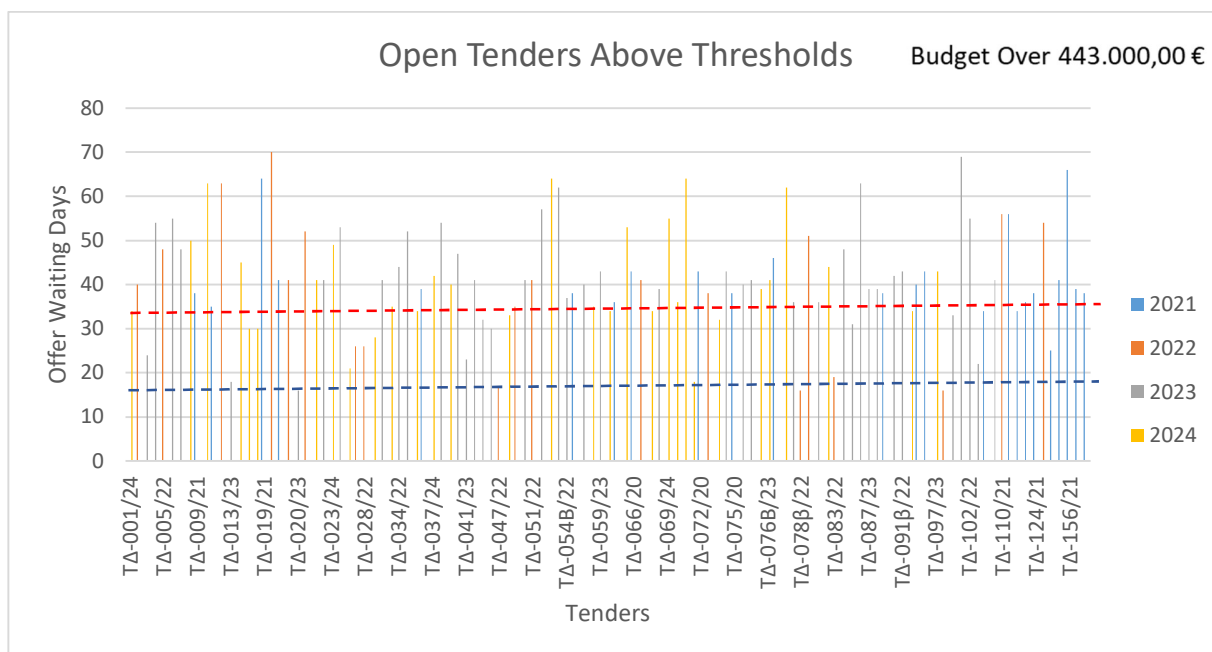


Chart 17: Open Tenders Above Thresholds - Competition deadline extension

Tender extensions typically arise from inquiries by economic operators and, less frequently, from internal decisions to correct or clarify parts of the tender notice.

Often, inquiries from economic operators aim to tactically delay the process, leveraging the bureaucracy within public enterprises regarding issuing clarifications and decisions. In tenders, conflicts of interest among economic operators are frequently observed, leading to delays in the tender process.

At this point, we underline the importance of properly preparing a tender. A tender that is well-prepared and clearly defines its requirements and technical specifications/descriptions minimizes the possibility for economic operators to pose critical questions.

4.2.4 Time from bid opening to the provisional contractor decision.

Another critical timeframe for investigation is the period between the opening of bids and the issuance of the decision for the provisional contractor. During this period, the tender committee reviews the participation documents, as well as the financial and technical offers of the economic operators.

This stage of the tender process is characterized by numerous peculiarities and complexities. For instance, the exclusion of an economic operator may occur, and such a decision must precede other decisions while adhering to the required deadlines for filing an appeal against it. At this stage, the committee may require clarifications on the financial and technical offers, which can also contribute to delays in the tendering process. Additionally, the committee may need the assistance of technical services to evaluate the technical offers before making its final recommendation for the provisional contractor.

Below is a summary chart showing the timeframe for evaluating financial offers and participation documents up until the approval of the provisional contractor's decision.

The evaluation of bids and the resulting decisions are critical, as an incorrect assessment during the review process could lead to appeals and significant delays in the tendering procedure.

Three diagrams follow:

- A cumulative chart illustrating the improvement in the timeframe for evaluating financial offers and participation documents.

- A second chart displays the improvement in average evaluation times for open tenders, both above and below the threshold.
- A third chart with the Average Days that Deciding Authority needs to approve the Tender procedure.

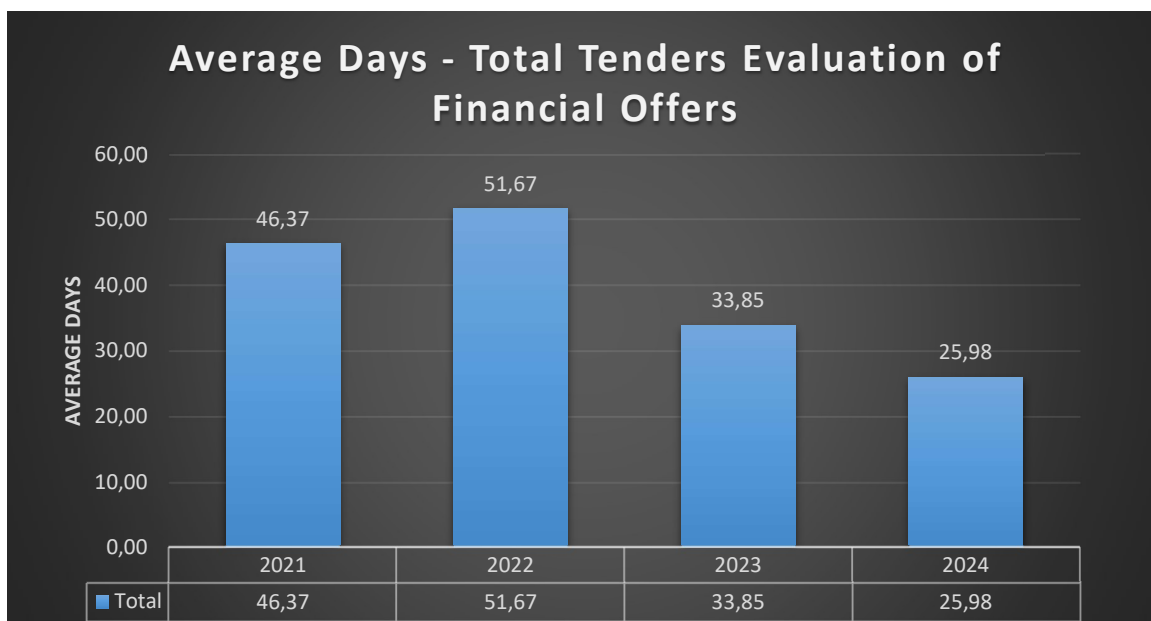


Chart 18: Average tenders duration days for financial offers evaluation

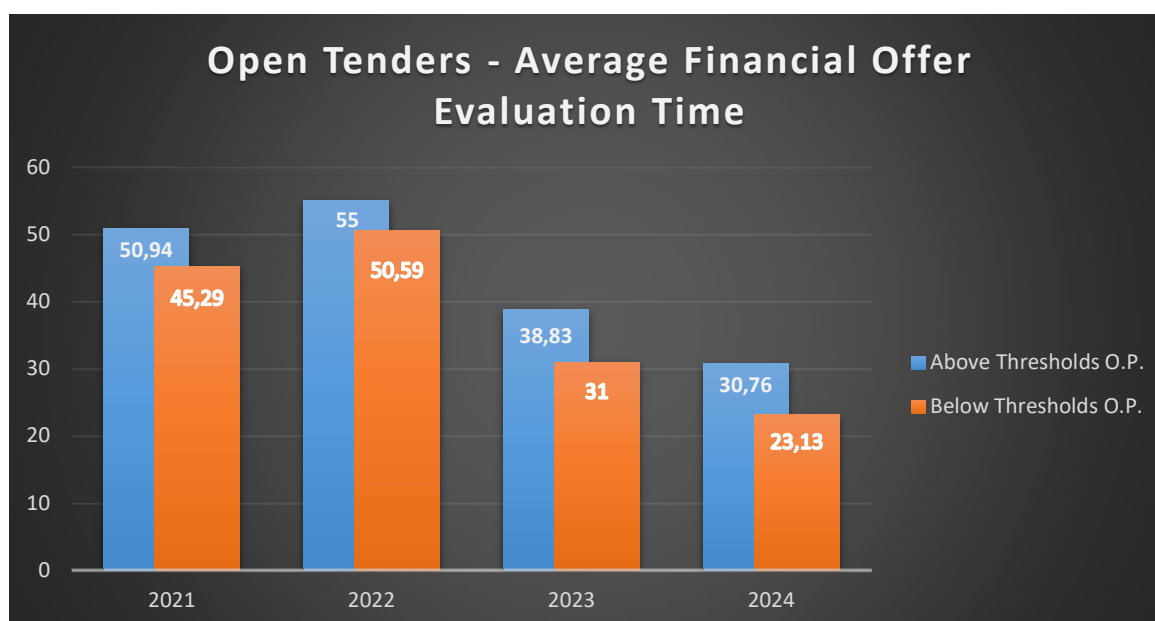


Chart 19: Average open tenders duration days for financial offers evaluation

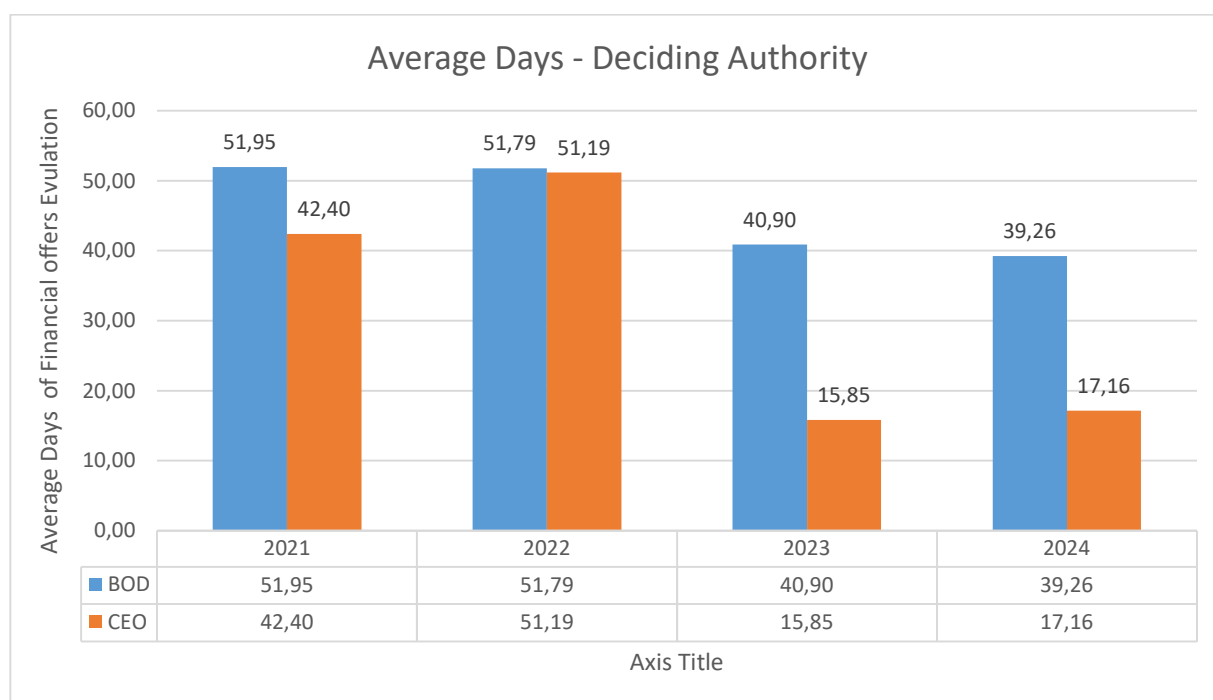


Chart 20: Average tenders duration approval of financial offers

4.2.5 Time from provisional contractor decision to tender award.

This period refers to the timeframe between the decision on the provisional contractor's report and the final award decision.

During this period, the tender committee awaits the submission of the award documentation by the provisional contractor within a 10-day deadline. Due to the complexity of issuing these documents by economic operators, there are often requests to extend the submission deadline. Once the documentation is received, the tender committee reviews its validity and compliance with the tender's terms. If no clarifications or additional documents are required, the committee prepares the award report.

However, if discrepancies with the tender terms are identified, the committee recommends the exclusion of the economic operator and, with a new decision by the contracting authority, calls upon the next bidder in line as the provisional contractor. In such cases, significant delays occur due to the wait for appeals and the need to restart the evaluation process for the provisional contractor.

Below is a diagram showing the decrease in the average time required for finalizing tender award approvals between 2021 and 2024.

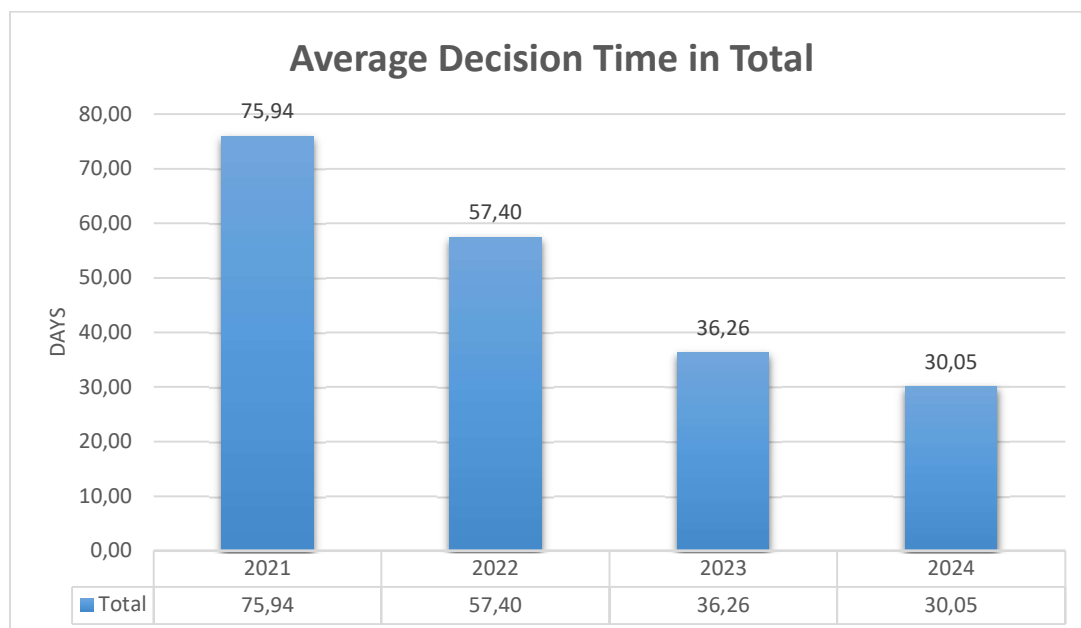


Chart 21: Average tenders decision time

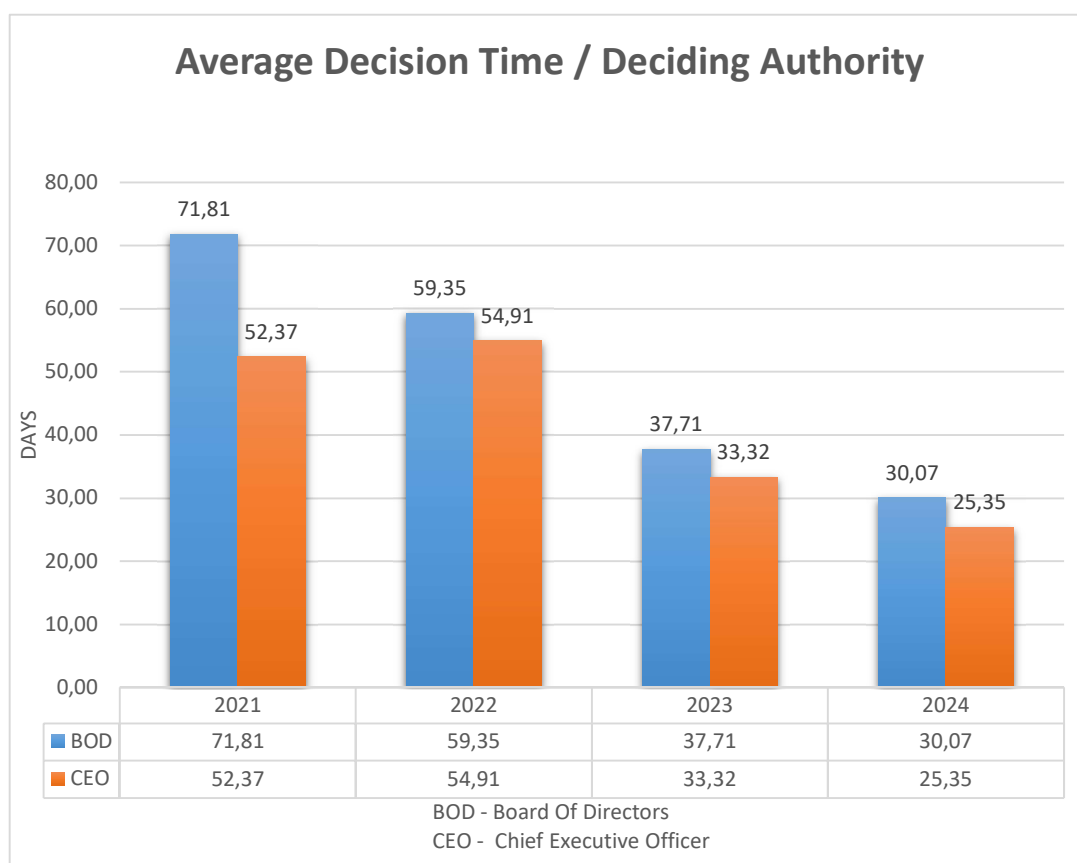


Chart 22: Average tenders decision time / Deciding Authority

4.2.6 Time from tender award to contract signing

The final but equally significant period for the completion of the tender process is the time between the award decision and the signing of the contract.

This period includes informing the economic operators participating in the procedure about the supporting documents submitted by the provisional contractor, the opening of all offers, and notifying the economic operators about the committee's minutes. During this time, the economic operators have the right to appeal against the award decision within 10 days of being informed about the outcome.

After the 10-day period has elapsed, the contracting authority invites the contractor to submit a performance guarantee and sign the contract within 15 days. The contracting authority, specifically the employees of the tender departments, verify the validity of the guarantees in communication with the issuing entities.

The procurement departments prepare and forward the contract text for signatures, and finally, the contract is validated through its publication in the KIMDIS system.

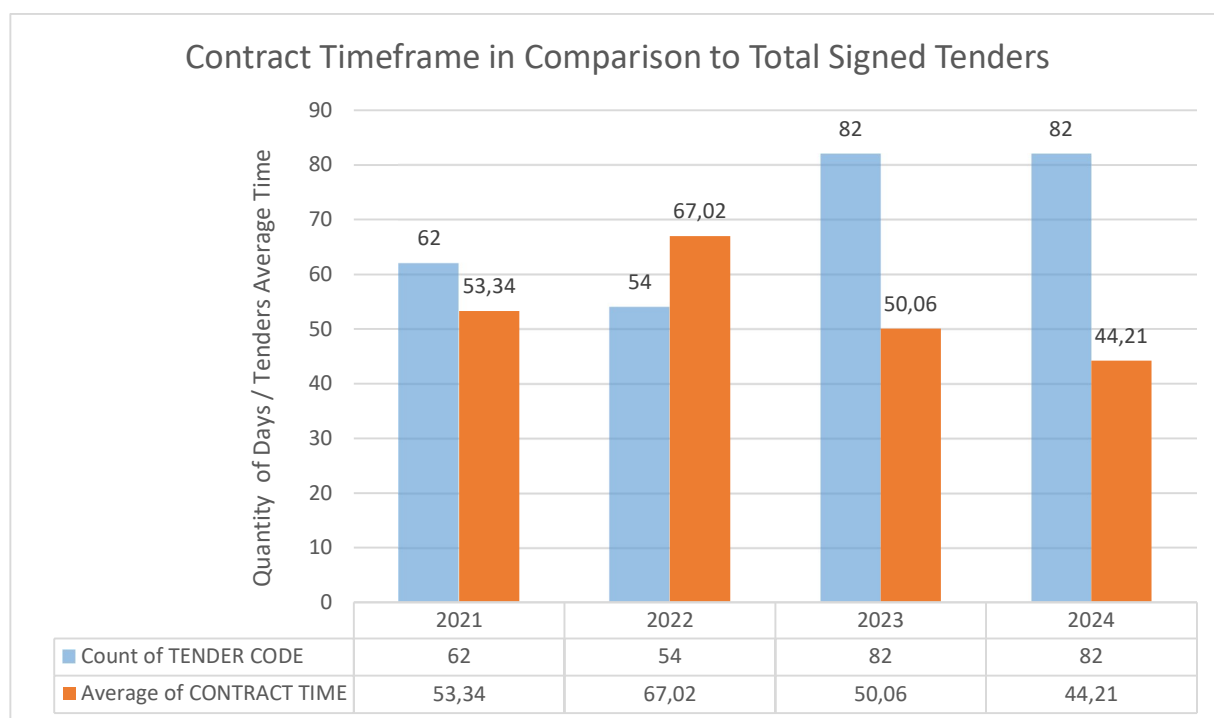


Chart 23: Average tenders timeframe for contract signing

Total Duration of the Tender Process

Taking into account 288 cases where extreme values were excluded from all stages of evaluation, and having the complete set of tender-related information, the following table and chart were created. These illustrate the time required for the completion of the cases during the years 2020 to 2024.

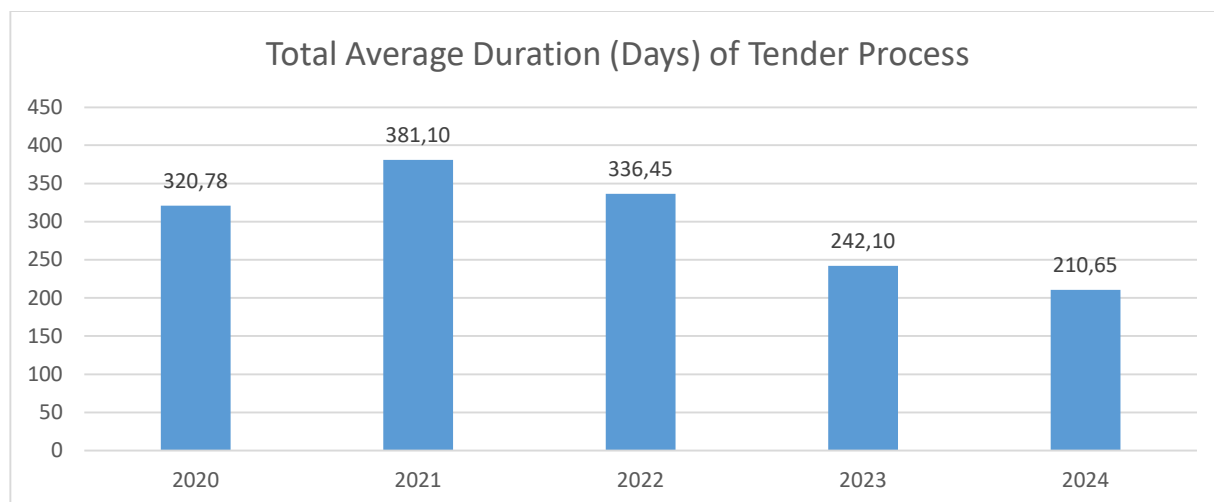


Chart 24: Average tenders total time

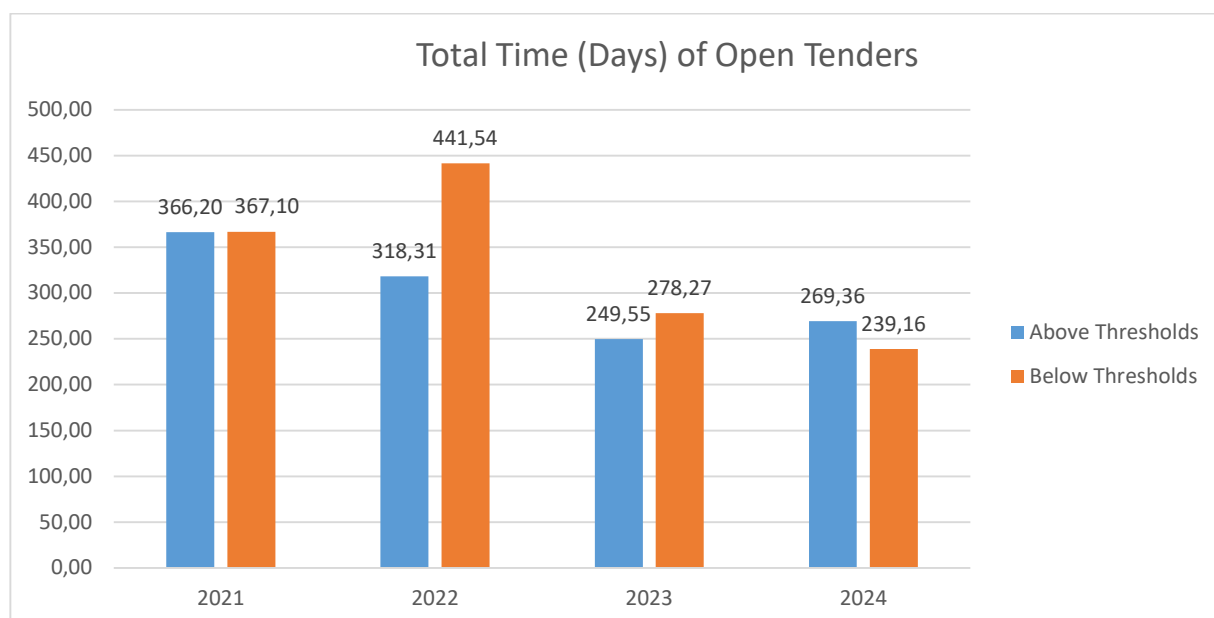


Chart 25: Average open tenders total time

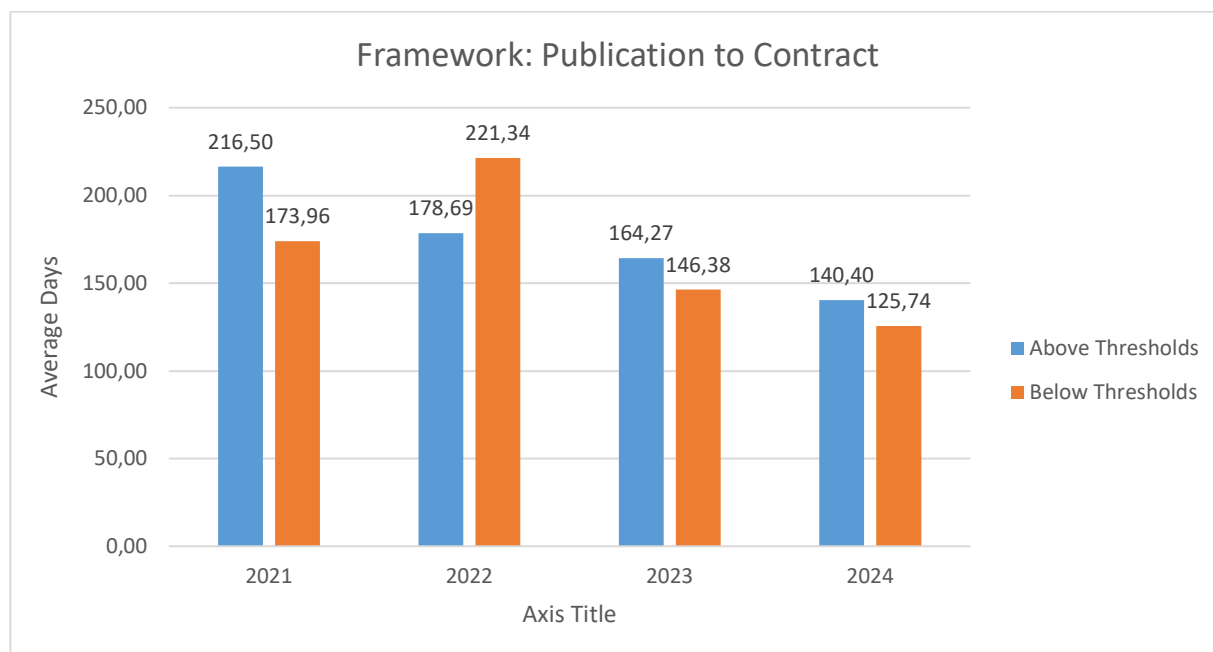


Chart 26: Average tenders duration – timeframe publication to contract

From the calculation of the descriptive statistics for the six steps - periods of the competitive process, the following average durations (in days) emerged. We proceeded to convert these averages into percentages, allowing us to observe the critical periods.

Tender Time Periods	Mean %
Request – Tender Approval	28.25%
Approval – Publication	13.70%
Publication – Opening of Bids	10.78%
Opening of Bids – Provisional Contractor	13.62%
Provisional Contractor – Final Award	15.61%
Final Award – Contract Signing	18.05%
Total	100%

Table 27: Tender critical time periods

The first period, representing the preparation and maturation of the competition, accounts for approximately 28% of the total process time. Additionally, the period involving the signing of the contract is also significant. However, if we consider the Provisional contractor and final award stages as one consolidated decision-making phase, this constitutes 29% of the overall process. These observations provide general insights. However, to implement the appropriate actions for optimizing the process, each case must be studied in greater detail.

We should not overlook the fact that the above statistical data was derived from analyzing competition data for the years 2020, 2021, 2022, 2023, and 2024. From the study of the six steps - periods of the process, as illustrated in the charts, there is a noticeable improvement in the duration of each phase year over year.

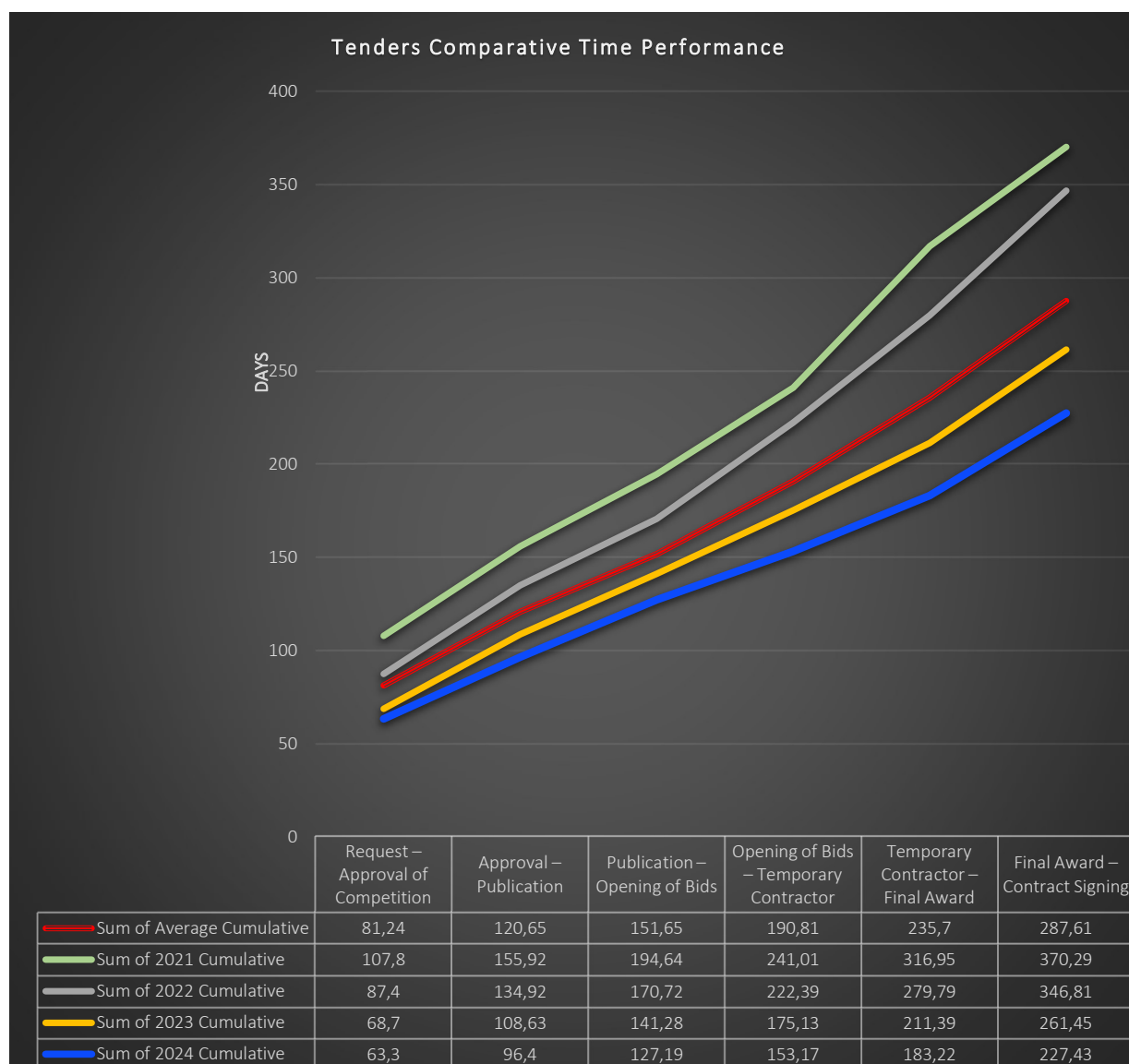


Chart 27: Tenders comparative duration performance

The above chart was created based on the average number of days per year for each of the six-time stages examined in the previous sections. The red curve represents the trend of the overall average across the years, the yellow and blue curves depict the improved years of the competitions, while

the gray and green curves correspond to the earlier years of our study. We observe a consistent improvement across all stages of the competition process.

4.2.7 Analysis of the Open Tender Process

From the analysis of the open tender process, we observed significant reductions in procurement times starting from the years 2021 and 2022. At this point, it is important to note the impact of the pandemic period. The effects of these challenges are evident in the poor performance of 2021. Beyond the disruptions in the supply chain that caused delays in deliveries across the market, suppliers faced difficulties in committing to availability and delivery times. Additionally, price increases, staffing shortages in public services for issuing necessary documents, and the absence of procurement staff from STASY for health-related reasons contributed to these delays.

The Procurement Directorate, in collaboration with the company's management, began monitoring the progress of tenders and intervened in internal procurement processes. The changes primarily targeted the decision-making stages, particularly the approval of committee minutes. Measurements of the committees' response times for drafting minutes revealed significant delays. To address this, a **bonus reward system** was introduced for committee members per session, provided that review times were not exceeded due to their responsibilities.

A second intervention involved the approval authority for the minutes. For this purpose, the **CEO** was authorized by the company's **Board of Directors (BOD)** to approve clarification and extension minutes during the period from publication to bid opening, as well as the minutes of the Provisional contractor, provided that only one financial offer was submitted in the tender. This authorization applies to tenders with a budget exceeding **€60,000.00**. As mentioned in paragraph 3.4 (*Approval Process for Purchase Requests*), these decisions were previously under the responsibility of the BOD.

These process interventions began to be implemented after **September 2022** and were fully applied in 2023 and 2024.

In the comparative chart above, we observe that the starting point of the curves for 2023 and 2024 almost overlaps but is significantly lower compared to 2022. This initial point corresponds to the tender maturation period. Starting from the **Publication** stage, there is a noticeable sharp change in the curves for 2023 and 2024, with the most significant change in the slope observed in 2024. This shift is attributed to the implementation of the interventions in tender committees and approvals.

The curve stabilizes and moves parallel during the **award and contract signing periods**, with clearly reduced times. This indicates that while interventions were made in the process concerning case monitoring, they were not drastic enough to significantly alter the slope of the performance curve during these periods. However, this is expected, as the **award and contract signing stages** are governed by specific deadlines set by **Law 4412/16**, which do not allow for substantial changes. The following table and chart present the construction of a baseline, using the year 2021 as the reference point. The baseline serves as a foundation for comparing the performance of subsequent years (2022, 2023, and 2024) across the six stages of the competition process.

The purpose of creating this baseline is to analyze trends in the competition timelines, identify areas of improvement, and evaluate the impact of interventions introduced over the years. By examining the deviations from the baseline, we can measure the efficiency of the process and pinpoint specific stages that require further optimization. This analysis aims to provide actionable insights to streamline the competition process and enhance its overall effectiveness.

Tenders Period Rate of Change				
Baseline 2021				
Tender Time Periods	Year 2021%	Year 2022%	Year 2023%	Year 2024%
Request – Approval of Tender	100,00%	81,08%	63,73%	58,72%
Approval – Publication	100,00%	98,75%	82,98%	68,79%
Publication – Opening of Bids	100,00%	92,46%	84,32%	79,52%
Opening of Bids – Provisional Contractor	100,00%	111,43%	73,00%	56,03%
Provisional Contractor – Final Award	100,00%	75,59%	47,75%	39,57%
Final Award – Contract Signing	100,00%	125,65%	93,85%	82,88%
Total	100,00%	93,66%	70,61%	61,42%

Table 28: Baseline design table

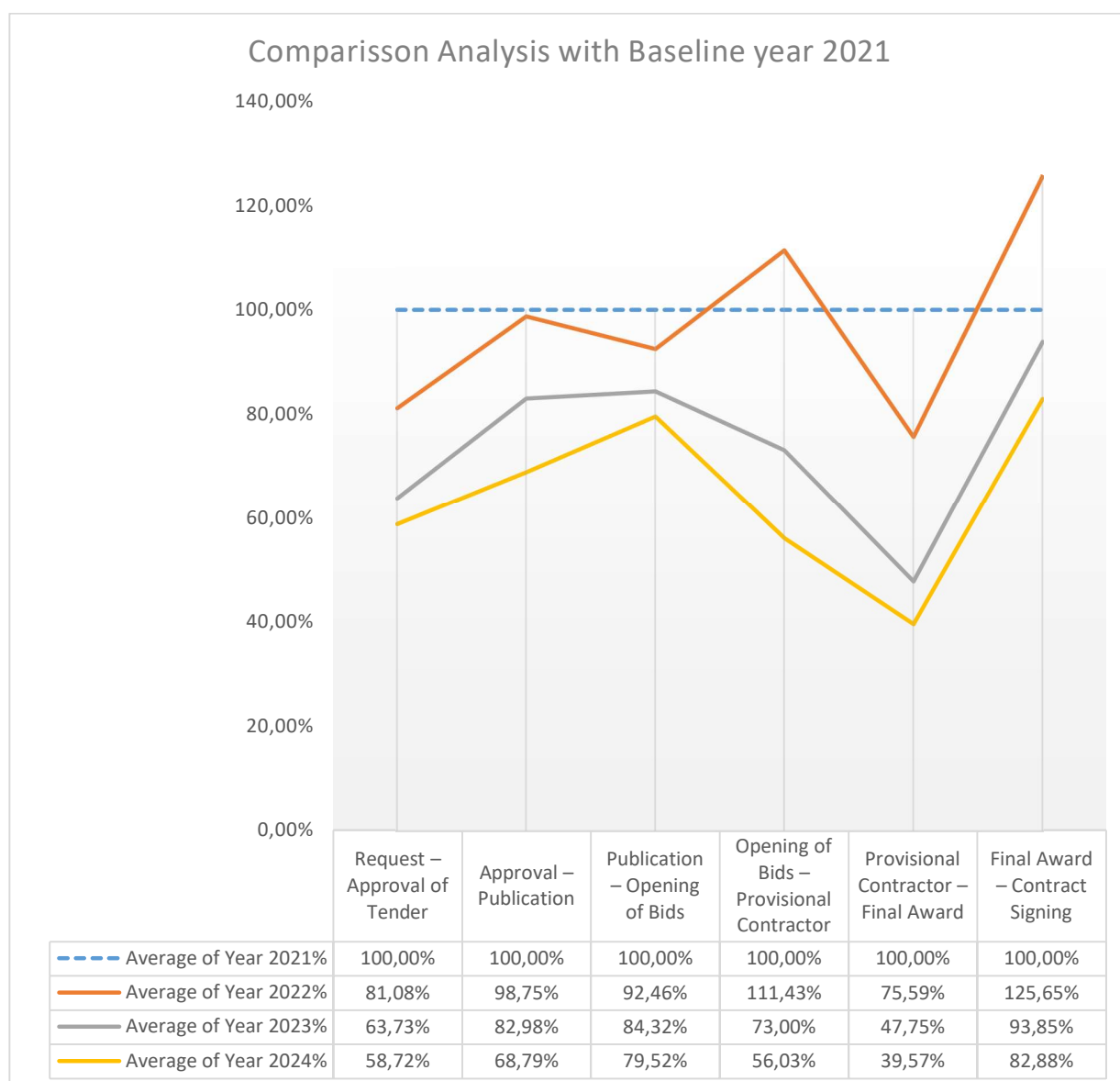


Chart 28: Performance monitoring baseline design (2021)

From the above results of tenders above €30,000.00 and observing the comparative diagram with the baseline year 2021, we observe that between the years 2022 and 2023, there is a significant deviation in the values across all six stages of our study, and the improvement in the performance time of the tendering processes is substantial. The decision to reward committee members had a huge impact on this improvement, as the vertical distances in the baseline diagram between the red (2022) and gray (2023) lines, at the points of the provisional award decision and the final award, are the largest observed.

There is also an improvement between the years 2023 and 2024, with the greatest improvement observed in the provisional award decision. At this point, the delegation of authority from the Board of Directors to the CEO played a positive role, as it allowed the CEO to issue the provisional award on behalf of the Board for tenders with a single bid. Further analysis (Key observations) of the comparison between the years and the periods of the tendering process follows.

Key Observations

1. Overall Trend

- There is a consistent reduction in time across all stages of the competition process, particularly in 2023 and 2024, compared to the baseline year of 2021.
- The sharpest reductions occur in earlier stages, such as "Request – Approval of Competition", with the process in 2024 completing in only 58.72% of the time taken in 2021.

2. Stage-by-Stage Analysis

Request – Approval of Tender:

- Shows the most significant improvements, with time reduced to **81.08%** in 2022, **63.73%** in 2023, and **58.72%** in 2024.
- This indicates successful interventions in the initial planning and approval stages.

Approval – Publication:

- Relatively stable reductions, from 98.75% in 2022 to 68.79% in 2024.
- The smaller decrease suggests a need for further optimization in this stage.

Publication – Opening of Bids:

- Gradual improvement, with percentages dropping from 92.46% in 2022 to 79.52% in 2024.
- Indicates moderate efficiency gains but room for further improvement.

Opening of Bids – Provisional Contractor:

- An anomaly is observed in 2022, where the time increases to 111.43% of 2021, possibly due to process inefficiencies or unexpected delays.
- Significant improvements follow in 2023 and 2024, reaching 72.99% and 56.03%, respectively.

Provisional Contractor – Final Award:

- A steady reduction is observed, with the process time dropping to 75.59%, 47.75%, and 39.57% in subsequent years.
- This stage demonstrates effective interventions leading to consistent improvements.

Final Award – Contract Signing:

- An increase to 125.67% in 2022 suggests a bottleneck in this stage.
- Improvements in 2023 and 2024, reducing times to 93.82% and 82.90%, highlight gradual process optimization.

3. Year-on-Year Comparisons

2022:

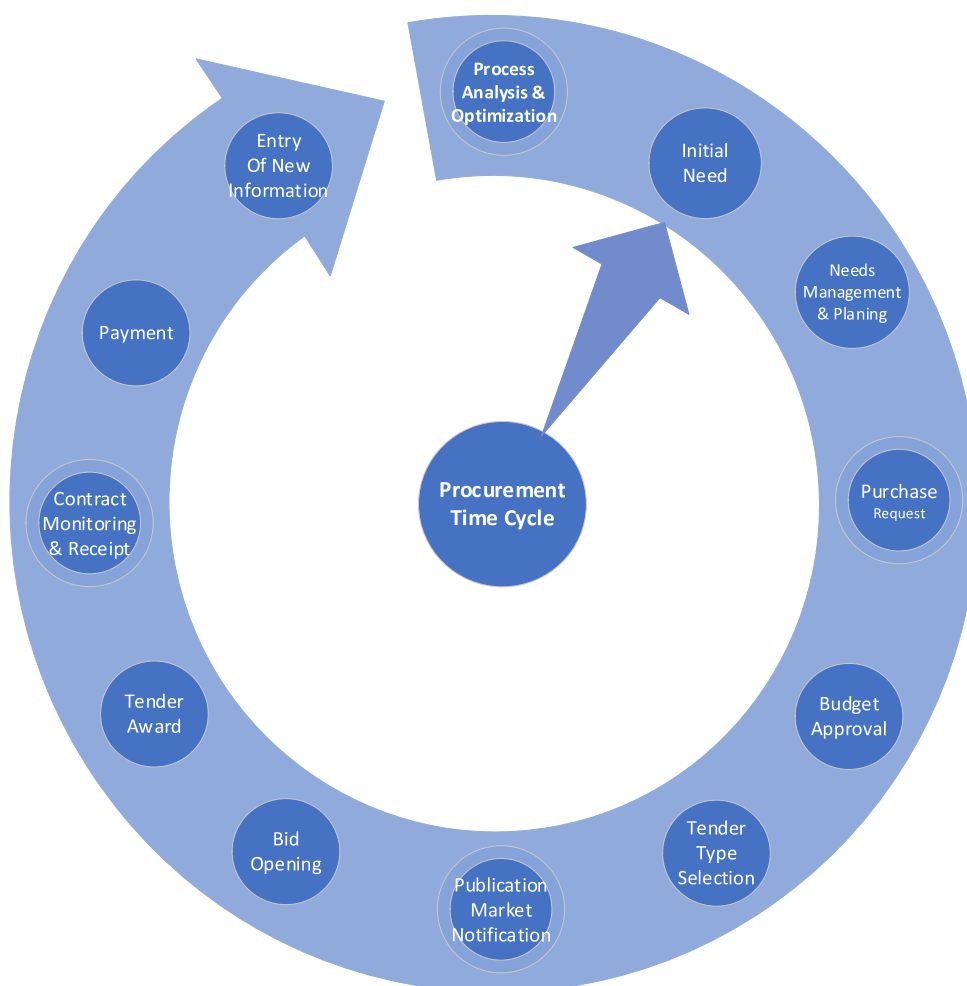
- Mixed performance, with improvements in some stages but increases in time for others, particularly "Opening of Bids – Provisional Contractor" and "Final Award – Contract Signing".
- Suggests a transitional year where interventions were still being implemented or refined.

2023 and 2024:

- Significant and consistent improvements are evident, especially in the decision-making stages.

- The parallel trends in these two years suggest process stabilization and the effectiveness of changes.

In conclusion, the competition process has shown significant improvements in terms of time reduction from 2021 to 2024. The early stages, such as the "Request – Approval of Competition," saw the greatest improvements, likely due to better planning and more efficient approval workflows. However, the later stages, particularly the "Final Award – Contract Signing," remain constrained by legal requirements, such as Law 4412/16, which limits the extent of time reductions. The year 2022 exhibited uneven performance, likely reflecting the transitional nature of this period, as new interventions and adjustments were being introduced to the process.



Plan 1: Procurement Time Cycle

The above “Procurement Time Cycle”, represented as a clock, illustrates the cyclical nature of procurement processes, where each phase, from identifying initial needs to final payment, can span days, months, or even years. This visual metaphor underscores the importance of monitoring and optimizing the movement between stages to reduce the total time required for tender completion. By leveraging additional information, thorough analysis, and improved management techniques, organizations can accelerate this cycle, enhancing efficiency while maintaining transparency and compliance. The ultimate goal is to streamline the process, ensuring that resources are allocated effectively and that procurement objectives align with organizational sustainability and operational goals.

4.2.7 The performance ranking of STASY between Greece and EU.

In the study of STASY’s tenders, we defined 6 observation categories for the tendering process. This is a method of monitoring and improving the issues that arise in the tender timelines. A similar methodology was followed by the European Court of Auditors in its report "Special Report 28/2003" titled "Public procurement in the EU – Less competition for contracts awarded for works, goods, and services in the 10 years up to 2021," for the grading/classification of public procurement episodes in European countries.

The Special Report 28/2023 from the European Court of Auditors focuses on public procurement within the EU, particularly assessing how procurement systems are managed and implemented, and whether they are effective, efficient, and aligned with sustainability goals. Key findings include substantial improvements in procurement processes due to digitalization, especially in reducing time delays and improving transparency. However, some legal barriers and procedural delays continue to limit the full potential for efficiency gains. The report emphasizes that while there have been gains in time management, further improvements are necessary, especially concerning contract awards and finalization stages.

Regarding Greece, the report notes that there are challenges in streamlining public procurement processes, particularly related to lengthy approval processes. It also highlights the need for better integration of digital tools to speed up the procurement cycle and reduce bureaucratic hurdles. Additionally, the report suggests the importance of adopting more European funding programs, such as NSRF, to improve infrastructure and reduce operational costs.

Key Findings	Details
Decreased competition in EU procurement	Competition in public procurement has decreased, with more single bids and direct awards.
Implementation issues with the 2014 procurement reform	Despite the 2014 reform aimed at simplifying processes, objectives like SME access and strategic procurement were not fully achieved.
Data gaps and lack of consistency in procurement data	Data on public procurement is incomplete, making it difficult to monitor and analyze the effectiveness of reforms.
Barriers to competition due to market concentration, restrictive procedures, and administrative capacity	Market concentration, restrictive procedures, and insufficient administrative capacity hinder competition.
Single bidding in Greece relatively low (3.1% in 2021)	Greece had a relatively low rate of single bidding compared to other EU member states.
Market concentration and administrative challenges in Greece	Greece faces challenges like market concentration and administrative barriers that restrict competition.

Table 29: European Court of Auditors Special Report 28/2023

In summary, the ECA's report reveals that while there have been reforms, competition in public procurement remains weak in several EU countries, including Greece, and the objectives of the 2014 directives have not been fully realized. The report stresses the need for more focused actions to improve the competitive nature of EU public procurement. The ECA calls for better data collection, improved monitoring tools, and more systemic efforts by the Commission and member states to address the root causes of declining competition in public procurement.

Below is a table with 3 key indicators for evaluating tenders from the EU. The competition index, which shows the percentage of single bids submitted in tenders, has an EU threshold of up to 20%, with Greece close to 50% and STASY at 40%. However, STASY has specificities in its procurement goods, as they involve spare parts for equipment from unique manufacturers or goods where monopolistic markets dominate.

An important indicator for the evolution of the tendering process is the decision-making index, which concerns the approval time for the financial offer and the award decision. Based on our calculations in the study, we concluded that the average decision-making time is 70.11 days for 2023 and 56.03 days for 2024, which is much shorter than the EU threshold of 120 days and Greece's 212 days. The scoring and ranking of STASY is also depicted in the diagram below. Finally, there is the direct award index, under Article 269 of Law 4412/16, where STASY and Greece are below the EU threshold of 5%.

EU tenders Indicators	EU Limits	Greece	STASY 2023
Single Bidding	≤20%	49%	40,6
Decision Speed	120 Days	212	70,11
Direct Awards	5%	1%	<5%

Table 30: Comparison of critical procurement indicators

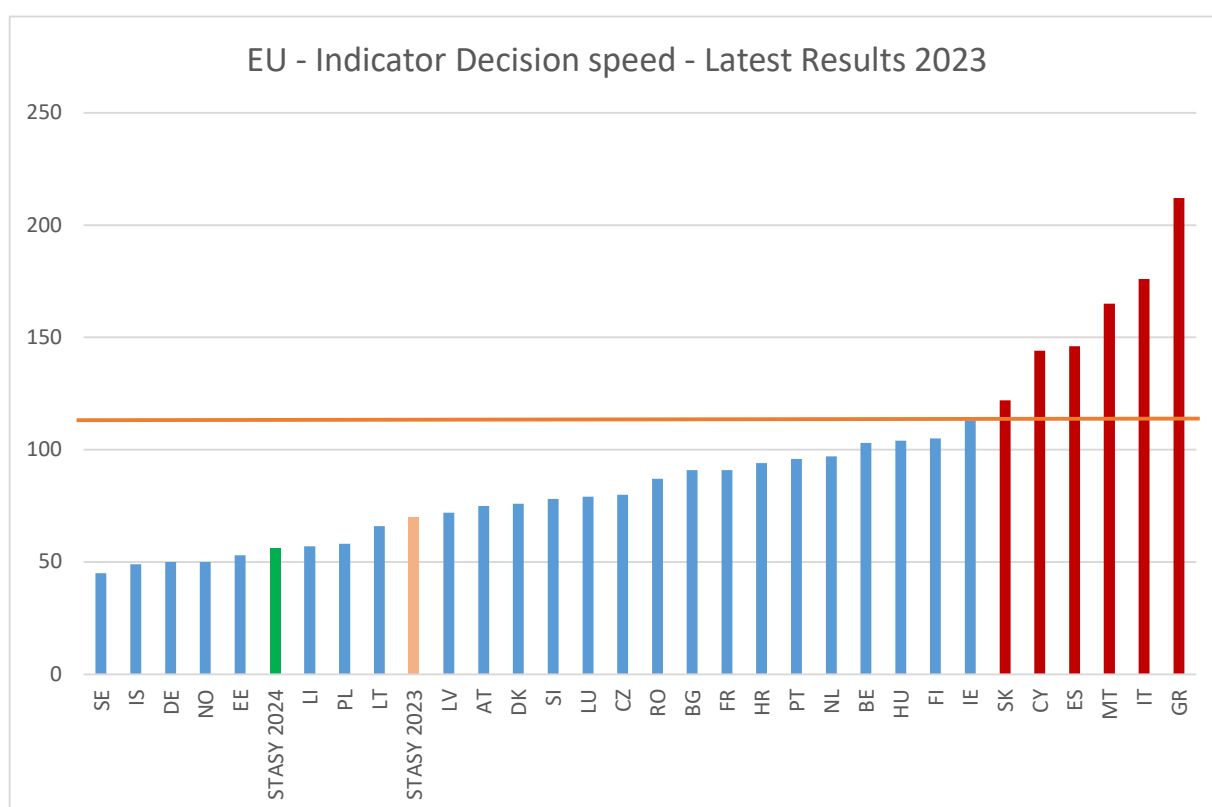


Chart 29: Comparison of decision time in the European Union (EU), Greece (GR), and STASY

5 Conclusions

This study highlights the critical role of technology in improving public procurement processes at STASY (City Railways of Athens), with a particular focus on monitoring tender cases to increase efficiency and sustainability. It was observed that the adoption of digital tools and expertise allows STASY to accelerate processes, enhance decision-making, and reduce bureaucracy. The tender data used in the case study was drawn from the IT system developed by the IT department, primarily focusing on cases up to €30,000, as well as data from tenders stored in databases maintained by the Procurement Department in spreadsheets.

The study aimed to examine how sustainability can be achieved in STASY's public procurement and the role of technology and risk management in fostering sustainable procurement practices. The integration of electronic systems for monitoring and managing procurement has been shown to significantly enhance operational efficiency, transparency, and accountability. Before the implementation of digital tools, monitoring the status of tenders and procurement requests was burdensome due to the volume and frequency of requests. However, with the introduction of an electronic routing system in 2023 and adapting it into a procurement tracking tool, procurement managers were able to streamline the process, making it much easier to track and efficiently complete procurement requests.

Additionally, monitoring the time of the tendering process has proven to be beneficial in presenting key performance data to the hierarchy, which aids in improving internal processes. Tracking uncompetitive tenders, tenders with only a single bid, and ensuring that the best value-for-money criterion is considered, further strengthens the decision-making process. Moreover, limiting the use of negotiation procedures to exceptional cases plays an important role in mitigating risks and ensuring sound decision-making.

The study also addresses the organizational structure of STASY, which is characterized by specialization, hierarchy, and a focus on operational reliability. However, the strict hierarchy can limit flexibility and innovation, especially in areas such as intelligent transport systems and environmental sustainability. The integration of more decentralized decision-making and cross-

functional teams could enhance flexibility and creativity, allowing STASY to better adapt to developments in the transportation sector.

The procurement process at STASY ensures sustainability through the continuous monitoring of tender cases and the submission of proposals for improving procedures. As demonstrated in the text and contract terms with suppliers, economic sustainability is secured by reducing tendering times, which leads to reduced labor hours and the release of surplus budget for other uses. Social sustainability is achieved through the terms of the tender, requiring collaboration with reliable suppliers who do not have debts to employees and ensuring that there is no child labor. Additionally, by reducing procurement times, STASY improves the quality of services provided. The timely completion of procurement tendering processes ensures a more immediate and effective impact on the experience of STASY network users. Furthermore, the invitations for tenders up to €30,000 offer an opportunity for collaboration with smaller and newer businesses, contributing to the labor market.

Environmental sustainability is realized through the contracts, with terms that require certified suppliers. New projects that have been contracted will contribute to green development, reducing the significant energy costs of the company's facilities. Moreover, with the introduction of digital monitoring and execution of tenders, paper-based documentation has been eliminated, minimizing paper usage and supporting sustainability.

The procurement process has significantly improved in terms of time reduction from 2021 to 2024. The early stages, such as "Request – Approval of Competition", showed the greatest gains, mainly due to better planning and approval workflows. Average approval times improved by 29.31%, speeding up procurement processes overall. The entire procurement process saw a time reduction of approximately 15%, highlighting the impact of digital interventions. Approval stages account for almost 50% of the total time required to complete a tender, marking it as an area that could benefit from further optimization through technology.

However, later stages, particularly "Final Award – Contract Signing", are still constrained by legal requirements, such as those imposed by Law 4412/16, limiting the extent of time reductions. The

year 2022 exhibited uneven performance, likely due to transitional changes as new interventions were introduced.

The role of technology in this process has been invaluable. Data analytics and real-time performance monitoring tools have provided valuable insights into procurement activities, enhancing decision-making and resource allocation. Digital tools also promote fair competition and market access, aligning with EU regulations and supporting sustainable procurement goals.

The following table outlines key improvement proposals aimed at enhancing STASY's procurement process. These proposals cover various stages of the procurement lifecycle, from identifying bottlenecks to integrating technology and improving staff performance. By addressing these areas, STASY can increase efficiency, ensure accountability, and promote sustainability within its procurement framework.

Proposals for Improvement

<i>Proposal</i>	<i>Description</i>
1. Address Remaining Bottlenecks	<ul style="list-style-type: none"> - Analyze stages like "Request – Approval", "Approval – Publication" and "Publication – Opening of Bids" to identify specific causes of delays and apply targeted solutions. - A potential solution includes optimizing procurement planning so that purchase requests are well-prepared and grouped, reducing the number of procurement processes and allowing procurement staff to focus on fewer cases. - Accelerate the budget commitment process for contracts longer than one year and digitize the approval process to provide real-time tracking of request progress. - Digitize tender documents with more attention to details such as technical descriptions, specifications, and requirements.
2. Leverage Technology	<ul style="list-style-type: none"> - Implement digital tools for real-time monitoring of committee decisions to improve accountability and reduce delays. - Use workflow automation to standardize processes across all stages, minimizing manual tasks and improving efficiency. - Expand the use of data analytics tools for real-time performance tracking and predictive analysis to forecast potential delays and identify bottlenecks early. - Develop a central digital platform that integrates all stages of procurement, for both small and large tenders, from initial request to contract signing, ensuring smooth information flow and reducing human errors.

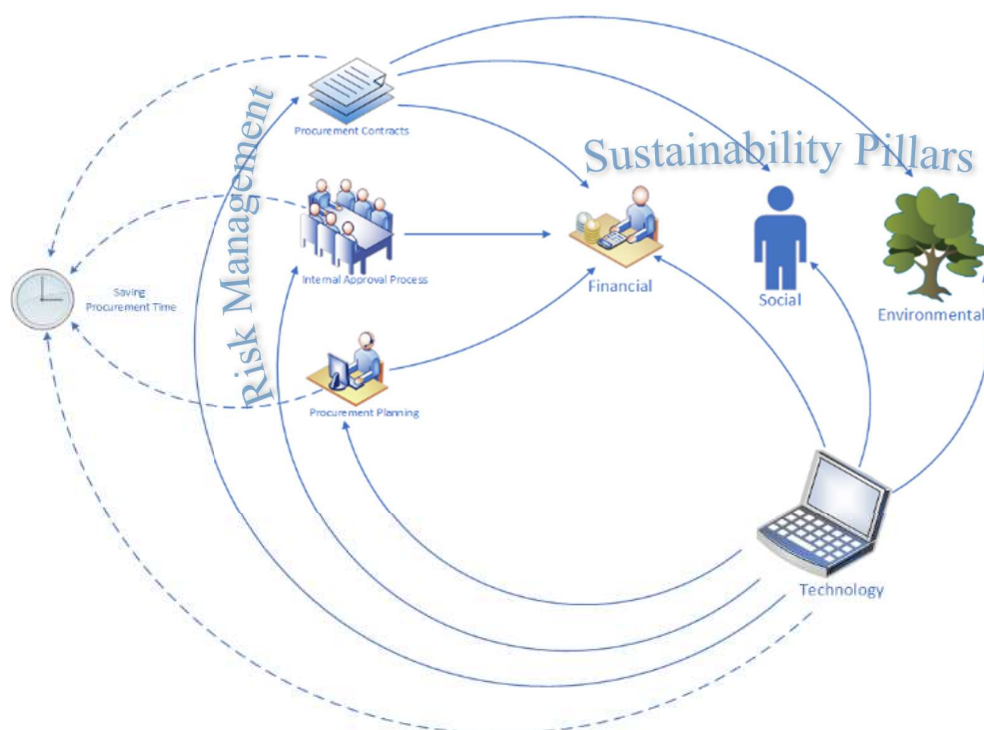
	<ul style="list-style-type: none"> - Strengthen the resources of the IT department to complete the internal IT system for procurement cases.
3. Enhance Staff Incentives	<ul style="list-style-type: none"> - Expand the bonus reward system by setting performance goals for procurement departments, ensuring that response times meet established benchmarks and using a baseline for evaluation.
4. Training and Capacity Building	<ul style="list-style-type: none"> - Improve training programs for procurement staff, focusing on digital tools, risk management, and sustainability. - Promote continuous professional development so that procurement staff remain updated on industry best practices, digital innovations, and sustainability trends. - Provide training for committee members and procurement staff to familiarize them with optimized workflows.
5. Continuous Monitoring and Feedback	<ul style="list-style-type: none"> - Create a system for continuous performance monitoring, with regular feedback loops to ensure the long-term effectiveness of improvements. - Develop and implement strong performance indicators (KPIs) to measure procurement efficiency, including processing times, cost savings, and supplier performance. - Establish regular feedback loops with suppliers, internal stakeholders, and users to improve and optimize procurement processes.
6. Collaboration with Stakeholders	<ul style="list-style-type: none"> - Collaborate with suppliers, committees, and public bodies to identify shared challenges and develop collaborative solutions, particularly for complex procurement processes.
7. Focus on Sustainable Procurement	<ul style="list-style-type: none"> - Integrate environmental and social criteria into procurement decisions, prioritizing suppliers with sustainable practices and ethical sourcing. - Develop a sustainability strategy for public procurement, aligning it with national and EU environmental goals.
8. Streamline Approval Processes	<ul style="list-style-type: none"> - Simplify approval processes, which account for a significant portion of procurement time. - Implement automated workflows and reduce unnecessary hierarchical steps to speed up approval times. - Introduce a fast-track approval system for urgent procurement cases to avoid delays.
9. Collaboration with SMEs	<ul style="list-style-type: none"> - Strengthen collaboration with SMEs by simplifying their participation in public tenders, expanding the supplier base, and encouraging innovation. - Use digital tools to reduce the administrative burden on SMEs, ensuring fair competition and creating opportunities for smaller suppliers.
10. Strengthen the Role of Senior Management	<ul style="list-style-type: none"> - Grant authorities for letters to suppliers at the Directorate level. - Letters regarding the notification of financial entities for posted decisions should be forwarded with the signature of the head or director.

11. Procurement Request Scheduling

- Approved tender documents and calls should not require a new approval cycle due to updates related to budget commitment and tender dates.
- Letters for the review of guarantees should be forwarded at the department or directorate level.
- Empower the Procurement Directorate to handle emergency low-value procurements with CEO request approval first.
- Empower the Procurement Directorate or General Directorate for direct assignments when the purchase request has been approved by the CEO.
- Gather and group purchase requests from the responsible services, as requests for the same groups of goods are often made by different departments and at irregular intervals.

Table 31: Proposals for Improvement

By focusing on addressing bottlenecks, utilizing technology for real-time monitoring, and implementing a collaborative approach with stakeholders, STASY can streamline its procurement processes and achieve significant improvements. This will not only lead to more efficient and cost-effective procurement but also strengthen the organization's overall sustainability goals, making it a more competitive and responsible entity in the public sector.



Plan 2: Sustainability in Public Procurement

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Definitions

- **CEO (Chief Executive Officer)** – The highest-ranking executive responsible for overall management and strategic direction in a company or organization.
- **BOD (Board of Directors)** – A group of individuals who oversee and guide the strategy and key decisions of a company or organization.
- **PD (Project Director)** – The person responsible for managing a specific project, ensuring its execution within budget, timeline, and quality standards.
- **GD (General Director)** – A senior executive managing an entire organization, department, or division, often reporting to the CEO.
- **ESIDIS (National System of Electronic Public Procurement - Greece)** – Greece's central electronic system for conducting public tenders and contracts, ensuring transparency and competition.
- **KIMDIS (Central Electronic Register of Public Contracts - Greece)** – A platform for recording and publishing all public contracts in Greece to ensure transparency in government procurement.
- **DIAVGEIA (Transparency Program - Greece)** – A government platform where all administrative decisions are published to ensure accountability and transparency.
- **TED (Tenders Electronic Daily - EU)** – The official EU public procurement journal where all tenders from member states are published.
- **Court of Audit (Greece)** – The highest financial court in Greece, responsible for auditing state expenditures, public contracts, and financial management.
- **Invitation for Bids (IFB)** – A formal request inviting suppliers to submit competitive bids for a contract, including specifications, terms, and evaluation criteria.
- **Offer Assignment** – The process of awarding a contract to a selected bidder based on their submitted offer.
- **Contract** – A legally binding agreement between two or more parties outlining obligations, rights, and terms.
- **Bid** – A formal offer to provide goods or services at a specified price, commonly used in procurement, tenders, and auctions.
- **HSPPA** – Hellenic Single Public Procurement Authority is the independent regulatory body responsible for overseeing and ensuring transparency, efficiency, and compliance in public procurement processes in Greece.
- **Declaration Document** – the official document issued by the Contracting Authority, defining the project scope, procurement procedure, award and selection criteria, budget, and execution terms.
- **NSRF – National Strategic Reference Framework** is Greece's main strategic tool for funding and implementing development projects through the European Union's Structural and Investment Funds.
- **SPP** – Sustainable public procurement
- **SME** – Small Medium Enterprises (local economy support)
- **GDP** – Gross Domestic Product

This comes from my work experience...

“Technology has placed powerful tools in our hands, influencing every aspect of our lives and work. However, its adoption in public procurement often faces resistance, leaving its true potential untapped. One of the key challenges in public organizations is bureaucracy, which, combined with strict public procurement laws, often leads to delays, inefficiencies, and rigid procedures.

This study highlights the crucial role of technology in overcoming these challenges and achieving sustainability goals. By enabling real-time updates on the progress of procurement procedures, technology improves monitoring, streamlines planning, facilitates performance measurement, supports informed decision-making, and accelerates approval processes.

However, technology alone is not enough. Alongside digital transformation, public sector administrations must place greater trust in the human factor, empowering professionals to exercise judgment, take initiative, and adapt to evolving needs.

Only by embracing both technology and human expertise can we navigate the complex maze of public procurement, overcoming legal and procedural obstacles, and transforming routine into efficiency, hesitation into innovation, and ambition into lasting success. Because it is not the tools that define us, but how we choose to use them.”

Declaration by the Author

“As the author of this dissertation, which presents a case study on the procurement processes of STASY, I hereby declare according to the article 8 of Law 1559/1986, this dissertation is solely the product of my personal work and also that my references are based on the company's officially published organizational structures, as defined by Law ΦΕΚ 85/τ.ΠΡΑ.Δ.Ι.Τ./15.06.2021, along with statistical data derived from decisions and published tenders.

Additionally, references have been made to the approval workflow processes within the Procurement Department and the company's procurement regulations. The data used in this case study aim to analyze STASY's procurement practices and optimize the process through the implementation of recommendations to achieve sustainability goals. The use of these data has been conducted with the consent of STASY's Chief Executive Officer, ensuring the proper and responsible handling of the company's information”.