

Progress on the preparation phase of a digital euro

Second progress report

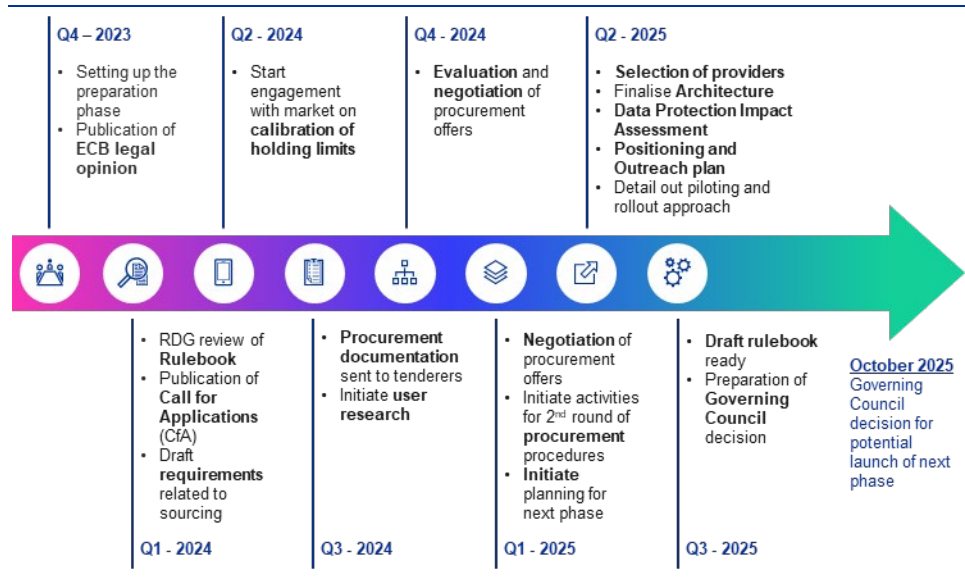
1 Executive summary

The Eurosystem's digital euro project aims to make central bank money available to the public in digital form. As e-commerce evolves and people increasingly prefer to make payments using electronic means, a digital euro would bring the valued features of banknotes into the digital sphere. The aim of a digital euro is to bring value to consumers, merchants and intermediaries, while reducing Europe's dependence on international card schemes and non-European digital payment wallet providers. A digital euro would complement cash by providing a digital payment option for consumers that is free, safe and easy to use. It would facilitate electronic payments everywhere in the euro area and increase competitiveness in the payments market for merchants. Payment service providers (PSPs) would be able to use the digital euro infrastructure to create new payment services, which would in turn increase innovation and competition in the European payments sector. A digital euro would also help regional and domestic European schemes to scale up the provision of their payment services in commercial bank money to a European scale by using the digital euro acceptance network. It would also expand the offer of private and public means of payment at the European level, thus supporting monetary sovereignty and strategic autonomy.

On 1 November 2023 a two-year preparation phase was launched, which is currently laying the groundwork for the potential issuance of a digital euro.

The primary objectives during this phase include providing a draft digital euro scheme rulebook, selecting potential providers for the digital euro platform and infrastructure and conducting further experimentation and stakeholder consultations to ensure a digital euro would meet the highest standards of quality, security, privacy and usability. By the end of 2025 the Governing Council will decide whether to move on to the next phase of preparations. The decision on whether to issue a digital euro will only be taken by the Governing Council once the European Union's legislative framework has been adopted.

Figure 1
Timeline of the digital euro project



This report outlines the progress of the digital euro project over the six-month period from May to October 2024¹.

In the first quarter of 2024 the digital euro scheme’s Rulebook Development Group (RDG)² concluded a review of the first draft of the rulebook (version 0.8), having received and carefully assessed around 2,500 comments. Seven new RDG workstreams, composed of market participants and central banks, were launched in May 2024. These are focusing on key areas of the rulebook, including minimum user experience standards, risk management and implementation specifications. The next draft of the rulebook is expected to be finalised during the digital euro preparation phase and will include comments from the RDG interim review. The rulebook is essential to ensure that digital euro payments are accepted throughout the euro area, just like cash payments, and will work in a harmonised manner. The draft digital euro rulebook will be sufficiently flexible to accommodate any future adjustments and will be updated in accordance with the outcome of the digital euro legislative process.

The project team has made progress on the sourcing procedures for selecting potential providers for a digital euro service platform (DESP). An invitation to tender for external components was published and offers are currently being assessed. In addition, Eurosystem national central banks have been invited to submit offers for internal components.

Building on work carried out in the investigation phase, further experimentation and user research activities have now started, with the aim of

¹ All previous progress reports on the digital euro can be accessed on the ECB’s website.

² The RDG was established in January 2023 and consists of representatives from the Eurosystem central banks and the European retail payments market, including consumers, retailers and intermediary associations.

gathering actionable insights into user preferences and informing decision-making. User research fieldwork started in September, the results of which will be published in mid-2025. Innovation partnerships with stakeholders, announced in a call in October, will test conditional payments and explore other innovative use cases for the digital euro, with an outcome report expected to be published in July 2025.

Work has also progressed on the design of a digital euro, specifically on (i) the calibration of the digital euro holding limit and (ii) the deployment of the offline digital euro solution on the secure elements of mobile devices. The digital euro holding limit was discussed in a technical session with member associations of the Euro Retail Payments Board (ERP^B) on 16 July 2024, who shared their views on the factors influencing its calibration. In parallel, deployment options for an offline digital euro were identified and potential roles for the Eurosystem were outlined. Technical talks were conducted with mobile device manufacturers and specialised technical service providers in October 2024.

Extensive engagement with internal and external stakeholders has been a key focus. The ECB has been actively engaging with the public, market stakeholders and policymakers to ensure the digital euro meets the needs of all stakeholders, and with co-legislators to support the legislative process. Public communication efforts continued to focus on raising awareness about why a digital euro is needed and explaining its potential benefits for users. Market engagement took place through the ERP^B technical sessions, the RDG and bilateral interactions, including meetings with the banking sector, merchants and consumers. Areas of focus in market engagement included the methodology for calibrating the holding limit and the fit of the digital euro in the payment ecosystem. At the technical level, the ECB has also engaged with European payment schemes and solutions and is talking to various international central banks about their respective progress in the area of central bank digital currency. The ECB continued to provide technical expertise in the context of legislative discussions with both the European Parliament and the Council of the European Union. Executive Board member Piero Cipollone took part in a public exchange of views on the digital euro at the meeting of the European Parliament's Committee of Economic and Monetary Affairs on 23 September. The ECB also provided an update on the digital euro project to the Eurogroup in October 2024 and continues to extensively support the legislative debate at the technical level.

We are now halfway through the digital euro project preparation phase and remain committed to providing regular updates on the ongoing work and the progress made. The next progress report on the preparation phase will be published in the second quarter of 2025.

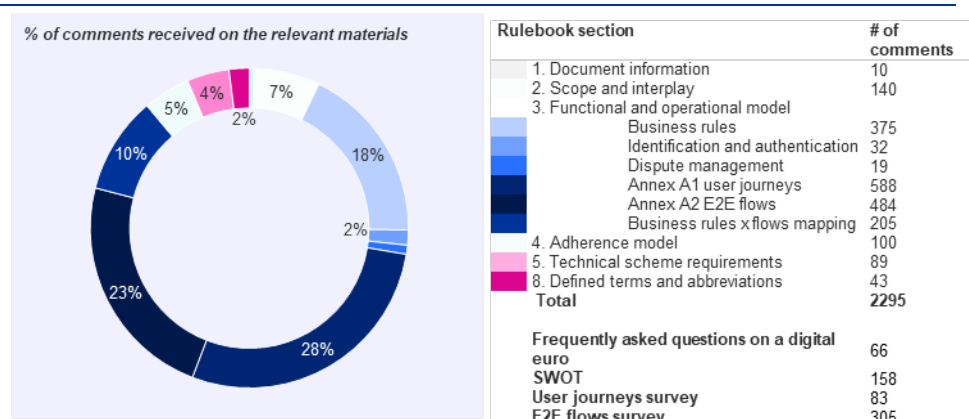
³ The ERP^B includes representatives of consumers, retailers and PSPs. For more information, see [Euro Retail Payments Board \(ERP^B\)](#).

The digital euro scheme's rulebook will be based on extensive feedback from consumers, retailers, PSPs and central banks; it will be designed to be flexible to incorporate future adjustments.

In 2024 the RDG focused on two main streams of activity: reviewing the first draft of the rulebook, version 0.8, and continuing to develop additional sections. The RDG represents the supply and demand sides of the market, including consumers, retailers, PSPs, Eurosystem central banks and observers from EU institutions. Version 0.8 of the rulebook was made available to RDG members at the beginning of 2024. It was drafted in line with the ECB's design decisions and legislative proposals in their then-current state and included core chapters about the scope, key actors, functional and operational model and technical requirements of the digital euro scheme. As part of the review process, RDG members carried out extensive consultations with stakeholders, resulting in approximately 2,500 comments that helped to further develop the draft. These comments were carefully assessed and taken on board through updates to specific sections, clarifications or further technical work. RDG members also shared their views on the opportunities and challenges associated with a digital euro.

Figure 2

Comments from RDG members on first draft of the scheme rulebook, version 0.8



The RDG continued to draft and refine additional sections of the rulebook.

Seven new workstreams were launched in May 2024,⁴ to develop additional sections of the rulebook that were not covered in the first draft, and to further expand existing sections, such as the workstreams covering minimum user experience standards, certification and approval frameworks and risk management. These workstreams, composed of experts nominated by RDG members, have provided detailed suggestions for various aspects of the digital euro rulebook.

- The workstream on user experience (i) consulted with market experts to set basic user experience standards, and (ii) drew up a proposal for a rulebook section outlining these standards. The standards will guide how PSPs design user journeys, allowing the private sector to innovate while ensuring a consistent user experience. This approach helps even inexperienced users to

⁴ [Calls for the creation of seven additional workstreams of the digital euro Rulebook Development Group.](#)

switch providers more easily, promoting competition among PSPs. A workshop on accessibility was held to provide practical and legal insights to ensure inclusive service provision.

- The workstream on risk management completed its first phase by creating a detailed list of topics to be considered, including fraud, financial crime and reputational risks, among others. It also identified existing EU regulations that need to be examined to understand how they interact with the digital euro rulebook requirements.
- The workstream on certification and approval frameworks focused on front-end elements, such as the devices used by end users and the terminals that accept payments. In July 2024 this workstream completed its first phase, which involved an assessment of existing certificates and the examination of an onboarding process for scheme members.

Details of the RDG review process, including the comprehensive feedback received on version 0.8 and the work of the different workstreams, were set out in the [update published on 5 September 2024](#).

The rulebook will be essential to standardise how the digital euro is used and managed seamlessly in the euro area, irrespective of the country or PSP so that, like a banknote, it can be used everywhere in the euro area. It will be an open standard that can also be leveraged by pan-European schemes. The draft digital euro rulebook will be sufficiently flexible to accommodate any future developments and will be updated in accordance with the outcome of the digital euro legislative process.

3 Shaping a digital euro through user research and experimentation

Comprehensive user research and technical experimentation activities are being conducted to gather actionable insights into user preferences and to develop innovative use cases for the digital euro.

Designing a digital euro that delivers value for end users is essential. We are building on the work conducted during the investigation phase by undertaking further research. The ECB has engaged a specialised provider to conduct comprehensive user research, which began in September 2024⁵. The aim of this research is to gather actionable insights into user preferences to enhance the digital euro's value proposition. Key focus areas include (i) a general segmentation analysis of the broader population – to identify which population segments would use a digital euro and what their needs are, (ii) user preferences for holding limits that will inform the technical work on the calibration models for holding limits (see also [Section 4.1](#)), and (iii) in-depth studies carried out with vulnerable groups and small merchants. The methodologies employed include surveys, focus groups, peer interviews and a standing online community for rapid consultation with users. The research findings are expected to be published in mid-2025.

In the area of technical experimentation with market participants, the goal is to stimulate engagement with the private sector through innovation partnerships

⁵ This engagement builds on [previous findings from the investigation phase](#) which were published in March 2023.

and to further develop potentially innovative use cases. A workshop on the future of B2B payments was held on 9 October 2024 as an open forum with industry and payment experts. Its purpose was to gather input on the challenges and needs arising from new use cases related to business-to-business (B2B) payments, beyond the current scope of the digital euro project on innovations in B2B payments. The workshop generated a large amount of interest, with more than 150 applications received. From these, six speakers were invited to take part from different sectors, including merchants, academics, representatives from financial services and banking and the travel industry. In parallel, the ECB has launched a joint (conceptual and technical) experimentation activity with PSPs and merchants to obtain a shared understanding of the requirements for facilitating conditional payments. A call was published on 31 October 2024 and applicants will be invited to explore conditional payments and additional topics and use cases by the end of 2024. The work will take place in the first half of 2025. An outcome report that includes our partners' conceptual and technical test findings is expected to be published in July 2025.

Figure 3
Overview of user research and experimentation work



4 Aspects related to the design of a digital euro

4.1 Holding limit

The Eurosystem is developing a methodology for calibrating the digital euro holding limit, balancing optimal user experience with the need to maintain price and financial stability.

The Eurosystem is fully committed to ensuring that the introduction of the digital euro aligns with a resilient financial environment, allowing an effective transmission of its monetary policy. Setting the holding limit, or "calibration", involves balancing optimal user experience with the need to preserve the transmission of monetary policy and financial stability. These three pillars mirror the principles recognised in Article 15 of the legislative proposal. The ECB has been working with experts from national central banks (NCBs) and national competent authorities to develop a methodology for the calibration of the digital euro holding

limit. At the technical session on a digital euro held on 16 July 2024, ERPB member associations shared their views on the factors influencing this calibration.⁶ The input has been incorporated with a view to developing a comprehensive methodology for calibrating the digital euro holding limit.

Usability and ecosystem

- Members from the consumer sector emphasised that the holding limit should facilitate usability. They suggested that if the holding limit was too low, it might discourage people from using the digital euro, especially if they do not want to use the "reverse waterfall" feature, which automatically transfers excess digital euro to a linked bank account.⁷ They also stated that the holding limit should allow the digital euro to function like a regular payment account. Other factors mentioned for consideration included average monthly salaries, the ability of PSPs to distribute a digital euro and whether merchants would accept this means of payment.
- Banking sector members added that the holding limit should match people's needs, such as their monthly spending on cash payments. They suggested that the reverse waterfall feature could allow for a lower holding limit, but if the transfer speed is slow, a higher limit might be needed. They also mentioned that ATM withdrawals could help to understand how people might adopt a digital euro.

Monetary policy and its implementation

- Banking sector members highlighted that the supply of credit is crucial for the transmission of monetary policy through banks. They pointed out that in a financial stress scenario, the interbank market might dry up, requiring intervention from the ECB. They also emphasised the importance of flexible collateral frameworks and the differences in these frameworks across regions.
- Consumer and merchant sector members noted that competition with cash should be considered, as people might prefer to use cash instead of a digital euro. They also mentioned that digital payment wallets already exist, allowing users to convert commercial bank money into electronic money.

Financial stability and banking supervision

- Members from the merchant and consumer sectors emphasised that banks could prevent outflows to digital euro by offering attractive interest rates. They stressed the importance of conducting user research to understand potential adoption and maximum deposit outflows. They also highlighted the uneven distribution of wealth and differences across households.

⁶ See [written feedback from the associations on the factors influencing the holding limit calibration methodology](#) following the July 2024 ERPB meeting and a [summary of the input and how it has been incorporated](#).

⁷ This feature automatically transfers excess digital euro to a linked bank account when the holding limit is reached. The mechanism ensures that users do not exceed their digital euro holding limits, which is crucial for maintaining financial stability and supporting the effectiveness of monetary policy.

- Banking sector members pointed out that the choice between prefunding and using the reverse waterfall feature could have different impacts on banks' liquidity. They noted that outflows could affect liquidity buffers and metrics such as the liquidity coverage ratio and net stable funding ratio. They also mentioned that the impact on profitability, differences among banks and the distinction between normal and crisis times are important factors to consider.

On 30 September 2024 a workshop entitled “Digital euro and its holding limit: how to calibrate it?” brought Eurosystem researchers, experts and policymakers together to further explore the holding limit topic. Bilateral engagement with European credit sector associations and their member institutions provided additional occasions for in-depth discussions with banks on the factors influencing the calibration of the digital euro holding limit. An update on the methodology is expected to be discussed with ERPB associations at the technical level before the end of 2024.

4.2 An offline digital euro

We are analysing how the offline digital euro solution can be deployed on the secure elements of mobile devices, holding technical talks with manufacturers and service providers.

The ECB has made progress in analysing how to deploy the offline digital euro solution on the secure elements of mobile devices. The secure element is a specialised hardware chip that enables offline digital euro transactions to be carried out directly on users' mobile devices. Due to its highly controlled environment, deploying an application remotely is complex and involves multiple stakeholders. The ECB has identified specific deployment options and outlined potential roles for the Eurosystem. To further clarify these roles, technical talks were conducted with mobile device manufacturers and specialised technical service providers in October 2024⁸. Furthermore, the ECB has worked with industry standard-setting bodies to analyse how existing standards can support the integration of the offline digital euro into current point of sale (POS) terminals. As part of this collaboration, they explored implementation possibilities and identified appropriate reusable standards. These standards will form the foundation for the technical integration work to be carried out by the provider of the offline solution.

5 Engagement with external stakeholders

Engaging with European stakeholders is at the core of the digital euro project. Over the past six months the Eurosystem has had extensive engagements with market stakeholders, co-legislators and the public.

⁸ See [invitation to the technical talks](#).

5.1 Engaging with market participants

Engagement with the market aims to gather input on the digital euro's integration into the European payments ecosystem, address challenges and explore new use cases, to ensure that a digital euro meets the needs of all stakeholders.

The ECB engaged with European market associations through two technical meetings of the ERPB, in which consumers, merchants and PSPs were represented. At the technical session held on 16 July 2024 the ECB provided an update on its plans to conduct user research⁹ (see also [Section 3](#)). At the same session, ERPB associations shared their views on the factors influencing the calibration of the digital euro holding limit (see also [Section 4.1](#)). This was complemented with a series of technical calls with bank experts to dive deeper into the factors considered for the calibration. The ERPB technical session held on 1 October 2024 included an update on the work of the digital euro scheme rulebook¹⁰ (see also [Section 2](#)) and kicked off the workstream set up to investigate how a digital euro will fit into the European payments ecosystem (see also [Section 5.2 for details](#)). As part of this work, the ECB has planned multiple touchpoints with experts from ERPB associations, PSPs, merchant associations and consumer groups. ERPB technical sessions will continue throughout 2024 and 2025 and will cover, for example, the update on the methodology for calibrating digital euro holding limits.

In addition to structured engagement with the market through the ERPB, the ECB has engaged with consumers and merchants as end users of the digital euro on different occasions. On 6 June 2024 a presentation to introduce the digital euro project was delivered to electrical retailers at the Strategic Session of the Annual General Meeting of Euronic. On 24 September 2024 the ECB participated in EuroCommerce Payments Day 2024. The ECB has included merchants in the future user research activities, ensuring their needs and concerns are captured for the development of a digital euro (see also [Section 3](#)). In September 2024 Executive Board member Piero Cipollone engaged in a round table discussion with the European Consumer Organisation (BEUC) to discuss the impact and opportunities of a digital euro.

Further bilateral engagement also took place with banks and other payment service providers. To gauge the potential for synergies by fostering standard harmonisation in the payments landscape, the ECB held bilateral meetings with major European payment schemes. By establishing open standards, the digital euro aims to integrate seamlessly into existing digital solutions and allow domestic schemes to leverage on a pan-European acceptance network (see also [Section 5.2](#)). Additionally, ECB President Christine Lagarde and Executive Board member Piero Cipollone took part in meetings with the European banking sector to discuss the implications and opportunities presented by a digital euro. These meetings emphasised the importance of collaborative efforts between major stakeholders to ensure its successful implementation and adoption.

The ECB is also providing information about a digital euro to market participants in dedicated sessions. On 9 September 2024 the ECB hosted an [online focus session](#), attended by over 1,000 financial industry experts, to provide an

⁹ [Update on user research and experimentation presented at the 12th ERPB technical session on digital euro.](#)

¹⁰ [Status of the digital euro scheme's rulebook presented at the 13th ERPB technical session on digital euro.](#)

update on (i) the progress of the digital euro project, (ii) the drafting of the digital euro rulebook, and (iii) the impact and opportunities of a digital euro for the financial industry.

5.2 Engagement on the fit of the digital euro in Europe’s payment ecosystem

The digital euro project aims to provide a pan-European retail digital payment solution, reducing our dependence on non-European providers and enhancing the resilience and strategic autonomy of Europe's payment ecosystem.

A technical workstream with market participants is investigating how a digital euro will fit into the European payment ecosystem. The current payment landscape in Europe lacks a pan-European retail digital payment solution. Domestic schemes and private initiatives are competing with international card schemes. The increasing popularity of digital wallets provided by non-European players poses an additional challenge. This reliance on non-European providers creates undesired dependence and potential vulnerabilities in payment resilience. The aim of a digital euro is to address these issues for the benefit of Europeans – consumers, merchants, PSPs¹¹. Expanding our engagement with market stakeholders on the fit of the digital euro in the payment ecosystem, [an ERPB technical session was held on 1 October 2024](#). The session first highlighted that a digital euro would guarantee merchants increased access to a European consumer base. Unlike most current payment methods, it would provide an efficient way to settle payments instantly. Additionally, there would be rules in place to ensure that the fees merchants pay are fair, given its status as legal tender. Second, consumers would have access to public money in digital form, which would provide a high level of privacy in their everyday payments and ultimately increase competition in the payments market. Third, the digital euro project has made deliberate choices to support the business models of European PSPs and strengthen their position vis-à-vis dominant international players, by:

- placing EU-licensed PSPs at the centre of the digital euro ecosystem, ensuring they retain valuable client relationships by distributing digital euro;
- supporting a compensation model that allows for both merchant and interchange fees, while also waiving any scheme or processing fees such as those charged by international card schemes;
- pursuing open standards and facilitating a pan-European acceptance network, that could be leveraged by private solutions to broaden their product portfolio and geographical reach;
- embedding safeguards for financial stability, such as individual holding limits, into the design of the digital euro.

More technical sessions to be held between the fourth quarter of 2024 and the second quarter of 2025 will revolve around the themes of competition,

¹¹ For further discussion on this, see Cipollone, P., “[Monetary sovereignty in the digital age: the case for a digital euro](#)”, speech made at the Economics of Payments XIII Conference organised by the Oesterreichische Nationalbank, 27 September 2024..

synergies and business models for PSPs. Further discussions on the value proposition of the digital euro for merchants and consumers will follow in 2025.

5.3 Technical input provided in the context of the legislative discussions

Engagements with co-legislators included workshops, technical input and bilateral outreach to discuss political priorities and facilitate progress in the legislative process.

The ECB regularly exchanges views with the European co-legislators on its progress on the design of the digital euro. Executive Board member [Piero Cipollone](#) took part in an exchange of views with the [Committee on Economic and Monetary Affairs of the European Parliament on 23 September 2024](#) to explain the role of the digital euro in enhancing the autonomy of the European payment sector. [The ECB also provided technical updates to the Eurogroup on 7 October 2024](#), as part of its regular updates on the progress on the design of the digital euro.

In parallel to the ECB's digital euro project, the European co-legislators are discussing the legal framework for the digital euro, based on a [proposal for a Digital Euro Regulation issued by the European Commission in July 2023](#). When requested, the ECB provides technical input that informs both the European Parliament and the Council on their work. This section provides a brief overview of the key areas in which the ECB has provided technical information in its role as an observer in the Council Working Party that discusses the legislative proposal. The technical information is based on its expertise and the views summarised in the Opinion on the legislative proposal as adopted by the Governing Council.

- **Means to achieve cash-like privacy for digital euro payments**
Guaranteeing the privacy of digital euro users is an essential part of the project, and the proposed Regulation reflects this with strict provisions on data protection and privacy for both online and offline transactions. The offline functionality would offer users a cash-like level of privacy, both for person-to-person payments and payments in physical shops¹². The Eurosystem has indicated its readiness to explore the possibility of making a few improvements to the user experience of the digital euro, so that citizens with a stronger privacy preference can benefit from cash-like privacy for all their digital euro payments made in physical proximity. One possible improvement could be to give users the option (i) to make all their low value payments carried out in the proximity of the payee's device offline payments by default and (ii) to decide on the amount they wish to regularly hold offline and benefit from automated funding, so they do not worry about their offline balance. In order to ensure that this improvement is convenient for users, the offline functionality should be available on mobile devices.
- **Update on the rulebook**
The ECB provided an update to the Council Working Party delegates on the progress made on the digital euro rulebook, following the publication of the RDG's progress report in September 2024 (see also [Section 2](#)). As part of this

¹² For more information about the digital euro and privacy, see the [June 2024 Progress report on the preparation phase of a digital euro](#).

update, the ECB explained that the draft rulebook will be sufficiently flexible to accommodate any future adjustments deriving from the legislative process.

In parallel, the ECB has continued to pursue a close cooperation with the European Commission.

5.4 Engaging with the public

Public communication efforts have continued to focus on raising awareness about the necessity of a digital euro and explaining its potential benefits for users through various channels. These have included website and social media communications, as well as media outreach. Public communication activities are crucial to ensuring potential users can be informed with accurate and reliable information about the digital euro, its importance and the benefits it could bring to the European payment landscape and their daily lives. This was the key message of the latest [ECB blog post “The digital euro: what’s in it for you?”](#) authored by Executive Board member Piero Cipollone. It was also published as an Op-Ed across the euro area, reaching millions of citizens.¹³ As part of its public outreach work, the ECB also engages directly with consumer groups that are not represented in the ERPB, which are given the opportunity to share their perspectives at the [ECB’s civil society seminars](#). The most recent seminar took place on 8 July 2024 and provided an update on the project’s progress¹⁴.

6 Next steps

Over the coming months, the RDG will produce a revised draft of the rulebook, incorporating feedback from the first draft (version 0.8). This version will include new chapters and further develop existing ones, reflecting the ongoing work of the RDG. The final draft will be completed during the digital euro preparation phase. Additionally, a progress report on the RDG’s work will be shared in the first quarter of 2025.

Following the discussions and insights obtained from the October ERPB technical session, future sessions to be held between the fourth quarter of 2024 and the second quarter of 2025 will address the core themes of competition, synergies and business models for PSPs. The aim of these sessions is to identify benefits and reduce potential risks or unintended consequences of a digital euro. These discussions, enriched by internal analyses, will ensure that all viewpoints are considered.

In the area of user research, the team will focus on a general segmentation analysis, user preferences for holding limits and in-depth studies carried out with vulnerable groups and small merchants. The research findings will be

¹³ The ECB Blog post was published on 1 November on the ECB’s website and on 31 October by some euro area media outlets.

¹⁴ See [slides](#) and [video recording](#) from the Civil Society Seminar: Laying the basis for a digital euro.

published in mid-2025. In parallel, the team will establish innovation partnerships with stakeholders to explore conditional payments and additional topics and use cases, with an outcome report expected to be published in July 2025.

In 2025 the ECB aims to conclude the procurement to select potential providers for the DESP. This will include evaluating offers for external components from external providers and offers for internal components from Eurosystem NCBs.

The ECB will continue to focus on public communication to raise awareness about a digital euro. The next ECB civil society seminar, focusing on financial inclusion, is scheduled for 13 November 2024 and will involve associations that protect the rights of consumers, citizens with disabilities and young people.

The next progress report on the preparation phase will be published in the second quarter of 2025.

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For specific terminology please refer to the [ECB glossary](#) (available in English only).

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