

Progress on the investigation phase of a digital euro – third report

The European Central Bank (ECB) and the euro area national central banks launched the investigation phase of the digital euro project in October 2021. The investigation phase aims to address key issues relating to the design and distribution of a digital euro. This report sets out the progress made during the investigation phase of the digital euro project and elaborates on a third set of design and distribution options that were recently endorsed by the ECB's Governing Council.

A collaborative approach is key to the preparation and eventual success of a digital euro. The ECB has been engaging extensively with external stakeholders, including the European Commission, the European Parliament and euro area finance ministers. A regular dialogue on a digital euro also takes place with market stakeholders through the Euro Retail Payments Board (ERPB), so that all sides of the market, including banks, payment service providers (PSPs), consumers and merchants, can provide their views on the design and distribution options identified by the Eurosystem.

In the second quarter of 2023, the European Commission intends to propose a regulation to establish a digital euro. The ECB will accommodate any necessary adjustments to the design of the digital euro that may emerge from legislative deliberations. At the same time, the Eurosystem will need to proceed with the project so it is ready to issue the digital euro in a timely manner once the legal act has been adopted, should the Governing Council decide to issue in the future.

This report contains the Eurosystem's views regarding digital euro access, holdings and onboarding, distribution aspects as well as digital euro services and functionalities.

With regard to digital euro access, the Eurosystem's proposal is to make the digital euro available to euro area residents, merchants and governments in its initial releases. Non-resident euro area citizens may also have access, provided they could have an account relation with a euro area PSP. Access for consumers in the wider European Economic Area (EEA) and selected third countries could be part of the subsequent releases. Individuals would be subject to uniform holding limits, which would cover day-to-day payments in each euro area Member State. Merchants and governments in the euro area would have zero-holding limits while waterfall and reverse-waterfall functions would allow incoming and outgoing payments to take place smoothly. Onboarding for the digital euro (e.g. the identification and authorisation steps necessary for intermediaries to open a digital euro account for an end user), should follow the procedures already established for opening a payment account with intermediaries.

PSPs, as defined in the Payment Services Directive (PSD2), would be responsible for the distribution of the digital euro. Therefore, scheme access criteria for PSPs distributing the digital euro would be based on the PSD2, in addition to other relevant legislation.

End users would be able to access and use the digital euro either through PSPs' existing online banking/payment apps (integrated approach) or through an app provided by the Eurosystem. The latter app would provide a harmonised entry point for basic payment functionalities, although end users would still need to be onboarded for digital euro services by distributing PSPs. In terms of technological options for making payments, the Eurosystem envisages that the first digital euro releases will offer end users the option of paying via contactless technology, QR codes or an easy way to pay online (via an "alias/proxy/app redirect" functionality).

With regard to digital euro services and functionalities, the Eurosystem foresees that PSPs could provide core, optional and value-added services to end users. The provision of core services (e.g. the opening/closing of a digital euro account, onboarding and funding/defunding functionalities), both for online and offline functionalities, would be mandatory for supervised intermediaries that distribute digital euro. On top of core services, optional services (e.g. recurring payments) and value-added services (e.g. splitting payments among multiple payers in person-to-person payments) could be offered voluntarily by intermediaries to further enhance the user experience. PSPs are best placed to develop value-added services such as conditional payments (defined as payments that are instructed automatically when pre-defined conditions are met).

With regard to cross-currency payments, the Eurosystem envisages that the provision of cross-currency functionalities could be supported by establishing interoperability between the digital euro and another central bank digital currency (CBDC) system, either by establishing a set of contractual, technical and operational links (an interlinking model) or by following a single-system approach whereby a common technical infrastructure would host multiple CBDCs issued by their respective central banks. The priority for the Eurosystem is to ensure the timely delivery of a digital euro that serves the needs of euro area users. If a digital euro is introduced successfully in the euro area the provision of cross-currency functionalities could be supported where there are mutual interests with other monetary jurisdictions.

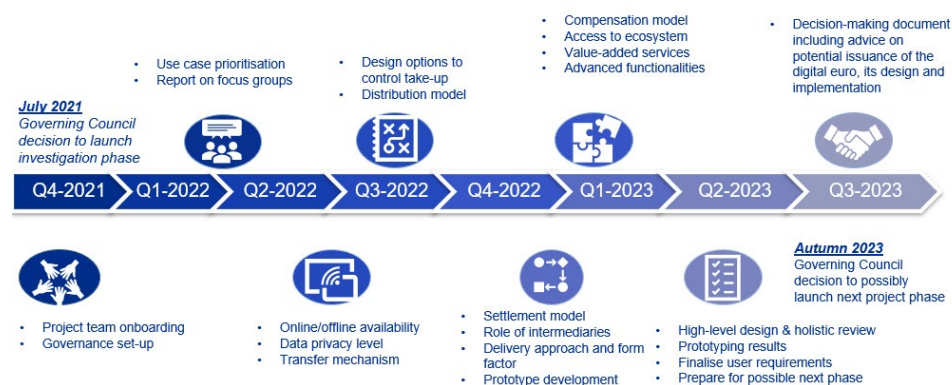
With the approval of the latest set of design choices, the foundations have been laid for the finalisation of the investigation phase and for building a proposal for a possible next phase. The Eurosystem is now reviewing all the design options and is bringing them together in a high-level design for the digital euro, which will be discussed with stakeholders in the coming months. The Governing Council will assess the outcome of the investigation phase in the autumn of 2023 and will decide, on the basis of this assessment, whether or not to move on to a next phase.

This report provides an update on progress made in the digital euro investigation phase over the past months.

It follows on from previous reports published in September 2022¹ and December 2022² that presented the first two sets of digital euro design and distribution options. This third report first explains key features relevant to end users and service providers, such as access, holdings and onboarding (Section 1, “Digital euro access, holdings and onboarding”).³ It then looks at a number of distribution aspects, including scheme access criteria, delivery approach and form factor (Section 2, “Distribution aspects”). Finally, the report describes digital euro services and advanced functionalities such as core/optional/value-added services, conditional payments and cross-currency functionality (Section 3, “Digital euro services and functionalities”).⁴

Digital euro project timeline

Tentative – timing subject to change



Given that a collaborative approach is key to the preparation and eventual success of a digital euro as a common European project, the design and distribution options discussed in this report have been endorsed by the Governing Council following engagement with a highly diverse set of stakeholders.⁵ There has been active engagement with public and private

¹ The first set of design options included issues such as the transfer mechanism, online/offline availability, privacy, and tools used to control the amount of digital euro in circulation, that were being examined by the ECB and the euro area national central banks as part of the digital euro project launched in October 2021. See [Progress on the investigation phase of a digital euro](#), ECB, 2022.

² The second set of design options included the settlement model, which defines who will settle online or offline transactions, the funding/defunding mechanism, the distribution model, where a digital euro scheme is envisaged, and the role of intermediaries, responsible for the onboarding of end users, anti-money laundering checks and consumer-facing services. See [Progress on the investigation phase of a digital euro – second report](#), ECB, 2022.

³ For clarity, this report adopts the following terminology for three types of payments: person-to person payment (P2P) users are referred to as individuals, while point-of-sale and e-commerce users are referred to as consumers and/or merchants. The terms “citizens” and/or “residents” are used when differentiating between jurisdictions. When referring to general users in all categories of payments, the term “end user” is adopted.

⁴ For a set of definitions in the context of the digital euro project, see the [Digital euro glossary](#).

⁵ Further information on stakeholder engagement is available on the [ECB’s website](#) and in a [letter of 14 July 2021](#) from Executive Board member Fabio Panetta to Irene Tinagli, Chair of the Committee on Economic and Monetary Affairs of the European Parliament, concerning the Governing Council’s decision to launch the investigation phase of a digital euro.

stakeholders and with society at large. Major design issues and policy-relevant aspects are discussed regularly at the European level with the European Parliament and with euro area finance ministers in the Eurogroup. Eurogroup members⁶ and Members of the European Parliament⁷ have expressed support for the digital euro and have emphasised the political nature of the project. There has also been close cooperation with the European Commission with a view to reviewing, at a technical level, a broad range of policy, legal and technical questions.⁸ There is regular dialogue on the topic of the digital euro with market stakeholders through the ERPB, so that all sides of the market, including banks, PSPs, consumers and merchants, can offer their views.⁹ Market practitioners in the Digital Euro Market Advisory Group have been providing advice on the design and potential rollout of a digital euro. At the Member State level, euro area national central banks have been engaging with domestic stakeholder groups and fora to ascertain their views on a digital euro. The European Commission intends to propose a regulation establishing a digital euro in the second quarter of 2023.¹⁰

Several design options have been considered over the course of the investigation phase. Agreement on the third set of design options described in this report will provide the foundation needed to finalise the investigation phase and prepare for a possible next phase. By the second half of 2023, the Eurosystem is expected to confirm its views on a high-level digital euro design which will incorporate all the design choices made up to that point and will make it possible to conduct a comprehensive review of possible interdependencies between design choices. The approval of this third set of design options does not prejudice any decision on whether to move to the next project phase, scheduled for autumn 2023, nor the ultimate decision on whether to issue a digital euro.

1

Digital euro access, holdings and onboarding

The Eurosystem proposes that in its initial releases, the digital euro will focus on euro area residents, merchants and governments. Provided they have an account with a euro area PSP, non-resident euro area citizens could also have access. It is envisaged that merchants outside the euro area will be able to offer digital euro acceptance via a collecting PSP in the euro area (see Section 1.1, “Access and holdings”). Access for consumers and merchants in the European Economic Area (EEA) and selected third countries could be part of the subsequent

⁶ See [Eurogroup statement on the digital euro](#), 16 January 2023.

⁷ See [European Parliament resolution of 16 February 2023 on the European Central Bank – annual report 2022](#), February 2023.

⁸ For more information, see “[ECB intensifies technical work on digital euro with the European Commission](#)”, *Press release*, ECB, 19 January 2021.

⁹ For more details of engagement with the ERPB, see the information on stakeholder engagement on the [ECB’s website](#) and “[ERPB engagement in the digital euro investigation phase](#)”, ERPB Secretariat, 10 November 2021.

¹⁰ See “[Commission work programme 2023 – A Union standing firm and united](#)”, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions*, European Commission, COM(2022) 548 final, 2022.

releases¹¹, depending on digital euro accessibility rules to be set in the legislative framework.

Onboarding services for the digital euro will not deviate from established procedures for opening a payment account. This will enable PSPs to reuse available information to the greatest extent possible, ensure easy adoption in the market and reduce overall implementation costs (see Section 1.2, “Onboarding”).

1.1 Access and holdings

The rules for access to the digital euro for euro area citizens and residents, as well as access in EU Member States whose currency is not the euro and in third countries outside the EU, will also depend on the legislative framework for the digital euro to be adopted by co-legislators following a proposal by the European Commission. The Eurosystem has endorsed views on how access could be facilitated for different categories of user from within and outside the euro area, with the objective of facilitating prioritised use cases within the euro area.

The Eurosystem is proposing that in the initial releases of the digital euro the focus would be on enabling access for euro area residents, merchants and governments. Non-resident euro area citizens could also have access to the digital euro, provided they have an account with a euro area PSP. Merchants outside the euro area could offer digital euro acceptance but, like euro area merchants, should not hold digital euro. They would obtain the equivalent in private money via a collecting PSP in the euro area.

Access for consumers in the wider European Economic Area (EEA) and selected third countries could form part of subsequent releases. Permanent access to the digital euro for consumers in the EEA and third countries should always be based on an agreement with the authorities of such jurisdictions. This could also apply to visitors from jurisdictions outside the EEA.

Individual holding limits for users outside the euro area should not exceed those for euro area residents and citizens. For initial releases, merchants and governments in the euro area would have zero-holding limits with deviations limited to what is required for the technical implementation of the waterfall and reverse-waterfall functions (i.e. exceeding holding limits only for a few seconds). Waterfall and reverse-waterfall functions would enable incoming and outgoing payments to take place smoothly.

1.2 Onboarding

The onboarding service for the digital euro refers to the identification and authorisation steps necessary for intermediaries to open a digital euro

¹¹ Microstates with a monetary agreement (i.e. Andorra, Monaco, San Marino and Vatican City) and regions aligning with the EEA via agreements (i.e. Northern Ireland and Switzerland).

account for an end user (consumer or merchant), including the linking of a payment instrument. Onboarding must ensure that a number of important checks, like “Know Your Customer” (i.e. the unique identification of an individual), are carried out. Individual account limits also need to be addressed.

Onboarding should use established procedures for opening a payment account as much as possible, and should oblige PSPs to utilise available information as often as possible. This ensures easy adoption in the market and reduces overall implementation costs.

The overall amount of digital euro in circulation could be controlled in a pragmatic way (and in line with current practice in the public sector) by limiting the number of accounts per individual, especially in the initial uptake. There would therefore be no need for reconciliation of individual holdings between different PSPs. Merchants could open multiple digital accounts as they would not actively hold digital euro (in line with Section 1.1) and as such would not be impacting the amount in circulation. A portability procedure for digital euro accounts would allow an end user to easily change the PSP providing the digital euro account. To facilitate portability, end users would keep the same digital euro account identifier, irrespective of their PSP. The Eurosystem is investigating possible emergency portability procedures.

2 Distribution aspects

As discussed in the second progress report, a digital euro scheme would achieve pan-euro area reach and would guarantee a homogenous user experience.¹² A digital euro scheme would establish a common set of rules, standards and procedures that supervised intermediaries would have to adhere to in order to distribute the digital euro. The Eurosystem is working with all market participants and relevant stakeholders to develop a digital euro scheme rulebook.¹³ PSPs would have to meet a range of scheme access criteria reflecting the legal obligations they would need to comply with for the purpose of distributing the digital euro. PSPs, as defined in PSD2, would be responsible for the distribution of the digital euro. Scheme access criteria for PSPs distributing digital euro would be based on PSD2, in addition to other relevant legislation (see Section 2.1, “Scheme access criteria”).

End users could access and use the digital euro either through PSPs’ existing online banking/payment apps (integrated approach) or through a digital euro app provided by the Eurosystem. While the latter app would provide a harmonised entry point for basic payment functionalities, these payment functionalities would still be performed by PSPs. In terms of technological options for making payments, the Eurosystem envisages that end users would be able to pay/be paid via contactless

¹² For more information on the distribution model and a digital euro scheme, see Section 2, “Distribution model” of [Progress on the investigation phase of a digital euro – second report](#), ECB, 2022.

¹³ See [ECB hosts first digital euro Rulebook Development Group meeting](#). For more information, see the [Rulebook Development Group mandate](#).

technology, QR codes or an easy way to pay online (see Section 2.2, “Delivery approach and form factor”).

2.1 Scheme access criteria

Digital euro scheme access criteria should ensure that the distribution of the digital euro is undertaken by capable intermediaries and that it facilitates the achievement of the digital euro policy objectives. PSPs distributing the digital

euro would have to meet a set of scheme access criteria reflecting the legal obligations they would need to comply with for the purpose of distributing the digital euro. They would also need to comply with other rules designed to guarantee the degree of harmonisation desired, so that payment solutions for the digital euro can be used anywhere and in a consistent manner throughout the euro area. The distribution of the digital euro should be undertaken by trusted and sound intermediaries that have the capacity to offer digital euro accounts and payment services and provide front-end solutions; are subject to anti-money laundering/countering the finance of terrorism controls and sanctions regulation-related framework; are solvent under the relevant insolvency law, demonstrate operational readiness and risk control; and are licensed and authorised by an appropriate competent authority and compliant with all applicable legislation.

The Eurosystem believes that PSPs, as defined in PSD2, would be best placed to distribute the digital euro. The digital euro scheme access criteria would be

based on PSD2, in addition to other relevant legislation (e.g. the Anti-Money Laundering Directive, the Payment Account Directive and the Settlement Finality Directive). The Eurosystem’s suggestion is that the different types of PSPs, as identified in PSD2, should be authorised to provide digital euro services in accordance with the services they are currently licensed to provide under PSD2. Thus, the following PSPs would be able to distribute the digital euro: credit institutions, electronic money institutions and payment institutions.¹⁴ They could offer digital euro payment services, provide digital euro accounts,¹⁵ make application programming interfaces (APIs) to digital euro accounts available and offer basic services associated with the digital euro (for a full list of services see the list of services as provided in PSD2)¹⁶

2.2 Delivery approach and form factor

End users could access and use the digital euro either through PSPs’ existing online banking/payment apps or through an app provided by the Eurosystem that would offer a harmonised entry point for basic payment functionalities

¹⁴ Payment initiation service providers and account information service providers.

¹⁵ Implementation of funding and defunding services might differ between different types of PSPs. Further analysis is ongoing as to how to facilitate the provision of distribution-relevant payment services by electronic money institutions and payment institutions.

¹⁶ The basic services associated with the digital euro are yet to be defined but should be similar in nature to the basic services that credit institutions are to provide under the Payment Accounts Directive.

provided by PSPs. Supervised intermediaries could integrate the digital euro into their own platforms (integrated approach). In this way, users could easily access the digital euro through the banking apps and interfaces they are already familiar with. In addition, the Eurosystem would develop a digital euro app with a homogeneous look and feel that would facilitate a standardised approach to connecting end users to intermediaries (harmonised entry point approach). The app would offer basic digital euro payment functionalities and would connect with intermediaries' systems. This dual approach would benefit end users by offering them greater choice. At the same time, intermediaries would retain the ability to build their own integrated solution and would attract customers through value-added services, depending on their specific business model. For new or smaller intermediaries, the digital euro app could facilitate speedier digital euro adoption. Instead of carrying out their own development on their front-end payment layer for the digital euro, they could leverage the app. For consumers, the app would respond to the preferences of those individuals calling for an independent access channel where basic functionalities are available, in accordance with the wishes expressed by consumer associations and focus groups.^{17 18}

The so-called form factor is the technological tool that enables payer and payee to interact and exchange payment details. In order to ensure that all payers can pay with digital euro to all payees across the euro area, regardless of the intermediaries involved, it is crucial there is a harmonised and standardised technical interaction between payer and payee when the digital euro is used.

For in-store payments (point-of-sale use case), both QR-code and NFC contactless payments are envisaged. QR code-based payments could be more easily deployed than near-field communication (NFC) technology as QR codes entail fewer complexities in terms of standards and certification processes. Moreover, there are no dependencies on mobile device manufacturers, ensuring accessibility regardless of device type, which is not the case for NFC.¹⁹ QR codes would also foster a new European infrastructure as an alternative to the existing card rails infrastructure, contributing to the overall resilience of European payments.²⁰ In terms of innovation, the flexibility of QR codes provides more options for future innovation as well as scope for value-added services as it facilitates the addition of an extra layer of information in the QR code (e.g. further information on the purchased goods). NFC technology, however, provides a highly convenient end user experience which consumers in the euro area are already familiar with. Furthermore, NFC is the only widespread technology which could facilitate the development of a convenient offline payment method by introducing a physical card for the digital euro – this could foster financial inclusion. Emerging technologies for payment initiation would be

¹⁷ See [Written feedback after 4th ERPB technical session \(cross-currency, programmability, scheme access and form factor\)](#), 5 December 2022.

¹⁸ See “Study on new digital payment methods”, *Focus group report*, Kantar, March 2022.

¹⁹ In the case of iOS devices manufactured by Apple the access to its NFC antenna is not granted to third parties. This is currently under investigation by the European Commission.

²⁰ On resilience, an additional advantage relates to the lack of dependencies on specific technical components in mobile devices which, for some devices currently on the market, are locked to the companies' proprietary payment method.

monitored and could be adopted at a later stage, if proven to provide benefits to end users.²¹

Individuals could use contactless technology,²² QR codes or an alias/proxy²³ when making person-to-person (P2P) payments.²⁴ If both payer and payee are present ("local P2P payment"), the payment can be easily facilitated via physical NFC technology or QR codes that would avoid the payee having to share any personal data, such as their mobile phone number or email address, with the payer. An alias/proxy functionality could instead facilitate remote P2P payments when the payee cannot easily use NFC technology or share their QR code directly with the payer.

With regard to e-commerce payments, both a QR code and an alias/proxy functionality would be available. A QR code can be displayed on the checkout page and the consumer can simply scan it with a smartphone to trigger the payment. When operating on a single device in e-commerce (e.g. when shopping online using a smartphone), an alias/proxy functionality would offer a more convenient end user experience as it would not be possible to display and scan a QR code on the same device.

3 Digital euro services and functionalities

Supervised intermediaries could provide a variety of digital euro services to end users and build on the digital euro's advanced functionalities. All PSPs distributing digital euro to end users would be required to provide a set of core services, whereas optional and value-added services could be offered voluntarily by supervised intermediaries to further enhance the core product and improve end-user experience (see Section 3.1, "Core, optional and value-added services"). Conditional payments in digital euro should be made available by supervised intermediaries (see Section 3.2, "Conditional Payments").

The Eurosystem plans to support cross-currency functionalities. The priority for the Eurosystem is to ensure the timely delivery of a digital euro that meets the needs of euro area users. If a digital euro is successfully introduced in the euro area, the provision of cross-currency functionalities could be supported where there are

²¹ Emerging technologies currently being tested and piloted in the market include ultra-wideband and Bluetooth Low Energy technologies. However, these technologies are still immature and it might be years before they are widely implemented in the market.

²² Contactless (NFC) technology is used for contactless payments to dynamically exchange data between the POS terminal and the consumer's device (a mobile device or a card). NFC would facilitate the introduction of a physical card for the digital euro, which could foster financial inclusion.

²³ An alias/proxy is an easily memorisable, unique identifier (such as an email address or mobile phone number) that is linked to the technical identifier of a payment account number (e.g. IBAN) or a payment card (e.g. PAN).

²⁴ A unique identifier is linked to a payment account number. For example, the payer can easily initiate the transaction by typing into their mobile payment app the phone number of the payee, instead of introducing an IBAN. In e-commerce, the consumer introduces their mobile phone number to authorise the merchant triggering the payment and/or the merchant's e-commerce webpage initiates a mobile application call that links with the consumer's mobile payment application to authorise and initiate the payment in a seamless manner.

mutual interests with other monetary jurisdictions (see Section 3.3, “Cross-currency”).

3.1 Core, optional and value-added services

Core services may be defined as those must-have-from-the-start services that would shape the core product for the digital euro from an end-user perspective.

All supervised intermediaries distributing digital euro would be required to provide these core services to end users, for both online and offline functionality²⁵. The set of core services includes: (i) opening a digital euro account, onboarding and “Know Your Customer”; (ii) closing a digital euro account and offboarding end users; (iii) payment instrument management (provision and maintenance); (iv) linking the digital euro account to a payment account; (v) user life cycle management processes;²⁶ (vi) funding (manual and automated); (vii) reverse waterfall; (viii) defunding (manual and automated); (ix) waterfall; (x) transaction initiation (one-off transactions); (xi) authentication; (xii) payment confirmation/rejection notification; (xiii) refunds;²⁷ and (xiv) dispute/exception management.

Supervised intermediaries could offer optional services to enhance the core product and improve users’ experience. The provision of such services would be voluntary for supervised intermediaries. The development and provision of optional services by intermediaries would be supported by the Eurosystem via the digital euro scheme rulebook and/or by the development of back-end functionalities.²⁸ The following set of optional services would be supported: (i) access to a digital euro account held by another intermediary (account information service); (ii) recurring payments; (iii) pay-per-use enabled via pre-authorisation; and (iv) triggering the initiation of a payment from a digital euro account held by another intermediary (payment initiation service). The Eurosystem would expect the list of core and optional services to evolve over time as the market develops new services.

The development of value-added services will be left fully to the market. By way of illustration, value-added services could further enhance end-user experience via services such as delivery versus payment services and splitting payments between multiple payers in P2P payments (“splitting the bill”). The market would be free to develop its own platforms and solutions for these services as the Eurosystem would not play a role in defining rules for them, nor would it foresee specific features in the back-end.

²⁵ The digital euro scheme rulebook would set the different roles taken by supervised intermediaries in the provision of each core service and its mandatory acceptance, depending on intermediary type.

²⁶ Including identification services, data updates, information display on balance and transactions, account recovery, account portability and end-user support.

²⁷ For example, as a result of a consumer returning purchased goods to the merchant.

²⁸ For example, technical standards should be defined by the digital euro scheme rulebook.

3.2 Conditional payments

Within the scope of the digital euro project, conditional payments refer to payments that are instructed automatically when pre-defined conditions are met. Conditional payments are a broad category that includes both optional and value-added services.²⁹

Conditional payments should not be mistaken for programmable money, which has been excluded ex ante for use cases now and in the future. Programmable money would entail units of digital euro being used only to buy specific types of goods and/or services, or to buy them only within a certain period/geography. Programmable money contradicts the guiding principles of the digital euro endorsed by the Governing Council, as convertibility at par with other forms of the currency could not be guaranteed. The Eurosystem has therefore concluded that a digital euro would never be programmable money.

Supervised intermediaries are best placed to develop conditional payment services. Conditional payments are a developing and innovative space in digital payments: supervised intermediaries are aware of the market dynamics and can flexibly respond to customer needs. The Eurosystem could support the development and provision of conditional payment services but intermediaries would always be able to develop their own conditional payment functionalities in digital euro without making use of Eurosystem support.

The Eurosystem intends to support the provision of conditional payments by the market in two ways. First, common scheme standards could be provided via the digital euro scheme rulebook, if requested by the market. Common standards could support intermediaries in the development and execution of their own business logic – either in their individual IT systems or by means of processors they own collectively.³⁰ Second, the Eurosystem could provide additional settlement functionalities in the digital euro back-end infrastructure, notably a “reservation of funds” functionality, which would be necessary for the safe provision of some conditional payment services to end users.³¹

3.3 Cross-currency functionalities

Cross-currency retail payments are transactions between the payer and payee that include a cross-currency conversion as part of the payments chain. This would serve, for instance, use cases of retail international trade and remittances.

²⁹ Examples could include a recurring payment from payer to payee on a specific day of the month selected by the payer, or an authorisation to pay, for example, €100 to a payee on the first day of each month. Another example would be pay-per-use services whereby a payment for goods and/or services is triggered within pre-defined limits set by the payer.

³⁰ Market stakeholders have stressed the need to ensure interoperability between the different conditional payment solutions by including common standards in the digital euro scheme rulebook. These common standards should avoid being too prescriptive, which would limit the capabilities of market participants to create innovative conditional payment solutions. For more information see the [Stakeholders' feedback to the 4th ERPB technical session on the digital euro held on 10 November 2022](#).

³¹ A reservation of funds functionality in the settlement infrastructure is a supporting feature of multiple potentially conditional payment use cases such as payment versus delivery and pay-per-use.

Cross-currency payments often rely on a long chain of intermediaries. As a result, processes are inefficient for the economy, opaque for end users and risky for the financial system. In the light of these obstacles, the G20 has included cross-currency payments in CBDC among the possible solutions to the issue of delivering more transparent and efficient transactions.³² The Eurosystem has taken the international work conducted in the G20 on possible models for cross-currency payments in CBDC as a baseline which is commonly agreed and understood across the central banking community.

The Eurosystem envisages supporting the provision of cross-currency functionalities. The priority for the Eurosystem is to ensure the timely delivery of a digital euro that serves the needs of euro area users. If a digital euro is introduced successfully in the euro area, the provision of cross-currency functionalities could be supported where there are mutual interests with other monetary jurisdictions.

The Eurosystem is investigating approaches that could support the provision of cross-currency functionalities where there are mutual interests with other monetary jurisdictions. There are trade-offs between efficiency gains and complexity for each approach, making them suitable for different currency pairs, as they are not mutually exclusive. The most realistic approach for advanced economies would be to use an interlinking model, linking digital euro and another CBDC system via a set of contractual agreements, technical links, standards and operational components, which would allow participants to transact with one another without participating in both systems. At the regional level, in the EEA a single-system approach relying on a common technical infrastructure hosting multiple CBDCs issued by multiple entities could be valuable. This would require the development of multi-currency capabilities in the digital euro back-end.³³ The Eurosystem is continuing to investigate whether to add multi-currency capability to the digital euro back-end, and is also engaging with other central banks to explore the extent to which other jurisdictions are interested in establishing cross-currency interoperability.

A use case for cross-currency payments would focus on P2P and consumer-to-business payments. Initial cross-currency use cases could include P2P payments in CBDC with foreign exchange conversion and digital euro users purchasing goods and services from an online merchant outside the euro area with currency conversion (i.e. e-commerce) or in-store payments facilitating an omni-channel approach with currency conversion.

³² For more information see [“Options for access to and interoperability of CBDCs for cross-border payments”](#), *Report to the G20*, Bank for International Settlements, July 2022.

³³ The Eurosystem has already accumulated some experience in designing a multi-currency back-end in the context of its TARGET services. It is currently investigating, in partnership with Sveriges Riksbank, whether and how [TARGET Instant Payment Settlement \(TIPS\)](#) could support payment transactions across different currencies. For more information, see [“ECB to explore cross-currency instant payments”](#), *MIP News*, ECB, 6 October 2020.

The third set of design choices endorsed by the Governing Council and discussed in this report will feed into the overall design of the digital euro.

Later in the spring of 2023, the Eurosystem will present a high-level comprehensive design for a digital euro, comprising all the design choices and elements described in this report and in the two previous reports. The design will be discussed with EU policymakers and the relevant market stakeholders. Findings from additional focus group research,³⁴ the prototyping exercise³⁵ and market research³⁶ will provide further input.

In parallel, the Eurosystem is continuing with its analysis of distribution options and the development of a rulebook for a digital euro scheme. The digital euro project presented some core suggested principles for a compensation model³⁷ of a digital euro to external stakeholders for feedback in February 2022.³⁸ Work is also ongoing on detailing a possible rollout approach for a digital euro, including an analysis of the implementation effort and timelines.³⁹ In addition, the ECB appointed a rulebook manager in December 2022⁴⁰ and established the Rulebook Development Group in February 2023.⁴¹ The aim of the Group is to support the drafting of a rulebook for a digital euro scheme, obtain market input and gain an industry perspective.⁴²

The Eurosystem will continue to actively engage with a large number of stakeholders throughout the remainder of the investigation phase.⁴³ This will include dialogue with the European Commission, the European Parliament and the finance ministers of the euro area countries. therein parallel, there will be broad engagement with market stakeholders to ensure that the digital euro meets users' needs.

The Governing Council will review the outcome of the investigation phase in autumn 2023 and will decide, on this basis, whether to move on to a

³⁴ Link to be added once available [report to be published on the same day as this report].

³⁵ See "[ECB selects external companies for joint prototyping of user interfaces for a digital euro](#)", *MIP News*, ECB, 16 September 2022. See also the letter "[Publication of technical onboarding package for digital euro prototyping](#)" of 7 December 2022 from Executive Board member Fabio Panetta to Irene Tinagli, Chair of the Committee on Economic and Monetary Affairs of the European Parliament.

³⁶ See "[Market research on possible technical solutions for a digital euro](#)", *MIP News*, ECB, 13 January 2023.

³⁷ See "[Compensation model](#)", Item 4, 6th ERPB technical session on the digital euro, ECB, 22 February 2023.

³⁸ The Eurosystem believes that the digital euro, as a public good, should be free of charge for basic use by individuals, while the Eurosystem would bear its own costs, as is the case for the production and issuance of banknotes. The Eurosystem believes that the economic incentives for PSPs distributing digital euro should be similar to those for comparable electronic payment options. Ultimately, the co-legislators will determine the regulatory framework for the fees.

³⁹ See "[Rollout approach](#)", Item 5, 6th ERPB technical session on the digital euro, ECB, 22 February 2023.

⁴⁰ See "[ECB appoints Christian Schäfer as digital euro scheme rulebook manager](#)", *MIP News*, ECB, 5 December 2022.

⁴¹ See "[ECB nominates members for the Rulebook Development Group for a digital euro](#)", *MIP News*, ECB, 15 February 2023.

⁴² See "[Rulebook development](#)", Item 6, 6th ERPB technical session on the digital euro, ECB, 22 February 2023.

⁴³ For information on stakeholder engagement see the [ECB's website](#).

subsequent project phase in which the appropriate technical solutions and business arrangements necessary to provide a digital euro could be developed and tested. There would be no decision on the possible issuance of a digital euro until a later stage and this would depend on legislative developments with regard to a regulation to establish and govern essential aspects of the digital euro. Such a regulation would be adopted by the European Parliament and the Council of the EU, following a proposal by the European Commission. The ECB will accommodate any necessary adjustments that may emerge from legislative deliberations in the design of the digital euro.