

Digital euro

ECB Report on the digital euro

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Introduction

Background, digital euro key characteristics and timeline

A digital euro would be a central bank liability offered in digital form for use by citizens and businesses for their retail payments. It would complement cash, not replace it.

- The European Central Bank (ECB) published in October 2020 a **comprehensive report on the possible issuance of a digital euro**¹, prepared by the Eurosystem High-Level Task Force on Central Bank Digital Currency (CBDC) and approved by the Governing Council. A **public consultation was launched on 12 October 2020**, following the publication of the Eurosystem report on a digital euro. The ECB will publish a **comprehensive analysis of the public consultation in the spring**, which will serve as an important input for the ECB's Governing Council when deciding whether to launch a digital euro project.
- The Eurosystem Task Force **identified possible scenarios that would require the issuance of a digital euro**. This report describes the main grounds that might justify the issuance of a digital euro under a set of plausible scenarios and derives scenario-specific requirements that would allow a digital euro to fulfil the stated objectives (e.g. increased demand for electronic payments in the euro area that would require a European risk-free digital means of payment, a significant decline in the use of cash).
- As a consequence of the defined scenarios and associated requirements, **a digital euro** in summary would...
 - ... **still be a euro**: like banknotes but digital.
 - ... be an **electronic form of money issued by the Eurosystem** (the ECB and national CB) and accessible to all citizens and firms.
 - ... **not replace cash**, but rather complement it. The Eurosystem would continue to ensure the access to euro cash.
 - ... be a **risk-free** form of central bank money (i.e. a digital representation of cash).
 - ... **not be a crypto-asset**, due to its nature (i.e. the fact that it is a risk-free liability of the central bank).



1

Introduction

Core guiding principles for the design of a digital euro

Current Eurosystem policies provide some core guiding principles for the design of a digital euro

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1. **Convertibility at par.** A digital euro would be just another way to supply euro, not a parallel currency. It should therefore be convertible at par with other forms of the euro, such as banknotes, central bank reserves and commercial bank deposits.

2. **Liability of the Eurosystem.** A digital euro would be a liability of the Eurosystem and therefore by definition risk-free central bank money, different from other assets (particularly crypto-assets and stablecoins). The issuance and circulation of a digital euro should not create undue financial risks to the Eurosystem. This implies that the amount of central bank money issued in the form of digital euro should always be under the full control of the Eurosystem.

3. **European solution.** The digital euro should be widely accessible on equal terms to prospective users in all euro area countries, and supervised private intermediaries should have the opportunity to use their expertise and participate in the provision of payment services.

4. **Market neutrality.** The prospect of central bank initiatives to issue a digital euro should neither discourage nor crowd out private solutions for efficient digital retail payments in the euro area.

5. **Trusted by end users.** A digital euro must be trusted, just like any other form of the euro, and measures would need to be taken in order to ensure that it was trusted from its inception and that this trust was maintained over time.

2 | Reasons to issue a digital euro

Possible scenarios and implied requirements

The report determines the scenario-driven requirements, which would make the introduction of a digital euro consistent with the fulfilment of the Eurosystem's objectives and the needs of potential users

Scenarios	Requirements that the digital euro should fulfill
1 The digitalisation and independence of the European economy can benefit from a digital form of central bank money available to citizens.	Enhanced digital efficiency. The digital euro should keep pace with state-of-the-art technology at all times in order to best address the needs of the market as regards, among other attributes, usability, convenience, speed, cost efficiency and programmability. It should be made available through standard interoperable front-end solutions throughout the entire euro area and should be interoperable with private payment solutions.
2 The role of cash as a means of payment declines significantly.	Cash-like features. To match the key distinctive features of cash, a digital euro should permit offline payments . Moreover, a digital euro should be easy for vulnerable groups to use, free of charge for basic use by payers and should protect privacy . It should have a strong European branding.
3 A form of money that becomes a credible alternative as a medium of exchange and , potentially, as a store of value in the euro area.	Competitive features. The digital euro should have features which are at the technological frontier . It should offer the basis for providing functionalities that are at least as attractive as those of the payment solutions available in foreign currencies or through unregulated entities.
4 The Eurosystem conclude in the future that the issuance of a digital euro is necessary or beneficial from a monetary policy perspective	Monetary policy option: The digital euro should be remunerated at interest rate(s) that the central bank can modify over time.
5 There is a need to mitigate the probability that extreme events ¹ could hinder the provision of payment services.	Back-up system. If aiming to improve the overall resilience of the payment system, the digital euro should be widely available and transacted via resilient channels that are separate from those of other payment services and can withstand extreme events.
6 The international role of the euro gains relevance as a Eurosystem objective.	International use. The digital euro should be potentially accessible outside the euro area in a way that is consistent with the objectives of the Eurosystem and convenient to non-euro area residents.
7 The Eurosystem decides to proactively support improvements in the overall costs and ecological footprint of the monetary and payment systems.	Cost saving. The design of the digital euro should achieve a reduction in the cost of the current payments ecosystem. Environmentally friendly. The design of the digital euro should be based on technological solutions that minimise its ecological footprint and improve that of the current payments ecosystem.

¹ E.g.: cyber incident, natural disaster, pandemic events.

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Potential effects and risks

Consequences for the balance sheet and the core tasks and functions of the Eurosystem

The digital euro should be designed so as to avoid potential undesirable consequences of its issuance, thereby limiting any adverse effects on monetary policy and financial stability, and on the provision of services by the banking sector, as well as mitigating possible risks

Effects and risks	Requirements that the digital euro should fulfill
1	<p>Effects on the banking sector, monetary policy and financial stability</p> <p>Ability to control the amount of digital euro in circulation. The digital euro should be an attractive means of payment, but should be designed so as to <u>avoid its use as a form of investment</u> and the associated risk of large shifts from private money (for example bank deposits) to digital euro.</p>
2	<p>Impact of a digital euro on the profitability and risk-taking of the central bank</p> <p>As profitability is not, per se, a policy objective of the Eurosystem, these considerations would have no immediate implications for the design of a digital euro.</p>
3	<p>Reputational and other risks</p> <p>Cooperation with market participants. A project to introduce a digital euro should be carried out in line with best practices in IT project management. The digital euro should then be made available on an equal basis in all euro countries through <u>supervised intermediaries</u>, which could <u>leverage their existing customer-facing services</u> and avoid the costly duplication of processes.</p> <p>Compliance with the regulatory framework. Although central bank liabilities are not subject to regulation and oversight, in issuing the digital euro the Eurosystem should still aim at complying with regulatory standards, including those in the area of payments.</p>
4	<p>Effects on the safety and efficiency of retail payments</p> <p>Safety and efficiency in the fulfilment of the Eurosystem's goals. It should be designed in a safe and efficient way. Its project and operating costs should be estimated and compared with the expected benefits, considering alternative solutions in any future scenario. The provision of <u>non-core services</u> should be <u>left to supervised private entities</u>.</p> <p>Easy accessibility throughout the euro area. The digital euro should be made <u>available through standardised front-end solutions throughout the entire euro area and should be interoperable with private payment solutions</u>. It should be easily <u>accessible by anyone</u>, including citizens who currently do not participate in the financial system (for example those who do not have an account at a commercial bank), and should be <u>easy to use</u>.</p>
5	<p>Effects on the cross-border use of the euro</p> <p>Conditional use by non-euro area residents. Specific conditions for access and use by non-euro area residents should be included in its design, to ensure that it does not contribute to excessively volatile capital flows or exchange rates (e.g. limits on or adequate remuneration policies for the holdings of digital euro of non-euro area residents).</p>
6	<p>Cyber risk</p> <p>Cyber resilience. Digital euro services will need to be highly resilient to cyber threats and capable of providing a high level of protection to the financial ecosystem from cyberattacks. In the event of successful attacks, the recovery time should be short and the integrity of the data protected.</p>

4 | Digital euro functional design possibilities

Key dimensions of functional specifications

Based on its possible features, two broad types of digital euro have been identified that would satisfy the desired characteristics: offline and online

Key dimensions	Features
Access model	Directly or through supervised intermediaries.
Privacy requirements	Verification / nor verification of legal identity when accessing services. If users are, different degrees of privacy can still be granted by both the issuer (the Eurosystem) and the providers of intermediary services.
Limiting its use as an investment	Holden amount by individual users would be kept within a range such that the overall value of the digital euro in circulation would remain below an aggregate threshold deemed reasonable. Anonymity would not be possible at least during onboarding.
Restrictions on access to digital euro services	The Eurosystem may want to restrict the scope of individuals/entities that can access digital euro services.
Transfer mechanism	A digital euro could be provided either through an account-based system or as a bearer instrument.
Payment device	A digital euro could be provided as a web-based service and/or through dedicated physical devices such as smart cards.
Availability and usability offline	Offline functionality avoids the sharing of transaction details with parties other than the payer and payee, enabling the digital euro to become a complement to cash and providing a back-up payment solution that is available in extreme situations.
Remuneration	The remuneration of a digital euro could be fixed or variable and, in the latter case, could be linked to other central bank rates.
Legal tender	The decision to assign legal tender status to the digital euro would in practice require that it be usable in any place and under all conditions, to allow the unconditional acceptance of payments.
Parallel infrastructure	A digital euro based on infrastructures existing in parallel to those of other payment solutions could help to resist extreme events.



ONLINE

- Remunerated at a rate that varies over time.
- Advanced functionalities and **value-added services**.
- **Not be tied to any specific device.**
- It would **exclude the possibility of anonymity for users.**

Vs.



OFFLINE

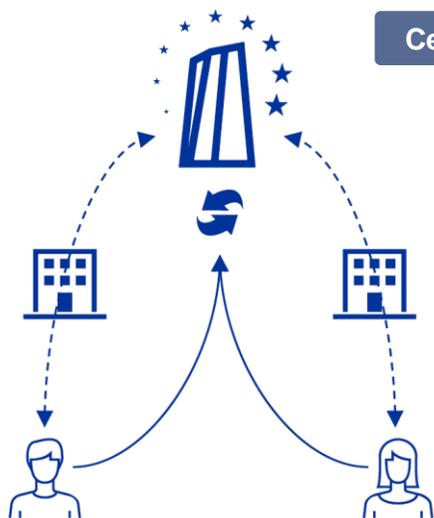
- Remunerated with a fixed and non-negative interest rate.
- It could be used **without third party intervention.**
- Transactions would be **anonymous** in principle.
- The infrastructure would de facto be **parallel to that of other electronic payment solutions.**

5 | Technical and organisational approaches to digital euro services

Back-end infrastructure

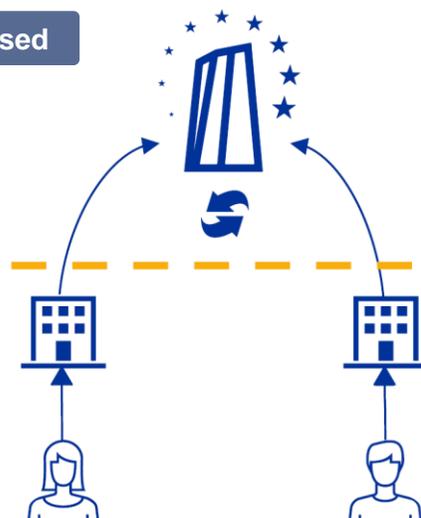
Potential approaches for the back-end infrastructure: centralised or decentralized, combined with direct or indirect access

Direct access by end users to central bank accounts



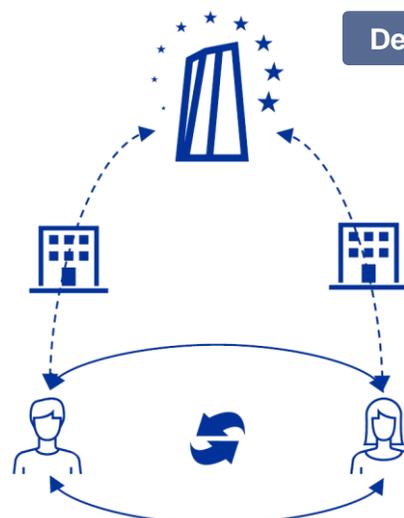
The **Eurosystem**, aided by gatekeepers, would grant end users the ability to directly access and operate accounts on its infrastructure. In this model, the Eurosystem would have **full control over the digital euro** life cycle as it would issue and redeem any unit of digital euro and would process transactions directly via its own infrastructure.

Intermediated access by end users to central bank accounts



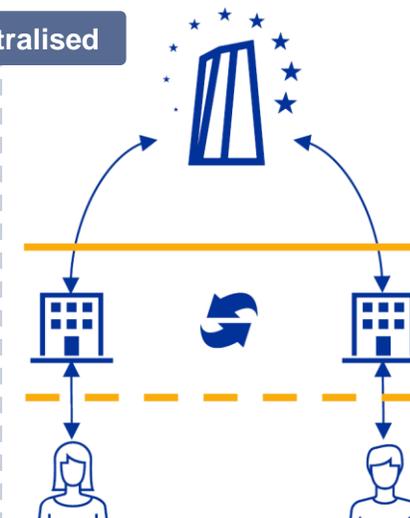
The Eurosystem could continue interacting directly only with **supervised intermediaries**, which would act as settlement agents instructing transactions on behalf of their customers. Digital euro accounts would still belong to the end users and the Eurosystem would retain full control over the life cycle and processing of transactions in real time via its infrastructure.

Direct end-user access to a bearer digital euro



A decentralised infrastructure could allow end users to **transfer holdings of the bearer digital euro among them** with no need to mandate a third party to play any role in the transaction. This approach could be implemented in two ways: either via distributed ledger technology (DLT) protocols or by means of local storage.

Hybrid bearer digital euro and account-based infrastructure



A hybrid decentralised infrastructure could be implemented to enable the use of a **bearer digital euro at the level of supervised intermediaries**, who could act as settlement agents on behalf of their clients for retail transactions in digital euro and also use the same infrastructure for their wholesale payments.