



EUROPEAN CENTRAL BANK

EUROSYSTEM

# Foundational design options for a digital euro

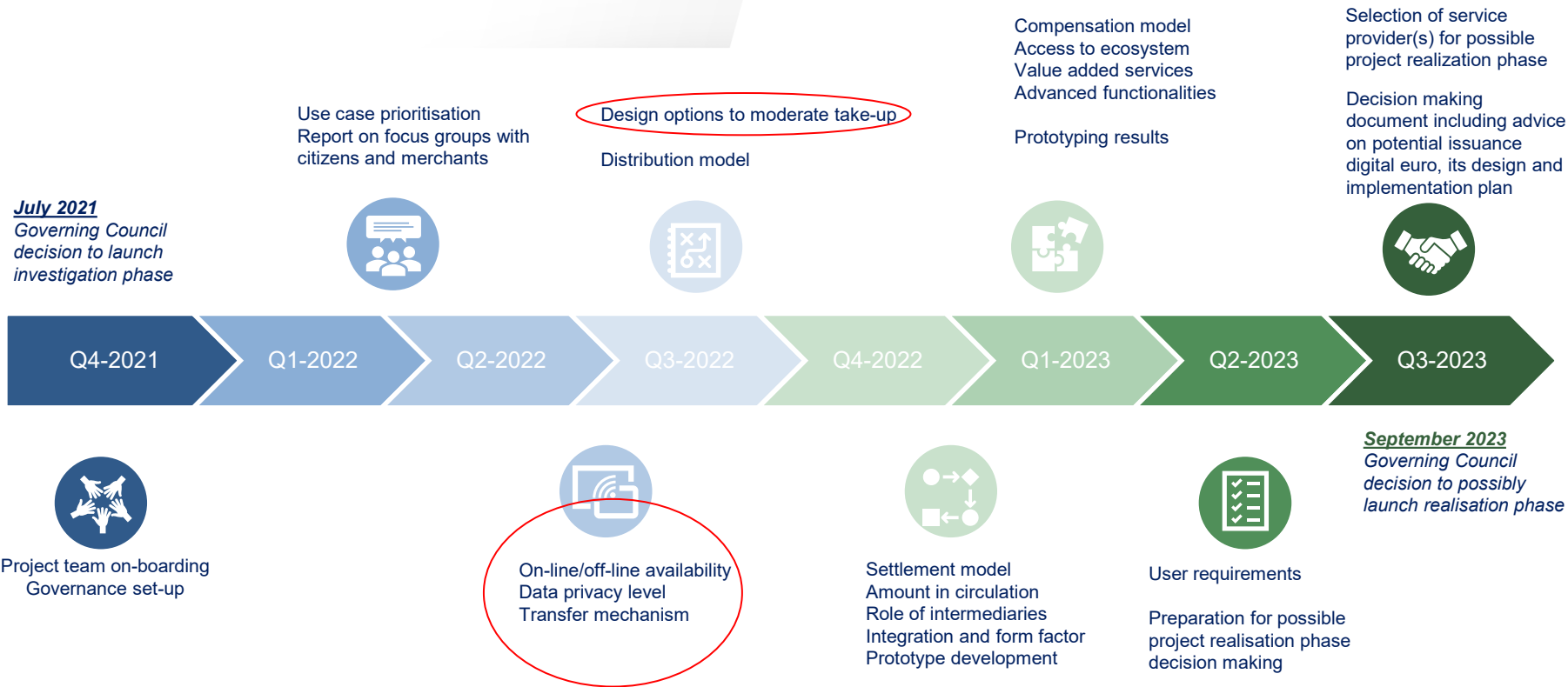
Euro Retail Payments Board  
technical session on digital  
euro

4 May 2022

Digital euro project team



# Digital euro project timeline



Tentative - timing subject to change

# Objective of today's exchange



Present Eurosystem's analysis of foundational design options for a digital euro



Invite **your feedback on design options** identified by Eurosystem (followed by written procedure) as input for Eurosystem preparations of final decisions on these options by Governing Council in autumn 2022

# Foundational design options for a digital euro

# Foundational design options for a digital euro

## 1. Transfer mechanism to settle transactions

- **Third party** would determine, on behalf of the payer and payee, whether a transaction is valid
- **Peer-to-peer** where the payer and the payee would be responsible for verifying any transfer of value between them

## 2. Connectivity

- **Online payment:** the settlement of which requires that either the payer or the payee (or both) connect to a network
- **Offline payment:** that is settled with no need for network connectivity.

3. **Privacy options** enabled by the data elements transferred among actors in digital euro payments

4. **Tools to avoid the excessive use** of the digital euro as a form of investment

	Offline	Online
Third-party validated	Impossible by design	<b>Option 2</b>
Peer-to-peer validated	<b>Option 1</b>	<b>Option 3</b>

Levels of privacy compatible with legislation

Set of tools for remuneration- and quantity-based limits

# Core elements of the three options

## OPTION 1

With peer-to-peer validation of offline transaction

- Peer-to-peer validation of offline transactions via secure hardware devices
- Privacy of low-value proximity payments within limits set by legislation



Closer to cash

*Its technical feasibility and associated legislative framework need to be further assessed*

## OPTION 2

Available online and validated by a third-party

- Third-party validation of online transactions
- Transparency of transaction data to intermediaries for AML/CTF purposes



Closer to digital age

*Solutions to increase its resilience to connectivity outages need to be further investigated*

## OPTION 3

With peer-to-peer validation of online payments

- Peer-to-peer validation of online transactions via secure devices
- Allows remote payments but transactions cannot be checked ex-ante



Experimental

*Experimental solutions, unlikely to be ready for the first release. Thus, not further analysed in this phase*

# Outstanding questions in the programme on the options



How to ensure that the offline option is sufficiently secure? Within which timeframe is developing such an offline solution feasible?



What tools, taken individually and/or collectively, would be effective to avoid the excessive use of a digital euro as a form of investment under different circumstances? Which ones should instead be discarded?



What leeway is available to improve users' privacy under the current legislation? How could payments that can only take place in proximity [like cash] fit within it?

# Feasibility & preliminary conclusions



# Criteria to evaluate the three foundational options

## Desirability criteria


- Coverage of high-priority use cases
- End-user value perception / focus group
- Policy considerations
- Possibility to enable design features (privacy, remuneration tools and quantitative limits)
- Implications for future design decisions
- Dependencies on external stakeholders


## Feasibility criteria

- Technical considerations
- Legal feasibility

# Eurosystem preliminary views

 **A digital euro available online and validated by a third-party is desirable and appears to be the most feasible option in the near future:** it covers the broadest set of high-level use cases, appears able to support Eurosystem policy objectives, leaves room for flexibility in other design decisions related to the digital euro, and its launch would have relatively little dependency on external stakeholders.

 **A digital euro with peer-to-peer validation of offline transactions could be pursued as part of the first digital euro release** because of its policy relevance, but it has strong dependencies on the technological innovation, regulatory framework and the readiness of secure elements to support a digital euro solution

 **Eurosystem will monitor market developments on peer-to-peer validated online payments.** This option shall not be considered for the first release of the digital euro due to technical and legal challenges. The Eurosystem will assess the possibility of its development at a later stage.

# Options for privacy

# Focus on privacy



Privacy is a **fundamental right** and a certain baseline option for a digital euro is mandated by legislation



Digital euro **public consultation** highlighted **privacy as a key concern of future users**



**Focus group research** on new digital payment methods & digital euro showed more nuanced views around privacy in payments

# Preliminary views on privacy



**Full anonymity of users is not a desirable feature** – it would otherwise be impossible to control amount in circulation and avoid money laundering



**Eurosystem shall only be able to see the minimum amount of necessary transaction data** – ranging from no data at all to the strict minimum necessary for validation of digital euro payments if it decides to perform such function



**Anonymised and/or aggregated data on the use of the digital euro should be available to the Eurosystem under any privacy option** – for statistical, research, supervisory and oversight purposes



**Supervised intermediaries shall be responsible for customer onboarding and AML/CFT checks** – building on existing customer relations to be retained



**Key role of European co-legislators** – decision on privacy options

# Privacy options (from user perspective)

**Preliminary view:  
not to be pursued**

## Anonymity

identity of users is unknown when they access services; no KYC during onboarding.

## Non-transparent to third party

KYC during onboarding; **holdings/balances and transaction amounts are not known to intermediary and central bank**

**Currently applicable  
baseline scenario**

## Transparent to intermediary

**KYC during onboarding;** transaction data and users' profiling data transparent to intermediary for AML/CFT purposes

## Selective privacy

KYC during onboarding; **higher degree of privacy for low-value transactions;** large-value transactions are subject to standard CDD checks

**Preliminary view:  
not to be pursued,  
only minimum info**

## Fully transparent to central bank

KYC during onboarding  
all transaction data and users' profiling data fully transparent to central bank

**Preliminary view: beyond the baseline, technical and legal dependencies to be investigated**

**Preliminary view: beyond the baseline, dependencies with legislation to be investigated**

# Exploring options beyond the baseline scenario

## Online



- Customer checks during onboarding
- **Higher degree of privacy for low-value / low risk transactions**
- Implies simplified checks (e.g. specific wallet with lower requirements during onboarding)

## Offline



- Customer checks during onboarding
- **Fully private offline transactions and holdings**, no transparency to intermediary or central bank
- **Only for proximity payments of lower value**



**Higher-value transactions would remain subject to standard controls**

Options for tools to  
avoid excessive use  
as a form of  
investment



# Excessive use to be avoided *by design*

- The digital euro will be designed so as to **avoid potential undesirable consequences** of its issuance. Limiting any adverse effects on:
  - monetary policy
  - financial stability
  - provision of services by the financial industry
- That does not imply the status quo should be maintained, but that any potential **risks should be mitigated in both normal times and financial stress**

# Ongoing work on the impact of digital euro issuance

- The analysis has been focussing on **many dimensions**, for example:
  - Liquidity risk
  - Impact on different banking business models
  - Balance sheet adjustments
  - Collateral availability
  - Central bank liquidity provision
  - Policy scenarios
  - Impact on usability and attractiveness
  - Impact on provision of services

# Remuneration- and quantity-based tools

- Tools merit **further analysis** in view of **limiting the use of digital euro as a form of investment** while supporting its payment function
- Current agreement is to deploy the **widest set of effective tools**
- Aiming at simplicity, in terms of technical implementation and understanding from the public, to **avoid negative user experience/public perception**
- Decision on parametrisation of tools will be taken **only close to possible introduction** of digital euro

# Way forward and discussion

# Way forward

 **Further investigation** on the possibility for **greater privacy of low-risk low-value digital euro transactions and offline functionality**

 Consultation of **Eurosystem committees**

 **Outreach to external stakeholders** on the identified design options



 **Confirmation of Eurosystem views on first set of design options in summer 2022** based on the outcome of Eurosystem committees' consultation, discussions with external stakeholders and additional internal analysis

 **Review of combined design decisions (“Bringing it all together”) in Q2 2023** and feedback by stakeholders on overall design prior to Governing Council decision making in autumn 2023

# For feedback

We invite **reflections on all aspects of the analysis**, including the following questions:

- What are your **views on the three foundational design options** for a digital euro (i.e. offline peer-to-peer validated, online third-party validated, online peer-to-peer validated)?
- What are your views on **privacy options for digital euro payments**?
  - How do you assess **greater privacy for low-risk low-value digital euro transactions** and **offline functionality**?
  - How do you assess the **role of intermediaries in the processing of users' transaction data**?
- What are your views on **tools to avoid excessive use of digital euro as a form of investment**?
  - How do you assess the impact of **remuneration and holding limits** on the usability of a digital euro?

**THANK YOU!**