



National Bank  
of Ukraine

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# E-hryvnia – digital money of the National Bank of Ukraine

## Draft vision of introducing e-hryvnia





## Central bank digital currency definition

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### Ukraine

The definition in the Law of Ukraine On Payment Services:

The e-hryvnia – is an electronic form of the currency of Ukraine issued by the National Bank of Ukraine (NBU)

**E-hryvnia is a cashless form of hryvnia**

**E-hryvnia = NBU's digital money = central bank digital currency (CBDC)**

**Digital money ≠ e-money**

### ECB<sup>1</sup>

Digital form of fiat currency, which is publicly available, is issued by the state, and has a status of a legal tender

### BIS<sup>2</sup>

Electronic form of a national currency unit issued by a central bank, which has a commitment to maintain it

### IMF<sup>3</sup>

Digital form of fiat currency that is issued by a central bank and serves as a legal tender

<sup>1</sup> - European Central Bank [https://www.ecb.europa.eu/paym/digital\\_euro/html/index.en.html](https://www.ecb.europa.eu/paym/digital_euro/html/index.en.html)

<sup>2</sup> - Bank for International Settlements <https://www.bis.org/publ/arpdf/ar2021e3.htm>

<sup>3</sup> - INTERNATIONAL MONETARY FUND <https://www.imf.org/en/News/Articles/2020/10/30/sp103020-new-forms-of-digital-money>



## CBDC's role in the modern monetary landscape<sup>1</sup>

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### The liabilities of the Central Bank

- **Cash** (money in physical form, available for general use)
- **Funds held in accounts with the Central Bank** (cashless with a limited access)

- **CBDC (in addition to cash and cashless money)**



### The liabilities of a private sector

- **Funds held in accounts with commercial banks**
- **E-money**
- **Some stablecoins** (for instance, they are backed by currency valuables in Ukraine). As for stablecoins, an **identified person has some obligations** to fulfill.



### No liabilities

- **Virtual assets** (*excluding covered bonds*)

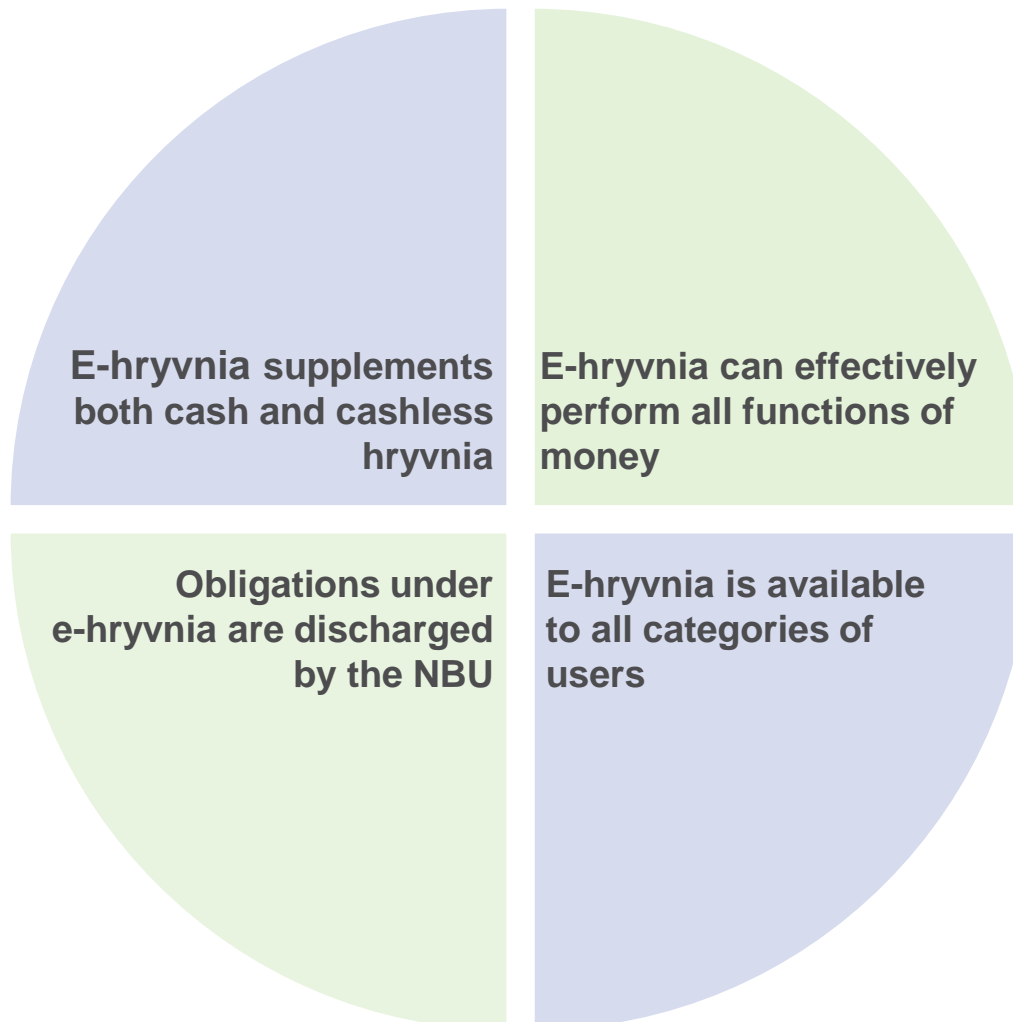
<sup>1</sup> - From ECB's presentation materials

[https://www.ecb.europa.eu/paym/digital\\_euro/investigation/profuse/shared/files/dedocs/ecb.dedocs221017\\_ecbatsibos.en.pdf?447523fb3a77c4c58413c7f3870340da](https://www.ecb.europa.eu/paym/digital_euro/investigation/profuse/shared/files/dedocs/ecb.dedocs221017_ecbatsibos.en.pdf?447523fb3a77c4c58413c7f3870340da)



## **Main e-hryvnia's properties for retail payments**

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## Purpose of e-hryvnia

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### Purpose

- ✓ To evolve Ukraine's payment infrastructure in line with global trends
- ✓ To ensure financial stability and economic security of Ukraine
- ✓ To improve the effectiveness of monetary policy

### Expected impact:

Decreasing the cost of payment transactions for market participants

Reducing the share of cash payments

Improving transparency of settlements

Strengthening the monetary transmission (still considered)

Digitization and development of the economy as a result of the e-hryvnia introduction

Raising trust in domestic currency



## Digital money in Ukraine

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### NBU's current state:

✓ **since 2016:**

a research of digital money has been performed on a regular basis

✓ **2018:**

a pilot project on the issuance of e-hryvnia

✓ **2020:**

CBDCinUA2020 international conference held in Kyiv

✓ **2021:**

survey of the market experts on consumer motivation and demand for e-hryvnia

launch of the E-hryvnia Project in September 2021

✓ **2022:**

the "e-hryvnia" trademark, owned by the NBU, was registered



## International experience. CBDC projects for retail payments<sup>1</sup>

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### A digital euro (ECB)



**Initial research:** 2020

**Technology:** selection is underway

*Distribution through banks*

#### **Current status of the project:**

- studying the effect on market and dissemination options
- addressing the issues regarding limits applied to wallets and to certain types of transactions
- addressing the issues of financial monitoring  
*(amendments to legislation are planned)*

**Decision-making year:** 2026

*No decision on a digital euro issuance yet*

### eKrona (Sweden)



**Initial research:** 2017

**Technology:** R3 Corda platform (DLT)

*Distribution through banks, PSP*

#### **Current status of the project:**

- studying the needs to amend the legislation
- carrying out an economic impact analysis
- testing a technical solution

**Decision-making year:** *No decision on eKrona issuance yet*

### e-CNY (China)



**Initial research:** 2015

**Technology:** Feitian Technologies (non-DLT)

*Distribution through banks*

**Entering test stage:** 2020

#### **Current status of the project:**

- testing the digital yuan (e-CNY) in 10 pilot regions of China
- releasing the e-CNY wallet
- paying taxes with the e-CNY
- rolling out the e-CNY at points-of-sale

**Full-scale issuance year:** 2023

**Currently, about 90% of central banks are considering issuance of CBDCs**

<sup>1</sup> - Information from central banks' websites, IMF, BIS, WB, [www.cbdctracker.org](http://www.cbdctracker.org)



## Road map for E-hryvnia project

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### Theoretical stage

#### Development and approval of the vision:

- Model, design and architecture for launching e-hryvnia
- Accounting model
- Studying the e-hryvnia's impact on monetary policy and financial stability
- High-level business model
- International cooperation

### Preparing Pilot

- Developing NBU's regulations (taking into consideration both legal and regulatory aspect)
- Introducing a technology platform
- Setting up an infrastructure for the pilot project

### Pilot

- E-hryvnia enters a test-circulation
- The digital money has been tested in the open environment
- Project deliverables and effects analyzed
- The conclusions approved

**A decision to issue e-hryvnia was taken**





## E-hryvnia usages

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### **E-hryvnia for retail payments**

with the options for 'programmed' money functionality and targeted social transfers

**E-hryvnia as a  
monetary instrument  
(still considered)**

### **E-hryvnia for circulation of virtual assets**

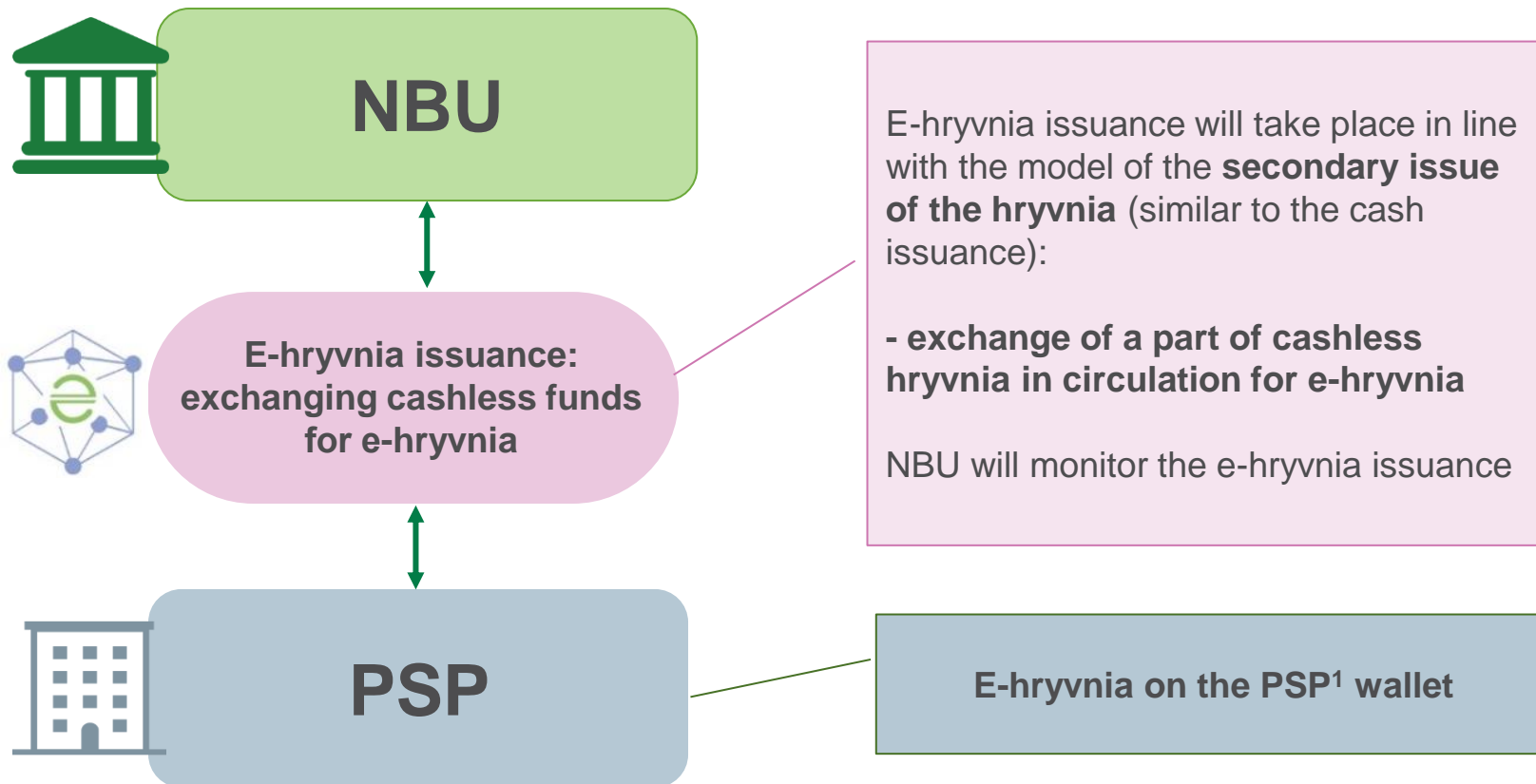
for instance, in the exchange and issuance of virtual assets and in other transactions with these assets

### **E-hryvnia for cross-border payments**



## E-hryvnia issuance

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<sup>1</sup> - Payment service providers



## E-hryvnia: components and functions (1/1)

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### Components

### Functions



#### E-hryvnia platform

E-hryvnia platform is a software suit for issuing and managing circulation of e-hryvnia

- Technology for issuing e-hryvnia
- Opening and operating wallets
- Executing and validating payment transaction (fund flows only within e-hryvnia platform)
- Analytics, automated collection of statistics, providing access for PSP to data, including for the purpose of financial monitoring



#### Wallet

Wallet is an e-hryvnia account

- Item of analytic accounting



#### NBU

Owner<sup>1</sup> and operator of E-hryvnia platform

<sup>1</sup> - joint property with third parties in progress

- Developing methodology (rules and regulatory requirements)
- Control and development of e-hryvnia platform
- Issuing e-hryvnia by exchanging cashless funds of PSPs for e-hryvnia
- Guaranteed e-hryvnia exchange of PSPs and users for cashless hryvnia (claim on)



## E-hryvnia: components and functions (1/2)

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### Components

### Functions



**PSP**

Intermediary between the NBU and user: banks/nonbank financial institutions<sup>1</sup>/Treasury

*<sup>1</sup>corresponding to criteria of E-hryvnia platform set by the NBU*

Cooperation with users:

- KYC, contractual arrangements
- Providing interaction channels for users (app)
- AML (based on the information from E-hryvnia platform)
- Exchanging cash and non-cash of the user for e-hryvnia (*and reverse transactions*)
- Notices of payment transactions



**User**

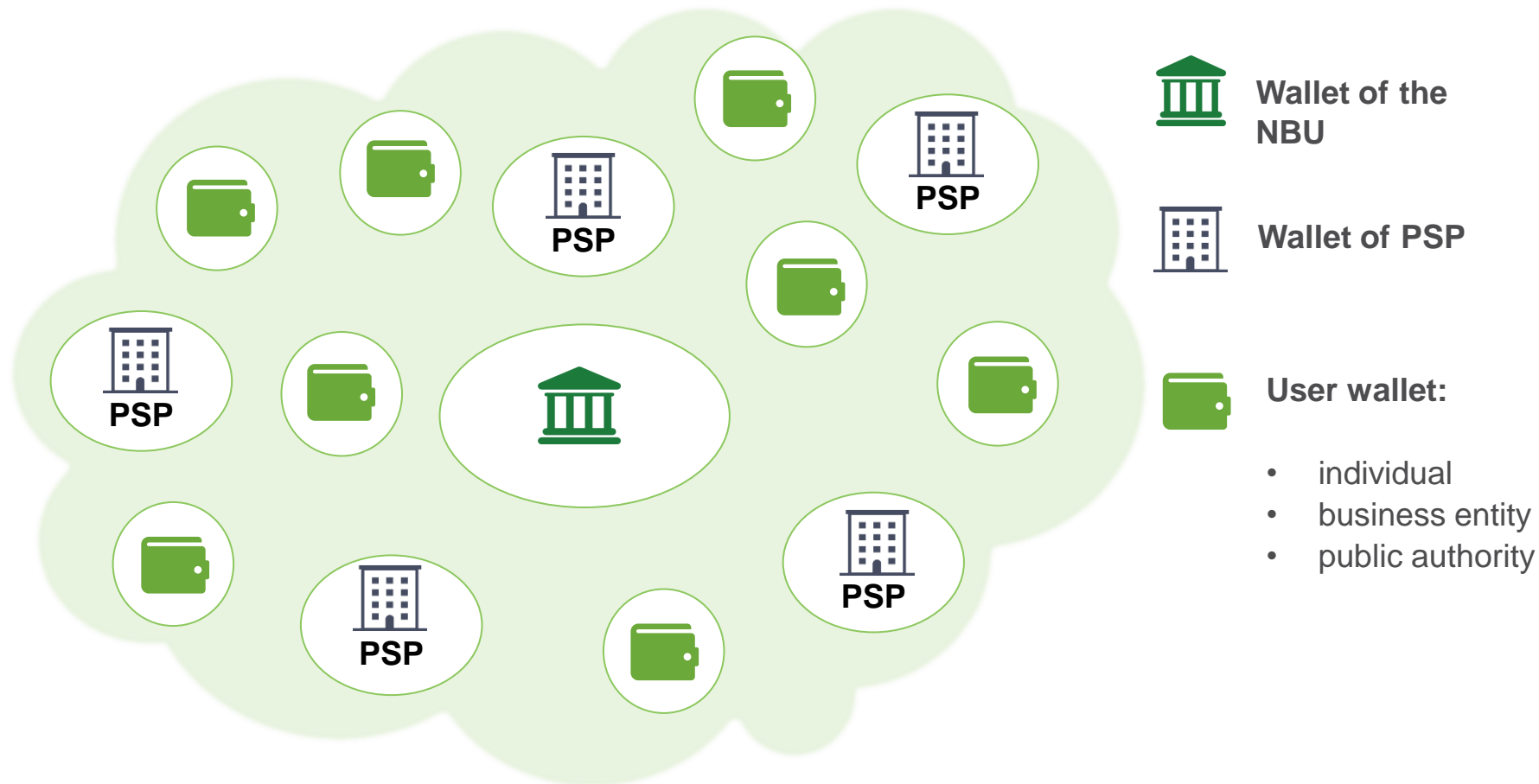
Individual/  
business entity/public  
authority

- Originator of payment transactions and recipient of e-hryvnia (*remittances, purchase of goods and services, etc.*)



## All wallets on E-hryvnia platform

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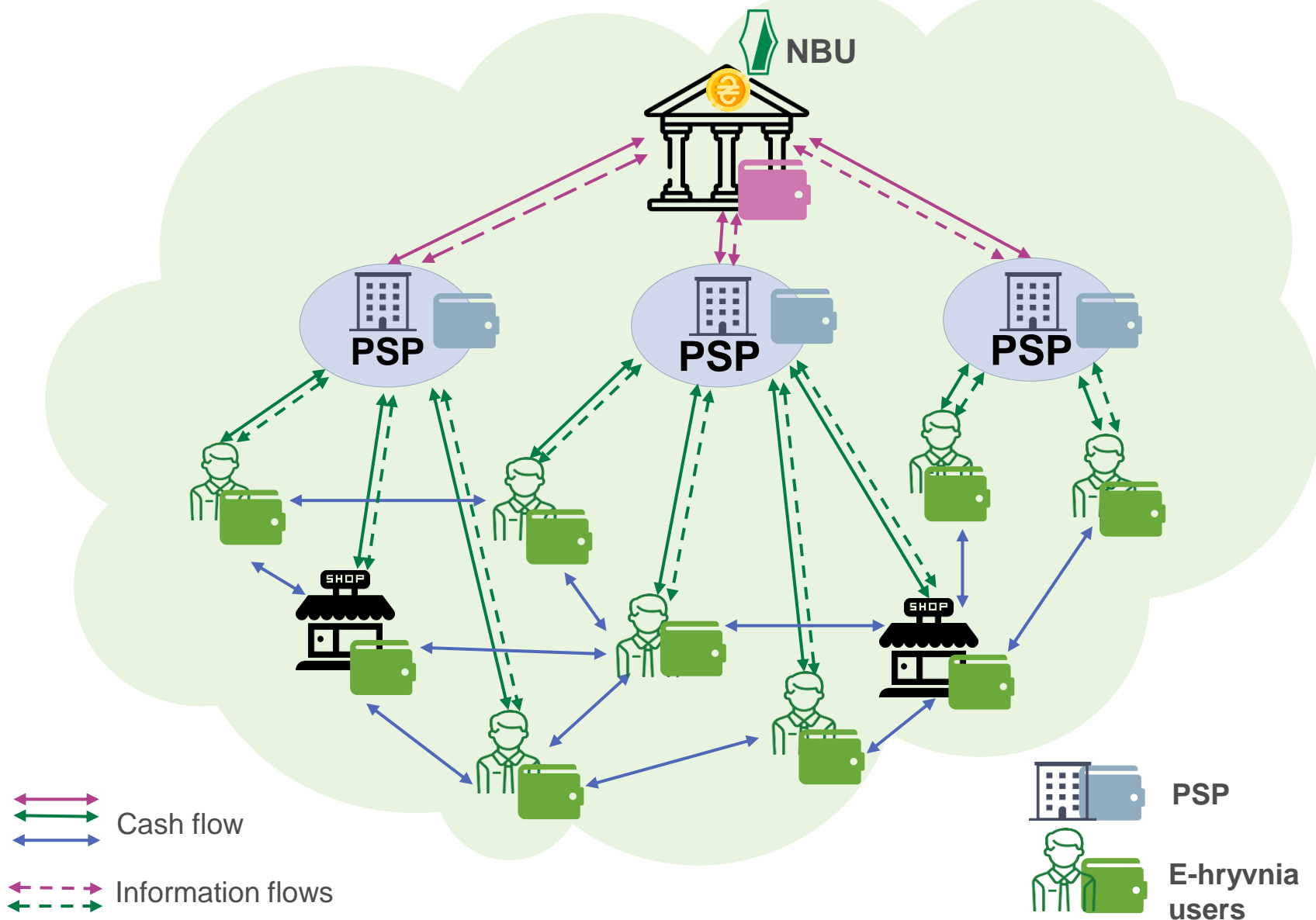


- **E-hryvnia transactions are executed by E-hryvnia platform**
- **All wallets (both of users, and of financial market participants, i.e. PSPs) are at the same level on the E-hryvnia platform**



# E-hryvnia platform: interaction between wallets

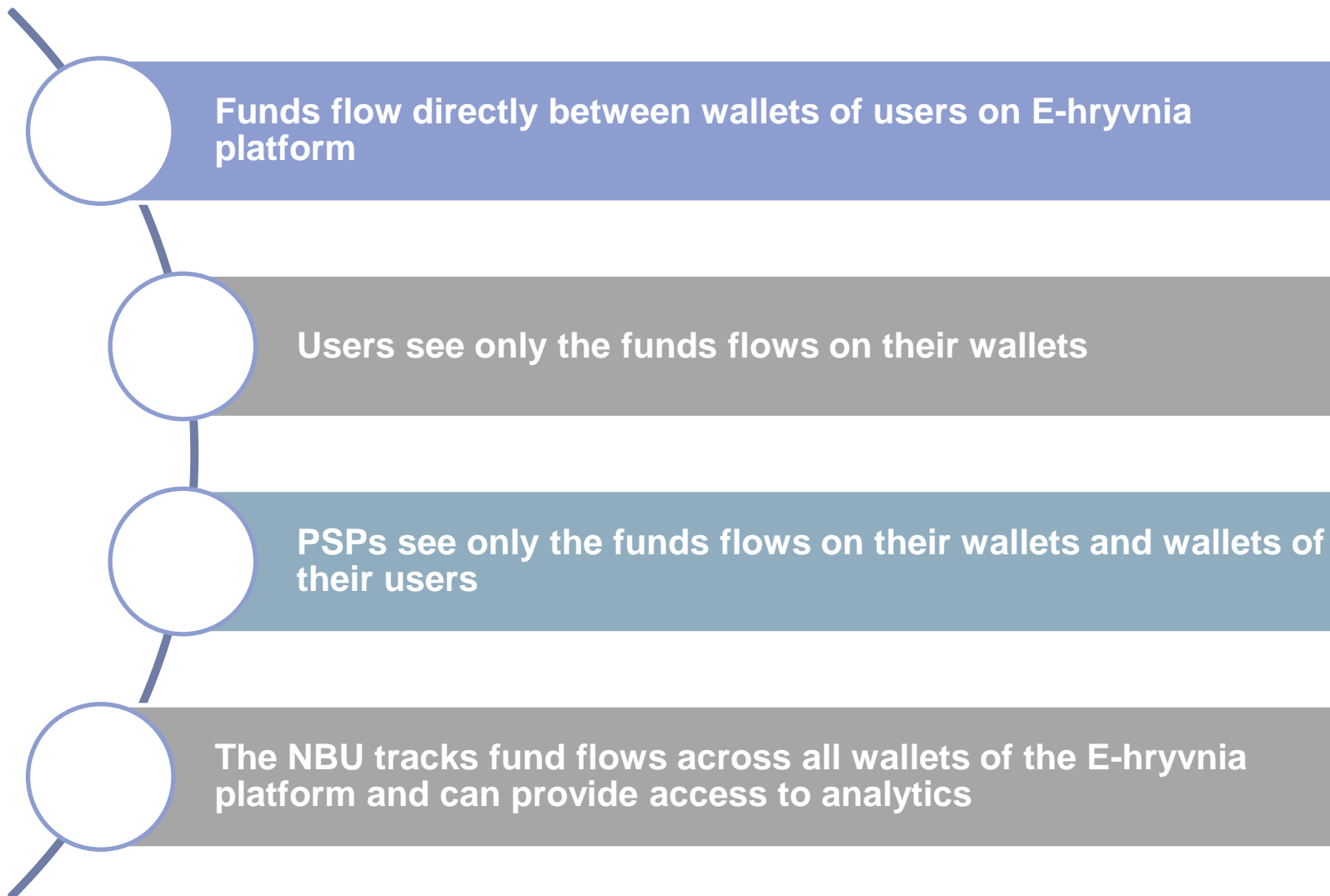
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## E-hryvnia platform architecture

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## Functionalities of E-hryvnia platform

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### Supporting all types of e-hryvnia payment transactions

Immediate crediting of funds

Collecting the analytics

#### Programmability:

- ✓ Smart contracts (including for performing targeted social transfers)
- ✓ Programmed payouts for the benefit of the state
- ✓ Creation of innovative financial products

### E-hryvnia wallets identified<sup>1</sup>

Delivery of toolkit for individual functions of subjects of primary financial monitoring (under consideration)

Integrating with new market participants for **purchasing/selling virtual assets and NFTs (non-fungible tokens)**

<sup>1</sup> - Anonymous wallets with limits are under consideration

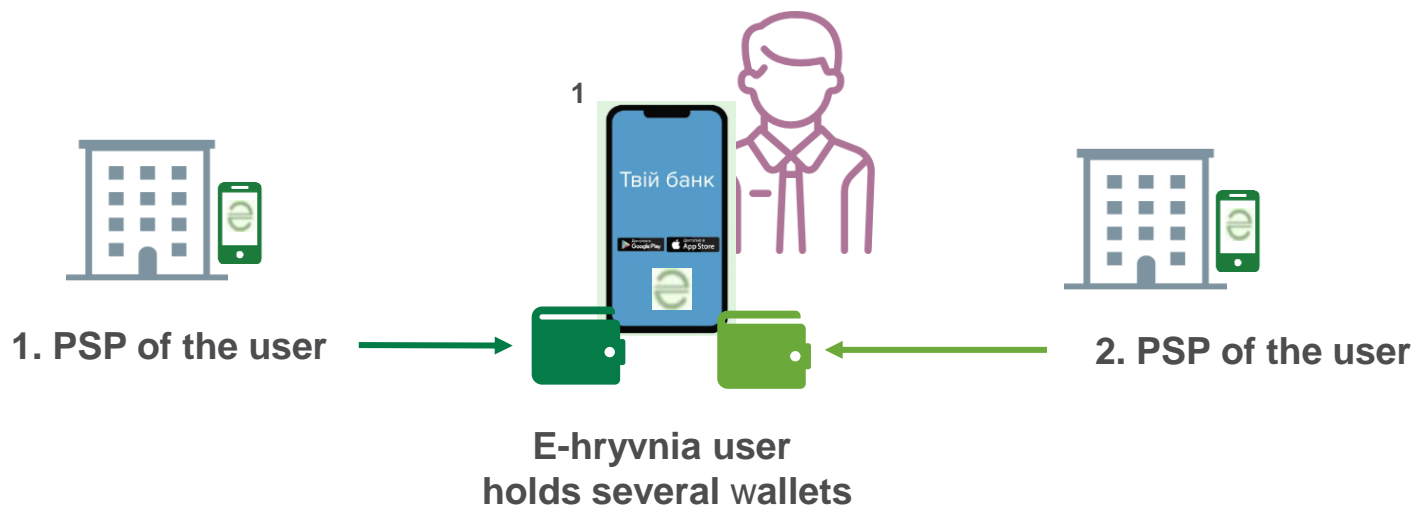




## Access to user's e-hryvnia wallet

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### Access for PSP to their user's wallet



<sup>1</sup> - Mobile/Web app is provided by a respective PSP



## E-hryvnia benefits for PSPs (1/1)

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**Reducing the costs on an IT system** and its maintenance, including transactional business (the NBU owns the system)

Streamlining **performance of individual functions of financial monitoring** by using information from E-hryvnia platform

**Safe delivery** to the user (no need for cash collection)

**No need to physically contact with the user** (remote identification + mobile app) and as a result no expenses on a branch network, payment card logistics

**Income sources are fees and commission (for exchange, wallet servicing)/interest income** (*under consideration*)



## E-hryvnia benefits for PSPs (2/2)

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Creating **new business cases, digital financial services**

Capacity to acquire **new customers**

No need to establish a proprietary PSP network for payments for e-hryvnia users

**Minimum financial risks for PSPs.** No need in additional guarantee deposits as in card payment systems. Obligation is 100% guaranteed by the NBU, which increases trust of the user in the product



## E-hryvnia options = all types of payments

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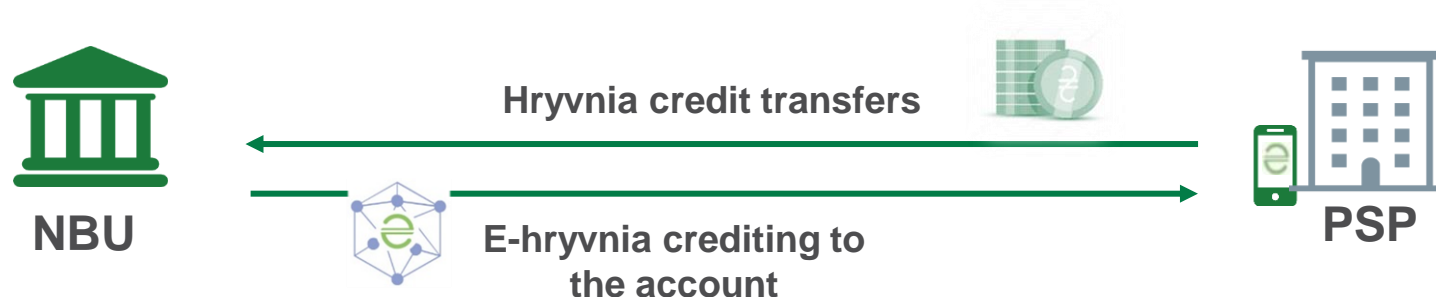


- Exchange: e-hryvnia ↔ hryvnia cash/cashless
- P2P remittances (between wallets)
- Paying for goods and services
- Paying to the state
- Delivering social transfers
- Paying out salary and other income
- Delivering donations
- Accepting deposits and issuing loans, indirectly through exchange for cashless hryvnia (*under consideration*)
- Purchasing/selling virtual assets (*under consideration*)



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## Creating and issuing e-hryvnia into circulation



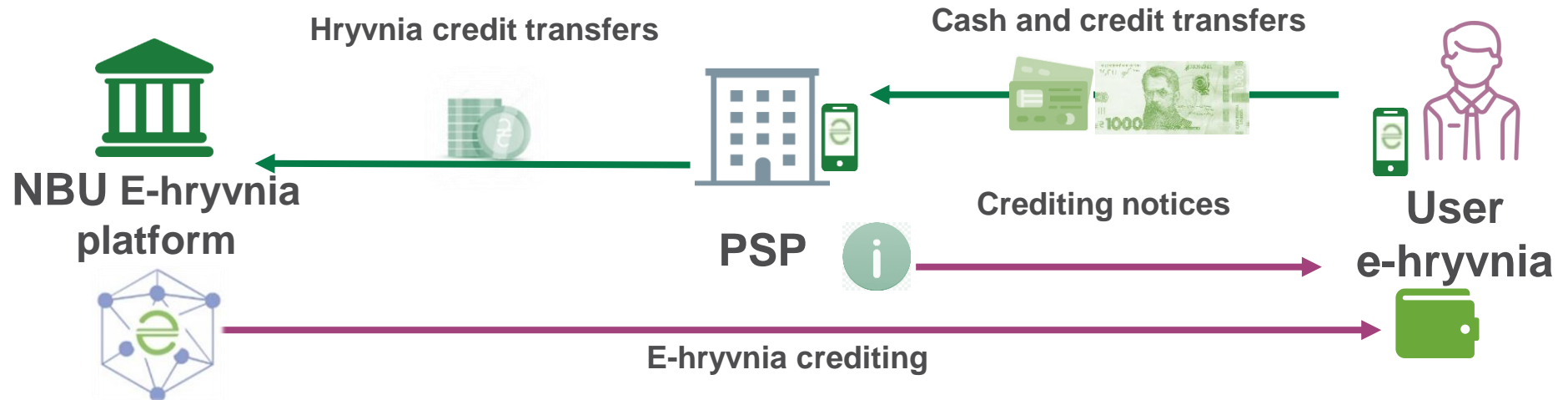
1. Creating e-hryvnia: technology for issuing
3. Opening a wallet for PSP on E-hryvnia platform
5. Credit transfers from PSP
6. Transferring e-hryvnia to PSP wallet

2. PSP authorization in the NBU
4. Credit transfers to the NBU (from a private account)
7. Crediting e-hryvnia to the wallet for further distribution to users or for private use



## Issue part 2: exchanging e-hryvnia for users

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- 4. Opening a wallet for a user on E-hryvnia platform
- 8. Transferring e-hryvnia transfer from PSP wallet to the user's wallet on E-hryvnia platform

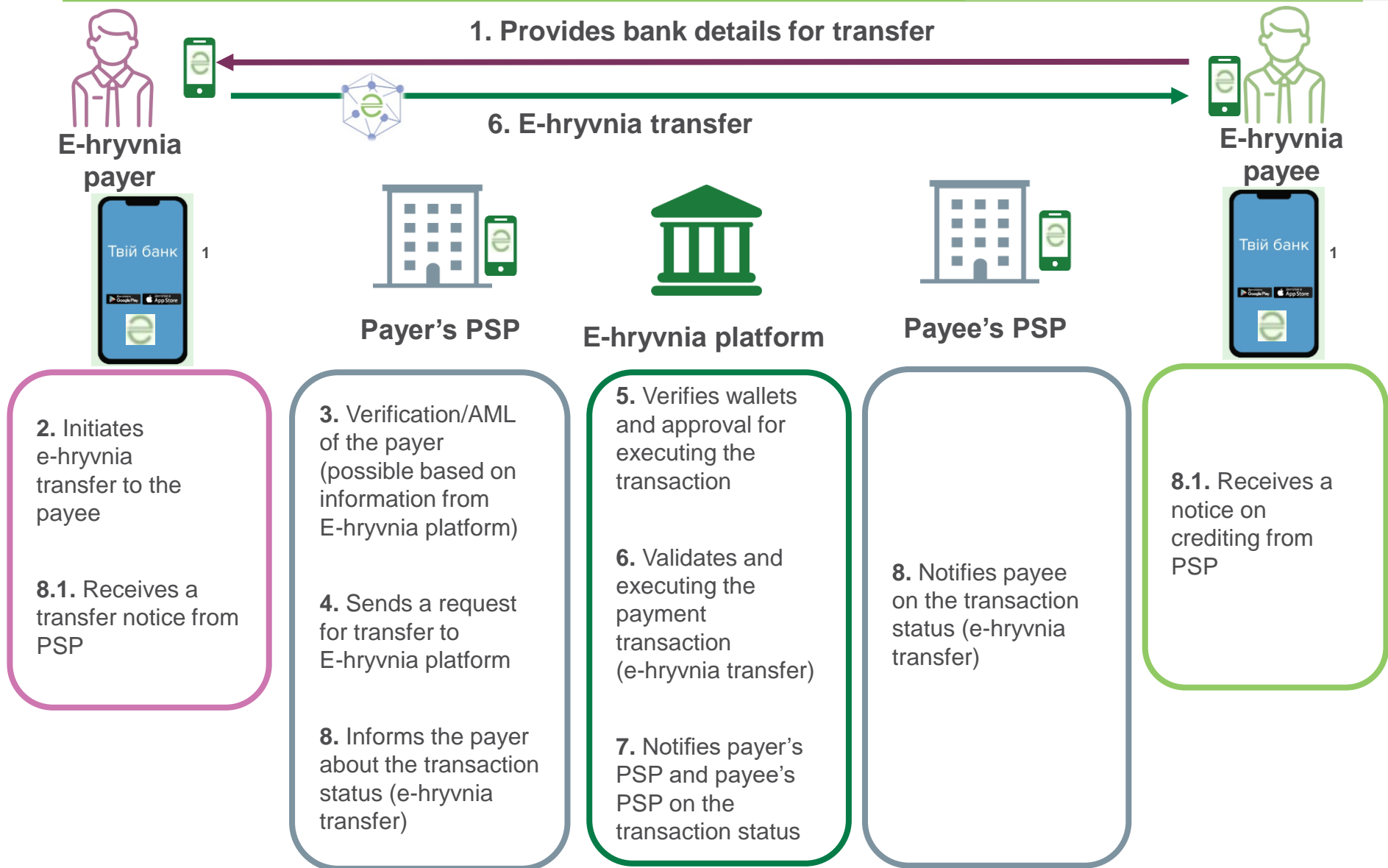
- 2. KYC/AML; user onboarding
- 3. Initiating opening a wallet for a user on E-hryvnia platform
- 5. Notifying the user on opening the wallet on E-hryvnia platform
- 7. Initiating e-hryvnia transfer to the user's wallet from PSP wallet
- 9. Notifying the user crediting e-hryvnia

- 1. Initiating opening and/or replenishing the wallet
- 5.1. The user's wallet opened on E-hryvnia platform
- 6. Transferring hryvnia cash/credit to PSP to purchase e-hryvnia
- 9.1. Crediting e-hryvnia to the user's wallet



# Diagram of e-hryvnia P2P transfer

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<sup>1</sup> - Mobile app/online account is provided by PSP



# Selecting technology for e-hryvnia

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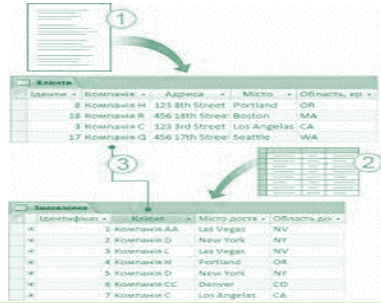
## Technology options<sup>1</sup> for e-hryvnia

1



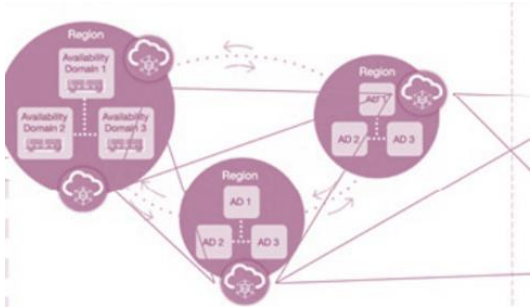
**DLT (distributed ledger technology)**

2



**Conventional database**

3



**Hybrid technology**

<sup>1</sup>The NBU is considering the technology option that will be determined in the future





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**THANK YOU!**