



E-Hryvnia

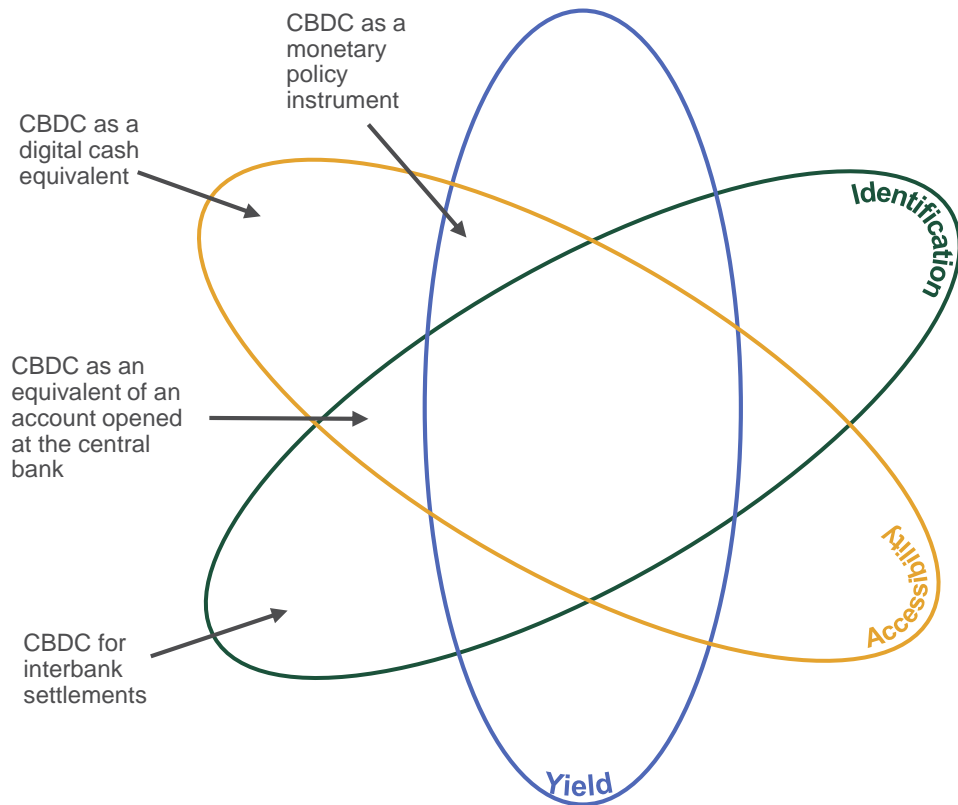
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Kyiv, February 2020



CBDC Flower



E-hryvnia vision – CBDC as substitute to cash



E-hryvnia is a digital currency issued by the NBU



E-hryvnia is fiat digital currency



E-hryvnia is convertible to cash or cashless funds without limitation in the 1:1 ratio

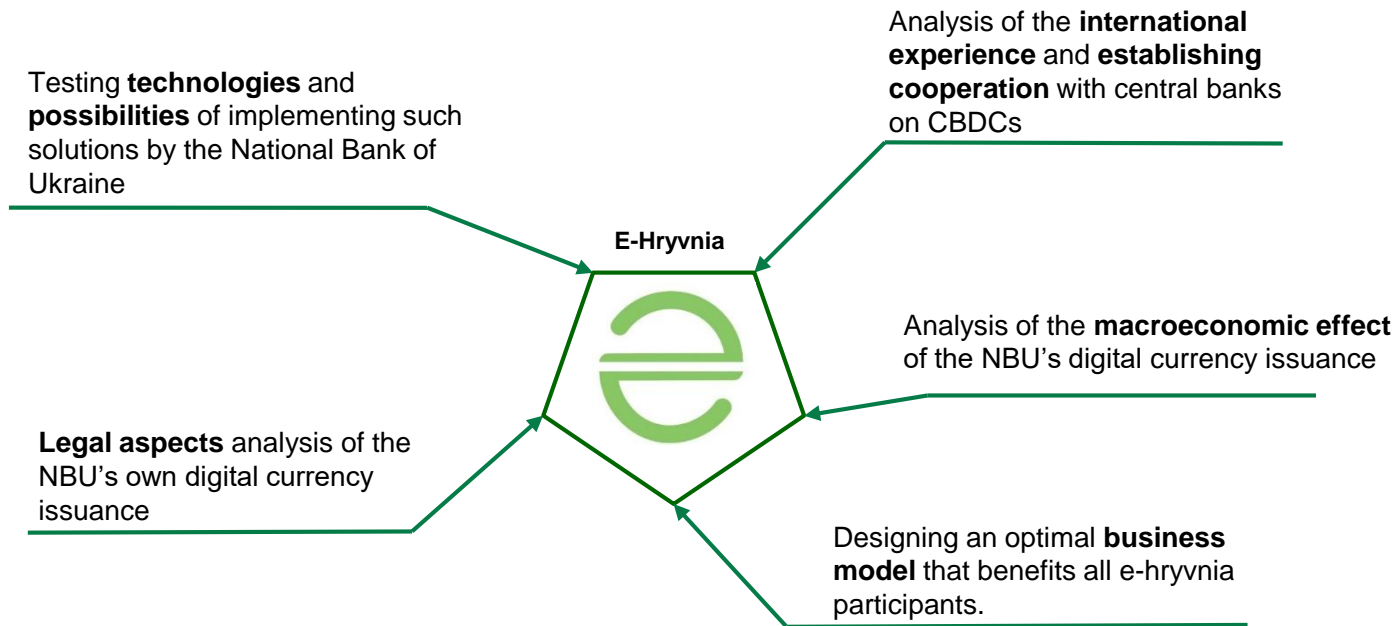


E-hryvnia is not a profitable tool, therefore, it is a means of payment, not a store of value



E-hryvnia can be both anonymous and with user identification, each option has its pros and cons

Purpose of the Pilot project



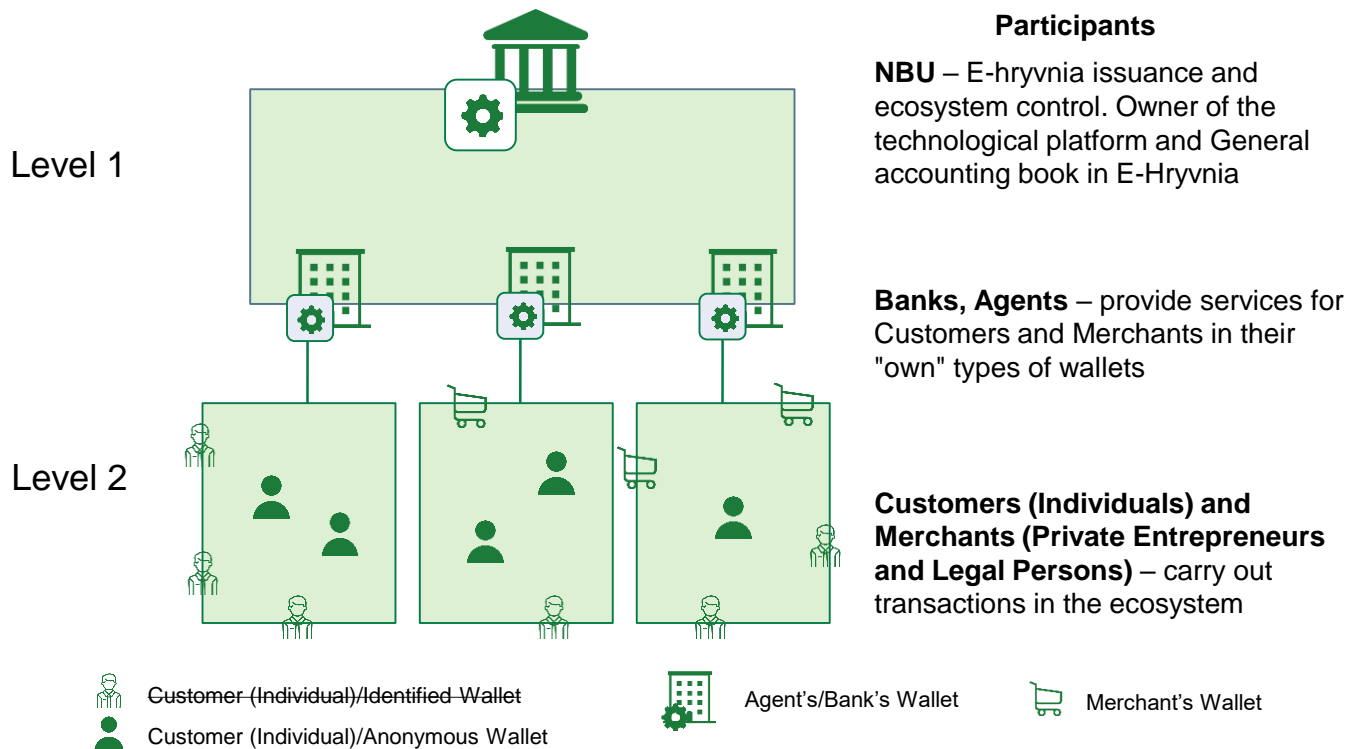
The pilot project on the implementation of the Electronic Hryvnia platform and electronic money of the National Bank of Ukraine (E-Hryvnia) - involves testing an innovative payment solution, created by the team of specialists of the National Bank of Ukraine and volunteers from the IT industry, based on the technology of distributed registers (blockchain) and "PROSTIR" payment infrastructure.

Operations with e-hryvnia

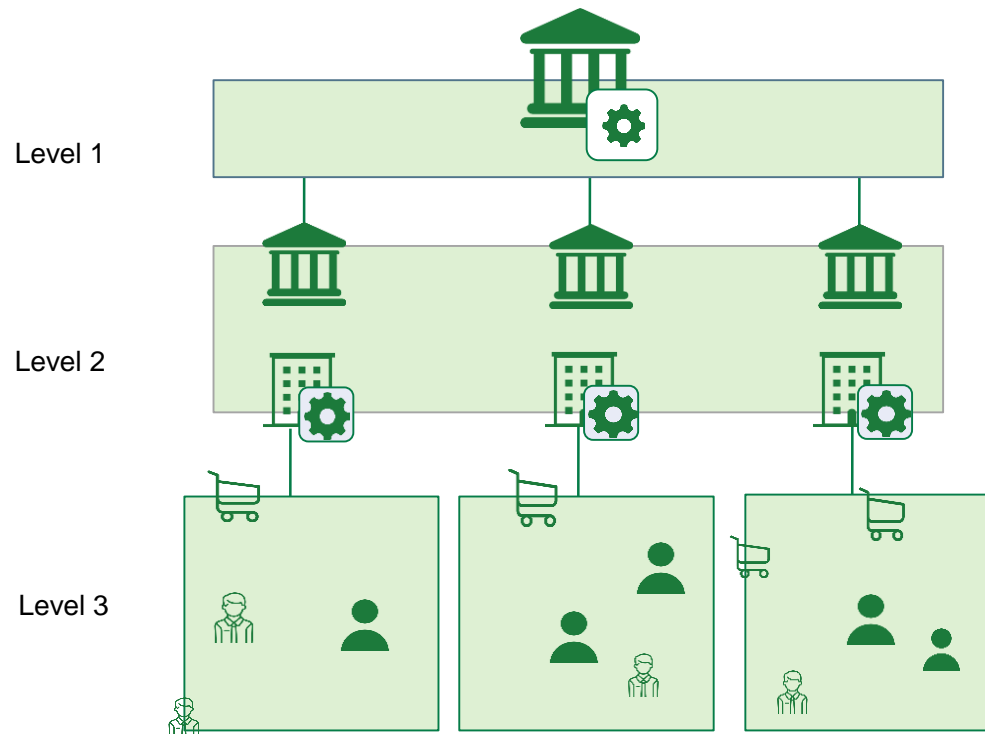
Available operations with e-hryvnia:

- ✓ Creation of e-wallet in web browser
- ✓ Installing the mobile app for Android or iOS
- ✓ Refilling the e-wallet with e-hryvnia, using PROSTIR card
- ✓ Transfer of e-hryvnia to another e-wallet (P2P)
- ✓ Topping up an account of mobile phone (mobile operator LifeCell)
- ✓ Charitable payment with e-hryvnia
- ✓ Repayment of e-hryvnia to non-cash with PROSTIR card

E-Hryvnia centralized ecosystem (tested)



E-Hryvnia decentralized ecosystem (not tested)



Participants:

NBU – ecosystem controller. Owner of the technological platform and General accounting book in E-Hryvnia

Banks, NBFIs, Mobile operators – e-hryvnia issuance

Agents – provide services for Customers and Merchants in their "own" types of wallets

Customers (Individuals) and Merchants (Private Entrepreneurs and Legal Persons) – carry out transactions in the ecosystem



E-hryvnia issuance's Wallet



Merchant's Wallet



National Bank
of Ukraine



Agent's Wallet



Customer (Individual)/Anonymous Wallet



Customer (Individual)/Identified Wallet

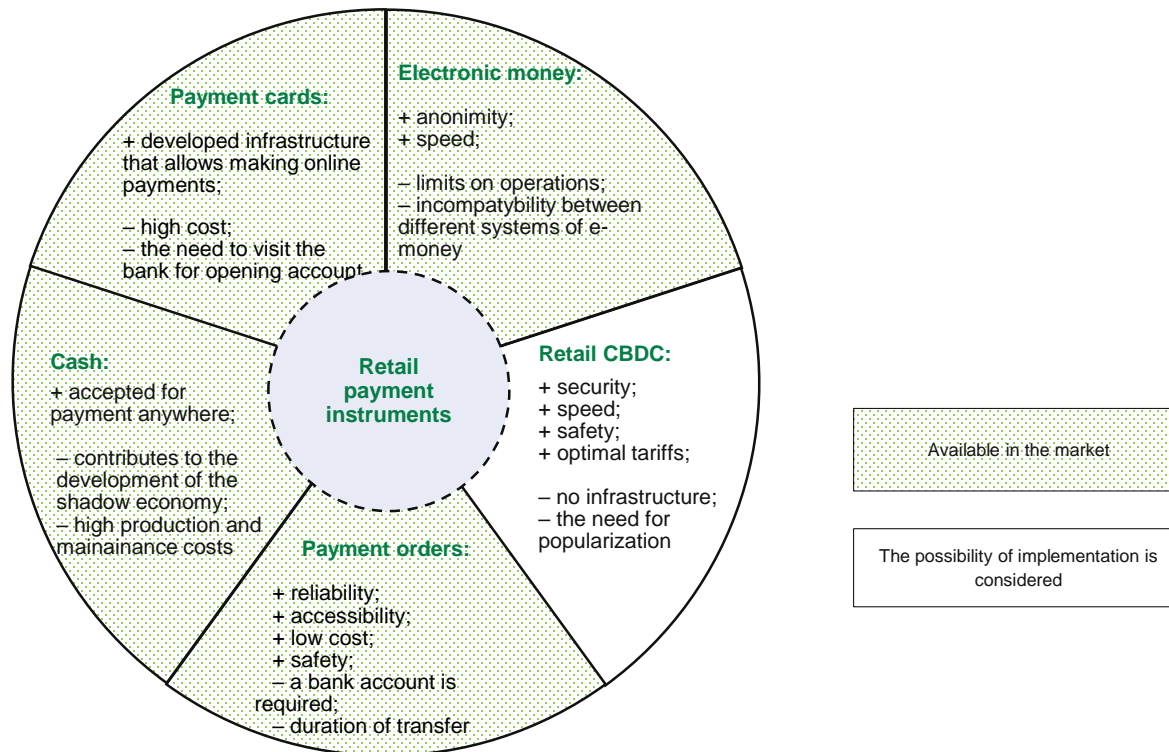
Comparative characteristics of e-hryvnia with other forms of money



Indicator	E-hryvnia Centralized model	Cash	E-hryvnia Decentralized model	Electronic money	Money on accounts
Essence	Fiat currency	Fiat currency	Store of value	Store of value	Fiat currency
Monetary aggregate	M0*	M0	M1	M1	M1
Form of issuance /accounting	Electronic	Paper	Electronic	Electronic	Electronic
Yield	No	No	No	No	Yes
Technology	Databases (1) or DLT (2)	Printing	DLT (1) or databases (2)	Databases (1) or DLT (2)	Databases
Identification	Anonymous, pseudo-anonymous or identified	Anonymous	Anonymous, pseudo-anonymous or identified	Anonymous, pseudo-anonymous	Identified
Limits on retail operations	Yes	No	Yes	Yes	Depends on the operations type
Liquidity	On the NBU	In the households/ banking system/ NBU	In the banking system	In the banking system	In the banking system
Issuer	NBU	NBU	Bank/NBFI under the NBU control	Bank	NBU
Velocity of money	High	Low	High	High	Average

* According to the People's Bank of China, CBDC refers to a monetary aggregate M0

Instruments and means for retail payments in Ukraine



Overall Results of the Pilot Project (1/5)

1

E-hryvnia may become an alternative to existing retail payment instruments and methods – **cash, cards, payment orders and electronic money**. Advantages of e-hryvnia are: usability, safety (payments and exchange are guaranteed by the National Bank of Ukraine), fast user registration, high transaction speed.

2

Considering that the Pilot Project had a limited list of transactions and range of users, as well as small value and volume of transactions, **it didn't allow to fully assess the attractiveness and potential level of involvement of the Ukrainian population** in such kind of instrument. Thus, it is difficult to predict how many Ukrainian citizens will use e-hryvnia.

3

E-hryvnia can be considered as “disruptive technology” as it can potentially significantly **change the ecosystem of the Ukrainian payment market** and redistribute the existing roles of market participants.

Overall Results of the Pilot Project (2/5)

4

The implementation of e-hryvnia will require **significant investments and time to modernize the payment infrastructure for such an instrument**, as the Ukrainian payment market is characterized by high level of competition, concentration and established infrastructure.

5

In order for e-hryvnia to become a truly mass product, there is also a **need for its popularization and promotion among the population**, taking into account existing consumer habits.

6

The implementation of E-hryvnia in the Ukrainian payment market should take into account **the possible introduction of other innovative payment instruments**, including instant payments and new instruments **in frame of the Open Banking concept**.

Overall Results of the Pilot Project (3/5)

7

Distributed ledger technology (DLT, blockchain) can be used as a platform for the issuance and circulation of e-hryvnia. However, **the main advantages of this technology**, namely: the lack of a single trust center and the possibility of checking any transaction by any person **are not used in case of the centralized model of e-hryvnia**. Hence, this technology use is not necessary in case of the centralized model. Above mentioned **advantages** can be used for **decentralized e-hryvnia model** more effectively compared to a centralized model.

8

Tested in the Pilot Project **private version of the blockchain protocol** functioned on a regular basis and after some refinements could be used to ensure the functioning of local e-money systems. **For the national level system, this version can not be used**, since its updating in accordance with the development of the basic protocol is virtually impossible. Instead, national level system can be designed on the basis of one of the public versions of modern "powerful" blockchain protocols.

9

Performing Pilot Projects on volunteer basis, on the one hand, **provided significant cost savings**, taking into account the high cost of software solutions and remuneration of the relevant specialists, and on the other hand, **showed inefficiency**. For external participants activities related with their participation in the Project were not prioritized compared with the main commercial activities.



Overall Results of the Pilot Project (4/5)

10

The business model of e-hryvnia requires further detailed elaboration with the payment market participants. Participants of the Pilot Project and the National Bank failed to reach agreement on the tariff/fee model for E-hryvnia, which would satisfy all parties, during the respective consultations. For the period of pilot testing, zero commissions have been set for all operations with e-hryvnia.

11

The National Bank has shown the ability to implement suchlike projects. The Pilot Project was conducted under conditions of limited human resources with the participation of representatives of eight structural divisions (internal working group of the Project). If the project is reformed on a national scale, significant human resources will be required.

12

The Pilot project used completely **anonymous e-wallets**, but the further development of e-hryvnia could provide full or partial identification of the user in accordance with the KYC principles, also to increase the limits size.

The further introduction of e-hryvnia **should take into account the AML / FATF requirements on the balance limits of the e-wallets and the volume of transactions.**

Overall Results of the Pilot Project (5/5)

13 **The implementation of e-hryvnia** will require **legislative regulation**.

14 **The implementation of e-hryvnia** in the Ukrainian payment market is possible by one of two alternative models (schemes) of interaction with participants: **centralized or decentralized**.
In the case of a decentralized model, e-hryvnia will no longer be a CBDC, since the issue of this digital currency will be carried out not by the Central bank, but by the participants of the payment market under the control of the regulator.
For both models, the question of choosing the optimal basic technology remains open. For a decentralized model, the main benefits of distributed registry technology (DLT) can be used more efficiently than for the centralized one.

15 In the case of the e-hryvnia implementation with **centralized model**, the National Bank of Ukraine will perform non-specific functions – **dealing with individuals** (including KYC, disputes resolution etc).

What may e-hryvnia look like?





National Bank
of Ukraine

Thank You!

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