

CBDC Policy-Maker Toolkit – Worksheets

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Phase 1 – Preliminary analysis

Worksheet for Section 1: Background assessment and project management

The policy-maker can begin the *Central Bank Digital Currency Policy-Maker Toolkit* worksheets by considering the following questions, which correspond with Section 1 of the toolkit.

- What are the institution’s current high priorities and strategic goals related to the retail or wholesale payments system or to central bank digital currency (CBDC) specifically?
- What are the institution’s constraints that could influence CBDC research and development?
- Is there an existing research agenda related to CBDC?
- What is the in-house knowledge, experience and expertise related to CBDC?
- Was CBDC in any form explored or considered in the past? How?
- What are the current positive or negative beliefs related to CBDC?
- Is there demand for and interest in CBDC among other stakeholders in the economy?

Legal and institutional evaluation

- What is the role of the state and central bank in retail payments?
- Is CBDC issuance within the central bank’s mandate? Is it legally permissible? If relevant, are changes possible that would enable CBDC?
- What potential legal roadblocks or regulatory constraints exist?
- Are existing legal and regulatory requirements compatible with the issuance of CBDCs or will different standards need to be developed prior to issuance?

Multistakeholder input

- Which parties in the public or private sector are required to provide input or consultation regarding a potential CBDC or changes in the payments system?
- From which institutions or parties would it be beneficial to solicit input?
- Which additional stakeholders should be represented and involved in decision-making?
- How will coordination between various stakeholders be managed?

Stakeholder matrix

Using the matrix below, identify key stakeholders and their role(s) in the CBDC decision process or how they may be affected by CBDC. Consider this list as you determine stakeholder involvement in CBDC project management, design and development, and deployment.

Note: Blank rows are spaces in which you may wish to add additional stakeholders and roles.

Classification	Stakeholders	Role
Central bank	Central banks	
Financial institutions	Market infrastructure providers	
	Commercial banks	
FinTechs	E-money issuers	
	Payment service providers	
Citizens and the private sector	Citizens/residents	
	Tourists	
	Merchants	
	Corporations	
Regulators and government	Parliament/Congress	
	Ministry of finance/treasury	
	Regulators	
Other	Civil society	
	International organizations	
Additional (complete)		

Project initiation, management and decision-making

- How will the working group managing and designing the CBDC process be identified? Could representatives from across departments and areas of expertise form the working group? How will coordination about the project be managed within the institution?

- What is the strategy and set of rules governing decision-making related to the CBDC?

- How much autonomy does the central bank have in the design, development and deployment of the CBDC? Engagement with parliament, the ministry of finance or other institutions may be desirable.

Worksheet for Section 2: Problem identification and analysis

In this section, the policy-maker identifies the policy objectives CBDC can address and the highest-potential use cases for CBDC.

1. List the major country-specific conditions, issues and limitations that could affect the usefulness or desirability of CBDC. You may wish to refer to the examples in Section 2 of the *CBDC Policy-Maker Toolkit* main document.

Geographic	
Political	
Economic	
Technological	
Other	

Given the conditions and challenges identified above, use the questions below to help determine how compelling and attractive CBDC may be for the economy. To answer the questions in this section, you may wish to conduct additional research and reference information in the Appendix to Section 2 of this toolkit.

Note: The examples in italics below are simply for the reader's reference. You may disagree with their scores or relevance for your economy. Furthermore, you may wish to expand the analysis below to consider a set of problems and solutions rather than a single issue. As in multiple areas of these worksheets, you may customize the approach based on your own interests and needs.

2. List the most important problems or challenges in your economy or payments system that a CBDC could potentially address (considering both the retail and wholesale contexts).

- A. _____
- B. _____
- C. _____
- E. *e.g. Low financial inclusion (low percentage of population in banking system)* _____

3. How valuable or important is it to address these problems, ranked on a scale of 1-10? A score of 1 indicates the problem is minimally valuable to address and a score of 10 indicates it is extremely valuable to address.

- A. _____
 B. _____
 C. _____
 D. e.g. 8 _____

4. How feasible and suitable is CBDC to solve each of the problems identified above?

A score of 1 for feasibility indicates CBDC would be very difficult to implement for this problem and a score of 10 indicates it would likely be very easy to implement. A score of 1 for suitability indicates CBDC would solve very little of the problem and a score of 10 indicates it would likely be very effective to solve the problem.

- | | Feasibility | Suitability |
|----|--------------|--------------|
| A. | _____ | _____ |
| B. | _____ | _____ |
| C. | _____ | _____ |
| D. | e.g. 7 _____ | e.g. 5 _____ |

5. For each problem (A-C), list the highest-potential corresponding alternative solution that could also address the problem, followed by a score from 1-10 on how feasible and effective the solution would be to implement and solve the problem.

- | | Feasibility | Suitability |
|----|---|-----------------------|
| A. | _____ | _____ |
| B. | _____ | _____ |
| C. | _____ | _____ |
| D. | e.g. Nationwide financial education or literacy programme _____ | _____ 7 _____ 4 _____ |

6. For each problem (A-C), average the scores assigned to the feasibility and suitability for the CBDC and for the alternative solution.

	Average of feasibility and suitability of CBDC to address the problem	Average of feasibility and suitability of the alternative solution to address the problem
Problem/challenge A		
Problem/challenge B		
Problem/challenge C		
Example problem D	$(7+5) / 2 = 6.0$	$(7+4) / 2 = 5.5$

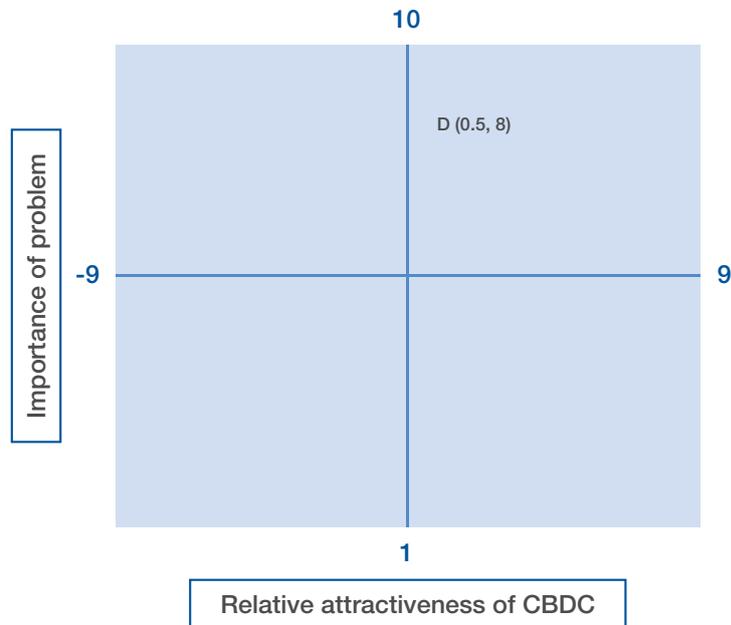
7. Subtract the averaged feasibility and suitability score of the alternative solution from the CBDC solution score (CBDC solution score – alternative solution score). A negative score indicates that the alternative solution is more attractive than CBDC while a positive score indicates CBDC may be more attractive than the alternative solution.

	CBDC solution averaged score – alternative solution averaged score
Problem/challenge A	
Problem/challenge B	
Problem/challenge C	
Example problem D	$6.0-5.5 = 0.5$

8. Compare the rankings and scores to identify where CBDC potentially addresses both a high-priority issue (3 above) while being more suitable and feasible than the alternatives (7 above). On the chart below, plot the importance of each of the three challenges against the relative attractiveness of CBDC to solve the challenge (compared with the alternative solution).

The y-axis corresponds to importance (on a scale from 1 to 10) while the x-axis corresponds to feasibility and suitability of CBDC relative to alternatives in addressing a given problem (from -9 to 9).

- Use cases in the top-right quadrant are very important challenges where CBDC could be beneficial. These may be promising to pursue.
- The top-left quadrant indicates high-priority issues that may be better solved with alternative solutions.
- The bottom-left and bottom-right quadrants indicate low-priority issues that may be better solved with alternative solutions, or solved with CBDC, respectively.



9. After the preliminary analysis above, does CBDC have potential to effectively address a high-priority problem or challenge (top-right quadrant)? Why or why not?

10. List the high-potential CBDC applications or use cases (those located in the top-right quadrant of the chart above):

- _____

- _____

- _____

You may also want to rephrase your findings in terms of policy goals or objectives.

Having identified the high-potential applications of CBDC, which are aligned with the top policy objectives for a CBDC within the economy? (e.g. *addressing financial inclusion challenges*):

- _____

- _____

- _____

If there are no relevant objectives and high-potential use cases for CBDC after the analysis above, the policy-maker may want to consider pausing the evaluation of CBDC. If an appropriate use case or multiple use cases have been identified, proceed to Phase 2.

Worksheet for Section 3: CBDC form

In this section, the policy-maker identifies the most relevant form(s) of CBDC to address the objectives and policy goals identified in Section 2.

Which form(s) of CBDC may be most relevant to address the problems identified in Section 2? (Circle all that apply):

- Retail CBDC
 - Domestic only
 - Cross-border

- Wholesale CBDC
 - Domestic only
 - Cross-border

- “Hybrid CBDC” (also called “synthetic CBDC”)

Why have you chosen these forms of CBDC to pursue? How do they meet the policy objectives and goals identified in Section 2? Include the top advantages, value-add capabilities and efficiency-gains expected from the CBDC:

Worksheet for Section 4: Digital payments ecosystem and landscape evaluation

In this section, the policy-maker considers how the decision to issue CBDC would influence and be influenced by the domestic and international digital payments ecosystems.

- Which important existing and future forces, trends, market participants and services are necessary to monitor and consider? How could these evolve over time?
 - **Example:** Are there any prominent payment service providers (PSPs) or potential market entrants in the economy? What is their role and how could it evolve?

- How would issuing a CBDC influence and be influenced by these market participants, services and forces?
 - **Example:** Which risks could arise in the economy from the CBDC interacting with any of these platforms? Can policies or regulations be designed to mitigate these risks? Would a CBDC inhibit or support private-sector innovation?

- How might “stablecoins” or a foreign-country CBDC that has high domestic adoption influence the economy, domestic currency use or payments?
 - **Example:** Could the usage of domestic currency decline in favour of an alternative digital currency, a stablecoin, or foreign-country CBDC? If so, how exactly?
 - **Example:** How would a significant portion of CBDC being held by a non-bank private institution impact the CBDC (e.g. if it is held as a reserve asset of a widely adopted stablecoin)?
 - **Example:** If a stablecoin becomes widely adopted within the economy, what are the potential effects to residents and the economy?

- What is the potential role of a CBDC in this environment?
 - **Example:** Would it be beneficial if a CBDC served as a counterweight to domestic adoption of a foreign-country CBDC, a stablecoin, cryptocurrencies, or other payment providers and technologies?
 - **Example:** What policies and regulations could complement or serve as an alternative to CBDC to manage these risks?

Worksheet for Section 5: “Hybrid CBDC” evaluation

In Section 5, the policy-maker determines the relevance of privately issued “hybrid CBDC” as a potential alternative to CBDC for addressing policy goals and objectives.

Policy-makers who identified retail CBDC as an area of exploration should consider the following questions:

- Is a privately-issued “hybrid CBDC,” or “synthetic CBDC” as coined by the International Monetary Fund, a potential option for the institution? If so, why, and which policy goals or objectives could it help achieve?
- What value does “hybrid CBDC” offer relative to retail CBDC (including retail CBDC issued via intermediaries in a two-tiered structure), if any?
- Are there statutory or policy constraints that might prevent the central bank from giving access to reserves to non-bank institutions?
- What could “hybrid CBDC” in the country look like? Are there specific types of financial institutions it could make sense to include or not include? What types of oversight regimes and policies could be appropriate?

Worksheet to complete Phase 2: Initial evaluation – Reconsidering CBDC value proposition

Does CBDC remain a compelling value proposition, after considering Sections 3-5? Why or why not? It may also be relevant to revisit Section 3 (CBDC form) after having evaluated “hybrid CBDC”.

If CBDC remains compelling, proceed to Phase 3. If not, consider pausing the evaluation of CBDC.

Worksheet for Section 6: Operational risks and financial inclusion in retail CBDC

In Section 6, the policy-maker considers risks associated with retail CBDC for end users, such as network failure and operational risks, cybersecurity risks and financial exclusion risks.

- If retail CBDC is under consideration, list the most important direct risks to citizens that it could introduce in your economy, including the examples listed in the toolkit, where relevant. List at least five risks:
 - 1.
 - 2.
 - 3.
 - 4.
 - 5.
- What policies and mitigating strategies must be developed for the risks identified above?
 - 1.
 - 2.
 - 3.
 - 4.
 - 5.
- What measures will be taken to ensure broad accessibility to the CBDC and financial inclusion and to ensure the security of the system?
- What other considerations can be made to protect citizens from operational, security and financial exclusion risks related to the CBDC?

Worksheet for Section 7: Data protections and compliance for retail CBDC

When introducing a retail CBDC, the issuing central bank must consider the possibility of large-scale adoption and use, and the data privacy and compliance challenges CBDC may present. It must balance user data privacy goals with anti-money laundering (AML) and countering the financing of terrorism (CFT) requirements and the need to limit illicit activity within the CBDC system.

- What policies need to be created to protect user data privacy?
- Should there be a user data charter or framework?

- The following questions should be considered alongside any retail CBDC development:
 - What customer data should be gathered from the CBDC?
 - Which cybersecurity and resilience policies must be put into place to support safe customer data storage and management?
 - How will users be protected from data privacy violations? Specifically, how will the solution protect against unauthorized access, acquisition, leak, alteration, loss, disclosure or destruction of user data?
 - Through what mechanisms will users be able to dispute the accuracy of data; object to how their data is collected, used or shared; correct erroneous data; and/or delete records if required?

- What design choices need to be considered to facilitate user data privacy protections? (see also Section 9)

- How can compliance support financial inclusion while maintaining adequate protections?

- With which regulatory and law enforcement organizations will unusual operations be reported? When and how will these operations be reported?

- Does the central bank have a proper record retention policy in place to meet requests by customers and appropriate third parties? If not, what would be required to implement one?

- Would the central bank have adequate risk management frameworks implemented to support a retail CBDC, consisting of appropriate policies, monitoring and auditing functions? Who would be the auditor?

- How will the central bank interact with other stakeholders such as commercial banks for sharing customer CBDC information securely while maintaining privacy?

- Should payments under a certain amount to or from a CBDC account be exempt from compliance requirements? What would the payment thresholds for compliance and reporting be, if any?

- To what extent could CBDC support AML, CFT, know-your-customer and other regulatory and compliance goals related to constraining or reducing illicit payments or identifying perpetrators?

- How will the central bank adhere to applicable tax regulations? For instance, should income from CBDC deposits (if any) be reported to relevant tax authorities?

Worksheet for Section 8: Evaluation of macroeconomic and financial risks and opportunities

Next, the policy-maker should evaluate the key macroeconomic and financial risks and opportunities that a CBDC presents.

- What important macroeconomic and financial opportunities and policy objectives could this form of CBDC enable in the economy? List the top goals or opportunities for the CBDC with respect to macroeconomic and financial policies, including those identified in Section 2.
- Which macroeconomic and financial risks is it important to consider?
- Which policies or strategies need to accompany CBDC to mitigate the identified risks?
- Who will have access to the CBDC, in terms of domestic and foreign citizens and financial institutions? (see also Sections 3 and 9)
- What is the anticipated effect on commercial banks? How are the roles and business models of banks expected to change after CBDC is deployed?
- Which additional types of firms would be positively or negatively affected by CBDC?
- What are the anticipated effects of CBDC (interest-bearing or not) on monetary policy?
- What would the implications of CBDC be for the domestic political environment, government institutions and geopolitics?
- Which macroeconomic policy decisions should be made with respect to CBDC?
 - Will CBDC be used to implement monetary policy goals and, if so, how? Will a retail CBDC be allowed to implement negative interest rates?
 - Will any significant cash policies be implemented alongside CBDC issuance?

- Should there be lending activity associated with a retail CBDC? Why or why not? (see also Section 9)

- How would a CBDC interact with existing policies related to international capital mobility?

- Which additional macroeconomic policy decisions or risks is it important to consider?

Worksheet to complete Phase 3: Risk evaluation – CBDC risk–benefit analysis

Revisit the objectives of CBDC identified in Phase 1.

- List the top policy objectives for a CBDC within the economy from Sections 1-2:

1. _____
2. _____
3. _____

- Does the CBDC form identified above in Phase 2 correspond with these objectives? Why or why not?

- What are the most important associated downsides and risks, considering all the relevant factors? (consider the responses in Sections 6-8):

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

Are the resources and capabilities sufficient to address and mitigate these risks and downsides? How will the risks be addressed?

Do the advantages CBDC can provide in meeting policy objectives outweigh the downsides and risks? You may wish to use the chart below to help answer this question:

Policy objective or goal	Top downsides and risks	Can these downsides be effectively addressed?	Do the benefits of CBDC outweigh the risks?

If the advantages of CBDC do not outweigh the downsides and risks, consider pausing or stopping the evaluation of CBDC. If they do, consider revisiting Section 3 (CBDC form), if relevant. Once this is complete, proceed to Phase 4.

Phase 4 – Designing

Worksheet for Section 9: CBDC design elements

In Section 9, the policy-maker identifies the critical design elements for the targeted CBDC and the challenges identified in the preceding sections.

Indicate the design choices for each parameter below, along with the rationale and any relevant additional information and considerations. Justify design choices based on the goals, constraints and risks identified in the preceding sections of this toolkit:

Availability/access	
Custody and storage	
Anonymity	
Account and transaction limits Interest payments	
Conversion and redemption rates	
Settlement times and finality	
Programmability features	
Lending activity	

Worksheet for Section 10: Technology choices, considerations and risks

After the target CBDC solution is fully defined, the policy-maker can investigate and identify the most suitable technology to deliver the CBDC, considering the following questions:

- Which core functionalities should the system provide?

- Which additional functionalities should the system support?

- Which characteristics are priorities? Select all that apply and describe relevant requirements:
 - Transaction scalability and performance
 - Privacy and confidentiality of transaction information
 - Transaction finality
 - Interoperability with existing payment systems and infrastructure

Based on this information:

- What are the trade-offs, pros and cons associated with various technology options or solutions under consideration?
- If distributed ledger technology is considered, which institutions or stakeholders would serve as the validating nodes? Which platform and consensus algorithm would be the most suitable, and why?
- Which technology providers, services or experts can support implementation?
- After considering the initial points above, which technologies and solutions appear most suited, and why?

Cost assessment:

- What cost constraints exist for the CBDC implementation? (revisited from Section 1)
- How much will it cost to implement this target technology? Is it within budget?
- How much ongoing maintenance will be needed with this technology and what are the associated costs?

Cybersecurity and resilience:

- How cyber-resilient is the platform, and why? What are the CBDC's cybersecurity vulnerabilities or "attack surfaces"?
- What level of cyber-resilience is required? How can the system's cyber-resilience be studied and tested?
- Which cybersecurity standards and best practices must be identified to reduce cyber risks?
- What are the ongoing cybersecurity monitoring requirements for the implementation of this technology? How will monitoring and upgrades be conducted so as to be minimally disruptive?

Additional considerations:

- How can vendor lock-in be avoided?

- How much has this technology been deployed and tested in the world? Is there sufficient software-developer availability and expertise to support the platform?

- How easily will this technology interoperate with existing and future financial systems?

- What are the ongoing monitoring requirements of this technology?

- How will the CBDC be minted (digitally created)?

You may wish to use the chart below to illustrate the key considerations for various CBDC technology options or recreate the chart with the most important technology considerations:

Technology	Scalability and throughput	Network and cybersecurity	Privacy	Ease of integration	Cost	Transaction finality
<i>(potential technology platform)</i>						

Worksheet for Section 11: Governance

Section 11 identifies key governance issues the policy-maker should consider when designing a CBDC. It is not exhaustive, and additional governance issues and requirements should be considered. The checklists below list the governance issues concerning CBDC identified in Section 11.

You may wish to answer each of these questions in a separate document and use the checklists to indicate when each issue has been evaluated.

Legal evaluation

- Which requirements with respect to laws and legal supervision exist? Do any legal frameworks need to be adjusted to support the objectives and requirements of CBDC?
- Would a retail CBDC be politically feasible? How might political limitations affect CBDC design? (For instance, would a negative interest rate on retail CBDC be politically tenable?)
- Is cooperation with legislative institutions appropriate?
- How will public interest in CBDC be assessed?
- Should there be any special consideration if there is an upcoming election cycle?
- Are CBDCs compatible with existing financial market infrastructure (e.g. the rulebooks of payment and settlement systems) and what legal validation must take place to ensure that transactions on financial market infrastructure are legally enforceable?
- Are there additional requirements and standards that custodians and intermediaries would need to comply with in relation to CBDCs (e.g. with respect to standards around safeguarding private keys, secure storage, etc.)?
- How would CBDC be treated from a prudential regulation or regulatory capital perspective? Are there prudential risks over and above those relating to traditional fiat currencies that must be considered?

User engagement

- How can end users (the public, commercial banks, etc.) be consulted on the CBDC concept and provide input on the design and testing process?
- Which solution requirements exist for usability, user interfaces, identity and key management, privacy and security?
- It could be valuable to provide a user guide or FAQs to various classifications of participants, with educational resources and background information on how to successfully engage with the CBDC.

Financial management

- How will financial management and monitoring for the project occur?
- What costs, if any, might private entities incur in providing the CBDC, and who is responsible for managing those costs?
- What additional considerations related to financial management must be determined for a CBDC deployment?

Identification of performance criteria

- Which relevant performance criteria and success indicators or metrics can be identified for the CBDC deployment?
- What will the monitoring and evaluation process for the deployment be? At which frequency will this monitoring occur?
- What will the user feedback and testing process entail? Will it happen before or after implementation?

CBDC termination

- Should a termination plan or process be identified before CBDC deployment?
- If so, what conditions would indicate that the CBDC programme should be terminated?
- Which obligations would need to be met before termination in order to reduce disruption and risks to users?
- How can the safety of public CBDC savings be ensured?
- How would CBDC be destroyed? Under what circumstances?

Additional considerations

- How will the environmental impact and footprint of the CBDC be monitored, evaluated and controlled?
- Can a third party such as a law enforcement institution freeze CBDC account assets, and under what circumstances?
- What additional deployment risks and unintended consequences must be considered?
- What additional governance issues must be considered?

Worksheet to complete Phase 4

Verify the following steps have been completed before proceeding to Phase 5. Where something has not been completed, please revisit the corresponding section and phase.

Phase 1

- Identification of target objectives
- Identification of initial stakeholders

Phase 2

- Identification of target CBDC form and evaluation of “hybrid CBDC” alternative for retail CBDC

Phase 3

- Identification of key economic, financial, technological and social risks
- Consideration of data privacy policies for retail CBDC
- Consideration of compliance and regulatory requirements

Phase 4

- Outline of design parameters
- Establishment of technology choices and requirements
- Establishment of cyber-resiliency requirements and strategy
- Delineation of governance policies: user engagement strategy, financial management, monitoring, termination and risk management strategies

Worksheet for Section 12: Implementation strategy

The final section of the toolkit focuses on surfacing an implementation strategy and key considerations for CBDC implementation. Consider the issues below:

Experiments and prototyping:

- Will the central bank conduct a proof-of-concept (PoC) or pilot to test the concept before implementation? Why or why not?

- If so, what are the goals of the PoC or pilot?

Methodology:

- What design and development methodologies and approaches will be employed?

- What is the role of user testing within design and development, and what will the user testing process be?

Public engagement for retail CBDC:

- How will the central bank communicate the CBDC effort with the public (if retail CBDC)?

- How can the public provide input and inform the CBDC's development?

Collaborative experimentation and deployment:

- Will any partners, such as international organizations, commercial banks, other central banks or other types of institutions, contribute to experimentation or development of the CBDC? Why or why not?

Introduction plan:

- Briefly describe the CBDC's introduction plan, including the scope, nature and timing of the initial deployment or pilot:

- What additional elements should be involved in a prudent implementation strategy?



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