

MEMO
TARGET DKK



Danmarks Nationalbank
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1. INTRODUCTION

One of Danmarks Nationalbank's core objectives is to contribute to efficient and stable payment and settlement systems. These systems are a crucial prerequisite for financial stability in Denmark, which is another core objective. Today, the Kronos2 payment system has a central role in this infrastructure – both in connection with the settlement of large, time-critical payments between banks and mortgage credit institutions (participants) and by virtue of Danmarks Nationalbank's role as a settlement bank for other payment and settlement systems. Kronos2 is also used to carry out monetary policy operations in accordance with Danmarks Nationalbank's exercise of monetary policy.

1.1 Danish kroner to migrate to TARGET Services

Based on a preliminary analysis, a risk assessment and dialogue with the financial sector, Danmarks Nationalbank has decided to discontinue Kronos2 and migrate the settlement of Danish kroner to the European consolidated payment and securities settlement platform TARGET Services. The migration to TARGET Services is planned for Easter 2025. TARGET Services will be able to support settlement in several currencies as well as the ISO20022 format to which payment messages must switch before November 2025.

In addition, the migration of Danish kroner to TARGET Services achieves:

- Consolidation of the settlement of account holders' payments and securities transactions in Danish kroner in a single platform.
- Strengthened IT security and a united front against cyber threats.
- Harmonised infrastructure with increased economies of scale in relation to maintenance and further development.

Danmarks Nationalbank issued a press release on 8 December 2020 to announce the migration to TARGET DKK.

1.2 Collaboration

The migration to a new payment system will entail changes in the underlying payment structure – for Danmarks Nationalbank, connected clearing and settlement systems, banks, data centrals etc.

The project of migrating Danish kroner to TARGET Services is ongoing until go live in close cooperation with the ECB, other European central banks, payment and settlement systems and representatives of the Danish financial sector. Sector cooperation comprises the establishment of a sector group at high management level, a reference group broadly representing the sector and a number of working groups. Danmarks

Nationalbank is the secretariat for all the groups and is also engaged in a close bilateral dialogue with e.g. Finance Denmark and e-nettet.

1.3 Contents of the memo

The functionality for payments and settlements in Kronos2 and TARGET Services is quite similar, but there are also a number of differences between the two systems. The differences entail some fundamental adjustments – including changes to the account structure, the monetary policy day, collateral, types of participants and the settlement of instant payments. This memo describes the most significant adjustments to be made in connection with the migration of Danish kroner from Kronos2 to TARGET DKK.

The memo focuses on the changes in Danmarks Nationalbank's systems and will therefore not describe how the migration will affect the infrastructure or internal processes of settlement systems and participants.

A successful testing procedure is a prerequisite to the successful migration of Danish kroner during Easter 2025. All sector participants are involved in tests, and this memo therefore contains a section about the testing procedure.

The memo is addressed to Danmarks Nationalbank's account holders (participants) and other stakeholders that currently use or have an interest in payment and settlement systems for Danish kroner.

1.4 What is TARGET Services?

TARGET Services is the European payment and securities settlement platform, gathering all settlements of Danish kroner in the future.

It consists of three services:

- T2, which consists of a payment system (RTGS) and a Central Liquidity Management (CLM) system
- T2S, which is the securities settlement system
- TIPS, which is the settlement system for instant payments.¹

It also includes a number of other cross-sectoral modules, e.g. static data, invoicing and an emergency system.

The main components of TARGET Services are shown in figure 1 below.

¹ RTGS: Real-Time Gross Settlement; CLS: Central Liquidity Management; T2S: TARGET2-Securities; TIPS: TARGET Instant Payment Settlement.



T2 is a fully modernised version of the TARGET2 payment settlement system from 2008 and is comprised of two business components: CLM and RTGS.

T2 CLM (Central Liquidity Management) handles the participants' liquidity management. The participants can acquire a total overview of their liquidity in all TARGET Services and any possible credit line.

T2 RTGS (Real-Time Gross Settlement) handles the participants' large time-critical interbank payments, customer payments and settlements of e.g. retail payments.

T2S (TARGET2 Securities) is the joint European settlement platform for securities transactions. Danish participants have used T2S since 2016 (Euro) and 2018 (Danish kroner).

TIPS (TARGET Instant Payment Settlement) is the Eurosystem's settlement platform for instant payments. In the future, instant payments in Danish kroner will be settled on TIPS.

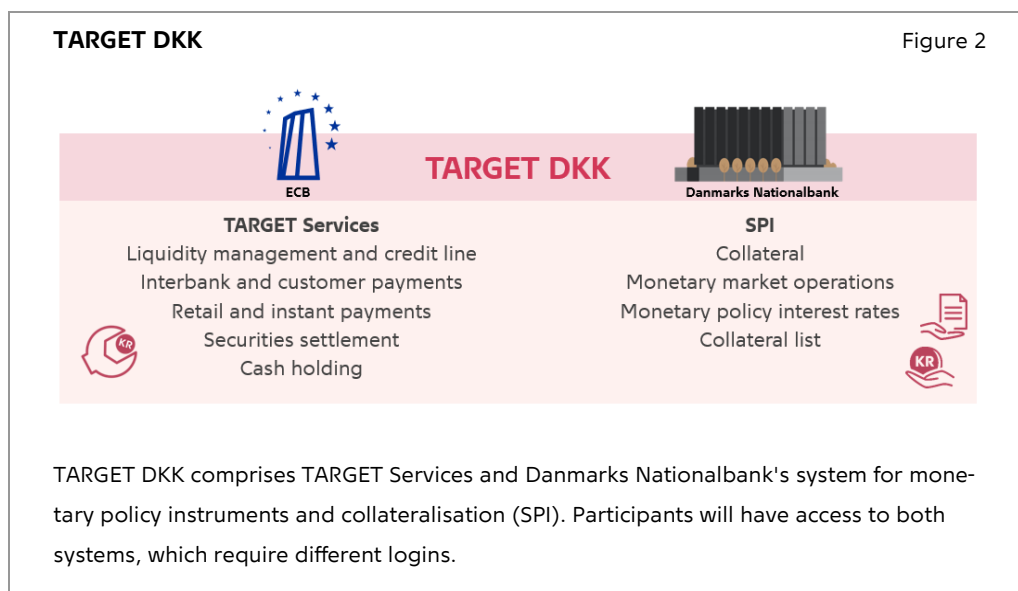
A number of cross-sectoral modules (common components) support T2, T2S and TIPS. They include the Common Reference Data Module (CRDM), which manages all cross-sectoral static data such as user information, account setup etc., and a module for billing etc. ECMS (Eurosystem Collateral Management System) will not be available in DKK.

1.5 What is TARGET DKK?

The TARGET Services do not support the Danish monetary policy instruments and traditional collateralisation. In the future, they will be supported by Danmarks Nationalbank's own system for monetary policy instruments and collateral management (SPI). The SPI system is based on

the portfolio management system Calypso, which already supports parts of the collateral feature in Kronos2 today.

The future payment infrastructure, comprising both TARGET Services and SPI, will be referred to as TARGET DKK, illustrated in figure 2.



2 ACCOUNT STRUCTURE IN TARGET SERVICES

In both Kronos2 and TARGET Services, participants manage their liquidity via their main account with Danmarks Nationalbank. The balance in the main account is affected by, for example, deposit and lending transactions, foreign exchange transactions, securities transactions and retail payments. Participants must continuously ensure that they have sufficient liquidity to make payments and meet their obligations during the day.

A number of accounts dedicated to settlement and payments are linked to the main account. The account structure in TARGET Services differs from that of Kronos2, which is described below.

2.1 Current account in Kronos2

In Kronos2, participants have a current account in Danish kroner, which is divided into two accounts: a settlement account and a loan account. Incoming and outgoing payments are entered in the settlement account, and the balance may be positive or zero. The loan account is the participant's account for the use of intraday credit, and the balance is negative or zero. Payments from the current account are made individually and instantly in real time.

At the close of the monetary policy day, any draws on the loan account must have been covered. If a participant fails to cover the outstanding amount, it is automatically covered by the transfer of funds from the settlement account to the loan account. The settlement account carries interest at the current account interest rate.

2.2 Account structure in TARGET Services

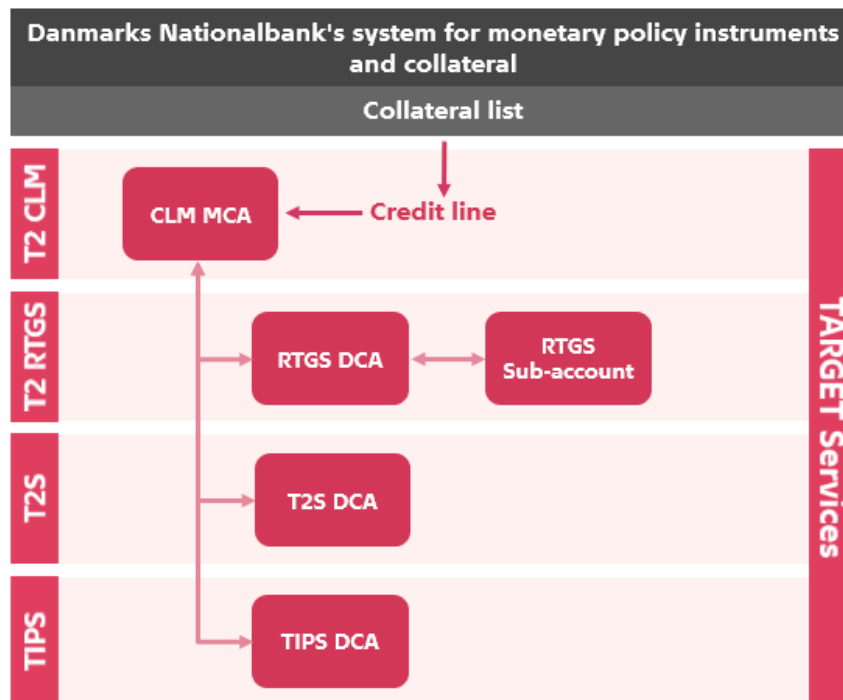
Participants may hold three different types of accounts in TARGET Services:

- Main Cash Account (MCA) in T2 CLM
- Dedicated Cash Account (DCA) in T2 RTGS, T2S and TIPS
- RTGS sub-account

It is possible to create several MCAs (see 2.2.1) and DCAs in T2, T2S and TIPS. The new account structure is illustrated in figure 3.

Account structure and credit line

Figure 3



The participants' main account in TARGET Services is an MCA in CLM, in which they maintain their overall liquidity management. The MCA can have a drawing right in the form of a credit line. Payments and settlements are not available for MCAs. Hence, participants distribute liquidity from the MCA to their DCAs in T2 RTGS, T2S and TIPS – the DCAs are used for this purpose. Settlement of retail payments as Batch Clearing (Sum Clearing and Intraday Clearing) is made in RTGS sub-accounts which are linked to an RTGS DCA.

2.2.1 Main Cash Account (MCA)

The Main Cash Account (MCA) is the central account for the participants' liquidity management. In principle, a participant can have several MCAs, but only one of these can have a credit line.

A credit line is a drawing right that, when used, results in a negative MCA balance. Credit lines are managed by SPI. When a participant makes a pledge, the full collateral value is automatically transferred to the participant's MCA in TARGET Services via a credit line. The available liquidity in an MCA with a credit line is the sum of total liquidity in the account and any credit line.

2.2.2 DCA

The participants can have three different types of Dedicated Cash Accounts (DCA) set up – one for each service:

- *RTGS DCA* is used to transfer large and time-critical payments (interbank and customer payments). The account is quite similar to the participants' existing settlement account in Kronos2. The RTGS DCA can be linked to the participant's MCA, allowing participants to e.g. create agreements on automatic liquidity transfers. The Batch Clearing is settled in a sub-account. The sub-account is connected to the RTGA DCA.
- *T2S DCA* is used to make payments in connection with the settlement of securities transactions and settlement of corporate action payments. T2S DCA has been in use for Danish kroner since 2018. A T2S DCA will automatically use auto-collateralisation if it does not have sufficient funds to pay for purchases of securities. This is an intraday facility which must be covered by end of day. If the T2S DCA is not covered, the bonds used as collateral for T2S auto-collateralisation will be retained.
- *TIPS DCA* is used for instant payments. TIPS is the only service that is open 24/7/365.

It is not possible to have a negative balance in a DCA. Participants wanting more liquidity in their DCA can transfer liquidity from their MCA or from a DCA in one of the other services.

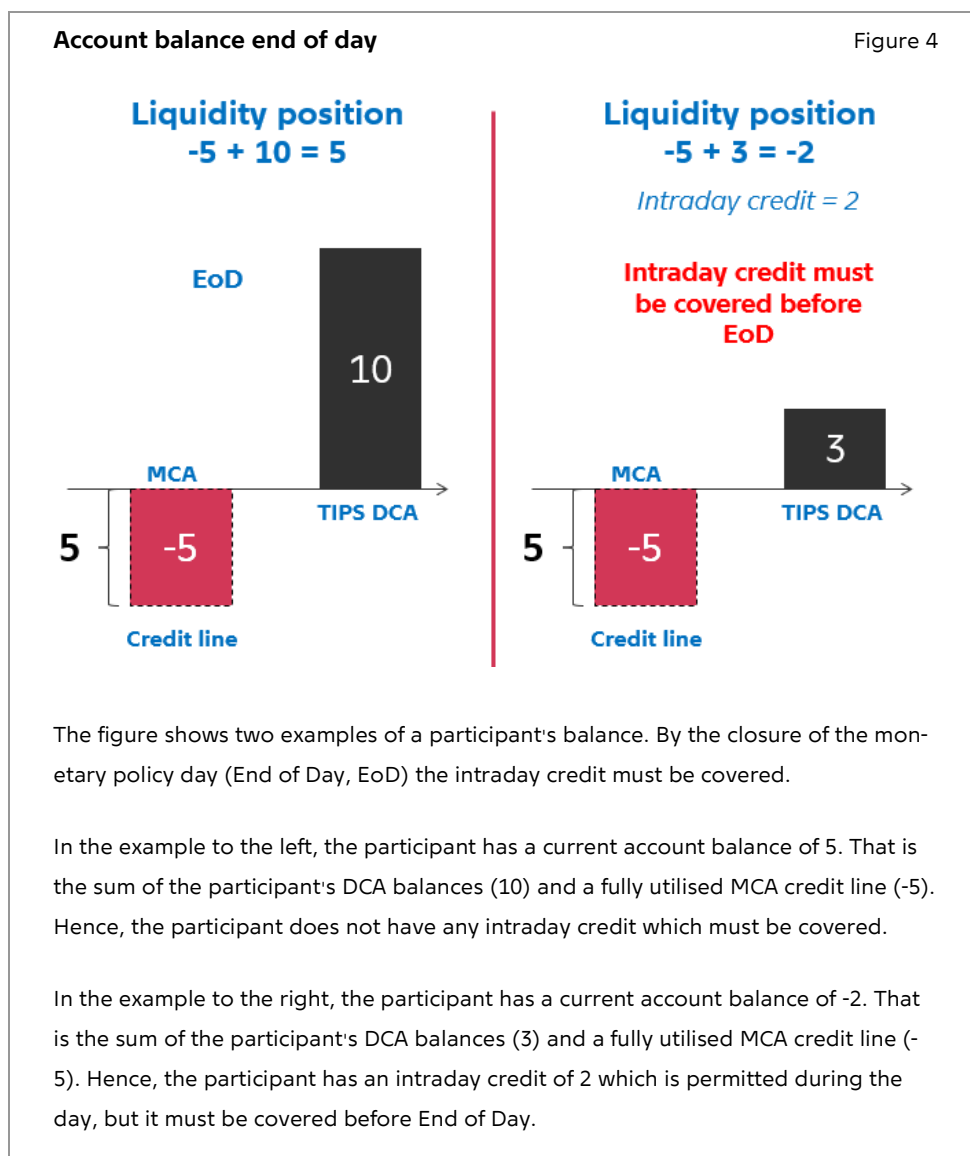
Participants may have liquidity deposited in DCA accounts at the closing and opening of the monetary policy day. A deposit in T2S DCA will automatically be transferred to the MCA ahead of the closure of the monetary policy day.

2.3 Current account balance and intraday credit

A participant's total current account balance consists of the total balance in the participant's TARGET Services accounts. The total current account balance is the sum of the CLM MCA balance and the deposits in the RTGS DCA, RTGS sub-accounts, T2S DCA and TIPS DCA. Note that sub-accounts are emptied and transferred to the participant's RTGS DCA after each settlement cycle. Thus, balances in the sub-accounts are in practice zero by the closure of the day (see also section 2.5.2).

As is the case today, participants may have a negative current account balance during the day within the limit of their credit line. This will happen if a negative MCA balance is not offset by positive balances in the

other accounts. A negative current account balance during the day is regarded as utilised intraday credit and must therefore be covered before the end of the monetary policy day at 17:00. This is illustrated in figure 4.



In this context, it is important to stress that participants can, in fact, utilise their credit line after the closing of the business day, as long as the overall current account balance is positive – meaning that a negative MCA balance is offset by positive balances in other accounts. At the closing of the system at 18:00, each participant's current account balance is calculated and carries interest at the current account interest rate.

2.4 Priority and queue functionality

There is no queue functionality in the current payment system (Kronos2). This means that if a participant attempts to settle a payment without having sufficient liquidity, the payment is rejected. Rejected payments will therefore have to be registered in the system again.

TARGET Services offers a queue feature. If a participant's liquidity is insufficient to settle payments at the required time, payments are placed in a queue. Participants thus avoid having payments rejected and having to place another payment instruction in the system in case of sufficient liquidity. Pending payments in the payment queue are removed at the end of the business day. Also, different types of transactions may be assigned priorities: "Normal", "High", and "Urgent". The RTGS system will then try to settle the payments with the highest priority first. Hence, the participant's liquidity is prioritised for the most important payments. Furthermore, the system has one queue per priority, i.e. three in total.

2.5 Settlement accounts

In both Kronos2 and TARGET Services, Danmarks Nationalbank serves as a settlement bank for payments in Danish kroner for other payment and settlement systems in the Danish payment infrastructure. Participants can have settlement accounts set up in which they can reserve amounts for individual settlements. The settlement account is locked during the settlement, which means that participants cannot dispose of the balance. This account structure ensures that Danmarks Nationalbank can guarantee the reserved amounts during the settlement.

The balance of each settlement account can be positive or zero, and any settlement account balances are transferred to overlying accounts after each settlement.

When Danish kroner are transferred from Kronos2 to TARGET Services, the basic principle for settlement accounts will remain the same, but the account structure will be different.

2.5.1 Settlement accounts in Kronos2

In Kronos2, the settlement accounts are called LOM (Liquidity Optimizing Mechanism) accounts, and the participants can have a settlement account set up for:

- Sum Clearing/Intraday Clearing (Intraday LOM)
- Straksclearing (Express LOM)
- VP trade settlement (VP Trade LOM)
- VP periodic payments (VP Periodic LOM)

- CLS (CLS LOM).

At the end of the monetary policy day at 16:45, the balance is zero in all LOM accounts.

2.5.2 Sub-accounts in TARGET Services

In TARGET Services, settlement accounts are called sub-accounts, and they are linked to the participants' RTGS DCA.

Retail payments

In TARGET Services, retail payments are settled in T2 RTGS (Batch Clearing) and in TIPS (instant payments). Batch Clearing uses the model known from Kronos2 with settlement happening in designated settlement accounts (sub-accounts in TARGET Services). The sub-accounts are linked to participants' RTGS DCAs. During the Batch Clearing MasterCard Payment Services (MPS) will transfer liquidity from participants RTGS DCA to their sub-accounts. Following settlement any deposited amount in the sub-accounts are transferred back to participants' RTGS DCAs. At 17:00 the balance in the sub-account is zero.

ES-CPH settlement (VP settlement)

In 2022, Euronext Securities Copenhagen (ES-CPH (formerly VP-Securities)), conducted a market consultation with their customers concerning the future settlement of securities in Danish kroner in the local settlement platform. Based on this consultation, it has been decided that ES-CPH settlements in Danish kroner via Danmarks Nationalbank will be settled without liquidity from the end of 2024. This means that there is no need to create separate accounts (sub-accounts) in TARGET Services for ES-CPH settlements. Thus, all settlements in DKK and EUR via ES-CPH will take place in T2S, wherein Danmarks Nationalbank will continue to make settlement accounts available for the participants in the form of DCAs for the settlement of Danish kroner.

CLS

CLS is a multilateral clearing and settlement system for FX trades in, currently, 18 different currencies, and it will still be possible to settle FX trades in Danish kroner. The CLS trades are settled in T2 RTGS with inter-bank payments (pacs.009) between the participants' DCAs and CLS. Participants are able to choose whether they wish to create a separate RTGS DCA dedicated to CLS payments or use their primary RTGS DCA.

3 RETAIL PAYMENTS – BATCH CLEARING

3.1 Batch Clearing in TARGET DKK

Sum Clearing and Intraday Clearing (collectively referred to as Batch Clearing), which are systems for the clearing and settlement of retail payments, are continued in TARGET DKK. The systems are owned by Finance Denmark, and MPS is the operator. Batch Clearing will be settled in T2 RTGS via the participants' RTGS sub-accounts.

3.2 Timing of settlement batches

Like in Kronos 2, batch-clearing settlement in TARGET DKK will take place at fixed times throughout the day, cf. box 1.

The settlement times will be the same as they are today, the only exceptions being that the night-time settlement will take place 01:00 instead of 01:30, and the technical Sum Clearing will take place 01:45 rather than 03:00. This is because T2 RTGS will have a window for possible maintenance from 03:00 to 05:00.

It has been decided that the cut-off time for night-time settlement will be moved to 15 minutes before the time of settlement. This means that the cut-off time for settlement at 01:00 will be 00:45, and the cut-off time for settlement at 01:45 will be 01:30. Cut-off times for all other settlements will still be 35 minutes prior to settlement.

The two clearings (Sum Clearing and Intraday Clearing) will share the same settlement time at 01:00. In the future, participants will see only one combined entry for the two clearings. The individual entries will instead appear in reports and via the GUI by MPS.

Timing of settlement – Batch Clearing

Box 1

The table gives an overview of batch-clearing settlement with settlement time and cut-off times for each clearing.

Settlement	Time of settlement	Cut-off
Sum Clearing and Intraday Clearing	01.00	00.45
Sum Clearing (technical))	01.45	01.30
Sum Clearing and Intraday Clearing (technical)	06.00	05.25
Intraday Clearing	09.00	08.25
Intraday Clearing	12.00	11.25
Intraday Clearing	14.00	13.25

Notes:

If the Sum Clearing is not completed by 01:00, it can be completed at 01:45, 06:00, 09:00, 12:00 or 14:00.
The 06:00 Sum Clearing is always done on the first day after a bank closing day.

3.3 Settlement of Batch Clearing

Today, liquidity is automatically transferred from the participant's settlement account to the Intraday LOM account prior to each settlement. The transferred amount is equal to the sum of the participant's forecast (liquidity forecast) and the selected excess coverage. The automated procedure ensures that clearing participants do not have to make manual transfers or create standing orders prior to the settlements.

In TARGET Services, MPS will transfer liquidity from the participants' RTGS DCA to the participants' sub-accounts on behalf of the participants. This means that participants do not have to perform manual transfers or register standing orders from the RTGS DCA to the sub-account ahead of a settlement. However, the participants are responsible for maintaining the necessary liquidity in the RTGS DCA ahead of a settlement. Like in Kronos2, the amount MPS transfers to the sub-account will correspond to the participant's forecast plus an excess coverage amount². As something new, MPS will only transfer the liquidity to the settlement account a few minutes prior to the settlement³.

As a baseline, MPS will try to perform total netting of settlements having the same settlement time. Serial settlement of clearings will take place if one or more participants do not have sufficient liquidity for total netting across the clearings. This means that the clearing of highest priority (Sum Clearing) will be settled first, whereafter settlement of the second

² Participants still have to register an excess coverage amount for the Sum and Intraday Clearing with MPS.

³ In Kronos2 liquidity is transferred to participants' Intraday LOM 35 minutes prior to settlement.

clearing (Intraday Clearing) will be attempted with the remaining liquidity in the sub-account.

If one or more clearing participants do not have sufficient liquidity in their sub-account to perform the Sum clearing, the Intraday clearing will be attempted instead.

During the settlement phase, the liquidity in the sub-accounts is locked. Thus, the amounts in the sub-accounts act as credit lines, i.e. the amounts that Danmarks Nationalbank guarantees on behalf of the participants. After each settlement phase, any remaining liquidity in the sub-account is transferred to the participant's RTGS DCA such that the sub-account balance is zero.

4 TIPS – INSTANT PAYMENTS

Today, *Straksclearingen* ensures instant transfers between Danish citizens at any time and on any day of the week. The transfers are called instant payments. *Straksclearingen* will be shut down when TARGET DKK goes live, and all instant payments will instead be settled via TIPS.

The settlement of instant payments is thus changed from a model based predominantly on a collateralised credit line to a model based on liquidity in the TIPS system. In TIPS, liquidity may be provided via an MCA credit line and may therefore indirectly be based on participants' collateral.

In TIPS, all instant payments will be settled via the so-called standard model. In the standard model, instant payments are settled immediately and directly in participants' TIPS DCAs. It is a requirement that participants have liquidity in their TIPS DCA available for settlements (see section 4.2).

4.1 TIPS participation

To be able to settle instant payments via TIPS, one has to be set up either as a TIPS participant (corresponding to a direct participant) or as a reachable party (corresponding to an indirect participant).

- A *TIPS participant* is the owner of one or several TIPS DCAs.
- A *reachable party* does not have its own TIPS account, but will instead have to enter an agreement with a TIPS participant to be able to use this participants TIPS DCA. A reachable party will thus be an indirect participant in the settlement of instant payments.

All TIPS participants must decide whether they want to instruct instant payments, i.e. whether they want to send/receive payment instructions directly to/from TIPS, or they wish to let a third-party handle this. Participants wishing to instruct instant payments themselves are required to communicate with TIPS via system integration (Application-to-Application (A2A)). Alternatively, a participant can appoint an instructing party to send and receive payments instructions in TIPS on behalf of the participant. TIPS participants that can only communicate with TIPS via a user interface (User-to-Application (U2A)) must enter into an agreement with a TIPS participant with A2A access to TIPS, making this participant the instructing party for the participant without access. The same goes for reachable parties, which should also appoint a TIPS A2A participant as their instructing party as reachable parties cannot access TIPS on their own. This is summarised in table 1.

TIPS participation Table 1

	Direct TIPS participant		Indirect TIPS participant
TIPS connectivity	A2A + U2A	U2A only	N/A
Account set-up	Has own TIPS DCA	Has own TIPS DCA	Does not have own TIPS DCA, but uses a direct participant's TIPS DCA for settlement
Instructing party	Possibility to instruct payment	Needs another direct (A2A) participant to act as instructing party	Needs a direct (A2A) participant to act as instructing party
Liquidity management	Possibility to manage liquidity	Possibility to manage liquidity	Liquidity managed by direct participant

Every day, TIPS generates a report, the so-called 'TIPS Directory', which contains a summary of all participants settling instant payments in Danish kroner. The TIPS Directory indicates, for each participant, which TIPS DCA will be used to settle instant payments.

4.2 Liquidity in TIPS

For an instant payment to be settled, the originator of the payment must have sufficient liquidity available in TIPS. Therefore, all TIPS participants must ensure that they have sufficient liquidity in their TIPS DCAs.

Participants can transfer liquidity to their TIPS DCA from their accounts in the other services, e.g. the CLM MCA or a DCA in RTGS or T2S. Transfer of liquidity to/from the TIPS DCA may only take place during T2's opening hours from 19:30 to 17:00 on banking days. TIPS is the only TARGET service to be open 24/7/365 for settlement. Hence, participants must transfer sufficient liquidity to TIPS within T2's opening hours. In particular, TIPS participants must make sure that their TIPS DCA has enough liquidity ahead of weekends and holidays when T2 is closed.

It should be noted that it is not possible to make transfers between TIPS DCAs – not even between a participant's own TIPS DCAs.

Reachable parties entrust liquidity management to the TIPS participants making liquidity available to them.

4.3 Recall and investigation

In TIPS, it is possible to make a so-called "recall request". This is a request of repayment (in part or in full) of an instant payment that has already been settled. The receiver can accept or reject such a request. If accepted, the requested amount is repaid to the sender of the originally settled instant payment.

Furthermore, it is possible to initiate a so-called "investigation". An investigation can be initiated by the sender of an instant payment if the sender has not received confirmation of one or more transactions. The sender will then receive information about the status of the transaction(s).

4.4 NPC Instant Credit Transfer (NCT Inst) scheme

It has been decided that settlement of instant payments in Danish kroner in TIPS must follow the Nordic Payment Council's (NPC) Instant Credit Transfer (NCT Inst) scheme. Relevant information about the NCT Inst scheme may be found on the NPC website. The latest version of the rulebook may be downloaded [here](#).

5 COLLATERAL

Collateral is the basis allowing Danmarks Nationalbank to offer credit facilities in the form of intraday credit and monetary policy loans to participants. Danmarks Nationalbank accepts so-called traditional collateralisation, certificates of deposit and pledging of Swedish or Norwegian kroner under the Scandinavian Cash Pool. Only traditional collateralisation can be used as collateral for monetary policy loans. Danmarks Nationalbank publishes a list of assets eligible for collateralisation.

5.1 Statement of collateral

The participants' collateral is stated in the collateral system, which today is integrated with the RTGS system in Kronos2, but which, in future, will be handled by Danmarks Nationalbank's portfolio management system Calypso. Calypso already supports parts of the collateral feature.

5.1.1 Collateral list

The participants' available credit with Danmarks Nationalbank is today stated in a special list – the so-called collateral list.

The collateral list shows the value of collateral that the participants have pledged to Danmarks Nationalbank as well as the utilisation of collateral – i.e. the drawn facilities to which participants have access.

In TARGET DKK, the collateral list will be accessed via SPI. The unutilised part of the collateral value in the collateral list will automatically be transferred as a drawing right in TARGET Services via a credit line to the participant's main account (MCA), see also figure 3. A credit line utilisation appears as a negative balance in the MCA. A credit line can be utilised both to establish intraday credit and to raise liquidity for e.g. instant payments.

Credit line utilisation is not equal to intraday credit, as long as the resulting negative balance in the MCA is offset by liquidity (and thus a positive balance) in other accounts. If a participant has a negative draw on its MCA that is not offset by positive balances in other accounts, the participant will have a negative current account balance and thus use intraday credit.

Increased draws on facilities on the collateral list – for example weekly loans – will mean that the MCA credit line is reduced correspondingly. Weekly loans are always granted based on traditional collateralisation.

5.2 Traditional collateralisation

Traditional collateralisation is a scheme for providing collateral for monetary policy loans, intraday credit etc. The participants request to transfer securities to/from an ES-CPH custody account which has been pledged to Danmarks Nationalbank. Based on this request, the collateral system will send matched instructions to ES-CPH on placement/withdrawal on its own behalf and on behalf of the participant.

On payment of interest and amortisation on the securities pledged, the proceeds initially go to Danmarks Nationalbank. The amount is immediately forwarded to the participants. Any debits – as a result of negative

interest rates – will be made according to current principles. In the long term, a coordination may be made with the Eurosystem's harmonisation of the area of collateral⁴.

5.2.1 Collateral in Kronos2

In Kronos2, participants can only request to transfer securities to/from the pledged custody account via Kronos2. Kronos2 will then submit a request to ES-CPH to execute an express transaction between the pledged custody account and one of the participant's own custody accounts. Once the transaction has been settled in ES-CPH, the drawing right is changed in Kronos2. As the transfer is made as an instant transaction, the participant's custody account must be a securities dealer custody account. Requests can be made from 07:00 to 16:45. A list in Kronos2, and on the Danmarks Nationalbank website, shows which securities can be used as traditional collateralisation.

5.2.2 Collateral in TARGET DKK

The current model for traditional collateralisation is continued with TARGET DKK. Via SPI, participants will be able to request the transfer of a security to/from the pledged custody account, just like in Kronos2.

5.3 Automatic collateralisation

Automatic collateralisation (*Sikkerhedsretten*) is a system for the provision of collateral for intraday credit in Danish kroner, which today can be used in Kronos2. The sector does not wish to keep automatic collateralisation, hence the functionality will be discontinued in TARGET DKK.

5.4 Scandinavian Cash Pool (SCP)

Scandinavian Cash Pool (SCP) is an agreement between Norges Bank, Sveriges Riksbank and Danmarks Nationalbank. The main principle of Scandinavian Cash Pool is that a pledged account location with one country's central bank constitutes the collateral basis for intraday credit with another country's central bank. The scheme is used to obtain liquidity across the participating currency areas (NOK, SEK and DKK) and as a guarantee for adequate liquidity, for example payments in CLS.

In Kronos2, the participant has a dedicated SCP pledge account to which the participant can transfer liquidity. The value of the pledge received from Norway or Sweden is stated in the participant's collateral list. This SCP pledge can be used in connection with the participant's intraday credit.

⁴ See [Single Collateral Management Rulebook for Europe \(SCORE\)](#)

If a participant wishes to obtain intraday credit from Norges Bank and Sveriges Riksbank on the basis of liquidity raised with Danmarks Nationalbank, the participant must set up an SCP pledge account with Danmarks Nationalbank. The participant must also be set up with Norges Bank and Sveriges Riksbank.

At the request of the sector, it has been decided that SCP will be continued in TARGET DKK. The solution will be based on TARGET Services.

Participants can provide krone liquidity as collateral for Norges Bank and Sveriges Riksbank in special accounts in the TARGET Services system. On this background, the central bank to which the pledge has been provided will make liquidity available to the participant in its own payment system. This is an outstanding account between the liquidity-providing central bank and the participant. Danmarks Nationalbank makes the necessary account facilities in TARGET DKK available to the parties on normal business terms and conditions.

It will also be possible for the participants to provide either Norwegian kroner or Swedish krona as collateral for access to Danish kroner. Such a pledge will be shown in the collateral list in the Danish Collateral System and will be an outstanding account between Danmarks Nationalbank and the participant. The collateral basis in Danish kroner will be calculated by the Collateral System using the exchange rate fixed by the central bank and with a deduction of haircuts. The collateral is accepted on an intraday basis and will be included in the collateral basis for intraday credit and, thus, the credit line linked to the participant's MCA in TARGET Services.

The participant will request to have the pledge released, after which an attempt will be made to reduce the credit line by the value of the pledged amount. Once the credit line has been reduced, the Collateral System will request the release of the pledge denominated in foreign currency from the relevant central bank. Danmarks Nationalbank will initiate a release of the pledge in relation to SCP no later than at 15:00.

5.5 T2S auto-collateralisation

Like today, it will be possible for participants in TARGET2 Securities (T2S) to raise intraday loans using T2S auto-collateralisation (loans against automatic collateral). The loans may be used for purchases of securities and execution of periodic payments in T2S and will be granted automatically against collateral in the form of traded securities or securities held in T2S. The loans must be covered at the end of Danmarks Nationalbank's

business day. The automatic cover of intraday credit will be removed after the migration to TARGET DKK. Henceforth, it will be the participant's own responsibility to have sufficient liquidity in the T2S DCA to cover the intraday loan.

6 MONETARY POLICY INSTRUMENTS

In TARGET DKK, the current monetary policy instruments will be supported by SPI. The monetary policy instruments consist of certificates of deposit, loans against pledges as well as liquidity-adjusting deposits and loans. Certificates of deposit are typically offered on open market operations and can be traded both with Danmarks Nationalbank and with other monetary policy counterparties. Loans against a pledge are only offered in connection with Danmarks Nationalbank's open market operations.

Danmarks Nationalbank is able to manage the outstanding krone liquidity via the total current account limit. This facility is currently suspended, but it can be reintroduced at the instance of Danmarks Nationalbank, which may raise the need for conversion of excess liquidity. The current account limit and a possible conversion comprise all account holders. This means that all account holders must have access to SPI.

7 THE MONETARY POLICY DAY

The monetary policy day currently begins at 17:30 and ends at 16:45 on the following business day. Payment transfers are open from 07:00 to 16:45, and in the period from 16:45 to 17:30 it is ensured that no participants' current account is overdrawn.

When Danish kroner are transferred to TARGET DKK, Danmarks Nationalbank will change the times for the business day. Danmarks Nationalbank's business day begins at 19:30⁵ on all Danish banking days and ends at 17:00 on the following banking day. Payments can be made during the period 07:00-17:00. Liquidity transfers (e.g. between DCA and MCA) are allowed from 19:30 to 17:00. In the period from 17:00 to 18:00, it is ensured that no participants' current account is overdrawn.

Note that the Monday business day opens already on the Friday calendar day at 19:30 and closes on the Monday calendar day at 17:00 – see the

⁵ TARGET Services End-of-Day and Start-of-Day phases are not currency-specific. This means that the day in Danish kroner depends on the opening hours of the Eurozone. The Eurozone postpones the opening of the day by 15 minutes to 19:45 approximately eight times a year. They do so on the last days of their so-called "Minimum Reserve Maintenance Period". Therefore, Danish kroner will correspondingly only open at 19:45 on these days.

info box 2 below for more details. This also has implications for the timing of the settlement of Batch Clearings in T2 RTGS.

In T2S, the Nighttime Settlement of the Monday business day starts on the Friday calendar day (typically at 20:00) and closes at 02:30 the same night (Saturday). If Nighttime Settlement has concluded earlier than 02:30, the Realtime Settlement starts shortly after. At 02:30, the Realtime Settlement is interrupted temporarily by the maintenance window and re-opens on Monday at 02:30. If the Nighttime Settlement has not concluded by 02:30, it will conclude on Monday at 02:30. Only after this conclusion will the Realtime Settlement start. The business days before holidays and other closed days are scheduled this way as well (e.g. during Easter⁶).

TIPS is never closed as it is available for instant payments in TIPS at all times, also on weekends. Thus, it is important that participants dedicate sufficient liquidity to be able to settle instant payments before the weekend.

Business Day Monday

Box 2

- The Monday business day starts on Friday at 19:30.
- T2S Nighttime Settlement typically starts on Friday at 20:00, and if it has not concluded by 02:30, it is temporarily interrupted by the maintenance window.
- Batch Clearing is settled on Saturday at 01:00.
- The maintenance window is completed between Saturday 02:30 and Monday 02:30.
- The Monday business day is resumed on Monday at 02:30.
- T2S Realtime Settlement starts when Nighttime Settlement has concluded.
- Sum Clearing 06:00 (first banking day after a bank closing day).
- The normal business day is running.
- The Monday business day closes at 17:00
- The Tuesday business day starts on Monday at 19:30
- Batch Clearing are settled on Tuesday at 01:00.

⁶ The Wednesday business day opens before the Easter holiday and continues until the Tuesday after the Easter holidays.

8 CASH DEPOSITS

Kronos2 handles functionalities related to cash deposits in the GCSD module. The functionality is only relevant for the five custodian banks that manage the deposits.

Custodian banks can request cash consignments between Danmarks Nationalbank and the cash deposit. Furthermore, custodian banks can register a collection of cash and a return of cash from a participant. In connection with handing out (handing in) cash from (to) a deposit, the recipient is debited (credited) in its RTGS for the corresponding amount. The custodian banks must provide collateral for the maximum cash amount in the custody account.

In TARGET DKK, cash deposits will be handled in TARGET Services, and there will be the same options as today. This means: 1) cash consignments between Danmarks Nationalbank and the deposit, 2) handing in/handing out cash to/from the deposit from/to the bank and 3) management of collateral.

9 ACCESS TO TARGET SERVICES

TARGET Services has one common access port: the Eurosystem Single Market Infrastructure Gateway (ESMIG), and all incoming/outgoing external communication takes place through this component. In order to make instructions in TARGET Services, you have to be a direct participant and have access to ESMIG. Alternatively, you can become an indirect participant or co-managee (see also section 11).

Direct access to ESMIG can only take place through one of the two Network Service Providers approved by the Eurosystem, which are currently SWIFT and SIA-Colt. A participant wanting direct access must thus enter into a bilateral contractual relationship (ESMIG Connectivity Services Agreement) with one or more of these providers.

The network service providers have different requirements as regards the necessary hardware and software, i.e. the connection itself. With direct access, the participant can own the connection itself or rent it from a service provider and use the service provider's connection. In this context, a service provider may, for example, be a data processing centre, another bank or a specialised service agency that has established the necessary IT infrastructure.

Direct participants must also decide on the communication form with TARGET Services – whether it will be through system integration

(Application-to-Application (A2A)), a user interface (User-to-Application (U2A)) or both. A2A is tailored to financial institutions with many transactions, and that therefore wish to automate the interchange of financial messages with TARGET Services. Financial institutions with fewer transactions that wish to handle them manually can choose 'U2A-only' – which is the equivalent of logging into Kronos2 GUI.

9.1 Requirements for BICs in TARGET Services

Bank Identifier Codes (BICs) are used in TARGET Services to:

- 1) identify an organisation (a so-called 'party')
- 2) address an account in CLM, RTGS or TIPS in a payment situation.

Each participant is identified by a BIC, the so-called party BIC. For CLM, RTGS, T2S and TIPS, two participants cannot exist in the same service with the same party BIC⁷. Participants wishing to settle payments in several currencies on the platform must therefore, as a minimum, have a unique published BIC for each currency.

Even if a participant is set up with a different BIC11 for each currency, the participant can use the same BIC11 as Authorised Account User (AAU) in all currencies. Thus, the participant may use the same AAU BIC to be addressed in connection with payments in several currencies (EUR and DKK). This means that counterparties still basically only need to know one BIC11 – the AAU – to address the participant regardless of currency.

BIC11 codes and not just BIC8 codes are used in TARGET Services. If a BIC11 is to be unique, it is sufficient that the last three characters are different⁸. For a BIC to be usable on the platform, it must also be included in the BIC Directory at TARGET Services. A BIC is registered in this BIC Directory if it is published by SWIFT. All BICs used in TARGET Services must therefore be published by SWIFT.

For more information about BIC requirements in TARGET Services, see the memo *Use of BICs in TARGET Services* (TARGET DKK MS Teams site).

10 ACCESS TO DANMARKS NATIONALBANK'S MONETARY POLICY INSTRUMENTS SYSTEM AND COLLATERAL SYSTEM

Danmarks Nationalbank's own system (SPI) has to support the TARGET DKK functionalities that TARGET Services cannot support, primarily the following two functionalities:

⁷ However, the party BIC can be connected to several services, and it will not be necessary to have a party BIC for each service.

⁸ This means that they have different branch codes.

- Collateral – e.g. pledging/withdrawing of securities for traditional collateralisation and viewing of the collateral list
- Open market operations – e.g. demand for purchasing certificates and monetary policy loans.

As mentioned, Danmarks Nationalbank's current portfolio management and collateral system, Calypso, will be expanded to function as overall backend system for this functionality. It has been decided that the same functionality will be available for both A2A (Application-to-Application) and U2A (User-to-Application), i.e. via a user interface.

10.1 SPI U2A – User-to-Application⁹

The U2A solution is expected to be a web application that users can log on to via the internet. The applications will support the handling of monetary instruments and collateral.

User administration is expected to be partially decentralised, with each participant's security officer being able to administer users directly in the application, as soon as the security officer has been created by Danmarks Nationalbank. User administration will consist primarily of the administration of rights to use the system's monetary policy instruments and collateral functionality. Danmarks Nationalbank expects the user administration to be based on B2B users in Azure AD (Danmarks Nationalbank's AD).

The U2A solution is not expected to use SWIFT in any regard, neither for network access nor user management.

10.2 SPI A2A – Application-to-Application

ISO20022 messages will be used in A2A communication with SPI. The messages will follow the "FINplus for securities" versioning, and they will be exchanged via the SWIFT FINplus service.

11 PARTICIPATION IN TARGET DKK

There are three types of participation in TARGET DKK: direct participation, indirect participation, and co-management.

For all three participation types, the participants' access to the systems is tied to the available functionalities. It is therefore important that the

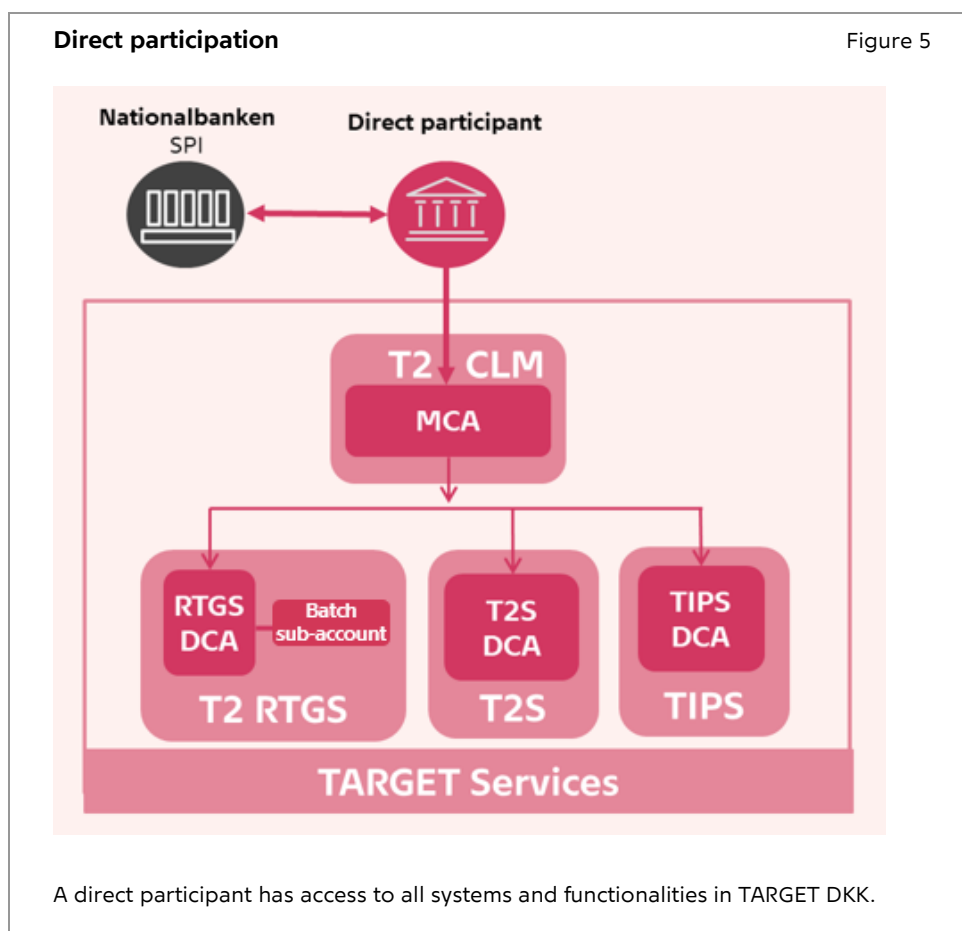
⁹ This solution is still being developed and is therefore subject to uncertainty.

participants consider their participation type in conjunction with the access requirements they will have to fulfil and desired functionalities.

In addition to the three overall participation types, there are other factors for the participants to assess as regards their participation in the individual services (T2, T2S and TIPS), for example how they wish to participate in TIPS.

11.1 Direct participation

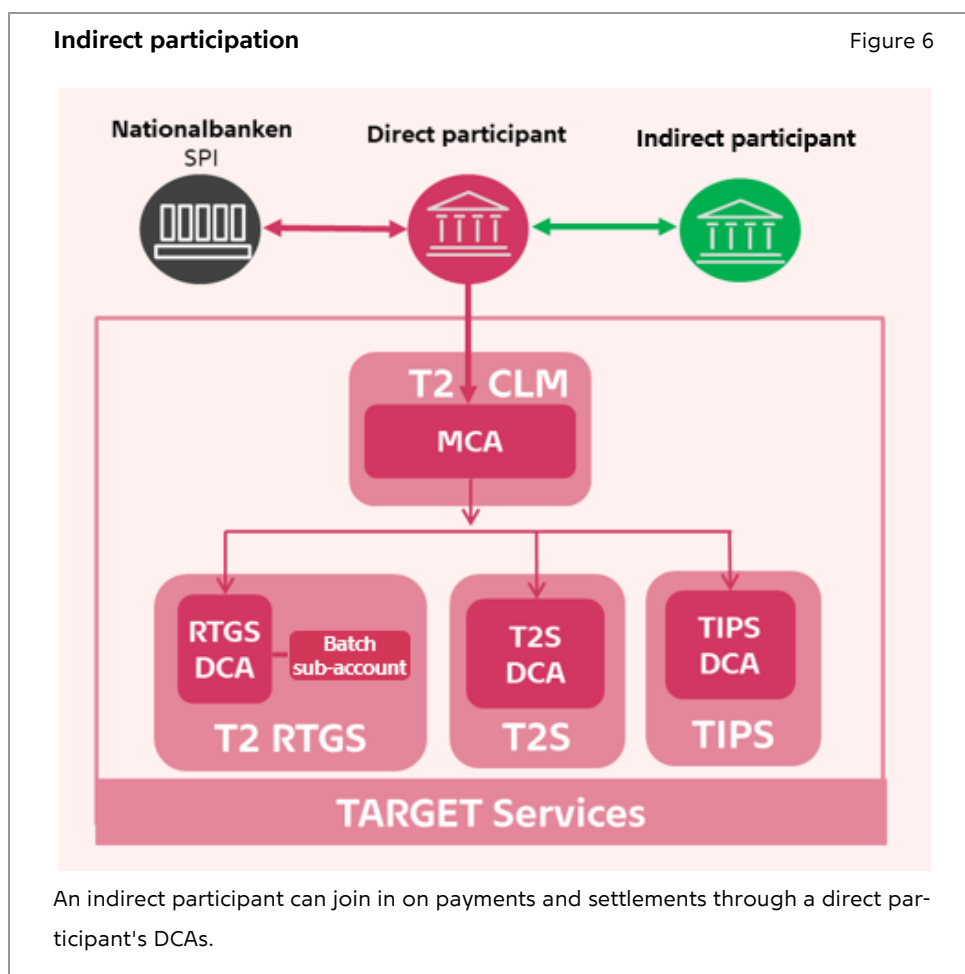
Direct participants have access to TARGET DKK and manage their own accounts, see figure 5. They have access to all functionalities in the systems. Direct participation in TARGET DKK corresponds to direct participation in Kronos2. Direct participation can be combined with indirect participation in settlements; for example, a direct participant can be an indirect participant in instant payments in TIPS and settlements in T2S via another direct participant's DCAs. A direct participant can interact with the TARGET Services and SPI A2A (Application-to-application) by sending ISO20022 messages and/or U2A (User-to-application) by logging on a graphical user interface (GUI) via a browser.



A direct participant gets access to TARGET Services via the Eurosystem Single Market Infrastructure Gateway (ESMIG). A direct participant gets access to SPI either A2A via the SWIFT network, or U2A via the internet. For most participants, the service bureau assists with establishing connection to the systems. See section 9 for elaboration on access to TARGET Services and section 10 for access to SPI.

11.2 Indirect participation

Indirect participation is also known from Kronos2. Unlike a direct participant, an indirect participant is neither an account holder nor does it have direct access to the systems. Instead, the indirect participant enters into a bilateral agreement with a direct participant to settle on the direct participant's accounts. Since an indirect participant uses a direct participant's account the indirect participant's liquidity will be mixed with that of the direct participant.



In TARGET Services, indirect participants can be registered on a direct participant's account. In T2 RTGS Directory, the indirect participant's BIC

can be registered as 'indirect participant' or 'addressable BIC'. This is also possible in TIPS where the indirect participant is registered as a 'reachable party' and in T2S as 'authorized BIC'. In this way, payments can be addressed to the BIC of an indirect participant, even though they do not have an account or access to the systems.

11.3 Co-management

Co-management is a new type of participation in Denmark. It is a standard model in TARGET Services tailored to smaller institutions. A co-managee is an account holder at Danmarks Nationalbank who *only* owns an MCA to deposit liquidity, see figure 7. The advantage of co-management is that the co-managee does not need connection to TARGET Services – instead, the administration of the co-managee's MCA is outsourced to a co-manager, who is another direct participant.

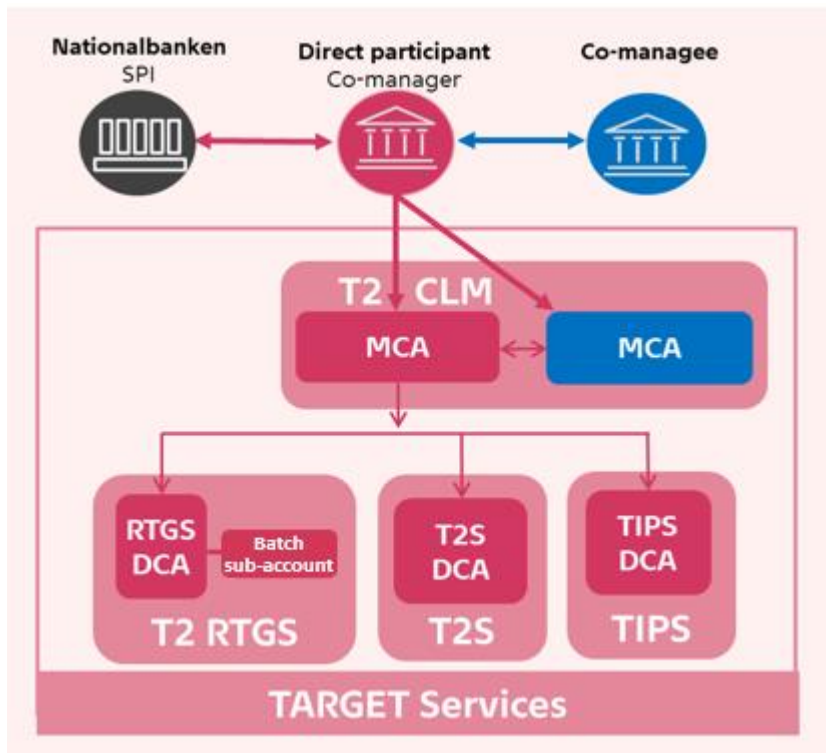
Co-management is offered to institutions that fulfil the following two requirements:

- Is in the group 3 or 4 of the Danish Financial Supervisory Authority's categorisation of banks by working capital.
- Is not an NSP participant (e.g. already a SWIFT participant)

Other institutions (e.g. mortgage credit institutions and institutions in group 5) can be offered co-management based on concrete and individual screening.

Co-management

Figure 7



Co-managee owns an MCA (blue) and can be indirectly participant in payments and settlements via co-manager or another direct participant's DCAs (red).

A co-managee enters into an agreement with a direct participant, typically a larger institution, as a co-manager. The co-manager gets the right to manage the co-managee's MCA, and the co-manager carries out the co-managee's instructions in CLM. Denmark's Nationalbank's daily contact is exclusively with the co-manager.

A co-managee is a monetary policy counterparty, and the MCA carries interest at the current rate. Co-managees can choose to make use of the monetary policy instruments and collateral. However, it is the co-manager who has access to and instructs in SPI, not the co-managee. Just as the administration of the co-managee's MCA is outsourced to the co-manager, the instruction in SPI is also outsourced to the co-manager. Thus, co-managees have access to credit against collateral, monetary policy loans and trade certificates of deposit.

Co-managees cannot own DCAs. However, co-management can be combined with indirect participation in payments and settlement in T2 RTGS,

TIPS and T2s. The co-managee makes an agreement with the co-manager or another direct participant to settle on their DCAs.

In practice, the daily operations of an indirect participant and a co-managee are similar: They do not have access to instruct payments and participate in direct settlements, and therefore have to communicate with their direct participant/co-manager, e.g. to make payments. The crucial difference between the two types is that the co-managee is an account holder. Since a co-managee owns their own account, there is no mix of liquidity as compared to indirect participation. However, there is a mix of liquidity when a co-managee uses a direct participant's DCAs for payments and settlement – but, when the payment has been processed, liquidity may be transferred to the co-managee's MCA, and therefore no longer be mixed with that of the co-managee. Liquidity can be moved directly from a DCA to a co-managee's MCA.

11.4 Participation in T2S

In Kronos2, it is possible to participate in T2S as an ICP (Indirectly Connected Party) or as a DCP (Directly Connected Party). A DCP can communicate with T2S directly via A2A (Application-to-Application) and U2A (User-to-Application), and can thus use all the features available in T2S. An ICP interacts with T2S through Kronos2 and therefore has limited functionality. The ICP model is mainly for liquidity transfers between Kronos2 and T2S as well as account statements from T2S.

After the migration to TARGET DKK, access to TARGET Services will be via ESMIG, and participants will be able to interact with T2S A2A and/or U2A. In order to be a DCP, T2S must be accessed via ESMIG.

Since Kronos2 is being phased out, Kronos2 cannot continue to serve as a link between the participant and T2S. Therefore, the ICP model disappears. However, TARGET DKK offers the same possibility of being a direct participant and having U2A access to T2S. This allows direct participants to instruct liquidity transfers to T2S and receive account statements. As a co-manager and indirect participant, it is also possible to settle via a direct participant's T2S DCA.

11.5 Participation in T2

The T2 system consists of CLM and RTGS. In CLM, you can be a direct participant or co-managee. In RTGS, you can be a direct participant or an indirect participant. An indirect participant in RTGS makes an agreement with a direct participant whereby the indirect participant can send and receive payments via the direct participant's DCA.

11.6 Participation in TIPS

There are two possible setups in TIPS: You become either a direct TIPS participant or a reachable party. See section 4.1 for more details.

12 ENHANCED CONTINGENCY SOLUTION (ECONS II)

The TARGET Services Enhanced Contingency Solution (ECONS II) enables real-time gross settlement in Central Bank Money for Payment Orders and Ancillary System transactions in a situation where the T2 service, i.e. the CLM and/or the RTGS component, is not usable. Following its activation by the system operator, the ECONS II component will always replace both the CLM and the RTGS contingency settlement components. For Payment Banks, only access through the Graphical User Interface via ESMIG (U2A) is possible. Such access is established via the respective Network Service Provider (NSP) and through a dedicated instance of the ESMIG component segregated from the instance serving T2 production environment¹⁰.

Contingency accounts are setup in CRDM (Common Reference Data Management), like regular accounts for CLM and RTGS. Each Payment Bank (PB) may have as many Contingency Accounts as it has MCAs, exclusively to be used for contingency settlement activities. A PB Contingency Account inherits the AAU BIC of the linked MCA; the linked MCA will be used for the balance sweep after the ECONS II closure. Note that the balance of a Payment Bank Contingency Account cannot go below zero.

When ECONS II is activated, all accounts have a balance of zero. Thus, to make payments, each PB Contingency Account needs an injection of liquidity. Liquidity can be injected in two different ways: either through external inbound liquidity transfers from T2S DCAs or through internal inbound liquidity transfers from Danmarks Nationalbank's CB Contingency Account in the form of intraday loans based on pledged collateral¹¹. Further it is expected that liquidity injections to the PB Contingency Accounts via participants TIPS DCAs will be possible in the future.

External inbound, internal inbound or external liquidity transfers can only be instructed by Danmarks Nationalbank. Thus, to transfer liquidity to a PB Contingency Account, participant banks must request Danmarks Nationalbank to do so. Once liquidity has been injected, participant banks can themselves instruct payments from their contingency accounts.

¹⁰ ECONS II Actors shall bilaterally have defined a relationship with one or more selected NSPs for the purpose of getting U2A connection to ECONS II. A2A connection is only used by Danmarks Nationalbank for the purpose of sending ASTransferInitiation files to ECONS II on behalf of Ancillary Systems.

¹¹ Note, the collateral value of the collateral pledged by the account holder during normal operation and stated in the account holder's collateral list will not be usable in this situation, as information about the utilisation of the account holder's credit line will not be available when CLM is unusable.

Payment banks can also, among other things, see all account transactions and balances from the U2A GUI e.g. to be used for their own reconciliation.

Settlement of Batch Clearing is only supported by AS Settlement Procedure A in ECONS II. Ancillary Systems use the Contingency Technical Accounts for the settlement of their AS transaction files. The settlement is coordinated between the Ancillary System and Danmarks Nationalbank through a bilateral agreement.

In ECONS II, no credit line facility exists. This means that credit based on pledged collateral will not be granted through an increased credit line, but through a direct liquidity transfer from Danmarks Nationalbank's CB Contingency Account to the PB Contingency Account, reflected as an account credit entry.

In an ECONS II contingency situation, providing sufficient funds to cover intraday loans could be challenging due to the frozen balances of T2 accounts¹². Thus, Danmarks Nationalbank can, in that situation, provide overnight credit (o/n-credit) for monetary policy counterparts. Such o/n-credit should in general reflect the frozen amounts in T2, and will be granted based on individual evaluation and agreement with each counterpart. The Payment Banks can also enter into intrabank loans with each other, as is the case during normal operations, to cover intraday loans.

The business day schedule will basically remain the same in ECONS II¹³. Once it is announced that T2 is available again, an ECONS II closing procedure starts, which means that liquidity transfers and payment orders can no longer settle. ECONS II then sends the final balances to CLM, after which all account balances in ECONS II are set to zero, and normal operations are resumed in T2.

After the contingency session has closed, the interest for every closing day in ECONS II will be calculated retroactively using the current account rate. In the interest calculation, the frozen T2 balances will be included. To this will be added the net inflow on the counterpart contingency account in ECONS II as well as TIPS and T2S balances¹⁴. There will be no

¹² This will depend on whether a counterpart has a payment inflow or outflow, and the sum of liquidity in T2S and TIPS DCAs.

¹³ The system operator can always postpone the closing or start of a business day, if deemed necessary.

¹⁴ The net inflow is defined as the sum of net payment and liquidity transfers to a counterpart's ECONS II Payment Bank Contingency Account. The o/n-credit provided to the counterpart by Danmarks Nationalbank is not included.

payment of interest on o/n-credit provided during the contingency session.

13 TARGET DKK TEST

This section covers the test process for TARGET DKK, and the main focus will be on the Danish User Testing (D-UT), which includes the Danish sector test of TARGET DKK as a whole.

The section briefly describes the purpose of the test, and additionally the overall approach to testing as well as migration and go-live, also including preliminary plans.

13.1 Test purpose

TARGET DKK systems are classified as extremely business-critical since it will be the backbone of all payment and settlement infrastructure in Denmark. It will have a significant impact on the banking sector and Danmarks Nationalbank operations if systems are not operational.

A successful test run is therefore crucial for the sector and Danmarks Nationalbank's future business-critical activities. To have a successful test run, all sector participants no matter the type of participation are required to participate actively in the Danish User Testing.

The overall purpose of the testing is to support the main goal of the TARGET DKK programme and validate that the systems are able to support payment settlement, collateral management and Danish monetary policy instruments.

The more specific purposes of the testing are to:

- Ensure that TARGET DKK systems live up to their overall purpose
- Ensure that all user-facing processes work according to requirements and specifications
- Ensure that all systemic processes work according to requirements
- Ensure that all non-functional requirements and measures are met
- Ensure that the solution meets operating procedures

13.2 Risk-based test

Danmarks Nationalbank will work with a risk-based approach to testing. This means that all system functions, described in the form of requirements specifications, are evaluated on the basis of a risk assessment. Risks are assessed on the basis of business criticality as well as the complexity of the product.

Based on the risk classification, the priority of the test is defined, including what and how deeply (how much) to test. The higher the risk classification, the greater the test scope.

The testing sequence will be based on the principle that areas with the highest risk classification are tested first, or as early in the process as possible. Any defects discovered in connection with the testing will be addressed according to the same principle, i.e. defects related to areas with a high risk classification are prioritised and rectified first, unless they are assessed to have a minor impact on the solution.

As regards the evaluation and reporting of tests, the risk classification is actively used to decide whether the test covers the individual areas well enough and whether the product quality meets the expected criteria. For example, if many defects are detected within an area with a high risk classification, a decision will probably be made to extend the regression test within this area in order to ensure that fewer errors get through, thereby ensuring better quality before go-live.

13.3 Test approach

The overall approach to testing TARGET DKK will follow the global standard (ISTQB).

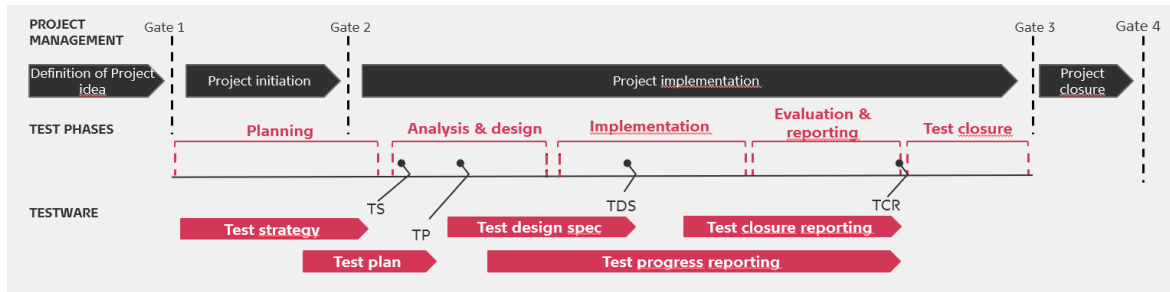
The test process that TARGET DKK will follow is divided into the following phases: planning; analysis & design; implementation; evaluation & reporting; and finally test closure.

Several of the phases will be overlapping, which is not shown in the figure 8, but will appear from the Danish User Testing time schedule.

Note that the phases in this section cover the Test process, not to be confused with the phases in the TARGET DKK programme itself.

Test process

Figure 8



Planning

During the planning phase, Danmarks Nationalbank will determine and describe the test strategy for TARGET DKK. The test strategy sets out the framework for and governance of the testing and describes the approach to testing in general terms. In addition, the strategy contains the overall plan. The test strategy will be shared and updated with the sector in the Test and go-live group.

During planning, Danmarks Nationalbank will also create detailed test plans for the Danish Central Bank testing (D-CBT), which covers Danmarks Nationalbank test with the ECB, and Danish User Testing (D-UT), which covers full sector testing. The plan for Danish User Testing is clarified with the ECB, and the Test and go-live group is invited to provide input to the plan.

The test plans are detailed and identify test tasks, as well as who is involved in the execution of each task and requirements for test environments together with entry and exit criteria for tests.

Analysis & design

During the analysis & design phase, test scenarios and test cases are created. Danmarks Nationalbank has established a test tool, in which requirements and test specifications are created and maintained to ensure traceability and transparency throughout the entire testing process.

For TARGET Services, mandatory requirements and test specifications from the ECB are expected to be reused in a Danish context. Danmarks Nationalbank decides on and prepares mandatory requirements and test specifications in the tool. The Test and go-live group actively assesses whether there is a need for further test specifications in addition to the mandatory specifications, and prepares these in the tool.

Based on the test analysis and design, Danmarks Nationalbank will prepare training material to be used in the test implementation phase.

Implementation

The implementation phase starts with test training sessions for all sector participants. Test trainings will run over a long period alongside/in parallel with test execution. The training sessions are based on the plans covering what is to be tested and when.

Before starting the Danish User Testing, all sector participants must complete Connectivity testing (checking that they can connect and have access to the test systems), and after approval of the connectivity test, the User Test can begin.

The User Test is executed in Danmarks Nationalbank's test tool, to which all sector participants are given access. All participants are expected, as a minimum, to complete the mandatory tests in the tool (based on selected participation type and services).

In the implementation phase, weekly meetings are held with all test responsible/sector participants involved in the User Test with the purpose of coordinating and following up on the test process, handling defects/error reports as well as handling any issues or tasks.

Evaluation & reporting

Evaluation and reporting take place continuously, at a frequency agreed with the TARGET DKK programme management and the ECB. Danmarks Nationalbank will collect test status, and it is a requirement that all sector participants involved in Danish User Testing contribute to the reporting during implementation.

Test status reporting will contain an overview of test progress in relation to the plan, including outstanding defects/error reports, and risks and issues in relation to testing. The ECB's reporting requirements will either be incorporated or reported separately. The reporting requirements will be agreed by the ECB and Danmarks Nationalbank. Test reports will be shared with the ECB and the TARGET DKK programme management.

When the implementation is finalised, Danmarks Nationalbank will collect test results from all sector participants involved in the Danish User Testing, assess the exit criteria for the test and deliver a test closure report to the TARGET DKK programme management and the ECB.

The report will contain a summary of the entire test process, as well as evaluation of tests related to exit criteria. The ECB and the programme management must formally approve the final report before the Danish User Testing can be formally concluded.

Test closure

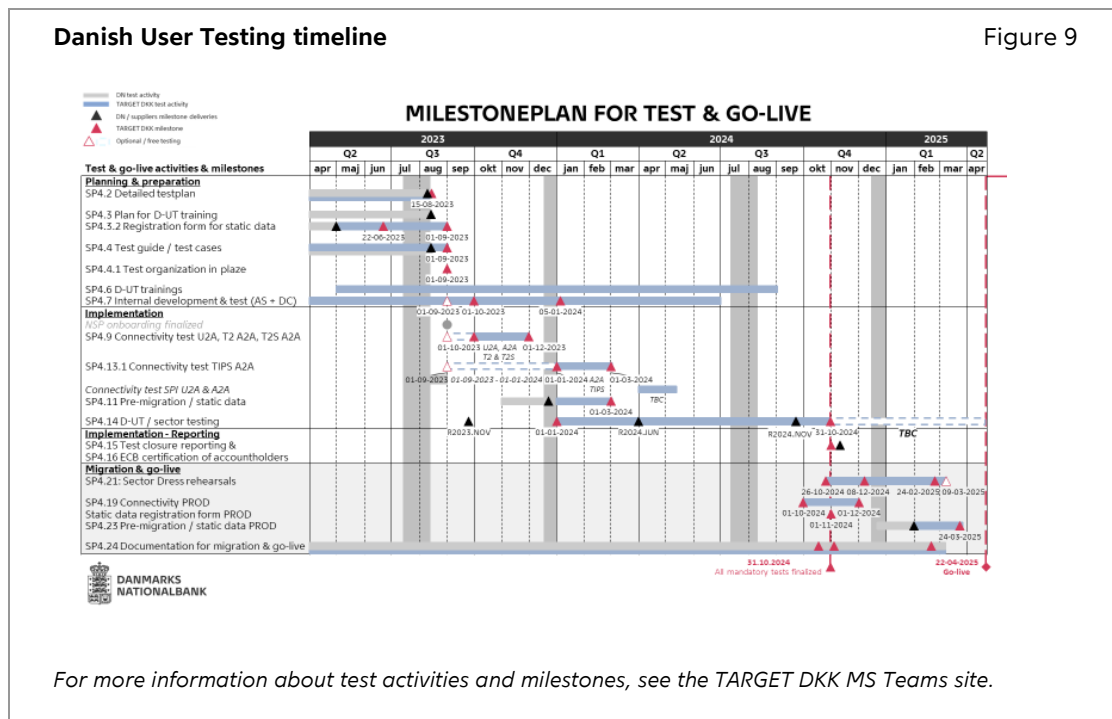
During the test closure phase, Danmarks Nationalbank and the ECB will ensure that any outstanding issues from the test are handled; either through the issue being resolved and completed within an agreed time period by the TARGET DKK programme, or by agreeing a plan for resolution, and transferring the ownership of the implementation of this solution to the relevant administration or organisation.

Danmarks Nationalbank will update the testware (such as test documentation for ongoing maintenance and testing), and hand it over to the relevant administration in Danmarks Nationalbank. If sector participants wish to receive testware upon test closure, a request can be made to Danmarks Nationalbank.

Danmarks Nationalbank and the ECB decide on and document what should happen to the TARGET DKK test environments, as well as how they will be handled going forward. The sector participants who have their own test environments are responsible for these in their own organisation.

13.3.1 User test milestone plan

The following milestone plan (figure 9) shows the overall Danish User Testing timeline.



The user test milestone plan reflects the synchronisation points related to test and go-live. A description of each synchronisation point can be found on the TARGET DKK MS Teams site.

13.4 Migration and go-live

Danmarks Nationalbank will create a plan for dress rehearsals, pre-migration and migration and migration based on material provided by the ECB as well as experience from the T2/T2S consolidation project.

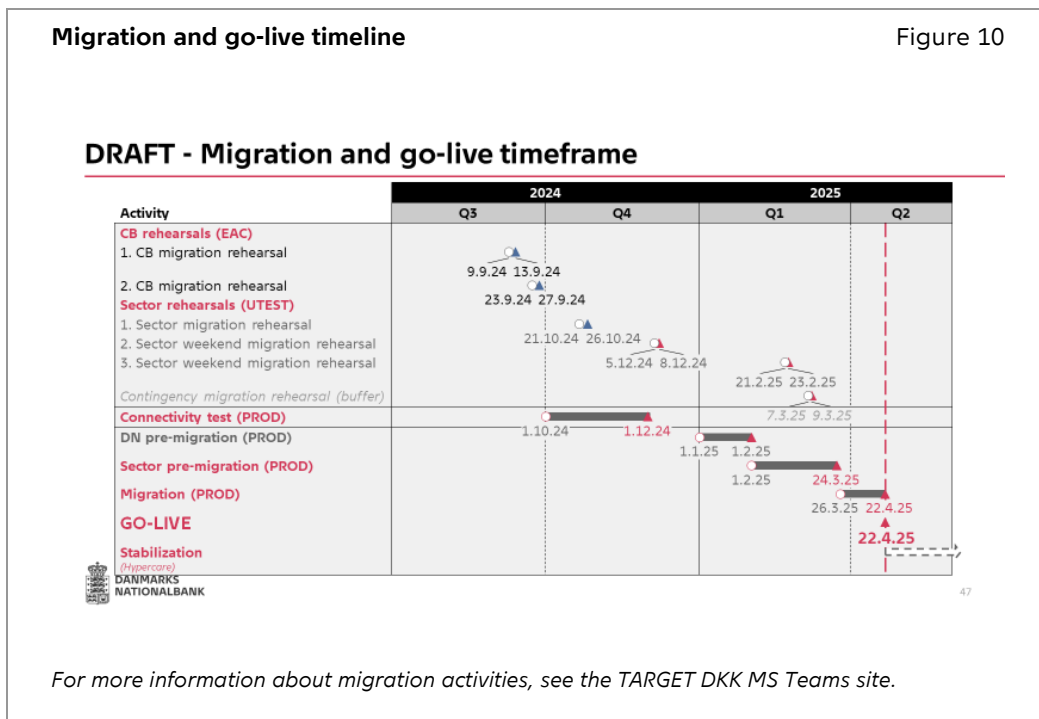
The plan is expected to contain five to six dress rehearsals, scheduled as close to the migration period as possible. The first two will be internal Danmarks Nationalbank rehearsals, and the next three (to four (contingency)) will be performed together with relevant sector participants. It is expected that all sector participants will attend the last two dress rehearsals before migration to production as a minimum.

Danmarks Nationalbank will prepare runbooks together with the Test and go-live group using ECB migration documentation as baseline.

Pre-migration and Migration will be carried out according to the agreed plan and guidelines.

13.4.1 Migration and go-live timeline

The following (figure 10) shows the overall preliminary timeline for migration and go-live.



- Dress rehearsals test the migration activities that must be carried out in connection with Go-live.
- Connectivity testing of the production environment is a check that all sector participants can connect to Production.
- Pre-migration activities cover configuration and master data setup in production.
- Migration is all the activities that must be completed before TARGET DKK can go into production, i.e. go-live.

14 CONTRACTUAL RELATIONSHIP

Danmarks Nationalbank has the administrative relationship and the working relationship with TARGET Services for the participants in connection with use of the platform for Danish relationships. Danmarks Nationalbank's terms and conditions will be updated to reflect the system changes entailed by the transfer of Danish kroner to TARGET Services. Like today, the account holders' contractual relationship will be with Danmarks Nationalbank. The fact that the Eurosystem is the system owner

and the fact that the system is also a payment system for other national central banks are thus of no legal significance for account holders at Danmarks Nationalbank.

15 FURTHER INFORMATION

- Questions can be sent to Danmarks Nationalbank at the email address: target2_sektoren@nationalbanken.dk
- [ECB's website](#)
 - See e.g. UDFS, UHBs and specific memos under Knowledge-based repository
- Applicable terms and conditions for accounts
- TARGET DKK MS Teams site