

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 another core objective. Today, the Kronos2 payment system has a central role in this infrastructure – both in virtue of settlement of large, time-critical payments between banks and mortgage credit institutions (participants) and by virtue of Danmarks Nationalbank's role as settlement bank for other payment and settlement systems. Kronos2 is also used to carry out monetary policy operations in accordance with Danmarks Nationalbank's monetary policy management.

1.1 Danish kroner migrates to TARGET Services

Based on a preliminary analysis, risk assessment and dialogue with the financial sector, Danmarks Nationalbank has decided to discontinue Kronos2 and relocate the settlement of Danish kroner to the new European consolidated payment and securities settlement platform TARGET Services. As part of the consolidation, TARGET Services are able to support settlement in several currencies and the coming 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 one single platform.
- Strengthened IT security and a united front against cyber threats.
- Harmonized infrastructure with increased economies of scale in relation to maintenance and further development.

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

1.2 Cooperation

The project of migrating Danish kroner to TARGET Services is ongoing until go live (expected in Easter 2025) in close cooperation with the ECB, European central banks, payment and settlement systems and representatives of the Danish financial sector. The cooperation in the sector comprises the establishment of a sector group at high management level, a reference group representing the broad part of 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 system owners of payment and settlement systems.

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 in account structure, the monetary policy day and collateral, types of participants and settlement of instant payments. This memo describes the most significant adjustments to the Danish payment infrastructure when Danish kroner is migrated from Kronos2 to TARGET DKK.

The migration to a new payment system will entail changes in the underlying payment structure – for Danmarks Nationalbank, connected clearing and settlement systems and participants. 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. The ongoing work with cross-border payments at European level are not a subject in this memo.

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

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

There are areas that, for natural reasons, have not yet been analysed in depth. The memo will be revised continuously towards go live. The next update will be in the first quarter of 2023.

1.4 What is TARGET Services?

TARGET Services is the European payment and securities settlement platform. It consists of three services, which gather all settlement of Danish kroner in one platform: T2, which consists of a payment system (RTGS¹) and a Central Liquidity Management (CLM) system, the T2S securities settlement system and the settlement system for instant payments TIPS. There are several other cross-sectoral modules, e.g. static data, invoicing and an emergency system.

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

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

Overview of TARGET Services

Figure 1



T2 is a fully modernised version of the TARGET2 payment settlement system from 2008. T2 Services 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 possible credit line.

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

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

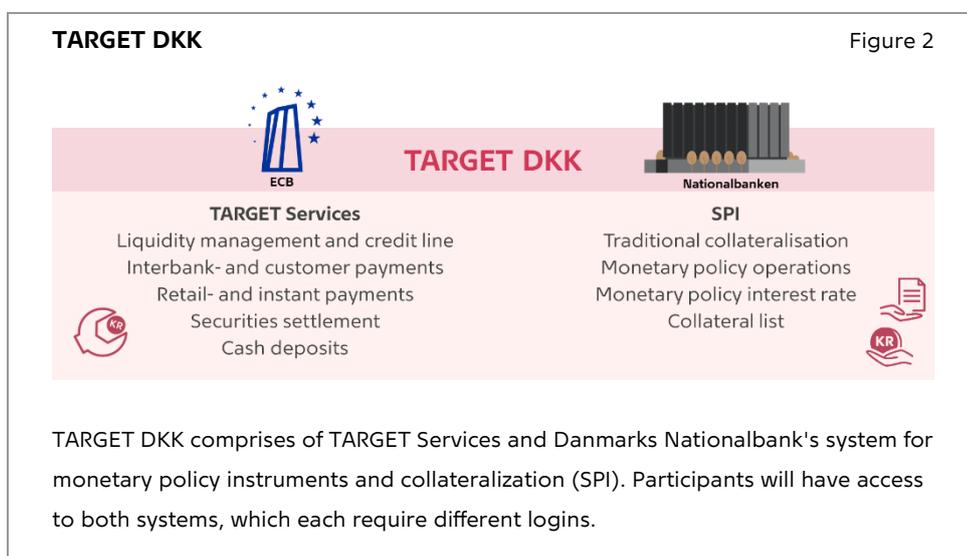
TIPS (TARGET Instant Payment Settlement) is the Eurosystem's settlement platform for instant payments. Instant payments in Danish kroner will in the future be settled on TIPS.

There are a number of cross-sectoral modules (common components) that support T2, T2S and TIPS. For example, the Common Reference Data Module (CRDM), which manages all cross-sectoral static data such as user information, account setup etc. and module for billing etc. ECMS (Eurosystem Collateral Management System) won't be available in DKK.

1.5 What is TARGET DKK?

TARGET Services does not support the Danish monetary policy instruments and traditional collateralisation. In the future, these are supported by Danmarks Nationalbank's own system for monetary policy instruments and collateral management (SPI). The system is based on the portfolio management system Calypso, which already supports parts of the collateral feature in Kronos2 today.

The overall term for the coming payment infrastructure, comprising both TARGET Services and SPI, is TARGET DKK.



2 ACCOUNT STRUCTURE IN TARGET SERVICES

In both Kronos2 and TARGET Services, the 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. The participants must continuously ensure that they have sufficient liquidity to complete their 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 Kronos2, which is described below.

2.1 Current account in Kronos2

In Kronos2, the 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.

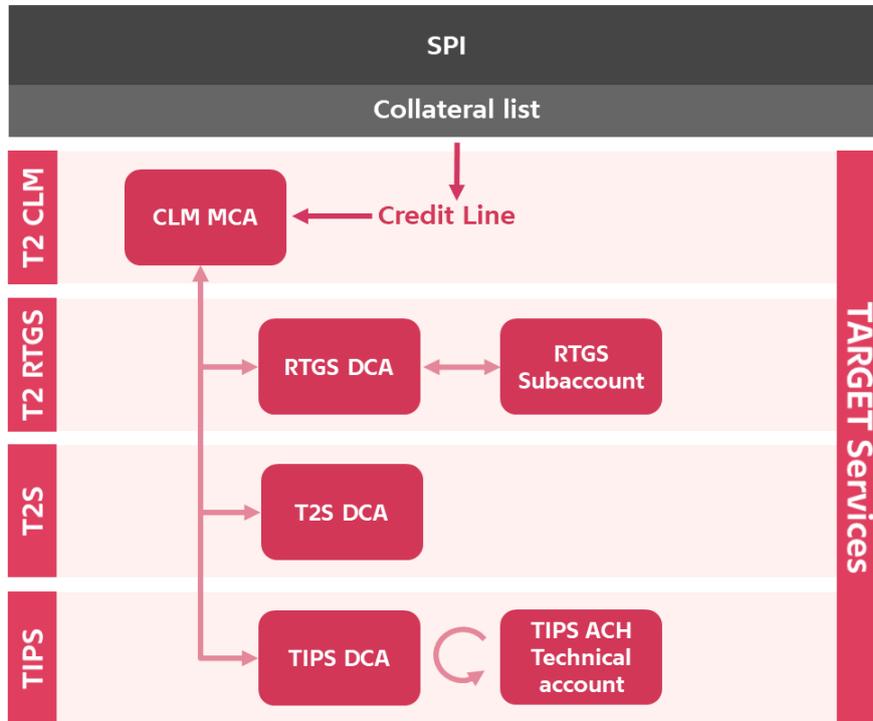
At the close of the monetary policy day, any draws on the loan account must have been covered. If the participant fails to cover the outstanding amount, it is automatically covered by transfer of funds from the settlement account to the loan account. The balance on the settlement account bears interest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

2.2 Account structure i TARGET Services

The participant owns three different types of accounts in TARGET Services: Main Cash Account (MCA) in T2 CLM, Dedicated Cash Accounts (DCA) in T2 RTGS, T2S and TIPS, and a RTGS subaccount. Note that it is possible to create several MCAs, DCAs and subaccounts in T2, T2S and TIPS. The TIPS ACH Technical account is used for settling instant payments by the ACH-model (see chapter 4). 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. Participant manages and distributes liquidity from the MCA to their DCAs in T2 RTGS, T2S and TIPS. Payment and settlements are not available on a MCA – the DCAs are used for this purpose. The MCA can have a drawing right in the form of a credit line. Settlement of retail payments in the Batchclearing (Sum-, Intraday-, and P27-clearing) are done on RTGS subaccounts.

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 Danmarks Nationalbank's Collateral System. 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 the potential 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*, where the participants can transfer large and time-critical payments (interbank and customer payments) to each other. The account is somewhat similar to the participants' existing settlement account in Kronos2. The RTGS DCA can be linked to the participant's MCA, such that one for instance may create agreements on automatic liquidity transfers.
- *T2S DCA* is used for making payments in connection with settlement of securities transactions and 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 that are used as collateral for the T2S auto-collateralisation will be retained.
- *TIPS DCA* is used for instant payments, which can be made 24/7/365.

The participants may choose to have more than one DCA per service.

It is not possible to have a negative balance in a DCA. If a participant wishes to have more liquidity in its DCA, the participant can transfer liquidity from its MCA or from a DCA in one of the other services.

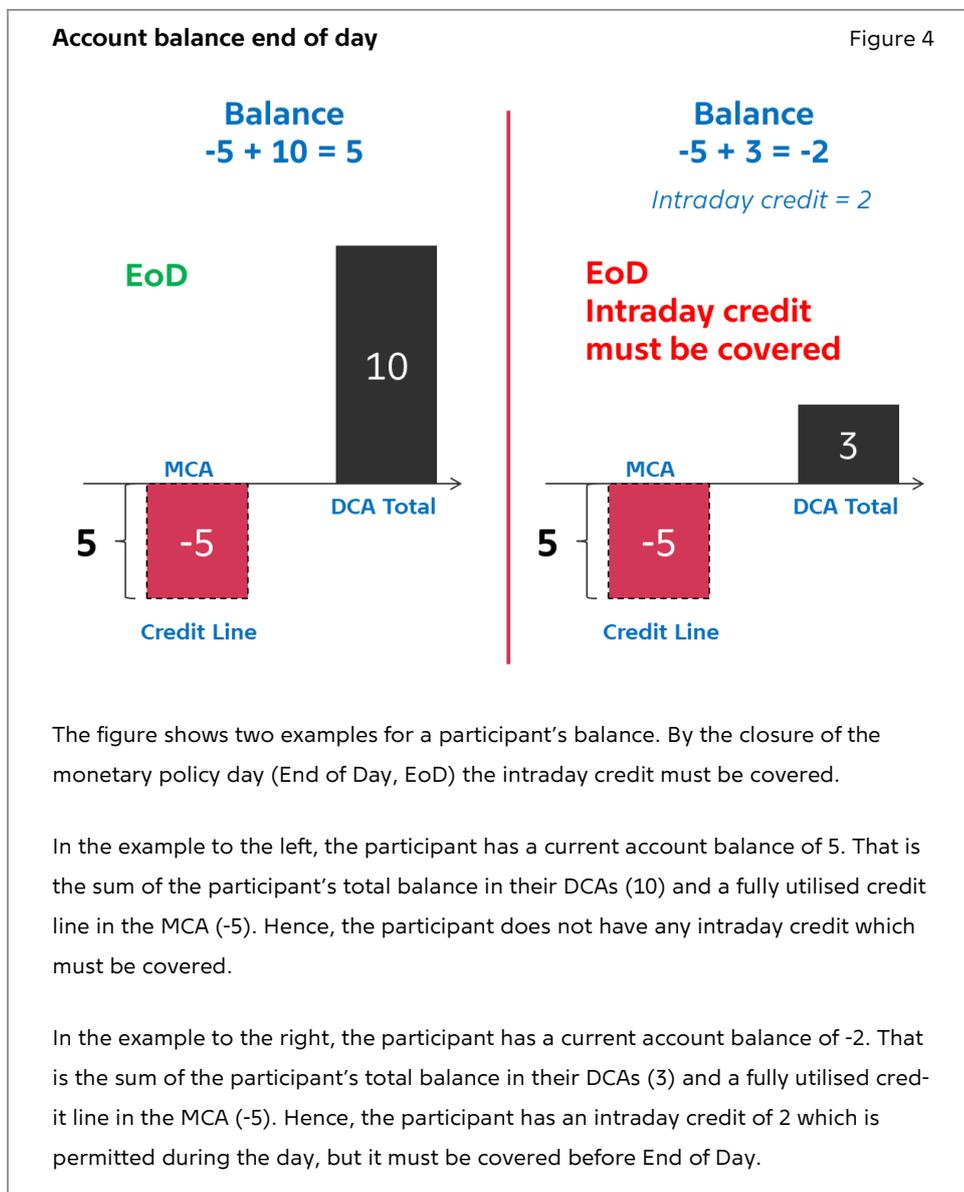
The participants may have liquidity deposited in DCA accounts at the closing and opening of the monetary policy day. A deposit in T2S DCA will be automatically transferred to the MCA ahead of the closure of the monetary policy day.

2.3 Current account balance and intraday credit

The participant's total current account balance consists of the total balance in participant's accounts in TARGET Services. The total current account balance is the sum of the balance in the CLM MCA and the deposits in the RTGS DCA, RTGS subaccounts, T2S DCA and TIPS DCA as well as deposits in P27's technical TIPS account. Note that subaccounts are emptied and transferred to the participant's RTGS DCA after each settlement cycle. Thus, balances in the subaccounts are in practice zero by the closure of the day.

The 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 other accounts. A negative current account balance during the day is regarded as utilized intraday

credit and must therefore be covered before the end of the monetary policy day at 17.00. This is illustrated in figure 4.



It is important to stress in this context that the participant can, in fact, utilise its 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, the participant's final closing balance for the 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.

However, TARGET Services offers a queue feature. Payments are placed in a queue if a participant's liquidity is insufficient for payment settlement at the required time. Therefore, the participant avoids the system rejecting a payment and, thus, having to place another payment instruction in the system when there is sufficient liquidity for the payment. Pending payments in the payment queue are removed at the end of the business day. Different types of transactions may also 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 prioritized 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. The participants can have settlement accounts set up in which the participant can reserve amounts for the individual settlement. The settlement account is locked during the settlement so that the participants do not have the right to dispose of the balance. This account structure ensures that Danmarks Nationalbank can guarantee the reserved amounts during the settlement.

The balance on each settlement account can be positive or zero, and a balance in settlement accounts is transferred to overlying accounts after each settlement.

When Danish kroner is 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 the retail payments are settled in T2 RTGS (Batch-clearing) and in TIPS (instant payments). Batchclearing uses the model known from Kronos2 with settlement happening in designated settlement accounts (sub-accounts in TARGET Services). The participants have a sub-account for settling retail payments (batch), they can transfer liquidity from the RTGS DCA to a sub-account, and they can, unless a settlement is taking place, transfer a deposited amount from the sub-account to the RTGS DCA. By the end of the monetary policy day, the balance on the sub-account is zero.

The existing Straksclearing will shut down in the Easter 2025 as all instant payments will be settled via TIPS, more on this in section 4.

VP settlement

Euronext Securities Copenhagen, ES-CPH (earlier VP-Securities) is currently doing a market consultation with their customers about the future settlement of securities in Danish kroner in the local settlement platform. On the basis of this consultation it will be decided in the Autumn 2022 whether ES-CPH settlements in Danish kroner continues via Danmarks Nationalbank or settled without central bank money. In the latter case, no settlement accounts are needed for the ES-CPH clearing in TARGET DKK.

CLS

CLS is a multilateral clearing and settlement system for FX trades in, currently, 18 different currencies, and it will keep on being possible to settle FX trades in Danish kroner. The CLS-trades are settled in T2 RTGS. The exact setup is expected to be clarified no later than end of 2022.

3 RETAIL PAYMENTS – BATCHCLEARING

3.1 The future of settlements

The sector has decided to replace the existing national Batchclearing (Sum- and Intraday Clearing), settled via Finance Denmark, with new

clearings settled via the clearing house P27 (P27-clearing). Therefore, it will be P27 that connects to T2 RTGS. Sum- and Intraday Clearing will be settled in TARGET DKK through a system integration between MasterCard Payment Services (MPS) and P27. Batchclearing will be settled via the participant's sub-account.

The transition to the new P27-clearing will take place after the migration of TARGET DKK. In the period from Easter 2025 until the first participant migrates to the new P27-clearing, there will, as today, only be two clearings (Sum and Intraday). From January 2026, transactions from the Intraday Clearing and the electronic clearing and truncation (dokumentløs clearing) will gradually be moved to the new P27-clearing. The Intraday Clearing and the electronic clearing truncation can be phased out in May/June 2026. Hereafter, only P27-clearing and Sum Clearing will be used.

3.2 Placement of settlement batches

The settlement of Batchclearing in TARGET DKK will, as in Kronos2, take place at fixed times throughout the day.

The settlement times are the same as today, the only exceptions being that the night 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 in the hours from 03:00 to 05:00.

The new P27-clearing will have the same settlement times as the Intraday Clearing. The three clearings (P27, Sum and Intraday) will therefore have a common settlement time at 01:00.² Furthermore, a new P27-clearing time is introduced at 15:30, which will ensure settlement of more credit transfers within the same day. The P27-clearing can also be included in the 01:45 clearing.

² The participants will however only see one entry in their RTGS sub-account for all three clearings. The division can be seen in the reports and via GUI at P27 and MPS, respectively.

Placement of settlement – Batchclearing

Info box 1

The table contains an overview of the settlement of Batchclearing with a settlement times for each clearing. *Note: The P27-clearing is only introduced in 2026 whereas the Intraday clearing is phased out in 2026.*

<u>Settlement</u>	<u>Time of settlement</u>
P27, Sum- and Intraday Clearing	01.00
P27- (technical) and Sum Clearing (technical)	01.45
Sum-, P27- (technical) and Intraday Clearing (technical)	06.00
P27- and Intraday Clearing	09.00
P27- and Intraday Clearing	12.00
P27- and Intraday Clearing	14.00
P27 Clearing	15.30

* 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 run on the first day after a bank closing day.

3.3 Settlement of Batchclearing

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 coverage. The automated procedure ensures that the clearing participants do not have to make manual transfers or create standing orders prior to the settlements. The automated procedure also minimizes the risk of a delay in the settlement of retail payments.

In TARGET Services, P27 can transfer liquidity from the participants' RTGS DCA to their sub-account on behalf of the participants. This means that the participants will not have to make manual transfers themselves or create standing orders from the RTGS DCA to the sub-account prior to a settlement. However, the participant is responsible for having enough liquidity in the RTGS DCA.

P27 will try to make total netting of clearings settled at the same time. At first, P27 will try to transfer the exact amount to the sub-account that each participant needs in order to cover the total net position across the Batchclearing. If the participants have enough liquidity, the Batchclearing are settled. Serial settlements will, however, take place if one or more participant(s) does not have sufficient liquidity for total netting across the clearings. In case of a serial settlement of the Sum- and Intraday Clearing, P27 will try to transfer liquidity to cover both the consolidated net position across Sum and Intraday plus an individually chosen coverage amount. The participants must, therefore, still register a coverage

amount in the Sum- and Intraday Clearing. The coverage amount must be registered in P27's system.

During the settlement phase, the liquidity in the sub-accounts is locked. Thus, the amount in the sub-accounts acts as credit lines, i.e. the amount 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 balance of the sub-account is zero.

4 TIPS – INSTANT PAYMENTS

Today, Straksclearingen ensures instant transfers between Danish citizens at any time 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 transferred from a model based predominantly on a collateralised credit line to a model based on liquidity in the TIPS system. The liquidity in TIPS may be provided via a credit line attached to MCA and may therefore be based on the participants' collateral.

4.1 TIPS participation

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

- A *TIPS participant* is owner one or several TIPS DCAs.
- A *reachable party* does not have its own account in TIPS, but will instead have to enter an agreement with a TIPS participant to be able to use this participant's TIPS DCA.

Both TIPS participants and reachable parties will have the opportunity to instruct instant payments themselves instead of using a clearing house (ACH). Alternatively, they can appoint an instructing party that can send and receive payment instructions in TIPS on their behalf.

4.2 Liquidity in TIPS

Settlement of an instant payment requires that the originator of payment has sufficient liquidity available in TIPS. This is a requirement regardless of the settlement model (see chapter 4.3). Therefore, all TIPS participants must ensure that they have sufficient liquidity in their TIPS DCA.

Participants can transfer liquidity to the TIPS DCA from their accounts in the other service, e.g. the CLM MCA. TIPS is, as the only TARGET service, open 24/7/365. Hence, the participants must transfer sufficient liquidity to TIPS in T2's opening hours. In particular, the TIPS participants must make sure that their TIPS DCA has enough liquidity ahead of weekends and holidays in which T2 is closed.

TIPS participant(s) will handle liquidity management on behalf of the reachable parties and make their liquidity available to them.

4.3 Settlement models

The participants can choose between two models for settling instant payments: The standard model in TIPS and the ACH-model in P27. The ACH-model will only be available for settlement between the TIPS participants/reachable parties that are also P27 participants. Non-P27 participants will only use the standard model. All P27 participants must, therefore, be able to settle with non-P27 participants via the standard model. Thus, the standard model ensures interoperability between participants.

Settlement models in TIPS		Figure 5
	Standard model	ACH-model
Non-P27 participant	Used for settlement of all instant payments directly in TIPS.	Not used by non-P27 participants.
P27 participant	Used for settlement with non-P27 participants. It is required that P27 participants are also able to settle via the standard model.	Used for settlement between P27 participants directly in P27.

*It is required that P27 and non-P27 participants are always able to reach one another regardless of the settlement model used. All participants must, therefore, be able to settle via the standard model. P27 participants may let P27 instruct payments in the standard model hereby leaving the settlement of all instant payments with P27.

4.4 Non-P27 participant

Non-P27 participants will settle all instant payments via the standard model, directly in TIPS. In this model every instant payment is settled di-

rectly in the participants' TIPS DCAs. Thus, it requires the participant to have sufficient liquidity in their TIPS DCA to make settlements.

A non-P27 participant may choose to instruct the instant payments themselves and will in this case send/receive payment instructions themselves to/from TIPS for settlement in the DCA. The participant may also choose a third party as instructing party which will then be able to instruct payments in the DCA on behalf of the participant.

4.5 P27 participant

P27 participants will mainly settle instant payments via the ACH-model. In the ACH-model, the payments are settled in P27 rather than in TIPS. The participants will only use TIPS for making liquidity available for P27. P27 will then use the reserved liquidity to clear the instant payments in their own systems. Thus, each P27 participant transfers liquidity from the TIPS DCA to P27's technical account in TIPS.³ The liquidity can then be used to settle payments with other P27 participants.

As in TIPS, all instant payments are settled separately and instantly. The distribution of liquidity in the technical account, and thus each of the participants' balances, is updated instantly every time an instant payment has been settled.

P27 can transfer the liquidity from the P27 participant's TIPS DCA to the technical account. This requires that the participant defines a rule in P27 for the desired level of liquidity in the technical account (corresponding to the primary instant clearing rule today). Automatic liquidity transfers from/to the participant's TIPS DCA will hereafter ensure that the participant has the desired level of liquidity. The adjustment is made automatically as soon as an instant payment leads to the balance exceeding an upper/lower amount in the technical account. If a P27 participant does not have sufficient liquidity in their TIPS DCA, the transfer will not take place (no partial liquidity transfers will be made). P27 cannot transfer more liquidity than what is available in the TIPS DCA such that the deposit in the DCA will act as a barrier. A P27 participant may also transfer liquidity to the technical account themselves.

All P27 participants must, in addition to the ACH-model, be able to use the standard model, as they have to be able to settle instant payments with non-P27 participants. This means that a P27 participant will use their TIPS DCA for two purposes: (1) to fund the technical account of P27 to be

³ P27 has only one technical account in TIPS to which all P27 participants transfer their liquidity.

able to settle with other P27 participants in the ACH model and (2) to settle instant payments in the standard model with non-P27 participants. P27 offers to instruct all payments in the standard model on behalf of the P27 participant (as instructing party). This means that P27 de facto will clear all instant payments on behalf of the P27 participants. Hence, P27-participants do not have to instruct payments via the standard model in TIPS themselves, and do, in principle, only need to make sure that their TIPS DCA holds sufficient liquidity.

4.6 Everyone must be able to reach anyone

Everyone settling instant payments in Danish kroner must be able to send instant payments to each other regardless of which settlement model is used. Thus, all P27 participants must as a bare minimum be able to receive payments from non-P27 participants and settle these directly in their TIPS DCA via the standard model. This ensures that all participants can reach one another in concordance with the requirement declared by Danmarks Nationalbank as well as the rules presented in NCT Inst (see chapter 4.8).

Every day, TIPS generates a report, the so-called "TIPS Directory", which contains an overview of all participants settling instant payments in Danish kroner. The TIPS Directory indicates which TIPS DCA is used to settle instant payments in the standard model for each participant.

P27 participants also receive a so-called "routing-table" from P27. This routing table contains information about which participants can receive instant payments in the ACH-model and which participants solely use the standard model. Thus, P27's routing table also contains information from the TIPS Directory.

4.7 Recall and investigation

In TIPS it is possible to make a so-called "recall request". This is a request of repayment of an already settled instant payment. The receiver can accept or reject the request. If it is accepted, the amount is repaid partially or fully to the sender of the original 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 a confirmation of the transaction. The sender will then receive information about the status of the transaction in question.

4.8 NPC Instant Credit Transfer (NCT Inst) scheme

It has been decided that settlement of instant payments in Danish kroner in TIPS must follow Nordic Payment Council's (NPC) Instant Credit Trans-

fer Inst scheme. Relevant information about the NCT Inst scheme may be found on NPC's website. The latest version of the rule book may be downloaded [here](#).

5 COLLATERAL

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

5.1 Statement of collateral

The participants' collateral is stated in the Collateral System, which is today an integrated solution 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 the 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 – the MCA. 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.

A 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) on other accounts. If a participant has a negative draw on its MCA which 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 credit line in MCA 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 a custody account in VP which has been pledged to Danmarks Nationalbank. Based on this request, the collateral system will send matched instructions to VP 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, the participants can only request to transfer securities to/from the pledged custody account via Kronos2. Kronos2 will then submit a request to VP 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 VP, 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 15:30. A list in Kronos2, and at Danmark Nationalbank's 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 the collateral system, the participants will have the opportunity to request the transfer of a security to/from the pledged custody account, just like in Kronos2. The list of eligible assets is expected to be supported U2A. Otherwise the list can be reached A2A or on Danmarks Nationalbank's website.

⁴ See Single Collateral Management Rulebook for Europe (SCORE)

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.

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 have 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.

The participants can put up 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 at 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 the Collateral System. 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 has the opportunity 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 Danmarks Nationalbank's Collateral System.

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 it is ensured in the period from 16:45 to 17:30 that no participants are overdrawn on their current account.

When Danish kroner is 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 will presumably be open 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 are overdrawn on their current account balances.

Note that the business day Monday already opens on the calendar day Friday 19:30 and closes on the calendar day Monday 17:00 – see the info box below for more details. This also has implications on the placement of the settlement of P27- and Batchclearing in T2 RTGS.

In T2S, the Nighttime Settlement of the business Monday starts on the calendar day Friday (typically 20:00) and closes 02:30 in 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 will reopen Monday 02:30. If the Nighttime Settlement has not concluded before 02:30, it will conclude on Monday 02:30. Only after this conclusion, the Realtime Settlement will 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 all the time, also on weekends. Thus, it is important that the participants dedicate sufficient liquidity to settle instant payments before the weekend.

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.

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

Business Day Monday

Info box 2

- The business day Monday starts Friday 19:30.
- T2S Nighttime Settlement typically starts Friday 20:00, and if it has not concluded by 02:30, it is temporarily interrupted by the maintenance window.
- P27 and Batchclearing is settled on Saturday 01:00.
- The maintenance window is completed between Saturday 02:30 and Monday 02:30.
- The business day Monday is resumed Monday 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 business day Monday closes at 17:00
- The business day Tuesday starts Monday at 19:30
- P27 and Batchclearing are settled on Tuesday 01:00.

8 CASH DEPOSITS

Kronos2 handles functionalities related to cash deposits in the GCSD module. The functionality is only relevant for the 5 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) of 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 of 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, ESMIG (Eurosystem Single Market Infrastructure Gateway), and all incoming/outgoing external communication takes place through this component. If one wants access to make instructions in TARGET Services, one has to be a direct participant and have access to ESMIG. Alternatively, one can become an indirect participant or co-managee.

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 that wants direct access must thus enter into a bilateral contractual relationship (ESMIG Connectivity Services Agreement) with one of these providers.

Each network service provider has requirements for the necessary hardware and software, i.e. the connection itself. With direct access, the participant has the opportunity to 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.

Participants with direct access must also decide how the communication form with TARGET Services will be – whether it will take place by a system integration (Application-to-Application, A2A), a user interface (User-to-Application, U2A) or both. A2A is directed to financial institutions that have many transactions and, therefore, wishes to automate the interchange of financial messages with TARGET Services. Financial institutions with less transactions who wish to handle them manually can choose “U2A-only” – which is an equivalent to logging into Kronos2.

9.1 Requirements for BICs in TARGET Services

BIC (Bank Identifier Code) is 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 party is identified by a BIC, the so-called party BIC. For CLM, RTGS, T2S and TIPS, two parties cannot exist in the same service with the same party BIC⁷. The participants that wish 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.

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.

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 at SWIFT. All BICs used in TARGET Services must therefore be published at SWIFT.

For more information about requirements for BICs 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 has to support the functionalities of TARGET DKK, which TARGET Services cannot support. This applies primarily to the following two functionalities:

- 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 system for portfolio management and collateral, 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 internet. The applications will support the handling of monetary instruments and collateral.

A partially decentralized handling of the users is being considered, where each participant's security officer can administer the users directly in the application, after the security officer has been created by Danmarks Nationalbank. The user-administration will primarily consist of the administration of rights to use the systems monetary policy instruments and

⁸ This means that they have different branch codes.

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

collateral functionality. Danmarks Nationalbank expects to base user-administration on B2B-user in Azure AD (Danmarks Nationalbank's AD).

The U2A solution isn't expected to use SWIFT in any regard, neither for network access or user management.

10.2 SPI A2A – Application-to-Application

A2A is based on the SWIFT network (SwiftNet, InterAct Service). It is therefore a prerequisite for using A2A that the participants have their own SWIFT platform or access to the SWIFT platform via a service agency and have a connected BIC. The participants have to sign up for the Closed User Group that Danmarks Nationalbank will set up.

Danmarks Nationalbank will prepare the messages to be used, which must comply with the format requirements of ISO20022.

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 are tied to the available functionalities. It is therefore important that the participants consider their participation type with the access requirements they will have to fulfill and desired functionalities.

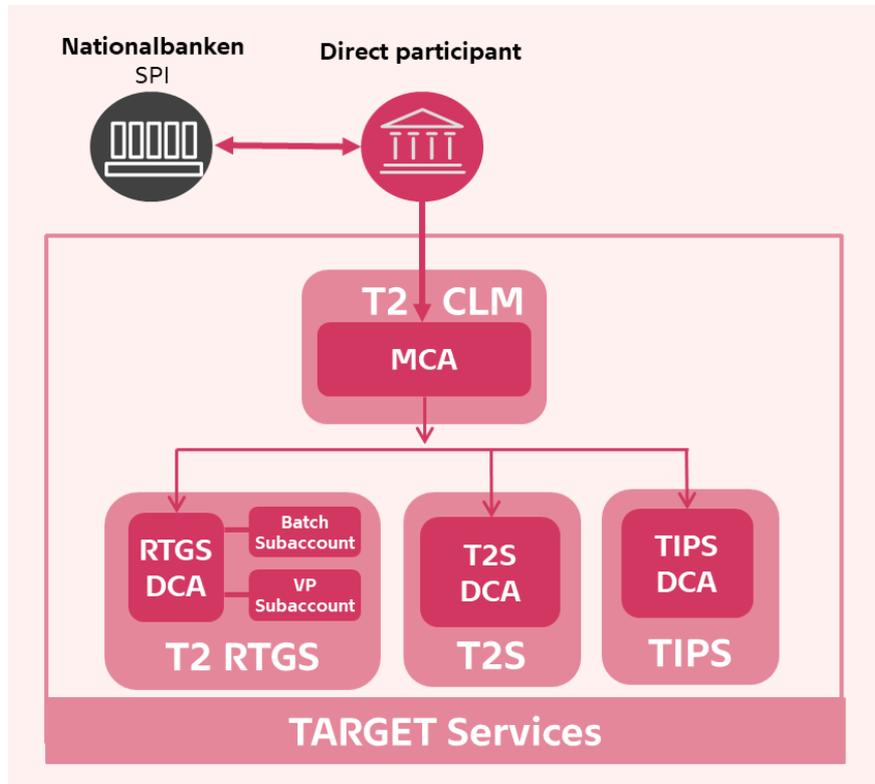
In addition to the participants having to consider the three overall participation types, there are other factors regarding the participation in the individual service (T2, T2S and TIPS) that they should assess. This applies, e.g., to how they wish to participate in TIPS.

11.1 Direct participation

The direct participant has access to TARGET DKK and manages their own accounts. The participant has access to all functionalities in the TARGET Services and SPI. A direct participant in TARGET DKK corresponds to direct participation in Kronos2. Direct participation can be combined with indirect participation in settlements; e.g. a direct participant can be an indirect participant in instant payments in TIPS, Batchclearing in T2 RTGS 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.

Direct participation

Figure 6



A direct participant has access to all systems and functionalities in TARGET DKK

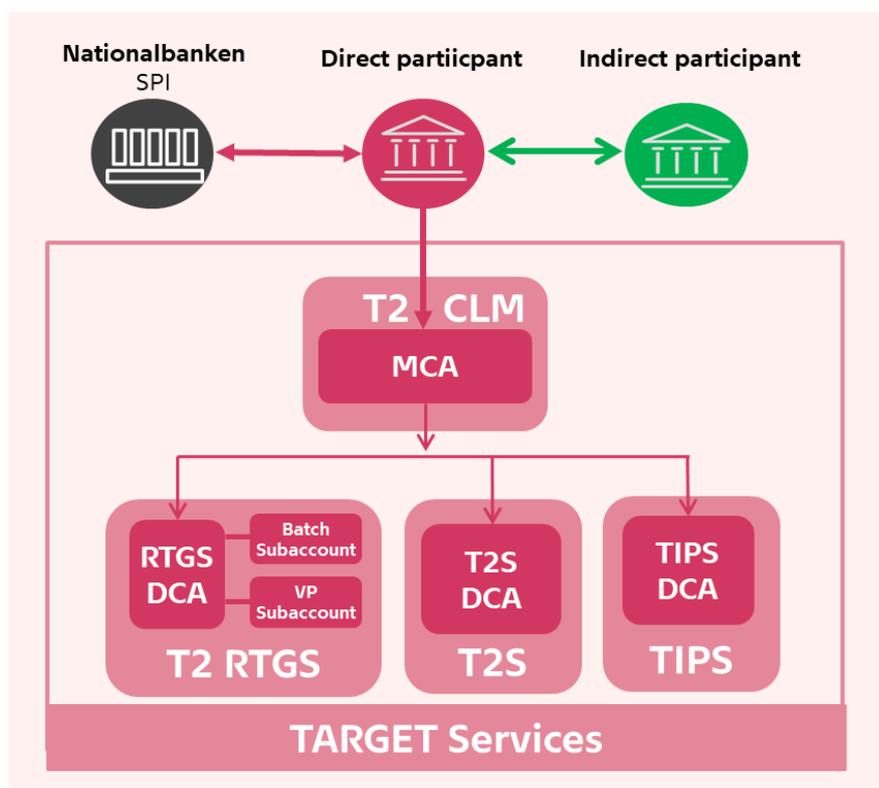
A direct participant get access to TARGET Services via Eurosystem Single Market Infrastructure Gateway (ESMIG). A direct participant get access to SPI either A2A via the SWIFT network, or U2A over the internet. For most participants, the service bureau assists with establishing connection to the systems. 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 have its own access to the systems. The indirect participant instead enters a bilateral agreement with a direct participant to settle on the direct participants accounts. Because the indirect participant uses another participant's account, the indirect participant has a counterparty risk towards the direct participant.

Indirect participation

Figure 7



An indirect participant can join in on payments and settlements through a direct participant's DCAs.

In TARGET Services, indirect participants can be registered on a direct participant's account in order to settle payments on the direct participant's account. In T2 RTGS, the indirect participant's BIC is registered as 'indirect participant' or 'addressable BIC'. This is also possible in TIPS where the indirect participant is registered as a 'reachable party'. In this way, payments can be addressed to the BIC of the indirect participants, even though they do not have an account or access to the system.

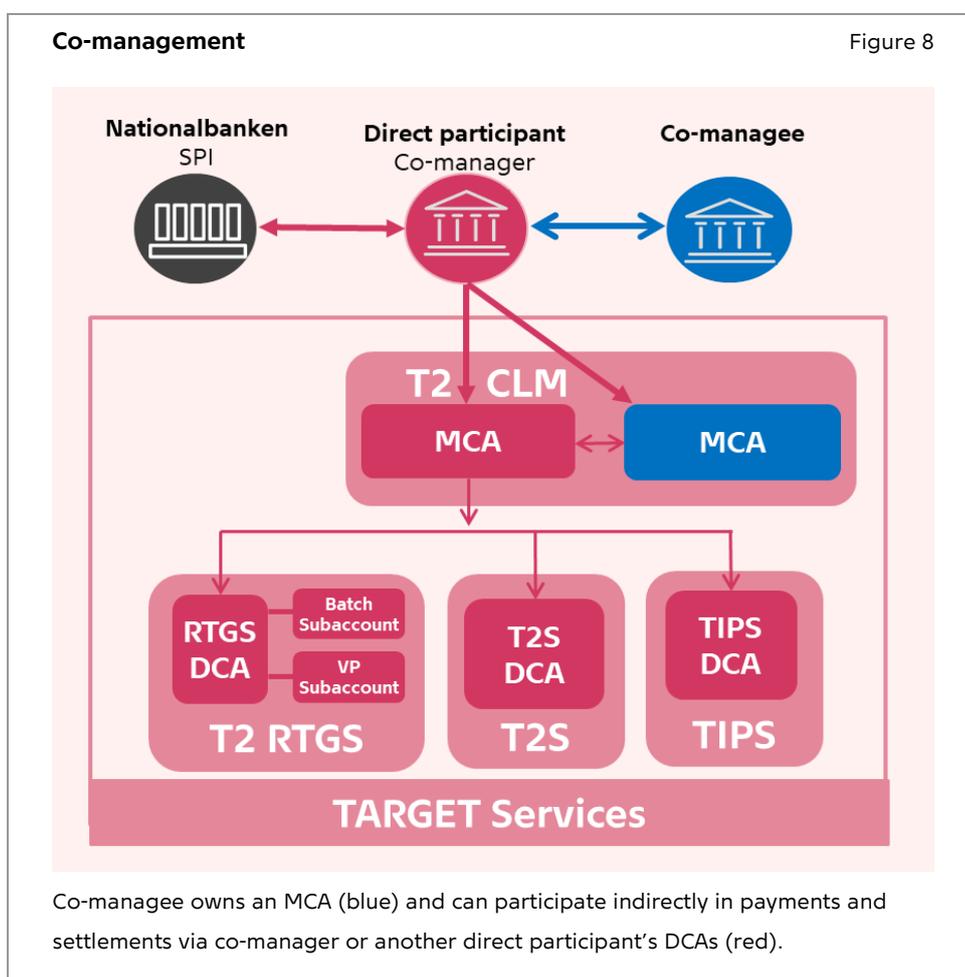
11.3 Co-management

Co-management is a new type of participation in Denmark. It is a standard model in TARGET Service, that is aimed towards smaller institut. A co-managee is an account holder at Danmarks Nationalbank and *only* owns a MCA to deposit liquidity. 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 fulfill the following two requirements:

- Is in the group 3 or 4 of Finanstilsynets categorization of banks by working capital.
- Is not a participant at an NSP (e.g. is already a SWIFT participant)

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



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

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 DCA's.

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 counterparty risk as in indirect participation. However, there is a counterparty risk when a co-managee uses a direct participant's DCA's for payment and settlements – but, when the payment has been processed the liquidity is transferred to co-managee's MCA, and the counterparty risk is minimized.

In the current design of TARGET DKK, the co-managee do not have access to SPI and thus cannot make use of collateral, monetary policy loans and trade certificates of deposit. Danmarks Nationalbank is currently revisiting the U2A solution for SPI. Depending on the design of the final U2A solution for SPI, co-managees may be given access to SPI. Danmarks Nationalbank is analyzing the conditions of co-managees gaining access to SPI.

11.4 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 so that the indirect participant can send and receive payments via the direct participant's DCA.

11.5 Participation in T2S

In Kronos2, it is possible to participate in T2S as ICP (Indirectly Connected Party) or 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 features available in T2S. An ICP interacts with T2S through Kronos2 and has therefore 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 is via ESMIG, and participants can interact with T2S A2A and/or U2A. In order to be a DCP, T2S must be accessed via ESMIG.

Since Kronos2 is phased out, Kronos2 cannot continue to be a link between the participant and T2S. Therefore, the ICP model disappears. However, TARGET DKK offers the same possibilities as the ICP-model offers by being a direct participant and having an 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.

11.6 Participation im TIPS

There are two setup options 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 components for contingency settlement. For Payment Banks, only access through the Graphical User Interface via ESMIG 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 liquidity injected. Liquidity can be injected in two different ways: either by external inbound liquidity transfers from T2S DCAs or TIPS DCAs, or by internal inbound liquidity transfers from Danmarks Nationalbank's CB Contingency Ac-

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.

count. Liquidity transfers from the CB Contingency Account in the form of intraday loans based on pledged collateral¹¹.

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 is injected, participant banks can themselves instruct payments from their contingency accounts. 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 AS transaction files are 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 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. The 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 operation, to cover intraday loans.

The business day schedule will as a starting point remain the same in ECONS II¹³. Once T2 is announced available again, an ECONS II closing procedure starts, where liquidity transfers and payment orders can no longer settle. ECONS II then send the final balances to CLM after which all account balances in ECONS II are set to zero, and normal operation is resumed in T2.

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 utilization of the account holder's credit line will not be available when CLM is unusable.

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

¹³ The system operator has always the possibility to postpone the closing or start of business day if deemed necessary.

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 balances on TIPS and T2S¹⁴. There will be no 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 Test (D-UT), which encloses the Danish sector test of TARGET DKK as a whole.

The section briefly describes the purpose of test, in addition it describes 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 DK.

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 are required to participate actively in the Danish User Test.

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

The more specific purposes of testing are to:

- Ensure that TARGET DKK systems are living up to their overall purpose
- Ensure that all user-facing processes work according to requirements and work as specified

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

- 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 consideration. Risks are assessed on the basis of the 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 deep (how much) to test. The higher the risk assessment, the higher coverage in the test.

The execution of tests will follow the principle that areas with the highest risk classification are executed first, or as early in the process as possible. The defects that are discovered in connection with testing will follow the same principle, i.e. that defects related to areas with a high-risk classification are prioritized and rectified first, unless these are assessed to have a minor impact on the solution.

In regards to 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, and thereby ensuring better quality before go-live.

13.3 Test approach

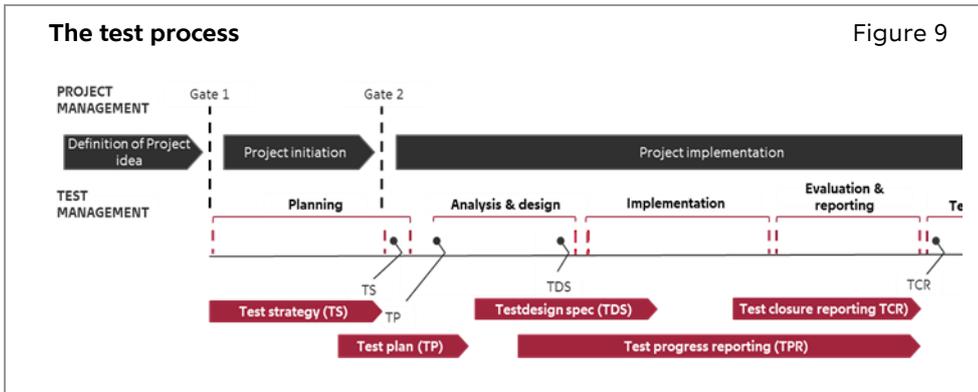
The overall approach for testing TARGET DKK will follow the global standard (ISTQB).

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

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

The test process

Figure 9



Planning

During the planning phase Danmarks Nationalbank will determine and describe the test strategy for TARGET DKK. The test strategy sets the framework for and governance of the test and in general terms describes the approach to testing, 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 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 test 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 and design

During the analysis and design phase, the test design begins. Danmarks Nationalbank will establish a test tool (Octane) where requirements and test specifications are created and maintained to ensure traceability and transparency throughout the entire test 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 assess whether there is a need for further test specifications in addition to the mandatory, and prepare these in the tool.

On the basis of 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 longer period alongside / in parallel with the test execution. The training sessions are based on the plans covering what is to be tested and when it is to happen.

Before start of the Danish User test, 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 (Octane), which is given access to, for all sector participants. It is expected that all participants as a minimum complete the mandatory tests in the tool (based on the selected participation type).

In the implementation phase, weekly meetings are held with all test responsible / sector participants involved in 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 and reporting

Evaluation and reporting take place continuously, in a frequency agreed with the TARGET DKK program management and the ECB. Danmarks Nationalbank will collect test status, and it is a requirement that all sector participants involved in Danish User test 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 between ECB and Danmarks Nationalbank. Test reports will be shared with the ECB and TARGET DKK program management.

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

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

Test closure

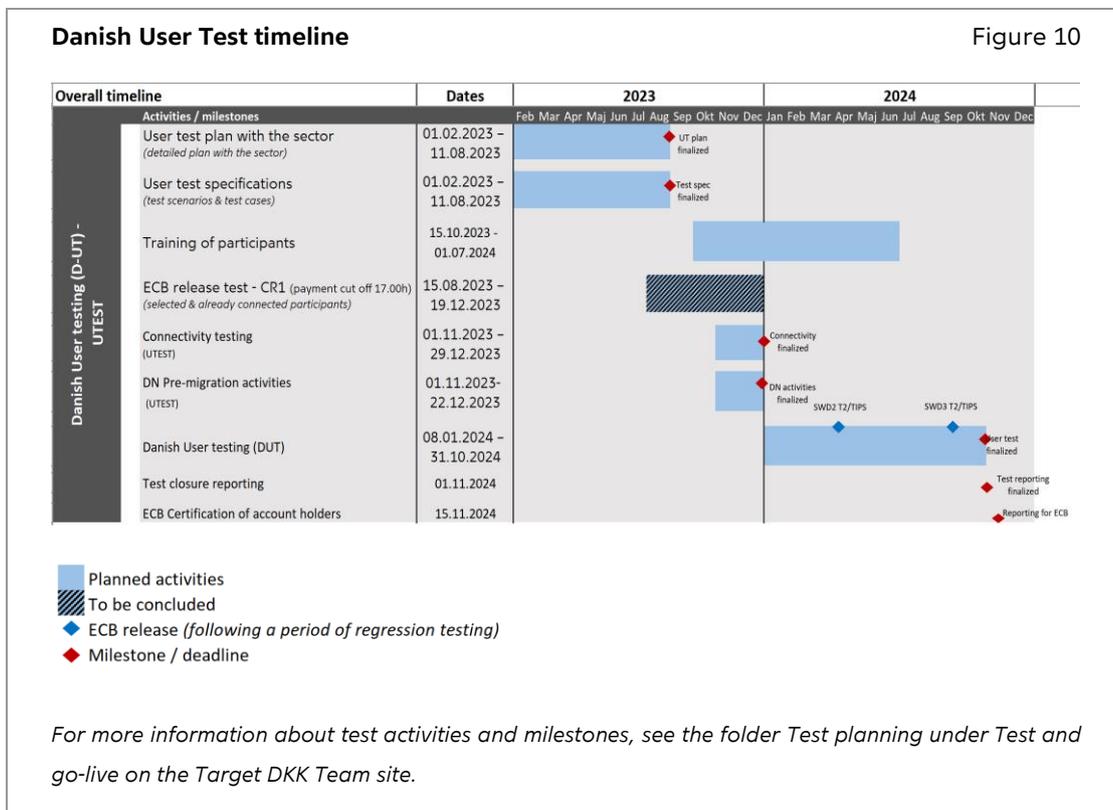
During the test closure phase, Danmarks Nationalbank and the ECB will ensure that any outstanding issues from test are handled. This is handled either by the issue being resolved and completed within an agreed time period by the TARGET DKK program, or by agreeing a plan for resolution, and transferring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

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, Danmarks Nationalbank can be contacted with the request.

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

13.3.1 User test timeline

The following test timeline shows the overall and preliminary schedule for Danish User testing.



- User test plan relates to the planning phase, and is the detailed planning of the overall Danish User test, the plan will also include the test training sessions
- User test specification relates to the test analysis and design phase, and is the preparation of test scenarios and test cases for User testing / implementation
- *ECB release test of Change request 1 covers 'Payment cut off at 17.00' and relates to the implementation phase. It must be agreed in more detail when and with whom this test is to be carried out*
- Connectivity test relates to the implementation phase, and is a test verifying that all sector participants can connect to relevant systems / environments
- DN Pre-migration activities relate to the implementation phase and is Danmarks Nationalbank configuration and setup of master data
- Danish User testing relates to the implementation phase and is the full sector test of TARGET DKK. This activity includes the sec-

tor's pre-migration activities in test, as well as testing of new releases from the ECB

- Test closure reporting and ECB certification of account holders relate to test closure, and is reporting as well as evaluation of the overall test (*the other test closure activities are not reflected in this schedule, but will be part of the hyper care activities in connection with Go-live*)

13.4 Migration and go-live

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

The plan is expected to contain 4 to 5 dress rehearsals, placed as close to the migration period as possible. The first 1-2 will be internal Danmarks Nationalbank rehearsals, and the next 2-3 will be performed together with relevant participants from the sector (to be agreed in the Test and go-live group). It is expected that all of the sector participants will attend the last dress rehearsal 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.

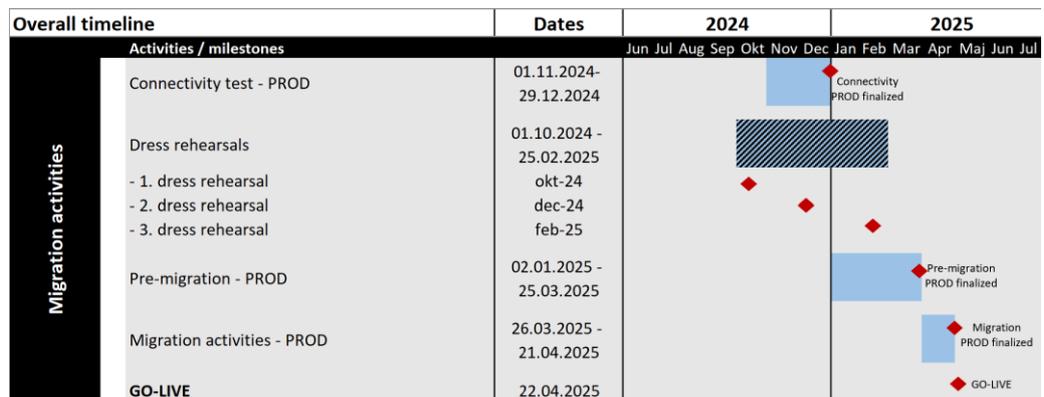
Pre-migration and Migration will be carried out according to the agreed plan and guidelines.

13.4.1 Migration and go-live timeline

The following shows the overall preliminary timeline for migration and go-live for the sector (Danmarks Nationalbank internal activities are not included).

Migration and go-live timeline

Figure 11



-  Planned activities
-  To be concluded
-  ECB release (following a period of regression testing)
-  Milestone / deadline

For more information about migration activities, see the folder Test planning under Test and go-live on the Target DKK Team site.

- Connectivity testing on the production environment is a check that all sector participants can connect to Production
- Dress rehearsals are a test of the migration activities that must be carried out in connection with Go-live
- Pre-migration activities are 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 account rules will be updated to reflect the system changes that the transfer of Danish kroner to TARGET Services entails. Like today, the account holders will have their contractual relationship with Danmarks Nationalbank. The fact that the Eurosystem is the system owner and that the system is also a payment system for other national central banks is thus of no legal significance for account holders at Danmarks Nationalbank.

15 FURHTER 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
- MS Teams area TARGET DKK
- Memo - Use of BIC's in TARGET Services