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PREFACE

PURPOSE

Euronext will be migrating Oslo Børs activities and instruments onto the Euronext Optiq® platform.

As a reminder, Migration scope will include:

- Transfer of **COB-Traded instruments related activities** from the current Millennium Exchange and SOLA systems onto the Euronext Optiq® platform (Cash and Derivatives).
- Transfer of **On-Exchange Off-Book activities** from the current Millennium Exchange and SOLA systems onto the Saturn Euronext platform.
- Transfer of **Euronext Market Data tradable instruments and indices dissemination** from the current system to the Euronext Optiq® MDG (Market Data Gateway).

TARGET AUDIENCE

The intended audience of this document is any client intending to connect to and trade on the Oslo Børs markets using Optiq® and or Saturn OBOE features.

This document is for informational purposes only, and should be consulted alongside its associated documents outlined below.

WHAT'S NEW

The following lists only the most recent modification made to this revision/version. For the Document History table, refer to the summary of changes section.

REVISION NO./ VERSION NO.	DATE	AUTHOR	CHANGE DESCRIPTION
1.1	29 April 2020	Euronext	Minor update

ASSOCIATED DOCUMENTS

The following lists the associated technical documents which either should be read in conjunction with this document or which provide other relevant information for customers.

Please refer to the version of the documents indicated or following versions.

■ Introduction to Optiq Trading System

- Guide to New Trading System – v3
- Euronext Derivatives – How the Market Works v3.1

■ Saturn Specifications and background documentation

- Euronext Global Reporting Solution - Saturn Interface User Guide v2.3
- Saturn Web Services Specifications– v2.8.8
- OBOE – Euronext Off-Book On-Exchange trades publication - Market Model overview
- Saturn example of OBOE upload file

■ Optiq® OEG Technical Documentation

- Euronext Markets – Optiq® OEG Client Specifications - SBE Interface – v4.0.X
- Euronext Markets – Optiq® OEG Client Specifications - FIX 5.0 Interface – v4.0.X
- Euronext Markets – Optiq & TCS Error List – v2.2.1
- Euronext Cash Markets – Optiq® Kinematics Specifications – 1.4.X
- Euronext Derivatives Markets – Optiq® Kinematics Specifications – v1.1.0
- Euronext Cash Markets – OEG Connectivity Specifications v2.2

■ MDG Technical Documentation

- Euronext Markets – Optiq® MDG Client Specifications – v4.0.X
- Euronext Markets – Optiq® File Specifications – v3.1.X
- Euronext Optiq® Market Data Gateway Production Environment v2.5
- Euronext Optiq® Market Data Gateway External User Acceptance Environment v2.4

Clients are advised to also refer to the [Euronext Rules and Regulations](#) documents for more details.

For the latest version of documentation please visit [IT documentation](#).

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1. INTRODUCTION

Following Euronext's acquisition of Oslo Børs VPS Holding ASA in June 2019, Oslo Børs' trading systems, across asset classes, will migrate from the Millennium Exchange and SOLA systems to the Euronext Optiq® systems.

LCH SA will be appointed as the CCP providing post-trade services for the Derivatives Market and the current interoperability model in the Oslo Cash Market will be continued with LCH Ltd, EuroCCP and SIX X-Clear.

Optiq provides a single resilient route to Euronext pan-European Cash and Derivatives markets providing reliability, enhanced throughput and predictable latency for all asset classes. It delivers a simplified harmonized messaging model with maximum flexibility, within a single trading platform for Cash and Derivatives, providing clients with high performance and stability.

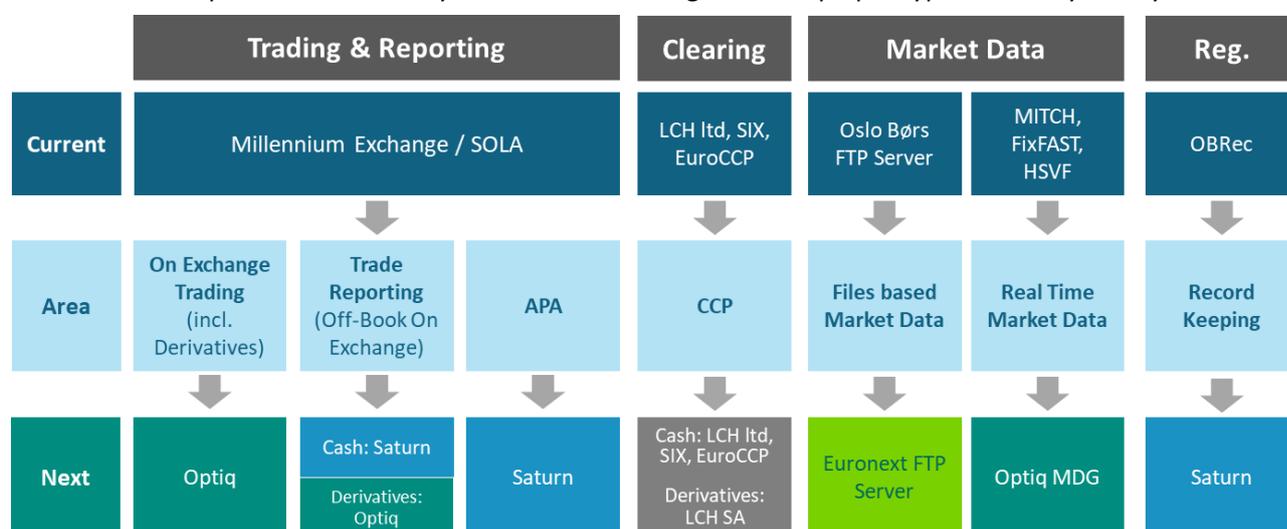
The move to Optiq has allowed Euronext to deliver an access model streamlined across markets, leveraging on its new leading edge technology. This simplified and flexible system allows shorter time-to-market for the delivery of new products and the implementation of customers' requests, while creating an opportunity for customers to reduce their administrative costs.

The migration of Oslo Børs to Euronext Optiq will allow clients to benefit from all the features provided by the platform through improved connectivity and protocols, and optimized messaging model.

The Cash Go-live is scheduled for 9 November 2020 and Derivatives and Fixed Income Go-live is scheduled for 30 November 2020, both pending regulatory approval.

1.1 SCOPE OF OSLO BØRS MIGRATION

The table below provides a summary of the Oslo Børs migration scope per type of activity and system:



SCOPE OF MARKETS AND PRODUCTS COVERED BY OSLO BØRS MIGRATION

Markets and Products		
Cash Markets	Equities (OEG + MDG)	✓
	Funds (OEG + MDG)	✓
	Fixed Income (OEG + MDG)	✓

OSLO BØRS MIGRATION GUIDELINES

	Warrants & Certificates (OEG + MDG)	✓
	Indices (MDG only)	✓
Saturn OBOE	Equities / Fixed Income / ETFs	✓
Derivatives Markets	Equity Derivatives	✓
	Index Derivatives	✓
MiFID II Reporting Service	Approved Publication Arrangement (APA)	✓

SCOPE OF SERVICES COVERED BY OSLO BØRS MIGRATION

Services	
End of Day files	✓
Drop Copy	✓
Euronext File Server (EFS)	✓

2. OSLO BØRS MIGRATION DESCRIPTION

The Euronext Optiq Order Entry Gateway (OEG) provides high-speed and real-time connection to Euronext Cash and Derivatives markets. The system offers predictability, ultra-low latency, harmonized messaging protocol, high availability and scalability through a reliable network solution.

2.1 ORDER BOOK EXCHANGE TRADES

Optiq® OEG and MDG will involve some changes for the Oslo Børs migration. The Oslo Børs instruments will be migrated over to the different Euronext Cash and Derivatives Optiq segments.

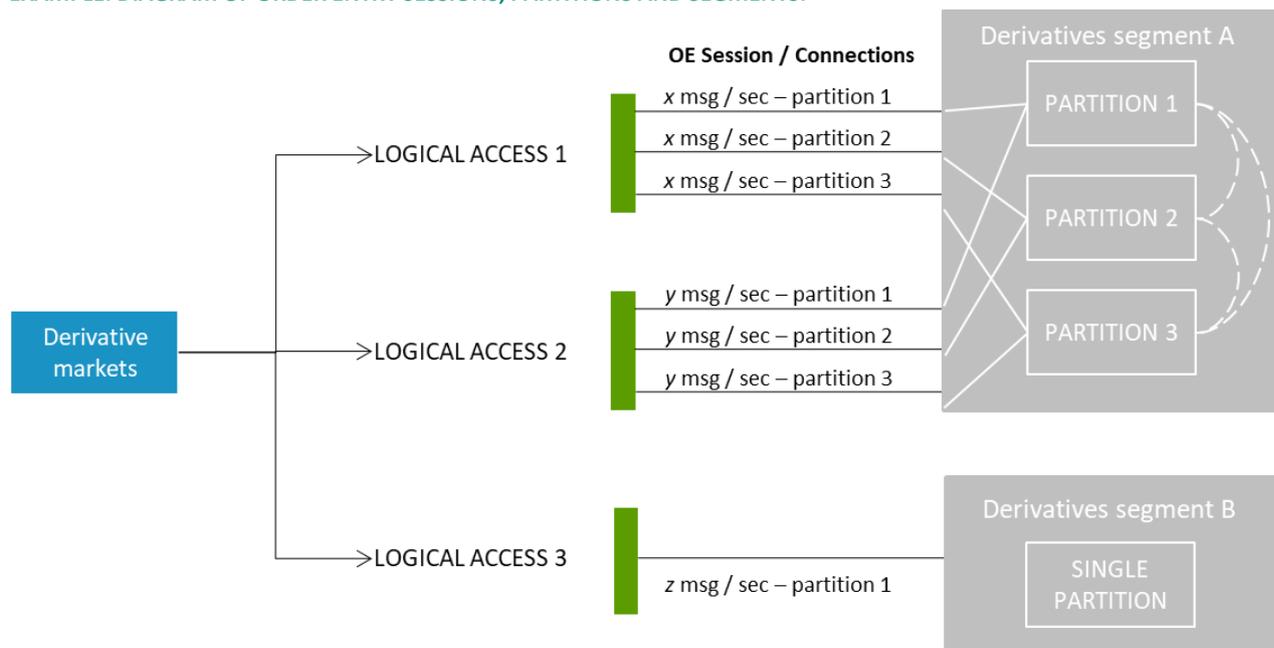
The list of instruments and their corresponding trading group/exchange, Optiq segment and partition will be available in the Appendix.

2.1.1 Connectivity Model

Euronext's connectivity model improves performance and stability by offering order entry sessions through Logical Accesses, which connect to dedicated partitions in individual Optiq segments.

- Each asset class is separated into an Optiq Segment.
 - ◆ Euronext Cash has five segments: Equities, Fixed Income, Funds, Warrants and Certificates, Euronext Block.
 - ◆ Euronext Derivatives have three segments: Commodities, Equity Derivatives, Index Derivatives.
- Each segment may be split into Partitions in order to benefit from improved performance and stability.
- To connect to a Partition, an Order Entry Session (OE Session) is required.
- OE Sessions are aggregated in a Logical Access for each segment.
 - With a Logical Access, customers are automatically given access to all Partitions within a segment.
 - Customers can choose to send an order to a Partition using the wrong OE Session and will be routed automatically. Latency is to be expected when using this route.
- One Logical Access can only apply to one segment. Using the same connection across multiple Optiq segments will not be possible.
- For Derivatives, all instruments of a single contract are available for trading in a single partition.

EXAMPLE: DIAGRAM OF ORDER ENTRY SESSIONS, PARTITIONS AND SEGMENTS:



Logical Access requirements are as follows:

- To send messages to an instrument hosted on any segment, the client requires a Logical Access on that specific segment. For instance, to send messages to an instrument hosted on the Equity Derivatives segment, the client requires a Logical Access on Equity Derivatives.
- The same Logical Access for a segment can be used to send orders to different Exchange Market Mechanism (EMM).
- Messages sent to an EMM can only be sent if the standing data contains the associated EMM for this book, i.e. EMM “1” (COB) and EMM “5” (TCS), etc.
- On Derivatives, logical Accesses are assigned a Functional Access Role. The list of such roles for Derivatives contains: Trading, Market Making, and RiskGuard.
 - ◆ Logical Access with role of Trading can send all private messages, except those associated to Market Maker Quotes, and RiskGuard.
 - ◆ To send Quote messages clients will require a Logical Access with role of Market Making. Such Logical Accesses can send any Trading and Market Making messages.
 - ◆ To send messages to an OEG for RiskGuard, clients will require a dedicated Logical Access setup for risk management purposes. Such Logical Accesses can send only messages associated to RiskGuard.
- On Cash, logical accesses can be configured with a Functional Access Role enabled for TCS and/or AFQ.

Drop Copy is provided as a separate service, for which a dedicated Drop Copy Logical Access is to be requested, and which has dedicated connectivity information. Drop Copy provides copies of trades and, at client’s request, orders – Drop Copy Logical Accesses can be multi-segment.

Referential standing data is provided on a daily basis for each Instrument / Contract via MDG messages and files (available on Euronext File Service (EFS)), identifying which Optiq Segment and partition an instrument belongs to.

More details can be found in the *Euronext Markets – Optiq® File Specification* available in the [IT Documentation section](#).

2.1.2 Partitions and Instruments Mapping

Individual Optiq® Segments are comprised of one or several Optiq Partitions.

An Optiq® Partition is a technical subdivision of an Optiq Segment. Each Partition relies on an optimized technical environment, physically independent from one another, and connected via a routing system to other partitions within the segment.

The target number of partitions per segment are as follows:

Cash Optiq Segment	Number of Partitions
Equities	4
Fixed Income	1
Funds	1
Warrants & Certificates	1
Derivatives Optiq Segment	Number of Partitions
Equity Derivatives	3
Index Derivatives	1
Commodities	1

One Logical Access will give access to all Partitions belonging to the same Optiq Segment. For example, one Equity Derivatives Logical Access will be able to connect to each of the 3 Equity Derivatives partitions, using 3 OE Sessions.

Within the same Optiq segment, the load balancing process may result in instruments being assigned a different Partition, and as such different routing information, from one day to another. Due to this, clients are encouraged to plan developments to leverage this dynamic structure and to download and incorporate the standing data on a daily basis to ensure correct routing of their messages. For more information please refer to the OEG Message specifications.

All contracts and instruments for Euronext markets are uniquely defined by their Symbol Index. The Symbol Index is valid for the lifetime of the instrument and is used as the Optiq system-wide identifier. Both public and private messaging systems rely on this identification, which also allows for an easier reconciliation of public and private messages.

Together with the Symbol Index Optiq uses the *Exchange Market Mechanism* (EMM) to route messages to the correct trading platform. EMM represents the platform to which the order sent by the client must be routed. Information on Symbol Index and EMM values available in each Optiq segment is provided in the Standing data files, and a Symbol Index may be assigned multiple EMMs

Please refer to the *Euronext Markets - Optiq MDG Client Specifications* document for further details on standing data files.

2.1.3 Cash Equities On Book

The Oslo Børs Cash markets will migrate to the Optiq platform and will use the current Euronext Cash Model.

The trading hours will follow what is already in place at Oslo Børs, with a closing at 16:20 CET.

The migration will bring a financial market, new exchanges and subsequent trading subscriptions.

The current interoperability model (using LCH SA, EuroCCP, and SIX X-Clear) will remain.

2.1.4 Derivatives On Book

The Oslo Børs on-book derivatives trading will be migrated to Optiq. Important to note are the following:

- The CCP (Central Counter Party) for the derivatives market will change from SIX X-Clear to LCH SA.
- Single stock forwards and tailor-made products will be discontinued and therefore will no longer be available for on-book trading. The Oslo Børs trading calendar will be maintained. After the migration to Optiq, the Oslo Børs derivatives will remain to be closed on the following days:
 - Wednesday before Easter (half trading day);
 - Maundy Thursday;
 - Good Friday;
 - Easter Monday;
 - Labour Day;
 - Constitution Day;
 - Ascension Day;
 - Whit Monday;
 - Christmas Eve;
 - Christmas Day;
 - Boxing Day.
- The Oslo Børs trading hours will be maintained. After the migration to Optiq, the Oslo Børs derivatives contracts will be open for on-book trading from 09:00 CET – 16:20 CET. In more detail, the trading patterns will be the following:

Scheduled Group State	Regular trading session	Half day trading session	Optiq phase
Start of Consultation (members can delete orders)	06:30	06:30	Closed
Pre-open	07:15 - 09:00	07:15 - 09:00	Call
Uncrossing	09:01	09:01	Uncrossing
Continuous Trading	09:01 - 16:20	09:01 - 13:00	Continuous
Surveillance Intervention (members can delete orders)	16:20 – 22:30	13:00 – 22:30	Closed
End of Consultation (members can no longer delete orders)	22:30	22:30	Inaccessible

- Deferred publication will not be available in Optiq.
- The OBOSX index futures will not be migrated to Optiq.
- At or after the migration, stock futures with cash settlement will be listed (next to the physically settled stock futures that will be migrated to Optiq).

2.1.5 Fixed Income On Book

The future market model for the Oslo Børs Fixed income market is currently being reviewed with the involvement of the current Oslo Børs members, but has not been finalised at the time of the publication of this document. The changes between the current market model and the future market model will be included in subsequent versions of this document.

2.2 OFF-BOOK ON-EXCHANGE TRADE REPORTING

Trade reporting for Cash, including Fixed Income, will be done through the existing Euronext Saturn solution. The Saturn OBOE service is currently used only by Dublin market but will be enhanced to support Oslo Børs instruments.

For Derivatives trade reporting will be done through the wholesale facility, supporting Large-In-Scale trades only.

2.2.1 Cash Equities Off-Book

The Cash Equities Off-Book On Exchange will possible via the Euronext Saturn solution.

2.2.2 Derivatives Off-Book

After the migration to Optiq, on-exchange derivatives trading will be possible via the Large-in-Scale trading facility that is available in Optiq. Important to note are the following:

- The CCP (Central Counter Party) for the derivatives market will change from SIX X-Clear to LCH SA.
- Single stock forwards and tailor-made products will be discontinued and therefore will no longer be available for off-book on-exchange trading.
- The Oslo Børs trading calendar will be maintained. After the migration to Optiq, the Oslo Børs derivatives will remain to be closed on the following days:
 - Wednesday before Easter (half trading day);
 - Maundy Thursday;
 - Good Friday;
 - Easter Monday;
 - Labour Day;
 - Constitution Day;
 - Ascension Day;
 - Whit Monday;
 - Christmas Eve;
 - Christmas Day;
 - Boxing Day.
- After the migration to Optiq, the Oslo Børs derivatives contracts will be open for off-book on-exchange trading from 07:15 CET – 18:30 CET.
- Deferred publication will not be available in Optiq.
- The OBOSX index futures will not be migrated to Optiq.
- At or after the migration, stock futures with cash settlement will be listed (next to the physically settled stock futures that will be migrated to Optiq).
- Oslo Børs Market Place Services (MPS) will be discontinued.

2.2.3 Fixed Income Off-Book

The future market model for the Oslo Børs Fixed income market is currently being reviewed with the involvement of the current Oslo Børs members, but has not been finalised at the time of the publication of this document. The changes between the current market model and the future market model will be included in subsequent versions of this document.

2.3 APA

Trade Reporting for Cash, including Fixed Income, both Off-Book On Exchange (OBOE) or via the Euronext APA, will be done through the Euronext Saturn solution.

2.4 POST TRADE OPERATIONS

The Oslo Børs Cash Market will continue the current interoperability model for cash clearing with the three existing Central Counterparts (CCPs): LCH Limited, EuroCCP and Six X-Clear.

The CCP for the Oslo Børs Derivatives Market will change from SIX X-Clear to LCH SA, encompassing the underlying physical delivery management further to option exercise/assignment and future tendering. Clearing onboarding to LCH SA (direct or via GCM) is mandatory. Electronic trading access will be required to trade the Oslo Børs Derivatives Market. Single Stock Forwards and Tailor-Made products will be discontinued, while the Single Stock Futures offering is expected to be expanded to more underlying shares.

Trading members must ensure they have valid clearing arrangements with a clearing member on Euronext Cash and/or Derivatives markets (where applicable) in order to be authorized to trade on Oslo Børs Markets.

2.4.1 Cash Equities Post Trade Operations

Current interoperable CCPs – LCH Ltd, EuroCCP and SIX x-clear – will continue providing clearing services to Oslo Børs Cash equities markets. The clearing system of interoperable CCPs will remain unchanged for clearing members with the migration to Euronext systems.

The CSD VPS will remain the provider of the central securities depository services for Oslo Børs securities. The VPS electronic settlement system will also remain unchanged for both CCPs and settlement agents with the migration to Euronext systems.

Clearing members of Oslo Børs clients are already clearing members of interoperable CCPs and therefore used to provide clearing services on Oslo Børs securities, including settlement with VPS.

For the above reasons, no impact and no regression are expected with the migration towards:

- Clearing members as they will keep their current CCPs and clearing services identical, and,
- Settlement agents with regards to the whole services provided by the CSD VPS.

Therefore, end to end tests from trading to clearing and settlement will not be mandatory, but only optional.

Current production set up of trading members, their relationship with clearing members as well as interoperable links with CCPs will be duplicated in Euronext systems for testing purposes unless trading members confirm Euronext to apply specific membership changes as a target for the migration.

Euronext will apply a freeze period to control trading and clearing membership changes a couple of weeks prior and after the migration to Euronext systems in order to secure and bring business continuity stability during the migration. More details will be communicated in due course.

For any further complementary information about the migration with current interoperable CCPs and CSD, please visit following websites or contact your CCP/CSD relationship managers:

- [LCH Ltd website,](#)
- [EuroCCP website,](#)

- [SIX x-clear website](#),
- [VPS website](#)

2.4.2 Derivatives Post Trade Operations

LCH SA will act the CCP providing clearing services to Oslo Børs derivatives markets instead of SIX x-clear. LCH SA clearing system is connected to Euronext systems and will adjust to some specificities of the Oslo Børs derivatives market, e.g. the physical delivery of Single Stock Futures.

Due to the change of CCP, the trading member must ensure he has valid clearing arrangements with a clearing member, in order to be authorized to trade on Oslo Børs derivatives markets. For this purpose, Euronext will require the trading member to liaise with his Clearing Member and confirm such details during the onboarding process.

Clearing members requiring a new membership with LCH SA will need to apply for [clearing member status](#) and complete onboarding process. End to end tests from trading to clearing will be mandatory for new trading and clearing members.

Trading members and their relationship with clearing members will be set up in Euronext systems for testing purposes so that to validate their readiness for the migration.

Euronext will apply a freeze period to control trading and clearing membership changes a couple of weeks prior and after the migration to Euronext systems in order to secure and bring business continuity stability during the migration. More details will be communicated in due course.

For any further complementary information about the migration with LCH SA, please visit following [LCH SA website](#) or contact your LCH SA relationship manager.

2.5 MARKET DATA AND INDICES

Oslo Børs Market Data will be migrated from the Millennium feed and the SOLA HSVF feed to Optiq MDG (Market Data Gateway). Oslo Børs APA data are in Millennium/SOLA distinguished from on-exchange trades using the VenueOfExecution/ExecutionVenue field (Value is 'SINT' or 'XOFF' for APA trades). In Optiq MDG APA trades will be published in a dedicated (Euronext existing) Optiq MDG channel.

Oslo Børs members, ISVs, data vendors that do not yet have Euronext data and wish to connect directly to Optiq MDG will need an order a SFTI connection. Clients that already have a SFTI connection will need to update their SFTI order form to access the new Oslo Børs Equities and Nordic ABM channels.

All clients that would like to receive market data in a feed format, either direct via SFTI or indirect via an ASP, ESP or data vendor need to sign a Euronext Market Data Agreement to license for the data. The EMDA documents can be found [here](#).

2.5.1 Real Time Market Data

Oslo Børs Market Data will be migrated from the Millennium feeds MITCH and FIX/FAST and the SOLA HSVF feed to the Optiq® Market Data Gateway (MDG).

See paragraph 2.5.2 for the Market Data Channel set up and paragraph 3.3.1 on how to arrange direct connectivity for production.

Euronext will migrate Oslo Børs market data clients onto Euronext's market data licensing agreements, integrating Oslo Børs market data into Euronext's commercial model effective 1 July 2020. Clients that wish

to have or retain access to, and license for, Oslo Børs market data must execute, or update, the Euronext Market Data Agreement (EMDA). The Documentation can be found [here](#).

2.5.2 Optiq® MDG Channels

New Market Data Channels will be created for Oslo Equities and Nordic ABM. Other Oslo Børs data will be disseminated via existing Euronext Optiq® channels:

Optiq® Segment	MDG Set Of Channels ID	MDG Set Of Channels Name	Impact
1 - Equities	6	Equities Netherlands	No change
	5	Equities France	No change
	7	Equities Belgium	No change
	8	Equities Portugal	No change
	9	Equities Dublin	No change
	10	Equities Norway	NEW
	11	Best of Book (RMF)	
2 - Funds	1	All Funds	Oslo ETFs and Funds will be added to existing channels
3 - Fixed Income	2	Fixed Income	Oslo Fixed Income regulated market will be added to existing channels
	12	Fixed Income Nordic ABM	NEW
4 - Warrants and Certificates	4	Warrants and Certificates	Oslo Warrants and Certificates and Oslo ETNs will be added to existing channels
9 - Indices	13	Euronext Indices	Oslo Indices will be added to existing channels
	14	Euronext iNAVs	Oslo iNAVs will be added to existing channels
	15	Euronext Dublin Indices	No change
10 – Trade Reporting and Publication	29	APA SI Quotes	Oslo APA data will be added to existing channels
	30	APA Trade Publication	Oslo APA data will be added to existing channels
11 – Index Derivatives	23	Index Options France	No change
	24	Index Options Netherlands	No change
	25	Index Derivatives Other	Oslo Index Derivatives will be added to existing channels
	26	Index Futures France	No change
	27	Index Futures Netherlands	No change
12 – Equity Derivatives	20	Equity Derivatives France	No change
	21	Equity Derivatives Netherlands	No change
	22	Equity Derivatives Other	Oslo Equity Derivatives will be added to existing channels
14 – Euronext Block	33	Euronext Block	

Oslo Børs APA trades are in Millennium/SOLA distinguished from on-exchange trades using the VenueOfExecution/ExecutionVenue field (Value is 'SINT' or 'XOFF' for APA trades). In Optiq® MDG APA trades

will be published in dedicated (Euronext existing) Optiq® MDG channels, see Optiq® segment 10 – Trade Reporting and Publication.

Please see *Euronext Markets - Optiq MDG Client Specifications* and *Euronext Optiq® Market Data Gateway Production Environment* documents for further details.

2.5.3 Files Based Market Data

After the migration to Optiq®, Files Based Market Data products will be published from Euronext FTP servers. The Oslo Børs file based products will be harmonised with Euronext file based products. Clients currently subscribing to Oslo Børs file based market data products will be approached in Q2 2020.

Participant Trading Data files for members (excluding the All Bond PTD file) will be decommissioned and clients are invited to migrate to Euronext File Services (see also paragraph 3.1.5.3).

2.5.4 Oslo Indices

Oslo Equity and Bond Indices will be migrated to the Euronext Optiq® platform. Indices will be published by Euronext either every 15 seconds or every second (in case of a change in level); the following indices will be published every second:

ISIN	Name	Family	MNEMO (post migration)
NO0000000021	OBX Total Return Index	OBX Family	OBX
NO0007035327	Oslo Børs Benchmark Index_GI	OBX Family	OSEBX
NO0007035335	Oslo Børs Mutual Fund Index_GI	OBX Family	OSEFX
NO0007033900	Oslo Børs All-share Index_GI	OBX Sector and All Share	OSEAX
NO0010590086	Oslo Børs OBX Oil Service Index	Investable Sector Indices	OBOSX
NO0010760663	Oslo Børs Seafood Index	Investable Sector Indices	OBSFX
NO0010771934	Oslo Børs Shipping Index	Investable Sector Indices	OBSHX

The current computed VWAP attribute of the Oslo Børs Indices, which is based on the VWAP of the Index constituents, will no longer be calculated as a separate index (OBXW). Instead, the end of day VWAP price will disseminated on the OBX record.

Following the migration of Oslo Børs Indices towards Euronext, all sectorial indices currently based on the GICS classification system will be delisted. New indices will be launched, on the basis of the ICB classification system. Indices will be launched on industry level only.

See the Appendix for a list of indices to be migrated.

2.6 RECORD KEEPING

The current Oslo Børs Record Keeping service will be discontinued following the migration of the Oslo Børs markets to Optiq®. It will be replaced by the existing Euronext Saturn solution named SLC manager.

See [Short Long Code Management \(SLC Manager\)](#) for further details.

3. MIGRATION PLAN

3.1 OVERVIEW

The migration to Optiq in Production will be conducted in two planned Go Live weekends – one for Cash and one for Derivatives. Prior to this Go Live date a number of preparatory events, infrastructure and high availability tests and rehearsals will be held to ensure a smooth migration.

	PRODUCTION MIGRATION DATES		
	Dress rehearsal	Final test in Production	Go Live
1. Derivatives migration	Saturday X Sep 2020 Saturday X Sep 2020	Saturday X 2020	Monday X 2020
2. Cash migration	Saturday X Sep 2020 Saturday X Sep 2020	Saturday X 2020	Monday X 2020

Software will be released in the test environment in order to enable customers to validate their software prior to Go Live. Details on the test and production environments can be found in later sections.

Other projects on Euronext markets may occur at the same time and may require separate development.

3.1.1 General Important Information

3.1.1.1 Overview Network Connectivity

TRADING

For customers based in Oslo/Norway, FNN will continue to provide the services from the Oslo Børs markets as today.

For customers based in the rest of Scandinavia, it is / will be possible to connect to SFTI via their POP in the Lunda datacentre.

Customers outside the Scandinavian region should connect to the Oslo Børs markets via SFTI.

SFTI can be contacted on icglobalnetwork-info@theice.com.

CLEARING

For connectivity to the three CCPs used in the Oslo Børs equities market, the connectivity will not change for the customers as a result of the migration to Optiq.

For connectivity to the LCH SA, the new clearing house in the Oslo Børs derivatives market, the LSEG CMC access network should be used. Euronext are investigating the potential for a simplified connectivity model for its Scandinavian based customer base, but this connectivity model has not been established at the time of writing this document.

3.1.1.2 Oslo Børs MIC Codes

Note that a new MIC – XOBD – will be created for Oslo Derivative products.

MIC	Operating MIC	Curent Name	Products	To migrate?
XOSL	XOSL	OSLO BORS ASA	Shares, Equity certificates, Bonds and Standardized derivatives	Maintained. In addition the MIC XOBD will be created for the Derivative market

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MERK	XOSL	MERKUR MARKET	Shares, Equity certificates	Maintained
XOAS	XOSL	OSLO AXESS	Shares	Maintained
XOAM	XOSL	NORDIC ALTERNATIVE BOND MARKET	Bonds and certificates	Maintained
XOAD	XOSL	OSLO AXESS NORTH SEA – DARK POOL		Discontinued
XOSD	XOSL	OSLO BORS NORTH SEA – DARK POOL		Discontinued
NIBR	XOSL	NORWEGIAN INTER BANK OFFERED RATE		Discontinued
XOSC	XOSL	OSLO CONNECT	FM derivatives	Discontinued

3.1.1.3 Oslo Mnemonics/Tickers vs Euronext Tickers

There will be a change of Oslo Mnemonics/Tickers with the migration to Euronext markets.

For Equities, the new mnemonic will be 5 characters max.

For Bonds, the current mnemonic will be represented in the **Instrument Name** field in Market data (*message Standing Data(1007)*).

For ETNs, the current mnemonic will be represented in the Instrument Name field. The Mnemonic field will be populated by 5 characters max.

For ETFs, the new mnemonic will be 5 characters max. The current Oslo Ticker value (which is longer than 5) will be represented in the **Instrument Name** field in Market Data (*message Standing Data (1007)*)

For Derivatives, the current Oslo mnemonic will be replaced by the AMR Code (as currently used within Euronext).

For Indices, the new mnemonic will be 5 characters max.

For iNAV ETFs, the new mnemonic will be 5 characters max.

3.1.1.4 Oslo Børs Markets

Oslo Markets Pre-migration	Oslo Markets Post-migration
NOTC	Euronext NOTC
Merkur Market	Euronext Growth
Oslo Bors	(Euronext) Oslo Bors
Oslo Axess	Euronext Expand Oslo

3.1.1.5 Trading Calendar

The Oslo Børs trading calendar will be maintained. After the migration to Optiq, Oslo Børs instruments will remain to be closed on the following days:

- Wednesday before Easter (half trading day);
- Maundy Thursday;
- Good Friday;
- Easter Monday;
- Labour Day;
- Constitution Day;
- Ascension Day;

- Whit Monday;
- Christmas Eve;
- Christmas Day;
- Boxing Day.

3.1.1.6 SBE Templates (OEG and MDG)

New SBE templates will be introduced for order entry and market data for the Oslo Børs migration to Optiq. These templates are driven by various projects, one of them being the Oslo migration.

SBE 300, which will be implemented with the Full Cash release in Next EUA (p-EUA), is both backwards and forwards compatible. Clients who will trade on Oslo Cash market must use SBE version 300 or higher. Clients who are not interested in Oslo migration are not required to use it.

SBE 217 will be implemented with the Full Derivatives release in Next EUA (p-EUA) and contains Oslo specific additions. Clients who will trade on Oslo Derivatives market must use SBE 217 or higher.

It is anticipated that SBE 300 will also be implemented in Derivatives Next EUA, but that will be communicated.

The market model for Fixed Income has not yet been defined and a new version of the SBE Template is anticipated.

3.1.2 OEG and Gateway (MDG) EUA availability

The OEG and MDG Optiq® applications are already available for clients in the Euronext Next External User Acceptance (Next EUA (P-EUA)) on both Cash and Derivatives environment.

Next EUA environment(s) will be upgraded to incorporate required Oslo Børs specific changes and updated technical specifications will be available and communicated. Next EUA upgrades will always be communicated in advance through an Optiq Notice / Oslo Børs Delta announcement.

Furthermore access to Next EUA (formerly P-EUA) is already set up from an ICE Data Services standpoint.

Cash Next EUA platform is available on week days between 9:00 and 18:30 CET.

Derivatives Next EUA platform is available on week days between 9:00 and 22:30 CET.

Both Cash and Derivatives Next EUA (p-EUA) environments are down every Wednesday morning until 13:00 CET for maintenance.

3.1.3 Saturn Next EUA Availability

Saturn OBOE will be updated with Oslo Børs specific features in **June 2020**.

	Next EUA Release
Saturn OBOE Oslo Børs enhancement	June 2020

3.1.4 Central Counterparty EUA Availability

3.1.4.1 Cash Equity Clearing

Interoperable CCPs will be connected to the Euronext Cash Next EUA (P-EUA) environment for clients front-to-back testing in **July 2020**. The exact date will be confirmed later in due course.

Please be informed that the ID of the clearing house in case of a CCP clearable transaction will be systematically populated by Optiq® in :

- Execution report (8) in the field called ContraBroker (375) on FIX protocol and
- Fill messages in the field called Counterpart Firm ID on SBE Protocol.

For Oslo Børs cash equities markets, the CCP ID Values populated in the above messages will be:

- '3'= LCH Ltd,
- '5'= SIX x-clear,
- '6'= EuroCCP.

The CCP testing platform availability is described in the following table:

CCP	Testing platform availability
LCH Ltd	week days between 9:00 and 16:30 CET
SIX x-clear	week days between 9:00 and 16:30 CET
EuroCCP	week days between 9:00 and 16:30 CET

3.1.4.2 Derivatives Clearing

LCH SA derivatives clearing platform is already connected to Euronext Optiq Derivatives platform which allows to perform front-to-back testing on current available Euronext derivatives instruments.

Euronext will introduce a subset of Oslo Børs derivatives instruments – cf. appendix 7.4 – in the testing environment in coordination with LCH SA in **April 2020** to enable front to back testing for clients on current BAU derivatives clearing functionalities. The exact date of availability of derivatives instruments and connectivity with LCH SA will be confirmed later in due course.

LCH SA will deliver a release covering specific features for Oslo Børs clearing (e.g. Single Stock Futures with physical delivery, etc.) in **July 2020**, which exact availability date will be confirmed in due course.

Next to this, LCH SA and SIX X-Clear will organise specific Dress Rehearsals involving clearing members to test the position migration / transfer of Oslo Børs derivatives instrument open interest in the EUA environment in **July and August 2020** (exact date to be confirmed in due course). A detailed description of the dress rehearsals and organization will be provided in due course.

LCH SA testing platform is available during week days between 7:30 and 19:30 CET.

The following table summarises the above key test milestones:

EUA scope	Opening of the EUA
Availability of Oslo Børs BAU instruments for clearing and connection with LCH SA	April 2020

Availability of Oslo Børs clearing specific features with LCH SA	July 2020
CCP Dress Rehearsal testing (position migration)	To be detailed in due course

3.1.5 Managing Order Entry and Market Data Services and Files during the Migration

3.1.5.1 Drop Copy

Drop Copy, a service providing near real-time copies of trade reports & order messages on Optiq, will be available for Oslo instruments via dedicated Drop Copy gateways and accesses.

Clients have to individually request an Optiq Drop Copy access, which is available only in FIX format. A Drop Copy provides messages across the assigned market (Cash or Derivatives) segments. More details can be found in the *Euronext Markets – Optiq Drop Copy Service* document.

3.1.5.2 EOD Application Files

The Euronext End of Day service, an application allowing a Member Firm to retrieve and download several files called “End Of Day” files containing order and trade information belonging to its Member Firm code, will also include Oslo. This service is only available for Euronext Cash Markets.

Trade files in the End of Day (EOD) applications for Optiq® remain in the same format as today with some adjustments, such as adjustment of values to be in line with Optiq®. Timestamps will match the ones in Optiq® and will be provided in UTC

Order files in Optiq® are provided in two different formats: XML and flat file.

More details can be found in the *Euronext Cash Markets – End of Day Files Specifications*.

3.1.5.3 Euronext File Services

Euronext File Services (EFS) is a service that provides full referential data for the Euronext markets, as well as feed configurations, key trading information and MDG and OEG SBE templates. Users of the Euronext market data feed should use the service to (i) Configure feed connections, (ii) Obtain the referential data, configuration and setup parameters, that are published on a daily basis. This is used for all Euronext markets.

Oslo Børs Cash and Derivatives markets will be integrated into the existing files on EFS.

The files for EUA are available : <https://efs-eua.euronext.com/main.html>

The files for Production are available : <https://efs.euronext.com/main.html>

More details can be found in the *Euronext Markets – Optiq File Specifications*.

3.2 TESTING APPROACH AND TEST ENVIRONMENTS

Next EUA is the environment which will be used for end-to-end testing of Optiq and for conformance for the Oslo Børs migration. The deliveries for the Oslo Migration in Next EUA will be made in different lots.

The first delivery for Cash is a light scope and includes the creation of a subset of trading groups and Equity instruments. The Market Data channels for Oslo are not yet in place, and market data for Oslo Equities will be sent through *MDG SET OF CHANNELS ID 9 – EQUITIES DUBLIN*.

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The second delivery is the full scope, which includes a new SBE Template version 300 for OEG/MDG and the new Market Data channels for Oslo. It also includes Indices. This second delivery will mark start of conformance testing.

Derivatives will have one delivery which will come with SBE Template version 217.

Saturn OBOE for Oslo will be released in June 2020.

Note that Fixed Income is not yet included and details will follow shortly.

Find below the timeline for Next EUA changes for Optiq.

The Availability date indicates when they are ready for clients to test. The technical implementation of the Full releases (and implementation of new SBEs) will occur about two weeks prior to each date and will be communicated in advance through Optiq Notice).

	Next EUA CHANGES	
	Availability for clients	Info Flash / Documentation
Technical set up For connectivity testing and validation of OE sessions	Already available	-
Light “referential” Cash <i>Subset of Trading groups, patterns, and Equity instruments will be listed. <u>Light Cash means that the data for Oslo is routed temporarily to the Equities Dublin channels until new channels are made available.</u></i>	17 March 2020	-
Full Derivatives <i>New Oslo Derivatives exchanges, contracts listed, SBE 217 will be implemented for Derivatives.</i>	13 April 2020	-
Full Cash <i>Additional instruments will be available, they will be gradually integrated. New Oslo MDG channels will be available. Subset of Indices will be added. SBE 300 will be implemented for Cash.</i>	18 May 2020	-
CCP connectivity access on Next EUA, for end-to-end testing in the Optiq® testing environment	July 2020 (Cash and Derivatives)	-
Saturn OBOE <i>Oslo specific features</i>	June 2020	-

3.2.1 Checking Order Entry Connectivity in Next EUA

Euronext will provide “default” Order Entry Sessions for Next EUA to new clients’ Member Connectivity Administrators and to new providers. Existing Euronext clients already have logical access ids for the EUA environments. Customers who have not received their Order Entry Sessions for Next EUA are invited to contact Customer Access Services (See Contacts section for details)

Full connectivity details to Next EUA can be found in the *EURONEXT MARKETS – OPTIQ® OEG CONNECTIVITY SPECIFICATIONS document*.

Clients are able to perform telnet to the Optiq Next EUA environment. Please refer to the *Euronext Markets - Telnet tests* document.

3.2.2 Connectivity to Next EUA

As a reminder, Euronext will provide Order Entry Sessions to all new clients' Member Connectivity Administrator and to all new providers. Existing Euronext clients should already have access to EUA environments. Next EUA Drop Copy sessions must be ordered by customers.

External User Acceptance (EUA) environments

Trading members and providers who are current members on Oslo Børs, but not on Euronext, will have a number of "default" Logical access per Optiq segment sent to them (in both SBE and FIX protocol) in due time. These connections has been set with minimum throughput to allow clients to start their technical tests.

Trading members and providers that are already a member of Euronext should already have logical accesses to access Next EUA (p-EUA) environment. For information, please contact Customer Access Services.

In addition to the default Logical Accesses, clients may request additional custom connections. This should allow clients and Euronext to perform tests in Optiq in the most realistic conditions.

The requests for adjustment and/or creation of new Logical Accesses in EUA environments can be submitted via the following forms:

EUA Ordering Forms	
Optiq Cash Order Entry	Access/DC creation – EUA
	Access modification
	Access deletion
Optiq Derivatives Order Entry	Access/DC creation – EUA
	Access modification
	Access deletion

Customers who have not received their Order Entry Sessions in Next EUA are invited to contact Customer Access Services team (see contact details in the [Support](#) section of this document).

Order Entry Gateway: Clients can refer to the *Euronext Markets – Optiq OEG Connectivity Specifications* document for full connectivity details to the Next EUA (P-EUA).

Market Data Gateway: Clients can refer to the *Euronext Markets –* for full connectivity details to MDG Next EUA (P-EUA).

Saturn/OBOE: Clients can refer to Saturn User Guide and Saturn Specifications to have full details of the system.

3.2.3 Validating Conformance Tests

The main test environment for the Oslo Børs migration is Next EUA (P-EUA). Below is a chart on the conformance tests for the migration.

Note that they are applicable for Cash and Derivatives markets – thus a client active on both Cash and Derivatives markets would need to perform **two** functional conformance tests, one for each market.

Note that Fixed Income may bring additional tests.

Test to be Performed			Cash		Derivatives	
	Cash	Derivatives	Start Date	End Date	Start Date	End Date
Functional Conformance Test [Mandatory]	✓	✓	18 May	One week before First Dress Rehearsal	18 May	One week before First Dress Rehearsal
High Availability [Mandatory]	✓	✓	2 March 2020	One week before First Dress Rehearsal	2 March 2020	One week before First Dress Rehearsal
Market Data Gateway (MDG) [Mandatory]	✓	✓	18 May	One week before First Dress Rehearsal	18 May	One week before First Dress Rehearsal
Throttling [Highly Recommended]	✓	✓	2 March 2020	One week before First Dress Rehearsal	2 March 2020	One week before First Dress Rehearsal
Front-to-Back [Mandatory]	✓	✓	July 2020	Go Live	July 2020	Go Live
Saturn OBOE [Mandatory]	✓		1 June 2020	Go Live		
Saturn SLC [Mandatory]	✓	✓	2 March 2020	One week before First Dress Rehearsal	2 March 2020	One week before First Dress Rehearsal

Note: Migration Go Live will be mandatory for every Oslo Børs Member, either using a certified Order Entry and Market Data solution or developing their own Order Entry and Market Data solution.

3.2.3.1 Order Entry Gateway (OEG) Tests

Following members and providers are required to perform a mandatory OEG **full conformance** test:

- New trading members accessing directly to Euronext Optiq® platform not conformed yet to the Optiq® Platform
- Software providers not conformed yet to the Optiq® Platform

More information on the script and process will be communicated in due time.

Trading members and Software providers already certified on the Optiq® platform are required only to perform an OEG **light conformance** test.

The following table describes the kind of conformance test applicable for each member and provider.

	Trading Member developer (if not conformed for Optiq®)	Liquidity Provider using a provider only	Trading Member using a provider only	Provider (if not conformed for Optiq®)
Full / Light conformance	Full	Light	Light	Full
Mandatory / optional	Mandatory	Mandatory	Mandatory	Mandatory

Guidelines for Light Conformance test:

The scenarios for the Light Conformance test (for current Euronext member(s)) will be communicated in due time.

Customers will need to book a conformance slot using a webform which will be communicated in due time.

As a reminder, no conformance test will take place on Wednesday morning as the Next EUA platform is closed for maintenance until 13:00 CET.

Please note that customers will not be able to access the Production environment neither during the Dress Rehearsal nor for Go-Live unless they have completed their **conformance tests**.

3.2.3.2 High Availability testing in Next EUA

High availability test is mandatory **only** for customers that are required to complete the **full conformance test**. The timeline for High Availability testing will follow shortly.

Full details regarding High availability test can be found in the High Availability section in the conformance scripts (Cash and Derivatives) available on the [IT Documentation](#) page.

3.2.3.3 Market Data Gateway (MDG) Test

MDG **full conformance** test is only mandatory for new trading members, software providers or market data providers not conformed yet to the Optiq® Platform.

Trading members, software providers or market data providers already certified on the Optiq® platform are required only to complete and submit the checklist web form.

Clients using exclusively a technology provider are not required to pass conformance testing as this will be managed by their technology providers. Customers are required to verify the conformance of their software solutions for all applications that wish to use the Optiq® Market Data in production.

Test to be Performed	Cash	Derivatives	How?
Real Time [Mandatory]	✓	✓	Self-test, script, feedback through webform
SBE template [Mandatory]	✓	✓	Self-test, script, feedback through webform
Emergency Command [Mandatory]	✓		Self-test, script, feedback through webform
SnapShot [Highly Recommended]	✓	✓	Self-test, script, feedback through webform

High Availability [Mandatory]	✓	✓	Self-test, script, feedback through webform
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There will be dedicated Oslo instrument(s) for the MDG conformance test. Order entry is forbidden for clients on these instruments as to not interfere with the tests results.

During the conformance test, clients must listen to Market data and record the data.

Confirmation of successful test needs to be submitted via webform that will be communicated in due time.

3.2.3.4 Saturn (OBOE/SLC) Test

On Saturn system the definition of full or light conformance tests does not apply.

Saturn OBOE and clients are only requested to perform a File upload and insertion of OBOE declaration and confirm the submission via a webform.

Saturn SLC and clients will likewise be requested to perform a File upload and insertion of a SLC file and confirm the submission via a webform.

The validation web forms will be available in due time.

3.2.3.5 Throttling Test

Throttling testing is a highly recommended tests for customers to ensure they understand and can handle the Throttling mechanism on Optiq. Customers can follow the Throttling conformance script and can submit a webform confirming their test completion.

These tests follow the Throttling mechanism that is described in the “OEG Throttling” section of the *Optiq OEG Connectivity Features & Configuration Specifications* document.

3.2.4 Front-to-back Testing

The migration to Optiq brings with it a large number of changes impacting the post trade systems of Clearing Members, in reconciliation with client back-offices. Clients are strongly encouraged to review the information that is included in the appendices of this document, as well as dedicated communication for the clearing impacts, and to ensure that their systems use the correct mapping of values and instructions for clearing data.

As a result, **front-to-back testing** is mandatory for the Oslo Børs migration for both Cash and Derivatives markets.

These tests will allow to confirm that the mapping of fields and the associated configured values from Order Entry to posting in clearing accounts is correctly populated by the clients’ trading facing systems, clearing members and back-offices.

When performing the Front-to-back clearing conformance test, the **Trading member is responsible to confirm with their Clearing member that mapping is as expected.**

	Trading Member developer	Member developer + using a provider	Market Makers using a provider only	Trading Member using a provider only	Provider
Mandatory / optional	Mandatory	Mandatory	Mandatory	Mandatory	Mandatory**

**** For providers that are hosting multiple trading members, each trading member must pass the front-to-back tests.**

Clearing testing must be completed by each individual trading firm, identified by a Firm ID (a.k.a. Member code / TMF) to ensure their account and configuration setup is correct.

Dedicated Front to Back test scripts for Cash and Derivatives will be published with more details on these tests.

3.3 PRODUCTION ENVIRONMENT

3.3.1 Direct Network Connectivity for Order Entry and Market Data Access

All clients (including Trading Members) that would like Market Data connectivity, either directly connected or via an Extranet Service Provider (ESP), Application Service Provider (ASP) or data vendor need to sign a Euronext Market Data Agreement (EMDA) to get market data access in production.

Clients (including Trading Members) that already have Euronext market data and would like to receive Oslo Børs market data will need to update their existing EMDA order form.

Oslo Børs clients (including Trading Members) that do not yet have Euronext data and wish to continue to receive Oslo Børs data will need to sign the Euronext Market Data Agreement prior to 1 July 2020.

The documentation for the Euronext Market Data Agreement can be found [here](#).

Clients that do not use an ESP or ASP and who would like to require direct connectivity can access Euronext's markets via the Secure Financial Transaction Infrastructure[®] (SFTI[®]).

Clients that already have a SFTI connection will need to update their SFTI order form to access the new Oslo Børs Equities and Nordic ABM channels in production.

Oslo Børs clients that do not yet have Euronext data and wish to connect directly to Optiq[®] MDG will need to order a SFTI[®] connection.

For more information about SFTI or if you wish to obtain access to the Optiq[®] Order Entry Gateway or MDG channels via SFTI, please contact your sales representative at ICE Data Services or send an email to icglobalnetwork-info@theice.com.

Additionally, ICE Data Services might contact Members to arrange administrative and form-filling processes for the access to Optiq[®] JSE production.

Please note that access to EUA is already set up from an ICE Data Services standpoint.

3.3.2 Ordering Order Entry Sessions to Access Production

All Trading Members connecting to Oslo Børs using Optiq[®] are required to submit their Optiq[®] Cash and Derivatives OE Sessions Order forms at the latest one week before a Dress Rehearsal. Please note that **Providers (ISVs, ASPs) do not have the ability to order OE Sessions on behalf of their clients.**

All Trading Members are required to order their Optiq Logical Accesses for Production one week before the start of the Dress Rehearsals.

The Logical Access connectivity details will be made available two days before the start of the Dress Rehearsals.

Trading Members who are already Euronext members should already have Logical Access IDs, but need to ensure that their current Logical Access IDs and related message outputs are up-to-date to account for Oslo Børs activities.

Please note that **Providers (ISVs, ASPs) do not have the ability to order OE Sessions on behalf of their clients.**

For any questions, please contact Customer Access Services.

The Production Order Forms are available online on the Euronext website at the following location (<https://connect2.euronext.com/en/membership/forms>)

PROD Ordering Forms	
Optiq Cash Order Entry	Access Creation - Production
	Drop Copy Creation - Production
	Access Creation – Free Package
	Access Modification
	Access Deletion

PROD Ordering Forms	
Optiq Derivatives Order Entry	Access Creation - Production
	Access Creation Market Maker - Production
	Drop Copy Creation - Production
	Access Modification
	Access Deletion

After receiving a request for a Logical Access, Customer Access Services will communicate login information to customer by email. Customers are required to have tested their connectivity in Production before the mandatory Dress Rehearsal.

As a reminder:

- Providers cannot order OEG Logical Accesses for Production
- Only trading members can order Production OEG Logical Accesses
- Logical Accesses can only be ordered by a nominated Member Connectivity Administrator (MCA). Any customer without an MCA account should contact the Customer Access Services (CAS) team for more information at cas@euronext.com / Tel: +33 1 85 148 589

3.3.3 Testing Order Entry Connectivity to Production and the Disaster Recovery Environments

Telnet connectivity testing for Euronext Production and Disaster Recovery environments is already available. Please refer to *Euronext Markets – Optiq OEG Connectivity Telnet Tests* document for more information.

Technical connectivity testing does not require any specific connectivity setup (i.e. Logical Access information) as it covers generic telnet testing.

Customers are required to perform Telnet commands in order for Euronext to receive network validation of the connectivity.

3.3.4 Dress Rehearsals

The mandatory Dress Rehearsals will take place before each Go Live, allowing customers to test the target Oslo Børs migration Production implementation in advance.

Customers will not be authorised to take part in the Dress Rehearsal week-end unless they have (i) validated their conformance test, (ii) confirmed Telnet connectivity to Production, and (iii) ordered their OE Sessions for Production.

The scope of the tests are the following for both Cash and Derivatives:

- Order Entry and Market Data
- The schedule and scope of Dress Rehearsals will be communicated at a later date in a dedicated document

Tests which are out of scope are the following:

- Clearing tests (LCH SA/LCH Ltd/EuroCCP/SIX X-Clear)
- End of Day files
- Functional high availability
- Saturn

Customers will be expected to conduct the following tests:

- Secure network resources to validate firewall / security path
- Connect to the Production environment
- Inject orders
- Purge the book at the end of the day and restore order book to Friday night
- Validate participation at the end of the day via a webform

The roll-back after each dress rehearsal should be managed by the participants of each test to ensure a smooth start-up on the next trading day. **All clients are required to participate in at least one Saturday dress rehearsal prior to Go Live.** Participation in the migration week-end is highly recommended.

On the Saturday before each Go-live, clients will be invited to connect to the Optiq OEG, as well as to the MDG multicast channels that will be implemented in Production on the next trading day.

Once the Go-Live is confirmed, clients will keep the configuration in place and will **not** perform a roll-back in order to begin trading using Optiq OEG and MDG on the following Monday. Clients will need to ensure that they have purged their systems of the orders placed during the Saturday tests.

A detailed description of the dress rehearsals, go-live organization, disaster recovery testing and test scenarios will be provided in due course.

3.3.4.1 CCP Dress Rehearsals

On Cash Equity clearing, there will be **no connectivity Dress Rehearsals** with interoperable CCPs and clearing members.

However, note that on **Derivatives clearing**, LCH SA plans to execute specific Dress Rehearsals tests with clearing members wishing to take part to the migration in order to validate the position migration transfer between SIX x-clear and LCH SA.

LCH SA will communicate their plan and DR dates in due course.

3.4 CUSTOMER READINESS CHECKLIST

3.4.1 For Oslo Børs members who do not have an access to Optiq/Saturn

		CASH	DERIVATIVES
	Members involved	Due date	Due date
Fill and Sign up AR, RP and MCA declaration forms Appoint key contacts	<i>All Trading Members</i>	ASAP	ASAP
Sign up the Optiq® Trading Platform Access Agreement (TPAA)	<i>All Trading Members</i>	Before Go Live	Before Go Live
Sign up Euronext Regulatory Reporting Solution Terms and Conditions	<i>All Trading Members</i>	ASAP	ASAP
Sign the EMDA Required to receive data from Optiq in Production	<i>Trading Members, ASPs and Data Providers</i>	1 July	1 July
Order OE Sessions Automatically provided for Next EUA; to be ordered for Production; required for Dress Rehearsals	<i>All Trading Members</i>	One week prior to First Dress Rehearsal	One week prior to First Dress Rehearsal
Order Oslo Market Data channels Automatically provided for Next EUA; to be ordered for Production; required for Dress Rehearsals Reminder: Clients/providers need to ensure they are correct configured for market data on the SFTI side.	<i>Trading Members, ASPs, ESPs and Market data Providers</i>	-	-
Configure network Update connectivity and perform Telnet tests	<i>Trading Members, ASPs, ESPs and Market data Providers</i>	First Dress Rehearsal	First Dress Rehearsal
Connectivity Test on Production order Entry Gateways	<i>Trading Members, ASPs</i>	First Dress Rehearsal	First Dress Rehearsal
Validate conformance tests Functional (prior to Dress Rehearsals) and technical (HA – prior to Go-lives) on all member codes, protocols with an OCS analyst	<i>Trading Members, ASPs and Market Data Providers First Dress Rehearsal</i>	One week prior to First Dress Rehearsal	One week prior to First Dress Rehearsal
Participate in Dress Rehearsals Validate technical and functional access to Production	<i>Trading Members and Providers</i>	10 October 2020 And 31 October 2020	14 November 2020 And 21 November 2020
Test final set-up on the migration week-end Validate technical and functional access before the market segments migrate to Optiq® and Saturn platforms	<i>Trading Members and Providers</i>	7 November 2020	28 November 2020

3.4.2 For Oslo Børs members who do have an access to Optiq/Saturn

	Members involved	CASH	DERIVATIVES
		Due date	Due date
Order OE sessions* To be ordered for Production and relevant segments; required for Dress Rehearsals	<i>All Trading Members</i>	One week prior to First Dress Rehearsal	One week prior to First Dress Rehearsal
Order Oslo Market Data channels Automatically provided for Next EUA ; to be ordered for Production; required for Dress Rehearsals	<i>All Trading Members</i>	-	-
Develop and test Trading Member developers and Providers For order entry and market data software in Next EUA	<i>Trading Members, ASPs, and Market Data Providers</i>	One week prior to First Dress Rehearsal	One week prior to First Dress Rehearsal
Validate light conformance tests Functional (prior to Dress Rehearsals) and technical (HA – prior to Go-lives) on all member codes, protocols and segments with an OCS Analyst	<i>Trading Members, ASPs, and Market Data Providers</i>	One week prior to First Dress Rehearsal	One week prior to First Dress Rehearsal
Participate in Dress Rehearsals Validate technical and functional access to Production	<i>Trading Members and Providers</i>	10 October 2020 And 31 October 2020	14 November 2020 And 21 November 2020
Test final set-up on the migration week-end Validate technical and functional access before the market segments migrate to Optiq® and Saturn platforms	<i>Trading Members and Providers</i>	7 November 2020	28 November 2020

**Only Members without Order Entry sessions for Production Cash and/or Derivatives must order Order Entry sessions.*

Note: Euronext members who already have an access to Optiq® and Saturn already have Order Entry Sessions for Next EUA (P-EUA) to be used for conformance tests.

3.4.3 For Euronext members who would like to trade Oslo products

Current Euronext members who already have an access to Optiq® and Saturn but do not trade on Oslo Markets yet and would like to start to trade on those markets on the migration Go Live date must complete a full membership extension process.

	Members involved	CASH	DERIVATIVES
		Due date	Due date
Sign up Euronext Membership Extension Form	<i>All Trading Members</i>	-	-
Order OE sessions* To be ordered for Production and relevant segments; required for Dress Rehearsals	<i>All Trading Members</i>	One week prior to First Dress Rehearsal	One week prior to First Dress Rehearsal
Order Oslo Market Data channels Automatically provided for Next EUA ; to be ordered for Production; required for Dress Rehearsals	<i>All Trading Members</i>	-	-
Develop and test Trading Member developers and Providers For order entry and market data software in Next EUA	<i>Trading Members, ASPs, and Market Data Providers</i>	One week prior to First Dress Rehearsal	One week prior to First Dress Rehearsal
Validate light conformance tests Functional (prior to Dress Rehearsals) and technical (HA – prior to Go-lives) on all member codes, protocols and segments with an OCS Analyst	<i>Trading Members, ASPs, and Market Data Providers</i>	One week prior to First Dress Rehearsal	One week prior to First Dress Rehearsal
Participate in Dress Rehearsals Validate technical and functional access to Production	<i>Trading Members and Providers</i>	10 October 2020 And 31 October 2020	14 November 2020 And 21 November 2020
Test final set-up on the migration week-end Validate technical and functional access before the market segments migrate to Optiq® and Saturn platforms	<i>Trading Members and Providers</i>	7 November 2020	28 November 2020

*Only Members without Order Entry sessions for Production Cash and/or Derivatives must order Order Entry sessions.

Note: Euronext members who already have an access to Optiq® and Saturn already have Order Entry Sessions for Next EUA (P-EUA) to be used for conformance tests.

4. OSLO BØRS MEMBERSHIP AND CONNECTIVITY APPROACH DURING MIGRATION PERIOD

Existing Oslo Børs customers who are not on Euronext already will have to update their membership agreement during the migration project.

Existing Oslo Børs customers who are already members on Euronext will not need to fill any particular membership papers.

Customers who are Euronext members, but currently not Oslo Børs member, would have to sign a Euronext membership extension form.

More details are in the Customer Readiness Checklist.

5. COMMUNICATION PLAN

Communication will continue throughout the Oslo Børs Migration project, in order to ensure that all clients have access to clear and useful information for the duration of the project. The following list of communications will be sent to convey key details and clients should be sure to subscribe to any relevant distribution lists.

- **Info Flashes:** These communications will announce key milestones of the project, and details that all clients should be aware of, such as: documentation publication, the opening of each platform, and confirmed Production implementation dates.
- **Oslo Børs Delta:** up-to-date information prior to and during the migration period will also be disseminated via the existing channel **Oslo Børs Delta**. If you for any reason at all wish to be removed from Delta notices, please send an email to webansvarlig@osloBørs.no.
- **Optiq Notices / Operational Notices:** The Client Support desk will provide programme updates via 'Operational Notices' to inform the market of milestones, EUA environment details, Optiq specifications, issue reminders of deadlines, changes and testing, as well as other important programme updates.
- **Technical Documentation:** new and updated documentation will be provided throughout the course of the migration, and will provide clients with the required information to develop and implement Optiq® and Saturn OBOE features. These documentations will be available in the IT Documentation section.

Note: to subscribe to Optiq Notices / Operational Notices, please contact Operational Client Services Desk on clientsupport@euronext.com or +33 1 8514 8585.

Subscription to Info Flashes can be done through Connect portal.

6. CONTACTS

Find below the contact details of Euronext's and partner support teams:

Team	Contact details
<p>Operational Client Services Members' first point of contact for Oslo Børs migration. Technical & functional assistance with the development and testing on Optiq. Assistance with the use of the EUA environment, conformances, timeline and customer readiness checklist.</p>	<ul style="list-style-type: none"> ■ Tel: +33 1 85 14 85 85 ■ Email: Oslomigration@euronext.com
<p>Membership Support to new and existing members with the onboarding process for becoming a trading member, including contracts (TPAA).</p>	<ul style="list-style-type: none"> ■ Tel: +31 207 214 264 ■ Email: EuronextMembership@euronext.com
<p>Customer Access Services Support to market participants' access and connections to Euronext markets, including Logical Accesses on Optiq (i.e. access and log-in credentials to Optiq OEG).</p>	<ul style="list-style-type: none"> ■ Tel: +33 1 85 14 85 89 ■ Email: CAS@euronext.com
<p>SFTI For more information about SFTI or if you wish to obtain access to the Optiq® Order Entry Gateway or MDG channels via SFTI, please contact your sales representative at ICE Data Services.</p>	<ul style="list-style-type: none"> ■ icglobalnetwork-info@theice.com

7. APPENDIX

7.1 LIST OF TRADING PATTERNS FOR OSLO BØRS INSTRUMENTS

The list of Oslo Børs trading patterns will follow shortly.

7.2 LIST OF TRADING GROUPS / EXCHANGES THAT WILL MIGRATE TO OPTIQ®

Cash Markets

The following trading groups are included in the scope of migration of Oslo Børs instruments to Optiq®:

Gr.	Class Name	Trading Pattern	OPTIQ SEGMENT
OA	<i>Reserved for Oslo</i>	TBC	Equities
OB	<i>Reserved for Oslo</i>	TBC	Equities
OC	<i>Reserved for Oslo</i>	TBC	Equities
OD	<i>Reserved for Oslo</i>	TBC	Equities
OE	<i>Reserved for Oslo</i>	TBC	Equities
OF	<i>Reserved for Oslo</i>	TBC	Equities
OG	<i>Reserved for Oslo</i>	TBC	Equities
OH	<i>Reserved for Oslo</i>	TBC	Equities
OI	<i>Reserved for Oslo</i>	TBC	Funds
OJ	<i>Reserved for Oslo</i>	TBC	Fixed Income
OK	<i>Reserved for Oslo</i>	TBC	Fixed Income
OL	<i>Reserved for Oslo</i>	TBC	Fixed Income
OM	<i>Reserved for Oslo</i>	TBC	Fixed Income
ON	<i>Reserved for Oslo</i>	TBC	Fixed Income
OO	<i>Reserved for Oslo</i>	TBC	Warrants and Certificates
OP	<i>Reserved for Oslo</i>	TBC	Warrants and Certificates
OQ	<i>Reserved for Oslo</i>	TBC	Warrants and Certificates
OR	<i>Reserved for Oslo</i>	TBC	Warrants and Certificates
OS	<i>Reserved for Oslo</i>	TBC	Warrants and Certificates
OT	<i>Reserved for Oslo</i>	TBC	Warrants and Certificates
OU	<i>Reserved for Oslo</i>	TBC	Warrants and Certificates
OV	<i>Reserved for Oslo</i>	TBC	Warrants and Certificates
OW	<i>Reserved for Oslo</i>	TBC	Warrants and Certificates
OX	<i>Reserved for Oslo</i>	TBC	Warrants and Certificates
OY	<i>Reserved for Oslo</i>	TBC	
OZ	<i>Reserved for Oslo</i>	TBC	

Note: Above list of trading groups will be available in Next EUA (P-EUA) and Production environments.

Derivative Markets

The following Exchanges are included in the scope of migration of Oslo Børs instruments to Optiq®:

Exch.	Class Name	Financial Market	Contract Type
L	Oslo - Cash Underlying	309	
N	Oslo - Index Derivatives	308	F (Future) O (option)
O	Oslo - Equity Derivatives	308	F (Future) O (option)

Note: Above list of Exchanges will be available in Next EUA (P-EUA) and Production environments.

7.3 LIST OF INSTRUMENTS IN NEXT EUA AND PRODUCTION ENVIRONMENTS

The below list of Equities will be created for the Light Cash Release in Euronext Cash Next EUA

ISIN Code	Symbol Index in Next EUA	Symbol Index in production	Trading group	Trading code	Mnemonic Code	MIC Code
CL0002409135	1342823	TBC	OC	CL0002409135	TBC	XOSL
FO000A0DN9X4	1342824	TBC	OB	FO000A0DN9X4	TBC	XOSL
NO0010341712	1342825	TBC	OC	NO0010341712	TBC	XOSL
NO0010791353	1342826	TBC	OC	NO0010791353	TBC	XOSL
NO0010815673	1342827	TBC	OC	NO0010815673	TBC	XOSL
NO0010816895	1342828	TBC	OC	NO0010816895	TBC	XOSL
NO0010851603	1342829	TBC	OC	NO0010851603	TBC	XOSL
NO0010856511	1342830	TBC	OC	NO0010856511	TBC	XOSL

7.4 LIST OF INDICES

Equity Indices

Pre-migration Ticker	ISIN	Name	Family (exact naming TBC)	MNEMO (post migration)
OBX	NO0000000021	OBX Total Return Index	OBX Family	OBX
OBXP	NO0007035376	OBX Price Index	OBX Family	OBXP
OBXU	NO0010865173	OBX Uncapped Total Return Index	OBX Family	OBXU
OSEBX	NO0007035327	Oslo Børs Benchmark Index_GI	OBX Family	OSEBX
OSEBXNR	NO0010865249	OSEBX Benchmark_NR	OBX Family	OSEBN
OSEBXPR	NO0010865256	OSEBX Benchmark_PR	OBX Family	OSEBP
OSEFX	NO0007035335	Oslo Børs Mutual Fund Index_GI	OBX Family	OSEFX
OSEFXNR	NO0010865264	OSEFX Mutual Fund_NR	OBX Family	OSEFN
OSEFXPR	NO0010865272	OSEFX Mutual Fund_PR	OBX Family	OSEFP
OSEMX	NO0010735640	Oslo Børs Mid Cap Index	OBX Family	OSEMX
OSEMXNR	NO0010865280	OSEMX Mid Cap_NR	OBX Family	OSEMN

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OSEMXP	NO0010865298	OSEM Mid Cap_PR	OBX Family	OSEMP
OSESX	NO0007035343	Oslo Børs Small Cap Index_GI	OBX Family	OSESX
OSESXNR	NO0010865306	OSESX Small Cap_NR	OBX Family	OSESN
OSESXP	NO0010865314	OSESX Small Cap_PR	OBX Family	OSESP
OSEAX	NO0007033900	Oslo Børs All-share Index_GI	OBX Sector and All Share	OSEAX
OSEAXNR	NO0010865223	OSE All share_NR	OBX Sector and All Share	OSEAN
OSEAXP	NO0010865231	OSE All share_PR	OBX Sector and All Share	OSEAP
NEW	-	OBX Technology GR	OBX Sector and All Share	OTECG
NEW	-	OBX Technology NR	OBX Sector and All Share	OTECN
NEW	-	OBX Technology PR	OBX Sector and All Share	OTECP
NEW	-	OBX Telecommunications GR	OBX Sector and All Share	OTELG
NEW	-	OBX Telecommunications NR	OBX Sector and All Share	OTELN
NEW	-	OBX Telecommunications PR	OBX Sector and All Share	OTELP
NEW	-	OBX Health Care GR	OBX Sector and All Share	OHCG
NEW	-	OBX Health Care NR	OBX Sector and All Share	OHCN
NEW	-	OBX Health Care PR	OBX Sector and All Share	OHCP
NEW	-	OBX Financials GR	OBX Sector and All Share	OFING
NEW	-	OBX Financials NR	OBX Sector and All Share	OFINN
NEW	-	OBX Financials PR	OBX Sector and All Share	OFINP
NEW	-	OBX Real Estate GR	OBX Sector and All Share	OREG
NEW	-	OBX Real Estate NR	OBX Sector and All Share	OREN
NEW	-	OBX Real Estate PR	OBX Sector and All Share	OREP
NEW	-	OBX Consumer Discretionary GR	OBX Sector and All Share	OCDG
NEW	-	OBX Consumer Discretionary NR	OBX Sector and All Share	OCDN
NEW	-	OBX Consumer Discretionary PR	OBX Sector and All Share	OCDP
NEW	-	OBX Consumer Staples GR	OBX Sector and All Share	OCSG
NEW	-	OBX Consumer Staples NR	OBX Sector and All Share	OCSN
NEW	-	OBX Consumer Staples PR	OBX Sector and All Share	OCSN
NEW	-	OBX Industrials GR	OBX Sector and All Share	OING
NEW	-	OBX Industrials NR	OBX Sector and All Share	OINN
NEW	-	OBX Industrials PR	OBX Sector and All Share	OINP
NEW	-	OBX Basic Materials GR	OBX Sector and All Share	OIMG
NEW	-	OBX Basic Materials NR	OBX Sector and All Share	OIMN
NEW	-	OBX Basic Materials PR	OBX Sector and All Share	OIMP
NEW	-	OBX Energy GR	OBX Sector and All Share	OENG
NEW	-	OBX Energy NR	OBX Sector and All Share	OENN
NEW	-	OBX Energy PR	OBX Sector and All Share	OENP
NEW	-	OBX Utilities GR	OBX Sector and All Share	OUTG
NEW	-	OBX Utilities NR	OBX Sector and All Share	OUTN
NEW	-	OBX Utilities PR	OBX Sector and All Share	OUTP
OBOSX	NO0010590086	Oslo Børs OBX Oil Service Index	Investable Sector Indices	OBOSX
OBSFX	NO0010760663	Oslo Børs Seafood Index	Investable Sector Indices	OBSFX
OBSHX	NO0010771934	Oslo Børs Shipping Index	Investable Sector Indices	OBSHX
OBSFXNR	NO0010865181	OBSFX Seafood_NR	Investable Sector Indices	OBSFN
OBSFXP	NO0010865199	OBSFX Seafood_PR	Investable Sector Indices	OBSFP

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OBSHXNR	NO0010865207	OBSHX Shipping_NR	Investable Sector Indices	OBSHN
OBSHXPR	NO0010865215	OBSHX Shipping_PR	Investable Sector Indices	OBSHP
NEW	-	OBOSX Oil Service PR	Investable Sector Indices	OBOSP
OSLENX	NO0010580590	OSLO Energy Index	Strong Sector Indices	SSENX
OSLSFX	NO0010580624	OSLO Seafood Index	Strong Sector Indices	SSSFX
OSLSHX	NO0010580640	OSLO Shipping Index	Strong Sector Indices	SSSHX
OSEEX	NO0000000062	Oslo Børs Equity Certificate Index	Equity Certificate Indices	OSEEX
NEW	-	Oslo Børs Equity Certificate Index PR	Equity Certificate Indices	OSEEP
OSEBXG	NO0010865363	OSEBXG Index	Custom Indices	OSEBG
OSEEXR	NO0010865371	OSEEXR Index	Custom Indices	OSEER
NAVIG	NO0010865348	Navigator Index	Custom Indices	NAVIG
OSEBX_STB	NO0010865355	OSEBX_STB Index	Custom Indices	OSEBS

Bond Indices

Ticker (pre migration)	ISIN	Name	Family	MNEMO (post migration)	Constituents
ST1X	NO0000000138	Government Bond Index 0.25	OB Core Bond Indices	ST1X	Bonds/T-Bills
ST2X	NO0000000146	Government Bond Index 0.50	OB Core Bond Indices	ST2X	Bonds/T-Bills
ST3X	NO0000000153	Government Bond Index 1.00	OB Core Bond Indices	ST3X	Bonds/T-Bills
ST4X	NO0000000161	Government Bond Index 3.00	OB Core Bond Indices	ST4X	Bonds/T-Bills
ST5X	NO0000000179	Government Bond Index 5.00	OB Core Bond Indices	ST5X	Bonds/T-Bills
OBGBA	NO0010721475	OB Government Bonds All Index	OB Specialized Bond Indices	OBGBA	Bonds
OBGB05Y	NO0010721491	OB Government Bonds < 5 year Index	OB Specialized Bond Indices	OBGO5	Bonds
OBGBU5Y	NO0010721483	OB Government Bonds > 5 year Index	OB Specialized Bond Indices	OBGU5	Bonds
OBGBF1Y	NO0010721509	OB Government Bonds Fixed Maturity 1 year Index	OB Specialized Bond Indices	OBGF1	Bonds
OBGBF2Y	NO0010721517	OB Government Bonds Fixed Maturity 2 year Index	OB Specialized Bond Indices	OBGF2	Bonds
OBGBF3Y	NO0010721525	OB Government Bonds Fixed Maturity 3 year Index	OB Specialized Bond Indices	OBGF3	Bonds
OBGBF4Y	NO0010721533	OB Government Bonds Fixed Maturity 4 year Index	OB Specialized Bond Indices	OBGF4	Bonds
OBGBF5Y	NO0010721541	OB Government Bonds Fixed Maturity 5 year Index	OB Specialized Bond Indices	OBGF5	Bonds
OBGBF6Y	NO0010721558	OB Government Bonds Fixed Maturity 6 year Index	OB Specialized Bond Indices	OBGF6	Bonds
OBGBF7Y	NO0010721566	OB Government Bonds Fixed Maturity 7 year Index	OB Specialized Bond Indices	OBGF7	Bonds
OBTBA	NO0010721574	OB Treasury Bills All Index	OB Specialized Bond Indices	OBTBA	T-Bills
OBTBO180D	NO0010721590	OB Treasury Bills > 180 days Index	OB Specialized Bond Indices	OBTBO	T-Bills
OBTBU180D	NO0010721582	OB Treasury Bills < 180 days Index	OB Specialized Bond Indices	OBTBU	T-Bills

7.5 LIST OF SUMMARY OF CHANGES

REVISION NO./ VERSION NO.	DATE	AUTHOR	CHANGE DESCRIPTION
1.0	13 Mar 2020	Euronext	First release
1.1	29 April 2020	Euronext	Minor update

Version	Change Description
1.0	First release
1.1	Minor update: Corrected an error on 2.5.1 for the Market Data Channel, corrected a typo in SFTI ID Index Derivatives Other to 25 (was 24), and corrected a typo in section 3.2.1 title
