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Cascading Futures at ECC

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1. The Cascading Model of ECC

Several partner exchanges of ECC currently offer futures products (e.g. Power and Gas markets) with consecutive contract maturities, i.e. month, quarter, season and year. These futures contracts are underpinned by the cascading methodology of delivery. Cascading means that futures contracts with longer contract maturities will be replaced by equivalent positions in shorter contract maturities, instead of immediate settlement. For instance, a year position will be broken into four quarters making up the year, then the first quarter will be broken into three months that form the respective quarter. As a result of the cascading procedure a yearly position has been transformed into three monthly contracts and three quarterly contracts.

This structure of contract maturities (Month/Quarter/Season/Year/Fiscal Year) and the consequential cascading delivery methodology was originally adopted by ECC and it is strongly aligned with the delivery periods and risk management requirements of power and gas utilities. A key advantage of cascading is that it enables having a yearly curve of prices rather than individual monthly prices. Furthermore, after contracts are cascaded, exchange participants can execute trading and clearing transactions of the remaining portions, where the contract has not yet entered delivery. Risk management can then cover the risk of positions in delivery much more accurately and use standard risk parameters for the remaining positions, e.g. shorter maturities month contracts.

This document provides an overview of the cascading process at ECC.

1.1. Applicable Products

The exchanges offer several product types, one for each target maturity: month, quarter, season, year. Each of these instruments has its own [ISIN code](#).¹

Cascading only applies to year (calendar and fiscal), season and quarter futures. These contracts are all eventually cascaded to month futures.

¹ Contract specifications for all products can be found on the [ECC website](#).

Figure 1 - ECC multi maturity products



For most Power and Gas contracts, the minimum lot size tradable per product is 1 MWh. The contract volume per product is calculated by multiplying the number of delivery hours (h) during the delivery period with the constant output (MW) specified in the respective contract. The maximum amount per day is usually 24 MW, on the day of the switch from winter time to summer time it amounts to 23 MW, whereas on the day of the switch from summer time to winter time it amounts to 25 MW.

The contract volume each product represents is consistent across maturities in the same Calendar year. Therefore, the number of MWh across 4 Quarter futures equals that of the Year future.

1.2. Trading of Cascading products via the Orderbook

On most markets, such as the EEX, market participants access individual orderbooks which are composed only of instruments that correspond to the underlying maturity, i.e., Month orderbook, Quarter orderbook, etc. This creates outright prices for each instrument. In the case of EEX there is no intra-day cross-matching in orderbook prices provided by the Exchange, yet, EEX Market Operations verifies there are no arbitrage opportunities in daily settlement prices between products that overlap in delivery periods within the same market area.

1.3. Trade execution

Each contract traded at the exchange results in one trade confirmation. There is a unique price of execution for each maturity, as it belongs to an individual orderbook. For example, if a trader posts 1 Cal at 45 EUR/MWh and is executed, they receive a confirmation of 1 Year at 45 EUR/MWh. The position will not be split (e.g. to month contracts) before the expiry date of the traded contract.

1.4. Settlement and Valuation

Since most exchanges like EEX offer independent orderbooks for each instrument, at the end of the day the Exchange publishes daily settlement prices per instrument: months, quarters, seasons, calendars.

These prices are used to conduct the so-called mark-to-market procedure which reevaluates open positions and transactions (e.g. trades) at the determined market price. The respective cash-flow that results from this endeavor is the variation margin. The variation margin is the monetary amount of difference to the previous price (i.e. last settlement price for positions, or transaction price for other clearing transactions, such as trades) multiplied by the lots and contract volume.

2. Cascading Futures

2.1 Cascading Process Description

Year (calendar or fiscal), season and quarter open positions are cascaded on their expiry date as stated in the Contract Details. The Contract Details file is available on the [ECC website](#).

Upon expiry of yearly/seasonal/quarterly open positions, the contracts are split according to the cascading logic. In December, the impact is highest. That is: **the year position gets split into four quarters, then the front quarter is split into months**. Furthermore, the mark-to-market procedure is applied during the cascading event.

Figure 2 - Cascaded Calendar Year Future in delivery

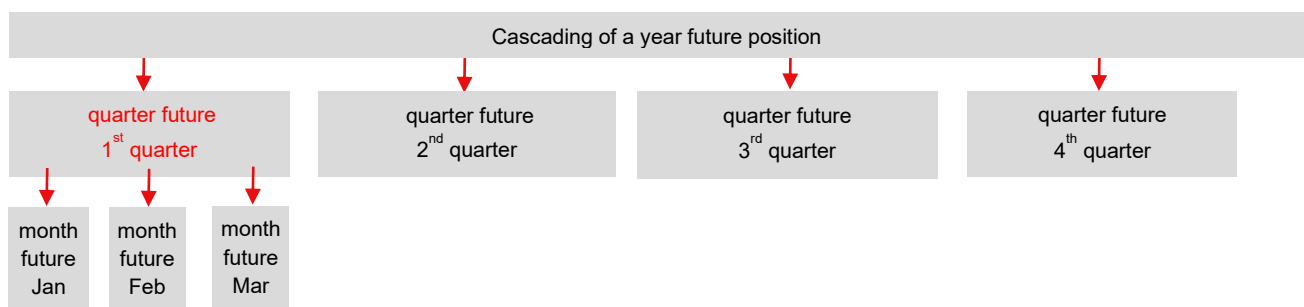


Figure 3 - Cascaded Fiscal Year Future in delivery

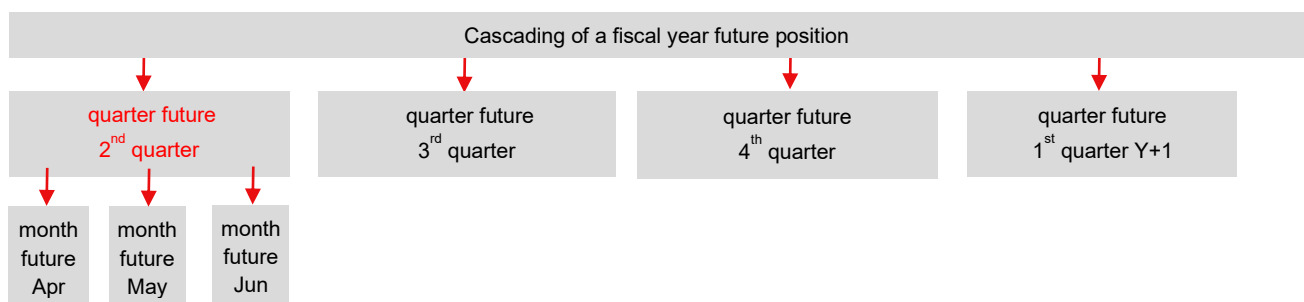
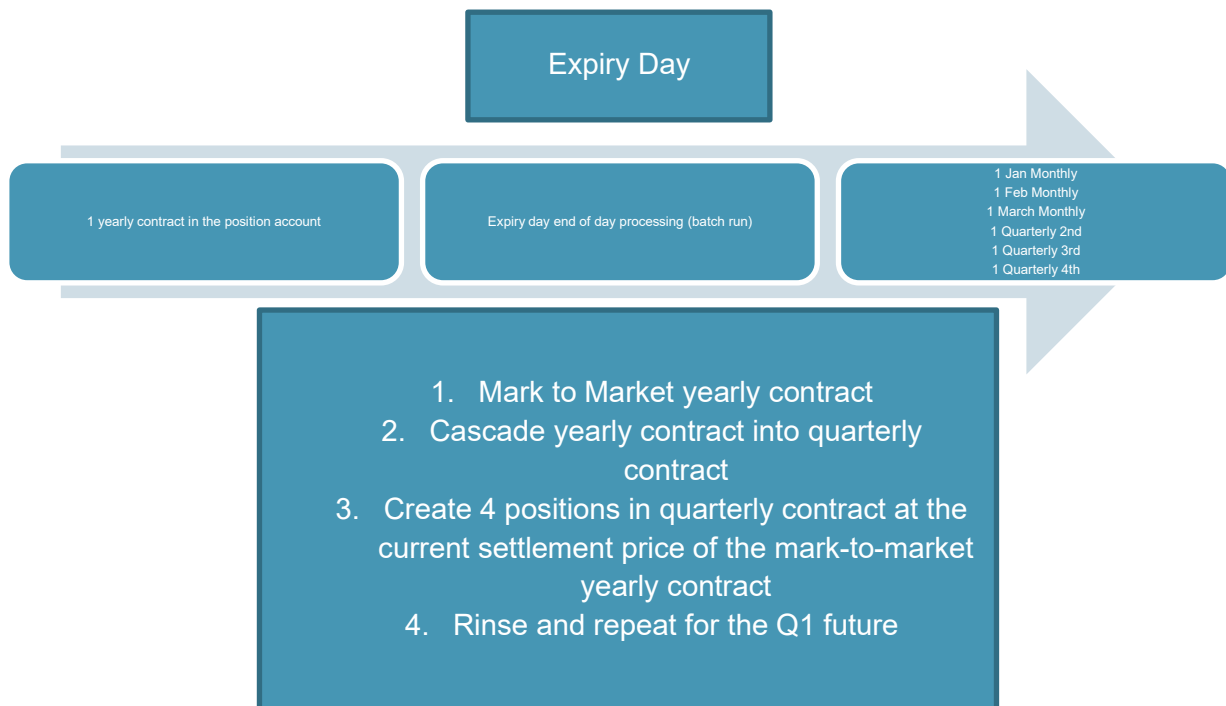


Figure 4 – Expiry of a Calendar Year Future



Calendar Future

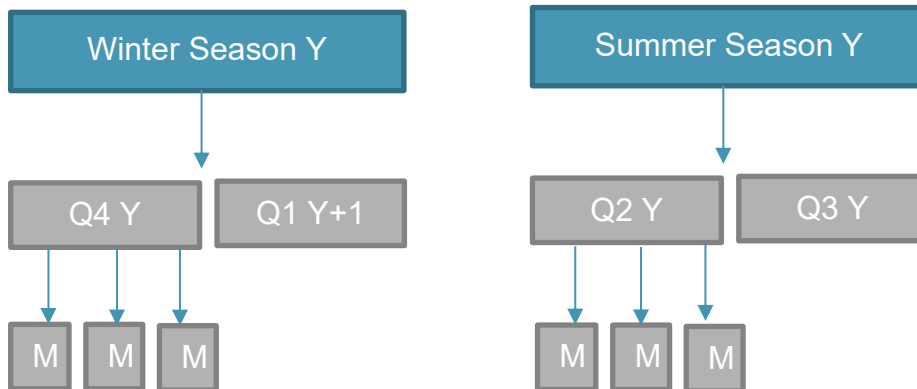
On the expiration date of a year future the yearly contract is exchanged by four quarterly futures (1st - 4th calendar quarter). On the same day the future position for the 1st quarter expires and is cascaded into three monthly futures. Which gives at the end three monthly contracts as well as 3 quarterly contracts.

Calendar Future: Fiscal Year

On the expiration date of a fiscal year future the yearly contract is exchanged by four quarterly futures (2nd, 3rd and 4th calendar quarter of the current calendar year plus 1st quarter of the following calendar year). On the same day the future position for the 2nd quarter expires and is cascaded into three monthly futures. Which gives at the end three monthly contracts as well as 3 quarterly contracts.

Seasonal Future

On the expiration date of a seasonal future the seasonal position is exchanged by 2 quarterly positions (2 consecutive quarters: 4th quarter of the current year + 1st quarter of the **next year** for winter season or 2nd + 3rd quarter for summer season). On the same day the future position in the front quarter expires and is cascaded into 3 monthly futures.



Quarterly Future

On the expiration date of a quarterly future position, it expires and is cascaded into 3 monthly futures which originally made up the quarterly contract.

2.2 Impact on Open Positions and Variation Margin

Cascading on the expiration day comprises three steps:

- Expiration (Position Close due to expiration)
- Final profit and loss balancing on the annual/seasonal/quarterly futures according to the final settlement price
- Booking of the new future contracts at the final settlement price of the expired yearly/seasonal/quarterly futures in the applicable position account.
 - ➔ This corresponds to a transaction in these futures contracts at the final settlement price of the yearly/seasonal/quarterly futures (Futures Position Creation).

Preliminary profit/loss balancing of the newly created positions is done according to the daily settlement price of the futures contracts they have replaced.

Figure 5 – Annual Contract in Cascading

Year Cascading								
Cascade Level	Contract	Delivery Profile	Contract Size (MWh)	Position	Transaction Type	Transaction Price	Settlement Price	Variation Margin ²
	DEBY JAN20	Year	8784	10	EOD Position	Previous Settlement Price 48,14	48.29	13,176.00
Level 1	DEBY JAN20	Year	8784	Expiry (-10)	116 Expiry (-10)			-
	DEBQ JAN20	Quarter	2184	10	126 Future Position Creation	Position created at 48.29	50.60	50,427.30
	DEBQ APR20	Quarter	2184	10	126 Future Position Creation	Position created at 48.29	44.26	-88,015.20
	DEBQ JUL20	Quarter	2208	10	126 Future Position Creation	Position created at 48.29	45.87	-53,433.60
	DEBQ OCT20	Quarter	2208	10	126 Future Position Creation	Position created at 48.29	52.41	91,010.80
Level 2	DEBQ JAN20	Quarter	2184	-10	116 Expiry			-
	DEBM JAN20	Month	744	10	126 Future Position Creation	Cascade Price 50.60	53.01	17,930.40
	DEBM FEB20	Month	696	10	126 Future Position Creation	Cascade Price 50.60	53.00	16,704.00
	DEBM MAR20	Month	744	10	126 Future Position Creation	Cascade Price 50.60	45.94	-34,623.80
Total Variation Margin								13,175.90

When the cascading has happened, the new positions will no longer match the open positions as originally traded, as ECC will report different positions as the open positions. Market participants must verify internally that new positions can be reconciled with old positions and match the new positions with the reports from their Clearing Member.

Market participants may also experience slight differences in variation margin payments when cascading takes place. This is due to rounding³ that is applied in the variation margin calculation. The already booked variation margin from e.g. a year contract (at the settlement price for that year) is broken down to subsequent smaller contract sizes at their respective settlement price. Market participants can then evaluate the risk of contracts close to expiry more precisely.

Except for the slight rounding differences, the sum of the variation margin after cascading always equals the final settlement of the highest cascaded contract, e.g. the year contract. This is ensured by the daily arbitrage free settlement prices of contracts with overlapping delivery periods in the same market area. As a result, market participants do not incur any losses from cascading.

² Variation Margin = (Settlement Price – Previous Settlement Price) * Position * Contract Size
Contract Size = Number of Days in Delivery Profile * 24

³ Differences occur due to rounding to two or three digits after the decimal place.

3. Reporting of Cascading Transactions

3.1 Common Report Engine

The Common Report Engine (CRE) allows a centralized provision of reports and non-transactional files from multiple exchange markets. The service is provided as an SFTP server and allows participants to easily retrieve their derivatives reports and non-transactional files from a single source.

This service is independent from the existing trading and clearing infrastructure, and participants can choose their preferred hardware platform and operating system. The CRE is free to access without charge for both Clearing Members and Non-Clearing Members.

A detailed User Guide on how to access the Common Report Engine may be found online:
<https://www.ecc.de/en/member-section/user-guides-manuals>.

3.2 ECC Clearing Report on Cascading Transactions

The ECC Clearing Report **CB012 Account Statement** will provide the following transactions the morning after the expiry that causes a cascading event, along with other important information:

- A yearly contract (delivery Jan-Dec) cascades into its constituent 4 quarterly contracts (Q1, Q2, Q3, Q4) immediately after which the first quarter cascades into 3 months (Jan, Feb, Mar)
- A fiscal yearly contract (delivery Apr of the current calendar year till Mar of following calendar year) cascades into its constituent 4 quarterly contracts (Q2, Q3, Q4, Q1 of Y+1) immediately after which the first quarter cascades into 3 months (Apr, May, Jun)
- A seasonal contract (Winter: Oct-Mar, Summer: Apr-Sep) cascades into its constituent 2 quarterly contracts (Winter: Q4, Q1, Summer: Q2, Q3) immediately after which the Q4 (or Q2 respectively) cascades into 3 months (Winter: Oct, Nov, Dec, Summer: Apr, May, Jun)
- A quarterly contract (Q1: Jan-Mar, Q2: Apr-Jun, Q3: Jul-Sep, Q4: Oct-Dec) cascades to its constituent monthly contracts

Figure 6 – Example Report CB012 Account Statement for Cascaded Calendar Year Future

rptCod	rptNam	membCgidCod	membExchIdCod	currTypCod	accountName	prodId	cntrExpMthDat	cntrExpYrDat	currSetlmtPrc_1	secuTrdUntNo	TransactionId	trnLngQty	trnShtQty	netQty	prnVmarAmnt	trnTyp	trnPrc
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBM	1	2021	45.5	744		0	19	-19	24,455.28	OPN	
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBM	1	2021	45.5	744	250S382	511	648	-137	-83,580.96	126	44.68
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBM	1	2021	45.5	744		511	667	0		END	
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBM	2	2021	47.01	672		3	9	-6	9,555.84	OPN	
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBM	2	2021	47.01	672	250U5PA	511	648	-137	-214,509.12	126	44.68
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBM	2	2021	47.01	672		514	657	0		END	
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBM	3	2021	41.75	743		0	11	-11	32,528.54	OPN	
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBM	3	2021	41.75	743	250U9L9	511	648	-137	298,247.63	126	44.68
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBM	3	2021	41.75	743		511	659	0		END	
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBQ	1	2021	44.68	2159		0	15	-15	87,439.50	OPN	
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBQ	1	2021	44.68	2159	250SJB1	511	633	-122	-400,364.96	126	43.16
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBQ	1	2021	44.68	2159	250UDG9	-511	-648	137	0.00	116	44.68
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBQ	1	2021	44.68	2159		0	0	0		END	
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBQ	4	2021	39.1	2184	250T172	511	633	-122	1,081,778.88	126	43.16
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBQ	4	2021	39.1	2184		511	633	0		END	
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBQ	7	2021	42.09	2208	250T4T7	511	633	-122	288,232.32	126	43.16
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBQ	7	2021	42.09	2208		511	633	0		END	
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBQ	10	2021	46.75	2209		3	0	3	-19,748.46	OPN	
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBQ	10	2021	46.75	2209	250T8E7	511	633	-122	-967,497.82	126	43.16
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBQ	10	2021	46.75	2209		514	633	0		END	
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBY	1	2021	43.16	8760		511	633	-122	3,174,098.40	OPN	
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBY	1	2021	43.16	8760	250TC01	-511	-633	122	0.00	116	43.16
CB012	Account Statement	ABCEX	ABCEX	EUR	A2	DEBY	1	2021	43.16	8760		0	0	0		END	

Step 2

Step 1

The example report shows information on start and resulting positions from cascading. Some explanatory remarks on the abbreviations:

- **trnTyp:** Transaction Type
 - OPN = Opening position balance
 - END = End of Day position balance
 - 116 = Future expiry (to be cascaded)
 - 126 = Future position creation (cascaded into)
- **currSetlmtPrc_1** = Settlement price of the contract
- **secuTrdUntNo** = Contract size
- **trnPrc** = Transaction price

Colours are used to identify the initial and resulting positions following cascading of Year and Quarter contracts:

- **Cascading 1 (Year → Quarter):** Start position in dark orange, resulting positions in light orange
- **Cascading 2 (Quarter → Month):** Start position in dark green, resulting positions in light green

More Questions?

Please contact the ECC Clearing Operations team: clearing@ecc.de