



PIX Pulp Europe Price Indices Methodology and Specifications

1. Introduction	1
2. Overview	1
2.1 Index currency	2
2.2 Publication frequency and time	2
2.3 Retroactive changes	2
3. Specifications	2
3.1 Product specifications	2
3.2 Types of transactions included	3
3.3 Gross prices	3
3.4 Final prices vs. prices to be adjusted at the end of the month	3
3.5 Minimum volume	4
3.6 Delivery and payment terms	4
4. Price data providers	4
4.1 Price data provider qualifications	4
4.2 Price Data Submitter Policy	4
4.2.1 Price data providers' responsibilities	4
4.2.2 FOEX' responsibilities	5
4.3 What price data providers submit	5
4.3.1 Use of previous month's market price	6
4.3.2 Fixed price transactions	6
4.3.3 Pricing with caps and floors	6
5. Data Collection	7
5.1 Collection and storage of price data	7
5.2 Access to confidential price data	7
6. Index Calculation Procedure	7
6.1 Data validation	7
6.2 Weighting	7
6.3 Aggregation of weighted average prices	8
6.4 Calculation procedure	8
6.5 Validity time of price points	8
6.6 Fall-back procedure	8
7. Revisions to the specifications	9
8. Commercial Use	9
9. Revision history	9
Appendix 1	11

1. Introduction

FOEX Indexes Ltd in Helsinki, Finland, operating under the Finnish law, produces trade-marked PIX price indices for selected pulp, paper, recovered paper and packaging grades as well as for wood based biomass and bioenergy products like pellets and wood chips. The first PIX pulp index was launched in September 1996. FOEX owns the trade mark rights to PIX Index.

PIX indexes are used as market reference prices for various purposes:

- price risk management services
- supply contracts for physical transactions between companies
- internal transactions between corporate divisions
- market research and miscellaneous uses

Methodology and Specifications are valid starting on November 1, 2018.

2. Overview

The general guidelines to ensure the reliability of the indexes:

1. The main goal for PIX indexes is to show the market price changes between two points of time in a reliable way, however, at the same time it aims to pinpoint the average level of the market price as accurately as possible.
2. The index calculation aims to include the prices of all eligible transactions over the current month to the extent possible with reasonable efforts.
3. The target is that the index calculations include every week as many price points as possible in order to maintain the accuracy of the index movements.
4. The Index values seek to optimize the balance of prices between buyers and sellers and between small and large price providers.

PIX Pulp Europe Price Indices Methodology and Specifications



The PIX pulp benchmark index is calculated and confirmed by FOEX based on confidential price information of actual, physical trades of pulp, collected on a weekly basis by telephone and email from companies trading in pulp. It represents the gross price agreed on contract business for pulp used for paper or paperboard production.

The method of index calculation is fixed. The index has a large market coverage and a stable group of price providers from week to week.

2.1 Index currency

PIX NBSKP and PIX BHKP: USD/metric ton, also a conversion to EUR/metric ton.

Prices reported to the index calculation in other currencies are converted to the index currency with the average ECB exchange rate of the previous week. The same rate is used for the conversion of the index values to EUR/metric ton.

2.2 Publication frequency and time

Weekly, on Tuesdays at noon Helsinki time. If Tuesday falls on a public holiday in Finland, the index will be published on the first working day thereafter.

2.3 Retroactive changes

FOEX will not retroactively change the index values, e.g. based on price data received after the index publication.

3. Specifications

3.1 Product specifications

PIX NBSKP Europe index: Prime quality, commodity grade Northern bleached softwood kraft pulp from North American, Nordic and Central European countries.

PIX BHKP Europe index: Prime quality bleached hardwood kraft pulp, eucalyptus or birch.

Technical quality criteria for both grades NBSKP and BHKP are: standard dryness 90% air dry, standard strength characteristics, brightness ISO 88 or higher, baled. Both

indices are measured US Dollars per metric ton which is the globally accepted unit of measurement for market pulp.

3.2 Types of transactions included

Transactions are against contract-based business or other recurring business with similar pricing and discounting terms, complying with the General Trade Rules for physical pulp business for paper or paperboard production purposes between companies regularly buying or selling pulp.

Specifically excluded are:

- Spot transactions: One-off transactions whose price is typically at a level from which no further discounts, allowances or performance rebates are given.
 - Integrated shipments: shipments between affiliated parties.
 - Indexed-price transactions: transactions whose prices are, according to the supply contract, tied to PIX or any other pulp price index.
- Index as fall-back mechanism: Some contracts stipulate that prices are negotiated between buyer and seller but that PIX or another index can be used to settle prices if the buyer and seller can't agree on a price. Transactions under these contracts are not considered indexed and thus shall be submitted to the index.

3.3 Gross prices

Prices reflected in the index are gross prices before customer-specific discounts or rebates. These discounts and rebates are typically agreed upon in long-term agreements. Any additional temporary discounts or rebates which differ from the long-term agreements are to be deducted from the price reported.

3.4 Final prices vs. prices to be adjusted at the end of the month

Prices reflected only include those with a final agreement for the month, i.e. without a retroactive adjustment clause.

3.5 Minimum volume

The total amount of the transaction is a minimum of 100 tons of NBSKP or 200 tons of BHKP.

3.6 Delivery and payment terms

The price is a gross transaction price on standard delivery and payment terms between buyer and seller. However, prices with delivery terms ex works at the producing mill shall not be reported to the index.

4. Price data providers

4.1 Price data provider qualifications

Pulp producers, buyers, agents and trading houses, including buyers/sellers acting on behalf of another buyer/seller, qualify as price providers. If a trading house buys and sells on its own account, those prices are not accepted into the index calculation.

4.2 Price Data Submitter Policy

4.2.1 Price data providers' responsibilities

Price providers designate a person and a deputy for the price reporting task.

Each price provider shall report their prices each week, or provide a note of how long the last reported price is valid, or report "no transactions" if a provider has no eligible transactions in a given week.

Price providers agree to report their prices according to the methodology described in this document and based on all transactions meeting the specifications and to consult with FOEX if they have any doubts as to the validity of a price to be reported.

Price providers receive a Data Submitter Policy outlining the standards FOEX expects of them.

Data provider is committed to supply FOEX their total annual pulp sales/purchase volume information of the previous year by the end of January in order to allow FOEX to determine the data provider company's weighting in the index calculation (Appendix 1).

4.2.2 FOEX' responsibilities

Within the FOEX organization, only the operative personnel employed by FOEX Indexes Ltd., have access to the price data received from the price providers.

FOEX' personnel dealing with the confidential price data or other sensitive information received from the price providers for the purpose of PIX index calculations, commits to life-long confidentiality agreements, as part of their employment agreement, not to disclose the data received, nor the source, outside FOEX.

FOEX commits to compile the price data, to calculate the index values and to publish the index values in accordance with the rules and specifications set forth in this document.

The calculation procedure and follow-up of the methodology of one PIX index will be audited each year by an internationally recognized auditing firm.

4.3 What price data providers submit

Each week, data providers submit prices reflecting all eligible transactions, to the extent possible with reasonable efforts, taking into account the practical problems in the weekly sales administrative work to collect all required transactions.

"Transaction" is defined as either of the following:

1. Final agreement on price for delivery of a specific quantity of pulp during the current month and each delivery against that agreement during the same month.
2. Final agreement on the price of pulp that has already been shipped within the current month or the month preceding the reporting date.

In order to further improve the accuracy of the index movements and to secure as many price points as possible every week, price providers are encouraged to report both the price when it is agreed and the price of every delivery from seller to buyer or an invoice against that price agreement.

However, pulp already under buyer's ownership delivered from buyer's port warehouse to the mill, should not be considered as a market transaction and should not lead to price reporting.

An "eligible transaction" is a transaction that meets the specifications in Section 3 above.

Providers have the option to submit prices in one of two ways:

1. Separate transaction prices: Providers submit prices reflecting all eligible transactions and additionally submit the share (either tonnage or %) of each of these transactions of the total volume of eligible transactions of that week.
2. Single weighted average price: Providers submit a single price reflecting the weighted average price of all eligible transactions over the previous week.

This weighted average can be calculated based on actual weekly volumes, average weekly volume calculated from the annual contract or from an annual estimate.

The method should however be consistently used from week to week to the extent possible with reasonable efforts.

4.3.1 Use of previous month's market price

Some agreements specify that the price for shipments in a given month are based on the previous month's market price. This usually means that the buyer and seller agree at the beginning of the month what the previous month's price was, then apply that price to shipments in the current month.

For these agreements, the price is reported to FOEX in the week when the price is agreed. In the following weeks during the month in question, if data provider has agreed new prices for the month, it should report those new prices, provided they are from eligible transactions, and stop reporting the prices based on the previous month's market price.

But if data provider has no new eligible prices for the month to report and deliveries from seller to buyer continue against the previous month's price, it can report those previous month's prices of deliveries from seller to buyer.

4.3.2 Fixed price transactions

Transactions with prices fixed in advance for a longer period than one month do not count as eligible transactions and shall not be reported to the index.

4.3.3 Pricing with caps and floors

If the pricing structure includes a cap and floor, the price shall be reported only as long as it remains between the cap and floor. After the price has hit either of the limits, the price within the cap and floor should not be reported.

5. Data Collection

5.1 Collection and storage of price data

Price data is collected weekly from price providers, typically by email or by phone. Possibilities to use other alternative ways will be followed-up whenever deemed useful.

Price data reported to FOEX by noon Finnish time on Monday (or the last working day preceding publication day) will be included in the index calculations for the publishing on Tuesday (or exceptional working day). FOEX has the discretionary right to decide whether to include price data received after noon on Monday into the index calculation that week.

Reported price data will be stored at FOEX for a maximum of five full calendar years.

5.2 Access to confidential price data

Company-specific data received from the price providers is accessible only to personnel employed by FOEX. Board Members do not have access to this data. The auditors, however, will be able to see the price data but they are bound by a confidentiality agreement of their own.

6. Index Calculation Procedure

6.1 Data validation

FOEX reviews the incoming price data in order to check its consistency with the reporting rules. If the price data looks suspicious, FOEX contacts the price provider.

6.2 Weighting

Weighting between price providers is achieved by assigning more price points to larger buyers/sellers than to smaller ones. The number of price points assigned to each provider is scaled by the annual volume of sales or purchases of market pulp in each main index grade (BSKP excl. fluff, BHKP). Market pulp includes integrated exports but not company internal volumes within the country of production. Each price reporter's weight is kept constant through the year, if no major changes occur in production

capacity or purchasing volumes. Volumes are checked at the turn of the year for defining the weighting for the following year.

While input to the index is generally evenly split between buyers and sellers, the share can vary from week to week. To eliminate any volatility caused by a shift in the share of the buyer/seller data, FOEX ensures that buyer and seller data each represent 50% of the index.

The weighting scales for NBSKP and BHKP (separate scales for sellers and buyers), based on the total annual volumes are shown in Appendix 1.

6.3 Aggregation of weighted average prices

If data providers submit a single weighted average price (see Section 4.3 above), that price point is included in the week's collected price points multiple times, according to the number of price points the data provider is allowed. For instance, if a seller of NBSKP is allowed 5 price points and submits a single weighted average price of \$X in a given week, then \$X is included 5 times in that week's collected price points.

6.4 Calculation procedure

The index value is the arithmetic average of the price points included. The highest and lowest 10 % of the number of price points are removed before calculating the PIX index values. This is done to eliminate clerical errors in the price reporting and to dampen any possible attempts to manipulate the PIX index value in one direction or the other.

6.5 Validity time of price points

If a price provider does not report prices in a given week (e.g. a company may not have sales or purchases during that week) FOEX may use the previous price points received, but only for one additional week.

6.6 Fall-back procedure

In the unlikely event that there are not enough eligible price points in a given week, and the lack of price points is threatening to distort the index development, FOEX reserves the right to roll forward previous price data beyond the limits mentioned above in Section 6.5. FOEX may also state that because there are an insufficient number of eligible price points, the previous week's index value will be republished.

7. Revisions to the specifications

In the event that significant changes are noticed in the general trading habits or terms and conditions of the international pulp business carried out in the European markets which are seen to reduce the index reliability, FOEX will engage in a market consultation process with all contributors as well as a number of non-contributing stakeholders. If there is enough feedback to justify a possible change to the methodology, a proposal for changes will be issued with a timeline for feedback. Based on the feedback from the market consultation process, FOEX will decide if the presently valid index specifications will be modified, and will communicate the changes publicly.

8. Commercial Use

The PIX Indexes are trademark registered by FOEX Indexes Ltd. Use of PIX Indexes commercially (e.g. as a reference for pricing in physical supply agreements or financial derivatives contracts) requires a commercial use license.

9. Revision history

(please see the corresponding Section for details)

November 2018

- 4.2 and 4.2.1 revised to reflect new Data Submitter Policy
- 4.2.2 Added sentence about auditing of FOEX calculation procedure and methodology
- 4.2.3 Auditing - Section has been deleted
- 6.2. Weighting - section has been shortened
- 7. FOEX Expert Panel section has been deleted

November 2017

- 4.2.3. Comment added regarding FOEX' current reviewing of its policy and compliance regime.

August 2016

- 8. Before major revisions to the specifications, FOEX will engage in a market consultation process.

November 2015

2. General guidelines to ensure the index reliability are presented in the overview.

4.2.3 The auditing of the price providers can also be carried out by evaluating the continuity of the weekly price reporting process. The auditing can be done onsite or remotely.

4.3 The requirement to report all eligible prices is eased in case practical administrative problems were difficult to overcome with reasonable efforts.

Data providers are encouraged to report both the prices when agreed and the corresponding prices when pulp is delivered or invoiced from seller to buyer.

Also estimated weekly volumes can be used when calculating the weekly weighted average price to report.

4.3.1 Reporting of prices based on the previous month's market price shall be done when agreed but then stopped if new prices have been agreed. Then the new prices should be reported. If there are no new eligible prices and deliveries from seller to buyer continue against the previous month's price, the price provider can report those previous month's prices.

6.2 FOEX ensures that the balance between buyer and seller data becomes 50/50 each week.

PIX Pulp Europe Price Indices Methodology and Specifications



Appendix 1

Weighting since Jan 2015 in Pulp indexes for Europe									
Categories based on annual production or consumption									
of all BSKP /BHKP grades during 2015									
				Price points					Price points
N B S K	S E L L E R S				B H K P	S E L L E R S			Price points
over	1,125,000	tons		10	over	1,125,000	tons		10
up to	1,125,000			8	up to	1,125,000			9
up to	925,000			7	up to	850,000			8
up to	675,000			6	up to	650,000			7
up to	475,000			5	up to	475,000			6
up to	325,000			4	up to	325,000			5
up to	200,000			3	up to	200,000			4
up to	100,000			2	up to	100,000			3
up to	50,000			1	up to	50,000			2
					up to	25,000			1
N B S K	B U Y E R S			Price points	B H K P	B U Y E R S			Price points
over	500,000	tons		10	over	600,000	tons		10
up to	500,000			9	up to	600,000			9
up to	350,000			8	up to	400,000			8
up to	250,000			7	up to	325,000			7
up to	175,000			6	up to	250,000			6
up to	125,000			5	up to	200,000			5
up to	85,000			4	up to	150,000			4
up to	55,000			3	up to	100,000			3
up to	32,500			2	up to	50,000			2
up to	15,000			1	up to	25,000			1