

# INDEX GUIDELINE

SOLACTIVE SMART CITIES EUR VT 10%INDEX

Version 1.0

29 September 2023



## TABLE OF CONTENTS

Introduction .....	3
1. Index Specifications .....	4
1.1. Scope of the Index .....	4
1.2. Identifiers and Publication .....	4
1.3. Initial Level of the Index .....	4
1.4. Prices and calculation frequency .....	5
1.5. Licensing.....	5
2. Index Selection .....	6
2.1. Index CONSTITUENTS.....	6
3. Calculation of the Index .....	6
3.1. Index formula .....	6
3.2. Accuracy .....	8
3.3. Adjustments.....	8
3.4. Corporate actions .....	8
3.5. Recalculation.....	9
3.6. Market Disruption.....	10
4. Miscellaneous .....	11
4.1. Discretion .....	11
4.2. Methodology Review.....	11
4.3. Changes in calculation method.....	11
4.4. Termination .....	12
4.5. Oversight .....	12
5. Definitions.....	13
Contact.....	14



## INTRODUCTION

This document (the "**GUIDELINE**") is to be used as a guideline with regard to the composition, calculation and maintenance Solactive Smart Cities EUR VT 10% Index (the "Index"). Any amendments to the rules made to the GUIDELINE are approved by the OVERSIGHT COMMITTEE specified in Section 4.2. The INDEX is owned calculated, administered and published by Solactive AG ("**SOLACTIVE**") assuming the role as administrator (the "**INDEX ADMINISTRATOR**") under the Regulation (EU) 2016/1011 (the "**BENCHMARK REGULATION**" or "**BMR**"). The name "Solactive" is trademarked.

*The text uses defined terms which are formatted with "SMALL CAPS". Such Terms shall have the meaning assigned to them as specified in Section 5 (Definitions).*

**The GUIDELINE and the policies and methodology documents referenced herein contain the underlying principles and rules regarding the structure and operation of the INDEX. SOLACTIVE does not offer any explicit or tacit guarantee or assurance, neither pertaining to the results from the use of the INDEX nor the level of the INDEX at any certain point in time nor in any other respect. SOLACTIVE strives to the best of its ability to ensure the correctness of the calculation. There is no obligation for SOLACTIVE – irrespective of possible obligations to issuers – to advise third parties, including investors and/or financial intermediaries, of any errors in the INDEX. The publication of the INDEX by SOLACTIVE does not constitute a recommendation for capital investment and does not contain any assurance or opinion of SOLACTIVE regarding a possible investment in a financial instrument based on this INDEX.**



# 1. INDEX SPECIFICATIONS

## 1.1. SCOPE OF THE INDEX

Category	Description
Asset Class	Equity
Strategy	Representation of securities active in creating Smart Cities, applying a volatility target layer on top.
Regional Allocation	Global
Volatility Target	10%
Decrement	3.5% per annum

## 1.2. IDENTIFIERS AND PUBLICATION

The INDEX is published under the following identifiers:

Name	ISIN	Currency	Type	RIC	BBG ticker
Solactive Smart Cities EUR VT 10% Index	DE000SLOKJ84	EUR	TR*	.SOLCITYV	SOLCITYV Index

TR\* means the volatility control index is calculated as total return.

The INDEX is published on the website of the INDEX ADMINISTRATOR ([www.solactive.com](http://www.solactive.com)) and is, in addition, available via the price marketing services of Boerse Stuttgart GmbH and may be distributed to all of its affiliated vendors. Each vendor decides on an individual basis as to whether it will distribute or display the INDEX via its information systems.

Any publication in relation to the INDEX (e.g. notices, amendments to the GUIDELINE) will be available at the website of the INDEX ADMINISTRATOR: <https://www.solactive.com/news/announcements/>.

## 1.3. INITIAL LEVEL OF THE INDEX

The initial level of the INDEX on the 18/07/2017, the START DATE, is 100. Historical values from the 04/10/2023 the LIVE DATE, will be recorded in accordance with Article 8 of the BMR. Levels of the INDEX published for a period prior to the LIVE DATE have been back-tested.



## 1.4. PRICES AND CALCULATION FREQUENCY

The level of the INDEX is calculated on each CALCULATION DAY from 9:00 a.m. to 10:53 p.m. CET based on the TRADING PRICES on the EXCHANGES on which the INDEX COMPONENTS are listed. Should there be no current TRADING PRICE for an INDEX COMPONENT, the later of: (i) the most recent CLOSING PRICE; or (ii) the last available TRADING PRICE for the preceding TRADING DAY is used in the calculation.

In addition to the intraday calculation a closing level of the INDEX for each CALCULATION DAY is also calculated. This closing level is based on the CLOSING PRICES for the INDEX COMPONENTS on the respective EXCHANGES on which the INDEX COMPONENTS are listed. The CLOSING PRICES of INDEX COMPONENTS not listed in the INDEX CURRENCY are converted using the 4pm London time WM Fixing quoted by Refinitiv. If there is no 4pm London time WM Fixing for the relevant CALCULATION DAY, the last available 4pm London time WM Fixing will be used for the closing level calculation.

## 1.5. LICENSING

Licenses to use the INDEX as the underlying value for financial instruments, investment funds and financial contracts may be issued to stock exchanges, banks, financial services providers and investment houses by SOLACTIVE



## 2. INDEX SELECTION

As this INDEX is based on a static basket, no selection takes place

### 2.1. INDEX CONSTITUENTS

The INDEX is composed of the following two components (each of them an UNDERLYING COMPONENT, together the INDEX COMPONENTS):

Component	Name	Currency	RIC	BBG Ticker
1	Solactive Smart Cities EUR Index NTR	EUR	.SOLCITYN	SOLCITYN Index
2	Euro Short Term Overnight Rate	EUR	EUROSTR=	ESTRON Index

## 3. CALCULATION OF THE INDEX

### 3.1. INDEX FORMULA

The level of the INDEX is calculated according to the following formula:

$$\begin{aligned}
 Index_t = & Index_{t-1} \\
 & * \left( 1 + exp_{t-1} * \left( \frac{UC1_t}{UC1_{t-1}} - 1 \right) + (1 - exp_{t-1}) * rate_{t-1} * \frac{DC_{t,t-1}}{360} \right. \\
 & \left. - decrement * \frac{DC_{t,t-1}}{360} \right)
 \end{aligned}$$

Where:

$Index_t$ : The level of the INDEX as of CALCULATION DAY t

$Index_{t-1}$ : The level of the INDEX as of CALCULATION DAY t-1

$exp_{t-1}$ : The exposure as of CALCULATION DAY t-1

$UC1_t$ : The level of the UNDERLYING COMPONENT 1 as of CALCULATION DAY t

$UC1_t - 1$ : The level of the UNDERLYING COMPONENT 1 as of CALCULATION DAY t-1



**$rate_{t-1}$** : The Euro Short Term Overnight Rate in % (RIC: EUROSTR=) as of CALCULATION DAY t-1

**$DC_{t,t-1}$** : The number of calendar days between CALCULATION DAY t (including) and CALCULATION DAY t-1 (excluding),

**$decrement$** : The decrement percent of 3.5% per annum, deducted daily.

The exposure as of CALCULATION DAY t is calculated according to the following:

$$exp_t = \min(maxExp, targetVol/realizedVol_{t-1})$$

Where:

**$maxExp$** : The maximum exposure, which equals 100%

**$targetVol$** : The level of the target volatility of 10%

**$realizedVol_{t-1}$** : The realized volatility as of CALCULATION DAY t-1

The realized volatility as of CALCULATION DAY t is calculated according to the following:

$$realizedVol_t = \max(Vol20d_t, Vol60d_t)$$

Where:

**$Vol20d_t$** : The 20 day volatility as of CALCULATION DAY t

**$Vol60d_t$** : The 60 day volatility as of CALCULATION DAY t

The n-day volatility (where n = 20 or n = 60) is calculated according to:

$$Volnd_t = \sqrt{\frac{252}{n-1} * \sum_{i=0}^{n-1} \left( \ln \left( \frac{UC1_{t-i}}{UC1_{t-i-1}} \right) - \mu n_t \right)^2}$$

Where:

**$UC1_{t-i}$** : The level of the BASKET as of the CALCULATION DAY which is i CALCULATION DAYS prior to CALCULATION DAY t

**$UC1_{t-1-i}$** : The level of the UNDERLYING COMPONENT 1 as of the CALCULATION DAY which is i-1 CALCULATION DAYS prior to CALCULATION DAY t

**$\mu n_t$** : The average of the last n-days of returns, including t



$$\mu n_t = \frac{1}{n} \sum_{k=0}^{n-1} \ln \left( \frac{UC1_{t-k}}{UC1_{t-k-1}} \right)$$

## 3.2. ACCURACY

The level of the INDEX will be rounded to 2 decimal places.

## 3.3. ADJUSTMENTS

Under certain circumstances, an adjustment of the INDEX may be necessary between two regular REBALANCE DAYS. Such adjustment has to be made if a corporate action (as specified in Section 3.4 below) in relation of an INDEX COMPONENT occurs. Such adjustment may have to be done in relation to an INDEX COMPONENT and/or may also affect the number of INDEX COMPONENTS and/or the weighting of certain INDEX COMPONENTS and will be made in compliance with the SOLACTIVE Equity Index Methodology, which is incorporated by reference and available on the SOLACTIVE website: <https://www.solactive.com/documents/equity-index-methodology/>.

SOLACTIVE will announce the INDEX adjustment giving a notice period of at least two TRADING DAYS (with respect to the affected INDEX COMPONENT) on the SOLACTIVE website under the Section “Announcements”, which is available at <https://www.solactive.com/news/announcements/>. The INDEX adjustments will be implemented on the effective day specified in the respective notice.

## 3.4. CORPORATE ACTIONS

As part of the INDEX maintenance SOLACTIVE will consider various events – also referred to as corporate actions – which result in an adjustment to the INDEX between two regular REBALANCE DAYS. Such events have a material impact on the price, weighting or overall integrity of INDEX COMPONENTS. Therefore, they need to be accounted for in the calculation of the INDEX. Corporate actions will be implemented from the cum-day to the ex-day of the corporate action, so that the adjustment to the INDEX coincides with the occurrence of the price effect of the respective corporate action.

Adjustments to the INDEX to account for corporate actions will be made in compliance with the Equity Index Methodology, which is available on the SOLACTIVE website: <https://www.solactive.com/documents/equity-index-methodology/>. This document contains for each corporate action a brief definition and specifies the relevant adjustment to the INDEX variables.

While SOLACTIVE aims at creating and maintaining its methodology for the treatment of corporate actions as generic and transparent as possible and in line with regulatory requirements, it retains the right in accordance with the Equity Index Methodology to deviate from these standard procedures in case of any





unusual or complex corporate action or if such a deviation is made to preserve the comparability and representativeness of the INDEX over time.

SOLACTIVE considers the following, but not conclusive, list of corporate actions as relevant for the BASKET maintenance:

- > Cash Distributions (e.g. payment of a dividend)
- > Stock distributions (e.g. payment of a dividend in form of additional shares)
- > Stock distributions of another company (e.g. payment of a dividend in form of additional shares of another company (e.g. of a subsidiary))
- > Share splits (company's present shares are divided and therefore multiplied by a given factor)
- > Reverse splits (company's present shares are effectively merged)
- > Capital increases (such as issuing additional shares)
- > Share repurchases (a company offer its shareholders the option to sell their shares to a fixed price)
- > Spin-offs (the company splits its business activities into two or more entities and distributes new equity shares in the created entities to the shareholders of the former entity)
- > Mergers & Acquisitions (transaction in which the ownership of a company (or other business organizations) are transferred or consolidated with other entities, e.g. fusion of two or more separate companies into one entity)
- > Delistings (company's shares are no longer publicly traded at a stock exchange)
- > Nationalization of a company (effective control of a legal entity is taken over by a state)
- > Insolvency

### 3.5. RECALCULATION

SOLACTIVE makes the greatest possible efforts to accurately calculate and maintain its indices. However, errors in the determination process may occur from time to time for variety reasons (internal or external) and therefore, cannot be completely ruled out. SOLACTIVE endeavors to correct all errors that have been identified within a reasonable period of time. The understanding of "a reasonable period of time" as well as the general measures to be taken are generally depending on the underlying and is specified in the SOLACTIVE Correction Policy, which is incorporated by reference and available on the SOLACTIVE website: <https://www.solactive.com/documents/correction-policy/>.



### 3.6. MARKET DISRUPTION

In periods of market stress SOLACTIVE calculates its indices following predefined and exhaustive arrangements as described in the SOLACTIVE Disruption Policy, which is incorporated by reference and available on the SOLACTIVE website: <https://www.solactive.com/documents/disruption-policy/>. Such market stress can arise due to a variety of reasons, but generally results in inaccurate or delayed prices for one or more INDEX COMPONENTS. The determination of the INDEX may be limited or impaired at times of illiquid or fragmented markets and market stress.



## 4. MISCELLANEOUS

### 4.1. DISCRETION

Any discretion which may need to be exercised in relation to the determination of the INDEX (for example the determination of the INDEX UNIVERSE (if applicable), the selection of the INDEX COMPONENTS (if applicable) or any other relevant decisions in relation to the INDEX) shall be made in accordance with strict rules regarding the exercise of discretion or expert judgement.

### 4.2. METHODOLOGY REVIEW

The methodology of the INDEX is subject to regular review, at least annually. In case a need of a change of the methodology has been identified within such review (e.g. if the underlying market or economic reality has changed since the launch of the INDEX, i.e. if the present methodology is based on obsolete assumptions and factors and no longer reflects the reality as accurately, reliably and appropriately as before), such change will be made in accordance with the SOLACTIVE Methodology Policy, which is incorporated by reference and available on the SOLACTIVE website: <https://www.solactive.com/documents/methodology-policy/>.

Such change in the methodology will be announced on the SOLACTIVE website under the Section "Announcement", which is available at <https://www.solactive.com/news/announcements/>. The date of the last amendment of this INDEX is contained in this GUIDELINE.

### 4.3. CHANGES IN CALCULATION METHOD

The application by the INDEX ADMINISTRATOR of the method described in this document is final and binding. The INDEX ADMINISTRATOR shall apply the method described above for the composition and calculation of the INDEX. However, it cannot be excluded that the market environment, supervisory, legal and financial or tax reasons may require changes to be made to this method. The INDEX ADMINISTRATOR may also make changes to the terms and conditions of the INDEX and the method applied to calculate the INDEX that it deems to be necessary and desirable in order to prevent obvious or demonstrable error or to remedy, correct or supplement incorrect terms and conditions. The INDEX ADMINISTRATOR is not obliged to provide information on any such modifications or changes. Despite the modifications and changes, the INDEX ADMINISTRATOR will take the appropriate steps to ensure a calculation method is applied that is consistent with the method described above.



## 4.4. TERMINATION

SOLACTIVE makes the greatest possible efforts to ensure the resilience and continued integrity of its indices over time. Where necessary, SOLACTIVE follows a clearly defined and transparent procedure to adapt Index methodologies to changing underlying markets (see Section 4.2 “Methodology Review”) in order to maintain continued reliability and comparability of the indices. Nevertheless, if no other options are available the orderly cessation of the INDEX may be indicated. This is usually the case when the underlying market or economic reality, which an index is set to measure or to reflect, changes substantially and in a way not foreseeable at the time of inception of the index, the index rules, and particularly the selection criteria, can no longer be applied coherently or the index is no longer used as the underlying value for financial instruments, investment funds and financial contracts.

SOLACTIVE has established and maintains clear guidelines on how to identify situations in which the cessation of an index is unavoidable, how stakeholders are to be informed and consulted and the procedures to be followed for a termination or the transition to an alternative index. Details are specified in the SOLACTIVE Termination Policy, which is incorporated by reference and available on the SOLACTIVE website: <https://www.solactive.com/documents/termination-policy/>.

## 4.5. OVERSIGHT

An oversight committee composed of staff from SOLACTIVE and its subsidiaries (the “**OVERSIGHT COMMITTEE**”) is responsible for decisions regarding any amendments to the rules of the INDEX. Any such amendment, which may result in an amendment of the GUIDELINE, must be submitted to the OVERSIGHT COMMITTEE for prior approval and will be made in compliance with the Methodology Policy, which is available on the SOLACTIVE website: <https://www.solactive.com/documents/methodology-policy/>.



## 5. DEFINITIONS

“**BENCHMARK REGULATION**” shall have the meaning as defined in Section “Introduction”.

“**BMR**” shall have the meaning as defined in Section “Introduction”.

“**BUSINESS DAY**” is a day on which New York Stock Exchange (NYSE), London Stock Exchange (XLON), XETRA Stock Exchange (XETR), TSX Toronto Exchange (XTSE), Tokyo Stock Exchange (XTKS), SIX Swiss Exchange (XSWX) and NASDAQ are open for general business

“**CALCULATION DAY**” is a day on which New York Stock Exchange (NYSE), London Stock Exchange (XLON), XETRA Stock Exchange (XETR), TSX Toronto Exchange (XTSE), Tokyo Stock Exchange (XTKS), SIX Swiss Exchange (XSWX) and NASDAQ are open for general business

“**CLOSE OF BUSINESS**” is the calculation time of the closing level of the INDEX as outlined in Section 1.4.

“**GUIDELINE**” shall have the meaning as defined in Section “Introduction”.

“**INDEX**” shall have the meaning as defined in Section “Introduction”.

“**INDEX ADMINISTRATOR**” shall have the meaning as defined in Section “Introduction”.

“**INDEX COMPONENT**” is each security according to Section 2.1.

“**INDEX CURRENCY**” is the currency specified in the column “Currency” in the table in Section 1.2.

“**LIVE DATE**” shall have the meaning as defined in Section 1.3.

“**OVERSIGHT COMMITTEE**” shall have the meaning as defined in Section 4.5.

“**SOLACTIVE**” shall have the meaning as defined in Section “Introduction”.

“**START DATE**” shall have the meaning as defined in Section 1.3.

The “**TRADING PRICE**” in respect of INDEX COMPONENT 1 and a CALCULATION DAY is the most recent price as calculated by SOLACTIVE.

# CONTACT

**Solactive AG**  
**German Index Engineering**

Platz der Einheit 1  
60327 Frankfurt am Main  
Germany

Tel.: +49 (0) 69 719 160 00

Fax: +49 (0) 69 719 160 25

Email: [info@solactive.com](mailto:info@solactive.com)

Website: [www.solactive.com](http://www.solactive.com)

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