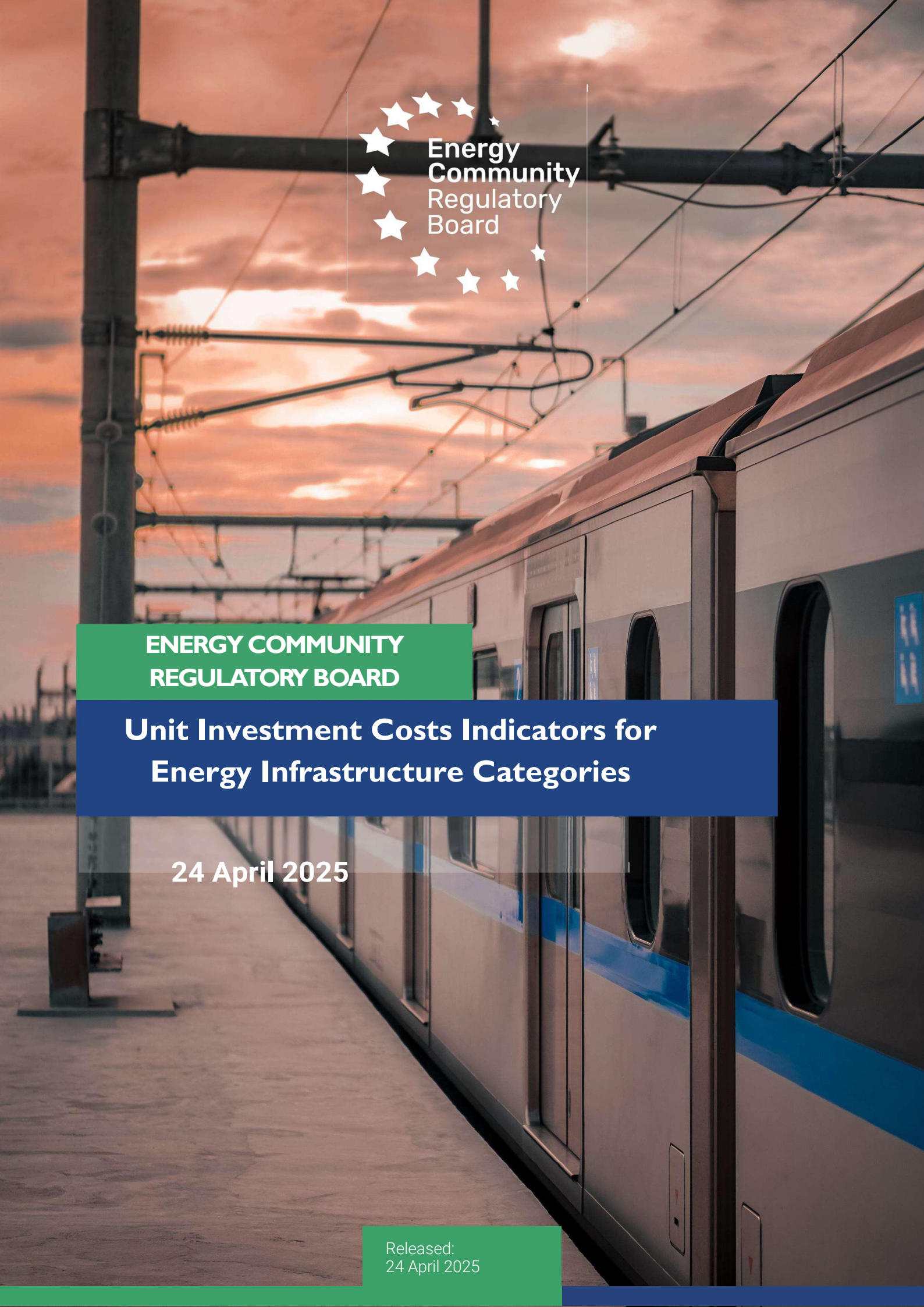

ENERGY COMMUNITY
REGULATORY BOARD

Unit Investment Costs Indicators for Energy Infrastructure Categories

24 April 2025

Released:
24 April 2025

THE ENERGY COMMUNITY REGULATORY BOARD,

Having regard to its role in accordance with Energy Community acquis,

Having regard to Regulation (EU) 2022/869 of 30 May 2022 on guidelines for trans-European energy infrastructure, incorporated and adapted by Ministerial Council Decision 2023/02/MC-EnC of 14 December 2023 amending Annex I to the Energy Community Treaty to adapt to and adopt Regulation (EU) 2022/869 on guidelines for trans-European energy infrastructure and amended by Ministerial Council Decision 2023/03/MC-EnC of 14 December 2023 amending Article 2(2) of the Energy Community Treaty (hereinafter 'Energy Community TEN-E Regulation'), in particular, Article 11, paragraph 9,

ADOPTED,

UNIT INVESTMENT COSTS INDICATORS FOR THE ENERGY INFRASTRUCTURE CATEGORIES
(24 April 2025)

Asset Category	Subcategory	Average UIC	No. of assets
Overhead lines (million EUR/km)	110 kV 2 circuit	0.208	2
	220 kV 2 circuit	0.442	2
	400 kV 1 circuit	0.271	3
	400 kV 2 circuit	0.668	2
AC Substation (million EUR/asset)	Up to 5 bays	7.231	5
Transformers (million EUR/asset)	400/110 kV	4.609	3
Variable shunt reactor/transformer (million EUR/MVAr)	150-250 MVAr	0.051	3[1]
UIC - Unit Investment Cost *No. of assets - the number of assets taken into account for calculation* *EUR/km - Euro per length in kilometres* *EUR/MVAr - Euro per capacity/(installed power) in Megavolt Ampere (reactive)*			

[1] Among the three projects provided by the NRAs, one includes a value derived from the TSO's analysis and estimation.

Annex 1 below provides further details on assessment of the UIC for the listed energy infrastructure categories by the Energy Community Regulatory Board (ECRB).

For infrastructure categories not covered by the ECRB assessment, the ECRB advises using the reference UIC values published by the Agency for the Cooperation of Energy Regulators (ACER), which are provided for information in Annex 2.

ANNEX 1

Background and Purpose

In line with the Energy Community TEN-E Regulation, ECRB is tasked with establishing and publishing a set of indicators and corresponding reference values to enable the comparison of Unit Investment Costs (UIC) for comparable projects within different energy infrastructure categories. This process ensures transparency and consistency in evaluating infrastructure investments across the Energy Community Contracting Parties. The necessary information for this purpose shall be provided by project promoters in accordance with Article 11.9 of the Energy Community TEN-E Regulation.

To fulfil this obligation, ECRB collected the data on costs from National Regulatory Authorities (NRAs) across the Energy Community and calculated the Unit Investment Costs (UIC) for various infrastructure categories. The methodology outlined in this document ensures that the collected data is properly adjusted for inflation and standardized to provide accurate and comparable UIC indicators.

Data provided cover the period of contract conclusion from 2019 until 2025. Projects considered are either finalised of under construction. Only the value of one project is based on an estimated value at which the contract of the project is expected to be executed.

The costs are adjusted for inflation and represented to April 2025 values.

Adjustment of the infrastructure costs

The inflation rates and cumulative inflation indices used in this methodology are sourced from:

- European Central Bank (ECB): Official macroeconomic projections and inflation rates.
- Eurostat: Harmonised Index of Consumer Prices (HICP) for the Euro area.

The following annual inflation rates were used:

Year	Inflation Rate (%)	Cumulative Index
2019	1.2%	80.1
2020	0.3%	80.3
2021	2.6%	83.3
2022	8.4%	90.3
2023	5.4%	95.3
2024	2.4%	97.5
2025	2.3% (est.)	100.0

The cumulative index represents the relative value of money for each year, where 2025 is set as the reference year (100.0).

Inflation adjustment formula

To adjust past investment costs to April 2025 values, the following formula is applied:

$$AC_{2025} = IC_{year} \times (100/INF_{year})$$

Where:

AC_{2025} = Adjusted cost in April 2025 values.
IC_{year} = Investment cost in the original year.
INF_{year} = Cumulative inflation index for the original year.
100 = The reference index for April 2025.

Based on this, all cost values prior to 2025 are converted to a comparable 2025 cost level.

ANNEX 2

The ACER publication, developed using data collected from stakeholders across the European Union, is available here and is also included in this Annex for informational purposes.

ACER
European Union Agency for the Cooperation of Energy Regulators

UNIT INVESTMENT COSTS INDICATORS FOR ENERGY INFRASTRUCTURE CATEGORIES

(04.07.2023)

Asset category	Subcategory	Average UIC	Median UIC	Q1	Q3	N. of assets
Overhead line (million EUR/km)	110-150 kV 2 circuits	0,325	0,26	0,224	0,393	3
	220 kV 1 circuit	0,412	0,362	0,303	0,543	7
	220 kV 2 circuits	0,53	0,503	0,442	0,573	21
	330 kV 2 circuits	0,574	0,530	0,522	0,573	5
	380-400 kV 1 circuit	0,465	0,397	0,298	0,606	18
	380-400 kV 2 circuits	1,261	1,05	0,533	1,635	45
Underground cable (million EUR/km)	110 - 150 kV 1 circuit	0,831	0,551	0,425	0,843	14
	110 - 150 kV 2 circuits	2,232	1,88	0,847	3,065	4
	220 - 225 kV 1 circuit	1,778	1,91	1,234	2,108	16
	220 - 225 kV 2 circuits	4,402	4,387	4,232	4,556	4
	300 - 500 kV 1 circuit	1,309	1,131	1,046	1,394	4
Submarine cable (million EUR/km)	AC	2,007	2,468	1,203	2,527	9
	DC	1,108	1,086	0,903	1,258	6
Offshore transmission cable (million EUR/km)		3,269	3,003	2,761	4,339	7
AC substations (million EUR/asset)	0-5 bays New AIS	11,713	8,692	3,569	16,907	24
	0-5 bays New GIS	10,468	8,204	5,166	11,093	8
	0-5 bays Refurbishment/Upgrade AIS	3,401	2,789	2,116	4,300	28
	0-5 bays Refurbishment/Upgrade GIS	4,448	2,405	1,991	8,397	13
	6-9 bays New AIS	12,141	9,943	8,179	16,681	24
	6-9 bays New GIS	9,821	9,554	7,815	11,530	20
	6-9 bays Refurbishment/Upgrade AIS	15,378	11,803	6,807	23,436	14
	10-60 bays New	43,572	30,801	22,72	58,867	13
	10-60 bays Refurbishment/Upgrade	29,246	24,459	20,576	41,917	10
Transformers (million EUR/asset)	150/60	1,212	1,099	1,096	1,27	3
	220/66	1,536	1,592	1,34	1,72	12
	330	2,445	2,494	2,419	2,495	3
	400/110	4,356	4,345	3,533	4,729	15
	400/220	4,631	3,947	2,944	6,516	7
HVDC converters (million EUR/kWh)		0,150	0,147	0,127	0,193	7
SSSC (million EUR/MVA)		0,03	0,025	0,016	0,04	15
Synchronous condensers (million EUR/asset)		46,599	50,662	36,463	51,041	5

ACER
European Union Agency for the Cooperation of Energy Regulators

Compression station (million EUR/MW)	<15MW	14,511	16,048	10,868	18,271	6
	10-50 MW	4,274	4,284	4,252	4,300	3
Advanced metering equipment - chromatograph (million EUR/ asset)		0,126	0,123	0,114	0,137	3
Hydrogen pipelines (million EUR/km)		2,271	2,244	2,216	2,299	4

The list of abbreviations:

UIC – Unit Investment Cost

Q1 – first quartile

Q3 – third quartile

N. of assets – the number of assets submitted and taken into account for calculation

SSSC – Static Synchronous Series Compensator

EUR/MVA – Costs per unit – Eur per capacity(installed power) in Megavolt Ampere

EUR/km – Costs per unit – Eur per length in kilometres

MW - Megawatt