



NEW EUROPEAN BAUHAUS self-assessment method and tool

Technical Workshop

New European Bauhaus self-assessment method and tool for buildings and living spaces

NEB self-assessment method

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Brussels, 3 April 2025

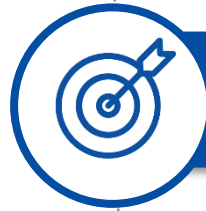


Joint
Research
Centre

beautiful | sustainable | together

Introduction

NEB self-assessment method



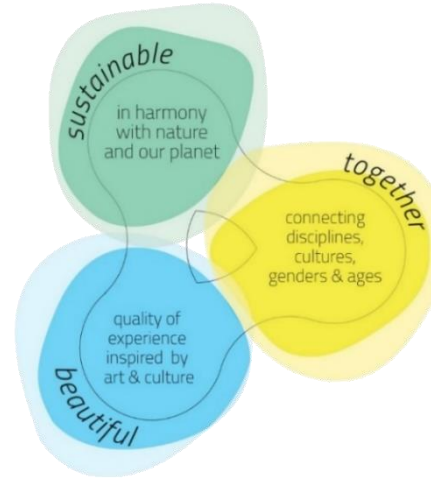
WHY



HOW



WHO



- **Alignment** of building/living space projects with the **3 NEB values**
- **Improvement** in the **built environment quality**



No foster competition/reward high-score projects

3 main assessment levels

Indicator

Key Performance Indicator (KPI)

NEB value (or Dimension)

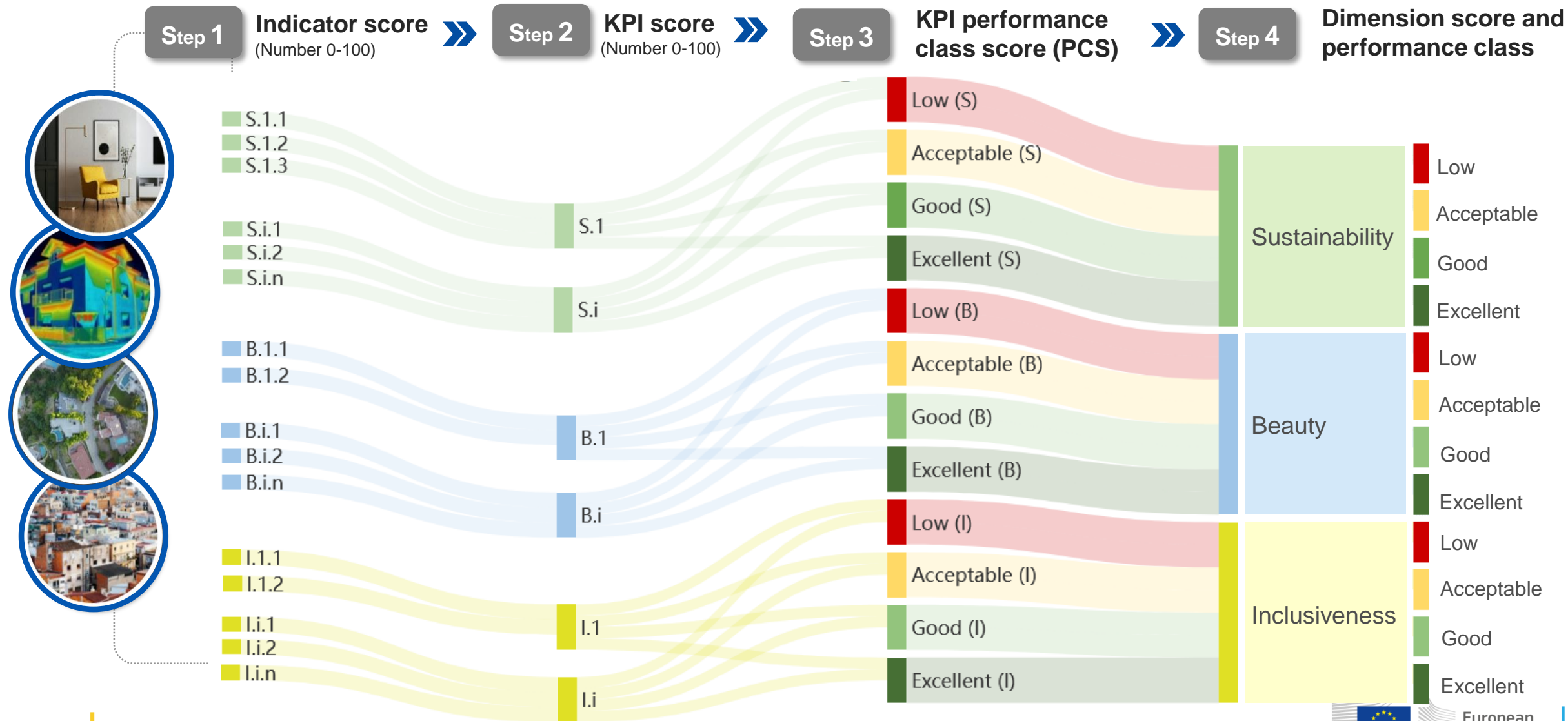
No combination of 3 NEB dimension scores

USERS | **Delivery phase** (design, construction, commissioning)
Operational phase (use and maintenance)

Professionals: Project managers, architects, engineers, etc.

Various stakeholders: Product manufacturers, policymakers, contractors, etc.

SCALE: Building/Neighbourhood/Urban | **TYPE:** Newbuild/Renovation | **MAIN USE:** Residential/Non-residential



Evaluation of indicator score

SCALE: Building/Neighbourhood/Urban | **TYPE:** Newbuild/Renovation | **MAIN USE:** Residential/Non-residential

Step 1

Indicator score

D.1.1 D.1.2 ... D.1.n₁ D.2.1 D.2.2 ... D.2.n₁ ... D.i.1 D.i.2 ... D.i.n_i

All 3 NEB Dimensions or Dimension(s) of interest

Function (f) of **metrics (M)** and **sub-metrics (SM)** ————— **Number**

$$D.i.j = f(M_1, M_2, \dots, M_k) = f[M_1, (SM_{2.1}, SM_{2.2}, \dots, SM_{2.l}), \dots, M_k] = 0-100$$

Three-level
code

$D.i.j$

D



S - Sustainability



B - Beauty



I - Inclusiveness

i

Ordinal number of the parent Key Performance Indicator (KPI)

j

Ordinal number of the considered indicator

Evaluation of KPI score and performance classes

SCALE: Building/Neighbourhood/Urban | **TYPE:** Newbuild/Renovation | **MAIN USE:** Residential/Non-residential

Step 2

Indicator weight



KPI score



All 3 NEB Dimensions or Dimension(s) of interest

Weighted average of indicator scores — Number

$$D.i = \frac{\sum_{j=1}^n (w_{D.i.j} \cdot D.i.j)}{\sum_{j=1}^n (w_{D.i.j})} = 0-100$$

Value 0-1

$\begin{cases} \leq 1 & \text{B - Beauty} \mid \text{I - Inclusiveness} \\ 1 & \text{S - Sustainability} \end{cases}$

Two-level code

D.i

D



S - Sustainability



B - Beauty



I - Inclusiveness

i

Ordinal number of the considered Key Performance Indicator (KPI)

KPI performance class

KPI thresholds ($t_{D.i}$)



0

Low (L)

$t_{D.i, \text{Acceptable}}$

Acceptable (A)

$t_{D.i, \text{Good}}$

Good (G)

$t_{D.i, \text{Excellent}}$

Excellent (E)

≤ 100

D.i



European Commission

Evaluation of KPI performance class scores

SCALE: Building/Neighbourhood/Urban | **TYPE:** Newbuild/Renovation | **MAIN USE:** Residential/Non-residential

Step 3

KPI score	D.1	D.2	...	D.m
KPI performance class score (PCS)	PCS _L PCS _A PCS _G PCS _E	PCS _L PCS _A PCS _G PCS _E		PCS _L PCS _A PCS _G PCS _E

PCS replaces the **KPI score**

Handle uncertainty in calculations and mitigate the effect of employing diverse indicator format

Fixed at **single dimension** level

Number
0-100

KPI performance class score (PCS) per Dimension

Performance class	Low (L)	Acceptable (A)	Good (G)	Excellent (E)
S - Sustainability	25	45	70	100
B - Beauty	0	40	70	100
I - Inclusiveness	10	45	75	100

Evaluation of Dimension score and performance classes

SCALE: Building/Neighbourhood/Urban | **TYPE:** Newbuild/Renovation | **MAIN USE:** Residential/Non-residential

Step 4

KPI weight

$w_{D,1}$

$w_{D,2}$

...

$w_{D,m}$

Dimension score

D

Weighted average of KPI performance class scores — Number

$$D = \frac{\sum_{i=1}^m (w_{D,i} \cdot PCS_{D,i})}{\sum_{i=1}^m (w_{D,i})} = 0-100$$

Value 0-1

$\begin{cases} \leq 1 & \text{B - Beauty} \mid \text{I - Inclusiveness} \\ 1 & \text{S - Sustainability} \end{cases}$

One-level code

D —  S - Sustainability |  B - Beauty |  I - Inclusiveness

Dimension performance class

Dimension thresholds (t_D)

 S - Sustainability

 B - Beauty

 I - Inclusiveness

Low (L)

Acceptable (A)

Good (G)

Excellent (E)

0 ≤

$t_{D, \text{Acceptable}}$

≥ 40

≥ 40

≥ 40

$t_{D, \text{Good}}$

≥ 60

≥ 65

≥ 60

$t_{D, \text{Excellent}}$

≥ 80

≥ 85

≥ 80

≤ 100

D



European Commission



S.1

Minimise the use of **fossil fuel** in the built environment

S.2

Maximise the use of **sustainable energy** in the built environment

S.3

Minimise **greenhouse gas emissions** from the built environment

S.4

Enhance **sustainable mobility** in the built environment

S.5

Minimise non-energy related environmental impacts to **air and water**

S.6

Minimise **non-energy** related environmental impacts from the built environment

S.7

Achieve the best possible greening of **public sector** in terms of its **economic involvement** in the sustainability of the built environment

S.8

Achieve the best possible greening of **private sector** in terms of its **economic involvement** in the sustainability of the built environment

S.9

Promote **circular economy** in the built environment



Quantitative approach

Indicators within **S.1-S.9 KPIs** are **mathematical operations** combining metrics (function of sub-metrics).

Metrics and **sub-metrics** are **calculated by the user** through simulations (e.g. energy performance assessment using engineering software), measurement (e.g. utility bills), or numerical input based on project data and parameters defined by **codes, standards, or other sources**.

Indicator scores within **S.1-S.6 KPIs** are **normalised** to **express improvement** relative to a **baseline** (context-related, e.g. EU, national, local level).



- B.1** Digitalisation in construction
- B.2** Quality of design and delivery
- B.3** Improving building resilience to extreme events
- B.4** Ensuring occupant health, comfort and wellbeing
- B.5** Improving accessibility of the built environment for everyone
- B.6** Maximising durability and service life
- B.7** Ensuring high level of aesthetic acceptance of buildings and spaces
- B.8** Providing spatial coherence in planning and design
- B.9** Improving preservation of cultural and natural heritage
- B.10** Maintaining *genius loci* and improving sense of belonging
- B.11** Aesthetic perception of buildings and spaces through comparison to actual 'styles' and tendencies in architecture



Mainly expert opinion-based approach

Indicator scores within **B.1-B.11** KPIs are mainly associated to a series of user responses to **multiple choice questions** that represent the relevant **metrics and sub-metrics**, whereas the **indicator score** is an **aggregation of metric (and sub-metric) scores**. In few cases, the indicator score is based on mathematical operations combining metrics.

In high-regulated aspects in Beauty (B.1-B.6 KPIs), **metrics** typically evaluate compliance to project design requirements set by **codes and standards and high-quality certification schemes** (e.g. BREEAM, LEED, and DGNB).

In less or not-regulated aspects in Beauty (B.7-B.11 KPIs), metrics measure **compliance to best practice or design features**, defined on the basis of thorough **state-of-the-art reviews** on existing knowledge and challenges.



I.1 Funding and land value

I.2 Affordability

I.3 Inclusive quality, equality and accessibility

I.4 Rent regulation

I.5 Impact on **neighbourhood social cohesion**

I.6 Needs and resources for **social accessibility**

I.7 Needs of **vulnerable** and **marginalised groups**

I.8 Anti-discrimination initiatives

I.9 Involvement of **stakeholders**

Expert opinion-based approach

Indicator scores within **I.1-I.9** KPIs are associated to a series of user responses to **multiple choice questions** that represent the relevant **metrics and sub-metrics**, whereas the **indicator score** is an **aggregation of metric (and sub-metric) scores**. **Indicator scores** vary depending on project **contextual questions**, thus the **scores** are based on a **matrix scale**.

Due to **less or non-regulated** aspects in Inclusiveness, **metrics** measure **compliance to best practice**, defined on the basis of thorough **state-of-the-art reviews** on existing knowledge and challenges.

KPIs & indicators

NEB self-assessment method: project classification

Variable No of KPI
and
indicators per KPI

SCALE: Building/Neighbourhood/Urban | **TYPE:** Newbuild/Renovation | **MAIN USE:** Residential/Non-residential

SPECIAL CONDITIONS: Independent from the combination of scale | type | use and based on particular project features

Total No

29
KPIs

Sustainability



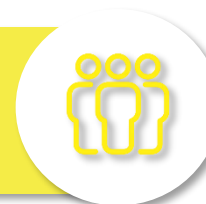
9
KPIs

Beauty



11
KPIs

Inclusiveness



9
KPIs

KPIs & indicators

NEB self-assessment method: project classification

Variable No of KPI
and
indicators per KPI

SCALE: Building/Neighbourhood/Urban | **TYPE:** Newbuild/Renovation | **MAIN USE:** Residential/Non-residential

*Based on project combination in **scale** | **type** | **main use:** Building | Newbuild | Residential

Total No

Sustainability



Beauty



Inclusiveness



27
KPIs*

74
Indicators*

9
KPIs

18
Indicators*

9
KPIs

24
Indicators*

9
KPIs

32
Indicators*

KPIs & indicators

NEB self-assessment method: project classification

Variable No of KPI and indicators per KPI

SPECIAL CONDITIONS: Independent from the combination of scale | type | use and based on particular project features

Total No

29
KPIs

Sustainability



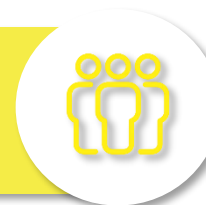
9
KPIs

Beauty



11
KPIs

Inclusiveness



9
KPIs

For example:

B.2

Quality of design and delivery

B.2.3

Compliance with **material efficiency**

applies to **RENOVATION** projects only when these include **alterations to the floor system**

JRC E.3

Built environment

Project management

*Technical
aspects*

François Augendre

Head of Unit

Silvia Dimova

Former Deputy Head of Unit

Paolo Negro

Project leader

Konstantinos Gkatzogias

Daniel Pohoryles

Elvira Romano

Georgios Tsionis

Dionysios Bournas

IT tool

Martin Poljanšek

IT team leader

Jessica Cavestro

Emilio Martorana

Claudio Mininni

Application of NEB method

Stefania Gerli

*Administrative
issues*

Maria Fabregat Morillas

Monica Colombo

+ **40 experts**

JRC B.4

*New European
Bauhaus*

Communication
and
dissemination



Thank you



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