Module 1
Indoor Energy, Renewables, GHG emission and Operational energy cost

Training Material

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2 – Renewable energy

KPI 5 - Renewable annual primary energy demand per area unit

2 – Renewable energy

Thematic area	Key Performance Indicator (KPI)		Unit	Reference framework
Renewable Energy	KPI 5	Renewable annual primary energy demand per area unit	[kWh/(m²a)]	1.1 Level(s)

Objective

- Renewable primary energy means energy from renewable non-fossil sources (e.g., wind, solar thermal and solar photovoltaic, geothermal energy, ambient energy, tide, wave, hydropower, biomass, biogas, etc.) which has not undergone any conversion or transformation process.

Applicability

Building use:

- Residential
- Non-residential

Project stage:

- Design
- Construction / As Built
- In Use

KPI 5 Renewable annual primary energy demand per area unit

Description

Renewable energy can be produced:

- On-site (e.g., PV panels, wind turbines, solar panels on the building roofs, heat pumps located on the building site)
- Nearby (e.g., renewable energy from district heating systems, PV panels, solar panels, wind turbines)
- Distant (e.g., renewable electricity from the electricity grid, PV panels, solar, panels, wind turbines)

It is noteworthy that PV or solar panels can be counted as onsite, nearby, or distant energy sources, depending on where the panels are located relative to the building. The same goes for wind turbines.

To avoid double-counting of renewable energy it is important to denote renewable primary energy demand with subscript following the chosen perimeters:

$E_{\text{Pren,onst}}$ – renewable primary energy demand produced on-site

$E_{\text{Pren,nrby}}$ – renewable primary energy demand produced nearby

$E_{\text{Pren,dist}}$ – renewable primary energy demand produced distant

KPI 5 Renewable annual primary energy demand per area unit

Scope

- KPI addresses residential and non-residential buildings with the default energy performance of buildings (EPB) services (see 3 Terms and definitions).

- KPI addresses the following module of the building life-cycle:B6 : Operational energy use

KPI 5 Renewable annual primary energy demand per area unit

Unit of measure

- Renewable annual primary energy demand per area unit for energy performance of buildings services (EPB services) E_{Pren} in [kWh/(m²a)]
- Delivered and exported energy are calculated or metered (measured) at the assessment boundary
- Multiplying renewable primary energy factors with the delivered/exported energy to calculate renewable primary energy demand follows outside the assessment boundary.
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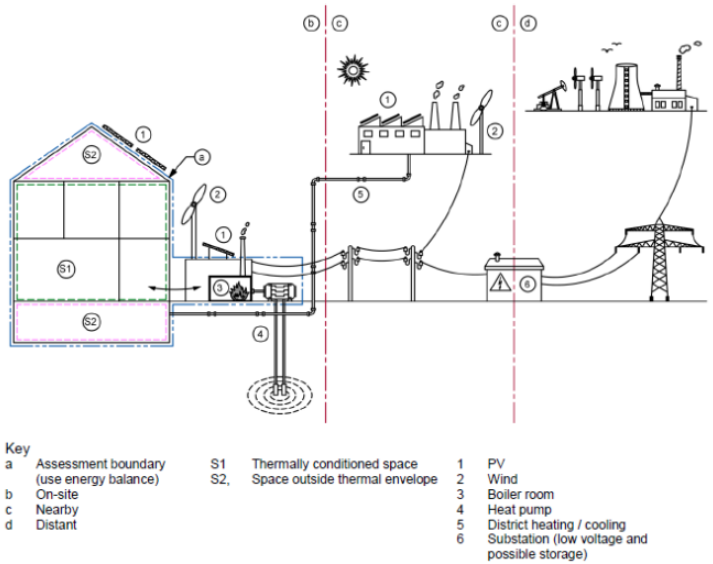


KPI 5 Renewable annual primary energy demand per area unit

Reference Standards

The energy calculation method for energy performance available across the EU include:

- use of national standards still applied (e.g., EN 15603 and its associated standards - EN 15316 series),
- use of national or regional calculation methods and associated software tools (which must comply with Annex I of the EPBD) or
- use of calculation methods compliant with the EN ISO 52000 series and standards developed under mandate 480.

EN 15603:2008 Energy performance of buildings – Overall energy use and definition of energy ratings

2 – Renewable energy

KPI 6 - Renewable energy ratio (on-site, nearby)

2 – Renewable energy

Thematic area	Key Performance Indicator (KPI)		Unit	Reference framework
Renewable Energy	KPI 6	Renewable energy ratio (on-site, nearby)	[%]	B1.4 CESBA MED

Objective

- One main sustainability target within the European Union is to increase the share of renewable primary energy demand in total primary energy demand to lower the dependency of the EU on fossil energy sources and to reduce the greenhouse gas emissions caused by fossil energy sources

Applicability

Building use:

- Residential
- Non-residential

Project stage:

- Design
- Construction / As Built
- In Use

KPI 6 Renewable energy ratio (on-site, nearby)

Description

Renewable energy ratio (on-site, nearby) is the ratio of the renewable primary energy demand produced on-site and nearby to the total primary energy demand. According to the EN ISO 52000-1, this KPI excludes distant produced primary energy demand.

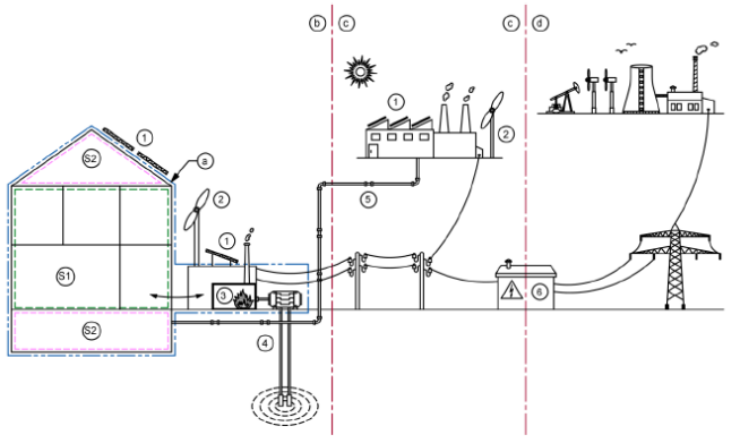
Perimeter choice	Choice – **RER calculation** (renewable energy)	Choice – RER calculation (total energy)
On-site	**Yes**	Yes
Nearby	**Yes**	Yes
Distant	No	Yes

NOTE: When calculating this indicator, the perimeter choices must always be clearly declared if they differ from default choices.

KPI 6 Renewable energy ratio (on-site, nearby)

Scope

- KPI addresses residential and non-residential buildings with the default energy performance of buildings (EPB) services (see 3 Terms and definitions).
- KPI addresses the following module of the building life-cycle:B6 : Operational energy use
- Dividing the renewable primary energy demand with the total primary energy demand follows outside the assessment boundary



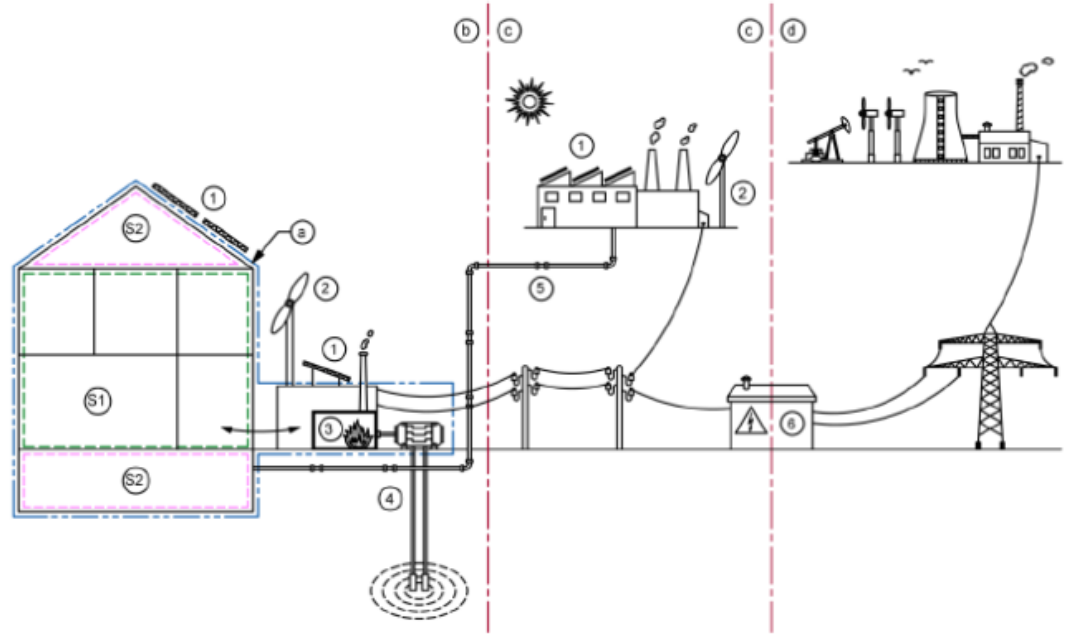
Key

a	Assessment boundary (use energy balance)	S1	Thermally conditioned space	1	PV
b	On-site	S2,	Space outside thermal envelope	2	Wind
c	Nearby			3	Boiler room
d	Distant			4	Heat pump
				5	District heating / cooling
				6	Substation (low voltage and possible storage)

KPI 6 Renewable energy ratio (on-site, nearby)

Unit of measure

- Renewable energy ratio (on-site, nearby) $RER_{\text{onst,nrby}}$ in [%]



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