

Rational use of Water

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Abstract

Two indicators were derived from the subject of concern « depletion of water resources »: embodied water use and operational water use. This presentation first demonstrates the significance of the building related water use and thereby the validity of those indicators. Thereafter, assessment methods and their applicability are discussed and some recommendations are made to improve the comparability of results. Finally, some unresolved issues are discussed.

RATIONAL USE OF WATER

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Rational use of water

Validity

- Depletion of water resources= subject of concern
 - water is **essential** to sustain life, food production,...
 - Already **scarce** in many regions and the problem is only getting worse
 - One of the EEA indicators, which can be considered to reflect areas of environmental concern is water



Rational use of water

Rational use of water

- Water use that aims at limiting the depletion of fresh water resources

Indicators

- Operational water use:** water used by users and technical systems during normal operation of the building
- Embodied water use:** water consumed to produce, install, maintain and dispose off the building materials/equipments



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Validity (2)

- Is the contribution from the building sector significant?
 - Operational water use
 - on average 20% of global fresh water consumption (up to 53% in Singapore)
 - Domestic sector: 60% of potable water consumption in Europe
 - Embodied water use:
 - (Little) available studies show that on a buildings life cycle it is less significant as operational water use (depending on source: 15 years or 10%) but still worth considering
 - Production phase is most significant in materials life cycle



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Assessment method (design phase)

- **Embodied water use:**
 - LCA of the building (EN 15978)
- **Operational water use:**
 - List building (and non building) related appliances
 - Calculate water consumption based on product characteristics and scenarios of use, eg.:
 - 6l toilet flush, used 4 times/day/user, 2 users⇒48l/day
 - Showerhead: 7 l/min, 5 min./person/day x 2users⇒70l/day



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Rational use of water

Comparability

- To improve comparability we recommend:
 - **System boundaries:** follow principles of EN 15978
 - Operational water use (=module B7 of EN 15978)
 - Incl. all **building integrated** water consuming processes of the building under operation (sanitation, irrigation, swimming pools,...)
 - if water use of **not building related** appliances are evaluated, report them separately
 - Document contributing factors (e.g. Type of installations,...) and scenarios
 - Report different qualities of water separately (potable water, rain water,...)



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Rational use of water

Applicability

- **Operational water use:**
 - Ok, technical data and scenarios are available
 - Real performance can also easily be measured during use phase (! Building and not building related appliances)
- **Embodied water use:**
 - Presently not commonly calculated
 - Need LCA data (EPD's) of materials and equipments
 - Will improve with availability of EPD's (according to EN 15804).



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Discussions / conclusions

- **Unresolved issues** → further research
- Does not account for the fact that water is scarcer in some regions than in others:
 - Operational water use: can be resolved with different weighting factors
 - embodied water use is more difficult (Import of materials!)
 - Ok, less is always better?
- How to account for different water qualities?



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Discussions /conclusions

- Embodied water use:
 - Actually **lack of data** and studies to evaluate its significance
 - Little information on the **% improvement** that can be achieved through careful material selection
- SBA should focus in the first place on operational water use:
 - More significant contribution
 - Reduction measures are relatively straightforward to implement
 - Real performance can be measured during the use phase
- Another “contributor” may be added to the system: water used for the production of operational energy of the building (e.g. For production of electricity).



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Thank you for attention

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