Webinar 1 – Methodology Overview (today)

- Initiatives and Standards
- ISO 14046, WULCA, WFN
- Terminology
- Water Scarcity Footprint

Webinar 2 - Water Assessment in the GaBi LCA software (thursday)

- Inventory – Regionalized Flows
- Impact Assessment
- Example
- Limitations
Water Resources – Relevance

11th Edition
Initiatives & Standards – Overview and examples

Risk assessment – foreground system
- CDP Water Disclosure
- WBCSD Global Water Tool
- Aqueduct Tool of WRI (World Resources Institute)

Environmental assessment (Water footprint)
- ISO Standard 14046
- UNEP-SETAC working initiative “Water use in LCA”
- Water footprint Network - Water Footprint Assessment Manual

Management
- Alliance for Water Stewardship (AWS)
Highlights of the ISO 14046 for practitioners (1)

- based on a **life cycle assessment**
- identifies **quantity** of water use and changes in water **quality**
- **stand-alone** assessment **or as part** of a life cycle assessment
- the term “water footprint” is **only** used when it is the result of an **impact assessment**
- **water footprint**: metric(s) that quantify(ies) the potential environmental impacts related to water
- a **set of different calculations**, **umbrella term** rather than to communicate a single number
If water related impacts have not been comprehensively assessed, then the term water footprint can only be applied with a qualifier.

Examples

- **Water scarcity footprint**: weighting of water consumption with water scarcity index
- **Water availability footprint**: considers reduced availability due to changes in water quality
- **Water footprint profile**: quality aspects considered through standard LCA indicators like eutrophication, acidification and toxicity
Assessment of Quantity (Water scarcity footprint) + Assessment of Quality (Impacts of water pollution)

Water Footprint Profile
- Eutrophication
- Toxicity
- Acidification
- Land Use
UNEP-SETAC working initiative “Water use in LCA” WULCA

Goals:
• Recommendations for scientists and practitioners

Outputs:
• Framework for water assessments and water footprinting
• Review of methods and further developments of methods
• Final goal: Harmonized method for assessment of water use in LCA

Alignment with ISO standard

WULCA
ISO 14046
Water Footprint Network

Calculates the amount of water consumed and polluted (degraded) for a product/company/region/nation

“Water footprint” of WFN = water volume (usually including rain water) → inventory method, no impact assessment

→ awareness raising

→ regional management

but less useful for corporate, supply chain, and product sustainability assessments
Terminology for Water inventories

**Water use → umbrella term:** all types of anthropogenic water uses

**Characterization of water use types - degredative vs. consumptive:**

**Degradative use (water degradation):** Water used and released into the same watershed it was withdrawn from (wastewater, cooling water) (possibly with degraded quality)

**Consumptive use (water consumption):** Evaporation, product integration, water transfers to different river basins, release to sea → water loss on watershed level

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Characterization of water use types - green vs. blue:

- **green water**: rainwater and moisture stored in soil that evaporates during production process, mainly during crop growth (evapotranspiration)
- **blue water** refers to surface and groundwater applied (e.g. irrigation in crop cultivation)

Characterization of water use types - in-stream vs. off-stream:

- **In-stream use** (hydroelectric generation, water transport, damming)
- **Off-stream use**: (total) withdrawal from water body (irrigation, water supply, cooling)
Classification Examples

[Images of various natural and industrial scenes, sourced from Wikipedia under public domain.]
Classification Examples
Water Scarcity Footprint - Overview

For an assessment of water scarcity, it is important to know WHERE water consumption takes place:

→ Regional water flows (country level) now available in GaBi
→ Will be covered in next webinar on Thursday
Water Scarcity Index (Pfister et al. 2009)
One of the first indices available to characterize water stress with global coverage, documented, public available, used in many water footprint studies so far

AWaRe (WULCA)
New consensus method of UNEP/SETAC working group on water use in LCA (WULCA); released 2015, beta status, suggested by JRC as new standard impact assessment method for water use in PEF

UBP (Frischknecht et al. 2013)
Eco-factors, expressed as eco-points per unit of pollutant emission or resource extraction (reference region Switzerland)
Water scarcity characterization: Water Stress Index (WSI)

WSI based on withdrawal-to-availability ratio \((m^3/m^3)\) (Pfister et al. 2009)

Takes into account water availability, use, and seasonal/annual variation in precipitation
Water scarcity characterization: AWaRe

Water Scarcity Footprint = \[
\text{Water consumption (inventory)} \times \frac{1}{\text{Availability - Demand}}\]

- Demand includes human and aquatic ecosystems
- The value is normalized (i.e. divided) with the reference flow of the world average (consumption weighted)
- Maximal value when Demand ≥ Availability
  → A value of 10 (denominator) means that there is 10 times more remaining water available in this region compared to the world average situation for water consumption.

- Factor is the inverse of remaining water
  → The more unused water available per area, the lower the potential to deprive other users!

http://www.wulca-waterlca.org/project.html
Further Information

**Water Assessment Guidelines – GaBi homepage:**


**Trainings:**

Deep dive into methods, issues relevant to your production system, advanced evaluation of results, WFP beyond GaBi defaults, quality assurance and much more…

**Get in touch!**
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