





Society and Materials (SAM)

19th International Conference

How are companies dealing with the increasing demands for environmental performance assessment?

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<http://chemeng.uliege.be/>



Context → Supervised communication



SERVICE PUBLIC FEDERAL SANTE PUBLIQUE,
SECURITE DE LA CHAINE ALIMENTAIRE
ET ENVIRONNEMENT
[C – 2014/24263]
22 MAI 2014. — Arrêté royal fixant les exigences minimales pour les affichages environnementaux sur les produits de construction et pour l'enregistrement des déclarations environnementales de produits dans la base de données fédérale

Le cadre technique de l'affichage environnemental

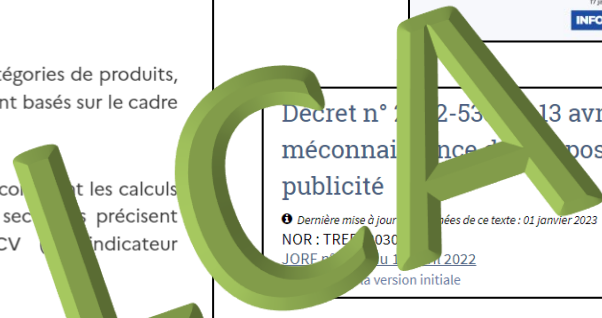
Le dispositif d'affichage environnemental se compose de plusieurs outils permettant de calculer le « score d'impact » et d'assurer la comparabilité des résultats :

- **Les principes généraux et le cadre méthodologique** : communs à toutes les catégories de produits, référentiel de type PEF (européen) ou BPC 30-323 (français). Ces référentiels sont basés sur le cadre d'analyse du cycle de vie (ACV).
- **Des référentiels sectoriels** : Ils précisent le référentiel commun en expliquant comment les calculs doivent être réalisées pour chaque catégorie de produit. Les référentiels sectoriels précisent également les compléments éventuels à ajouter aux indicateurs ACV (l'indicateur microplastique pour le textile).
- **Une base de données ACV générique** : fournit des valeurs environnementales « par défaut » nécessaires aux calculs de l'impact des produits. Exemple: impact de l'électricité, des transports etc. L'ADEME développe en partenariat les bases de données ACV « Empreinte » et "Agribalyse"; qui sont mobilisées pour l'affichage .
- **Des outils de calculs public ou privés facilitant la mise en œuvre** : exemple : Ecobalyse
- **Le format d'affichage** : une charte graphique et un logo.



Decret n° 2022-53 du 13 avril 2022 définissant le régime de sanctions applicables en cas de méconnaissance des dispositions relatives aux allégations de neutralité carbone dans la publicité

• Dernière mise à jour des données de ce texte : 01 janvier 2023
NOR : TREF1030
JORE n° 0196 du 24 août 2021
Version initiale



LOI n° 2021-1104 du 22 août 2021 portant lutte contre le dérèglement climatique et renforcement de la résilience face à ses effets (1)

• Dernière mise à jour des données de ce texte : 31 décembre 2023
NOR : TREF2100379L
JORF n° 0196 du 24 août 2021



Public procurements



La RE2020 impose l'utilisation de la méthode d'Analyse du Cycle de Vie (ACV). L'ACV est une méthode multicritère et multi-étapes qui doit fournir aux parties prenantes d'un projet de construction ou de rénovation toutes les informations dont elles ont besoin pour faire les meilleurs choix possibles en fonction des enjeux environnementaux, et ce sans oublier la qualité technique, le confort, le coût, ou encore la durabilité attendus pour l'ouvrage.



Public Procurement with the Environmental Cost Indicator (ECI)

In The Netherlands, circularity and green public procurement are becoming increasingly important. Thus, the results of Life Cycle Assessments (LCA) are gradually being adopted for this purpose.

Recently, results from LCAs are used increasingly in public procurement tenders, especially in the Dutch construction sector. In these tenders, the Environmental Cost Indicator (ECI) is used as an important criterion to determine the winning bid.

In The Netherlands, the Environmental Cost Indicator (ECI) is known as Milieu Kosten Indicator (MKI)

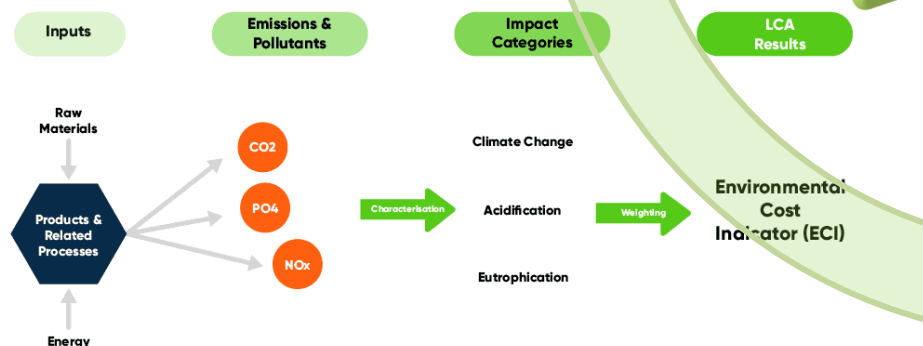
★★★★★ Rate this publication

Study on the implementation of life cycle assessment and environmental footprint methods in the context of public procurement

Final report

Directives (EU) 2014/24/EU and 2014/25/EU define the European regulatory framework on public procurement. They enable public procurers to use green criteria in their tenders, e.g. those that the European Commission develops and publishes (EU GPP criteria). Lifecycle assessment (LCA) plays a role in some of these criteria. The respective laws of the EEA Member States encourage the use of environmental criteria and allow instruments that are built upon LCA methods. The European Commission launched its Environmental Footprint Initiative in 2013 to support methodological harmonisation in the field of LCA as a potential suitable basis for supporting environmentally driven policies. This study aims at supporting the Commission in assessing how to best address LCA-based information in public procurement procedures by evaluating existing practices in nine EEA countries and assessing how LCA-based instruments may serve contracting authorities and tenderers. An analysis of relevant regulations, literature and an empirical approach that integrated interviews with experts on Green Public Procurement identified various instruments as applicable in all EEA countries and identifies possible best practice

LCA



GUIDE BÂTIMENT DURABLE .brussels

Rechercher dans le guide

bruxelles environnement .brussels

Intégrer des exigences liées aux matériaux de construction dans les marchés publics

L'impact environnemental des projets de construction et de rénovation est une problématique qui se pose sur un nombre croissant de projets. On a longtemps cherché à réduire l'énergie consommée des bâtiments, notamment au travers des PEB. Or, il serait réducteur de penser que l'impact d'un bâtiment sur l'environnement se réduit uniquement à l'énergie utilisée en phase d'utilisation. TOTEM est un outil très utile pour quantifier l'impact environnemental dû à la gestion des ressources sur toute la durée de vie. Il devient également intéressant lorsque cette thématique veut être intégrée dans un marché public, puisqu'elle permet d'objectiver cet impact et de suivre un objectif précis tout au long d'un projet.

Ces pistes ont pour but de donner des pistes pour l'intégration de TOTEM dans un marché public, permettant de fixer des objectifs réalistes et d'obtenir un cahier des charges cohérent. Ces pistes ne sont qu'un exemple de parcours de réflexion et d'élaboration d'un cahier des charges, et se basent sur un retour d'expérience d'accompagnements de 4 projets suivis entre 2020 et 2022. Ces 4 projets sont les suivants :

- Entre Deux Pont – Belliris : construction neuve de logements
- Clos des Mariés – SLRB : rénovation lourde de logements collectifs en logement social
- Abbé – CLTB : construction neuve d'un immeuble de logements
- Tréflès - Fonds du logement : création d'un quartier durable constitué de 3 îlots d'habitations




- https://conseils.xpair.com/actualite_experts/integration-acv-appels-offres.htm
- <https://op.europa.eu/en/publication-detail/-/publication/28948315-41da-11ec-89db-01aa75ed71a1/language-en>
- <https://ecochain.com/blog/environmental-cost-indicator-eci/>
- <https://www.guidebatimentdurable.brussels/totem-outil-belge-ameliorer-performance-environnementale-batiments/integrer-exigences-liees>

DNSH – European Taxonomy



- Climate change mitigation
- Climate change adaptation
- sustainable and protection of water and marine resources;
- transition to a circular economy
- pollution prevention and control;
- protection and restoration of biodiversity and ecosystems.

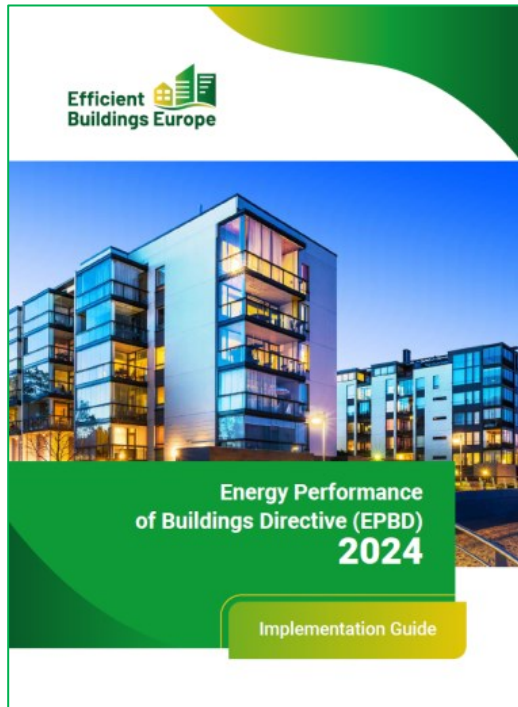
- ### The DNSH principle in EU initiatives
- In the EU Sustainable Finance Framework**
 - SFDR - Regulation (EU) 2019/2088
 - EU Taxonomy - Regulation (EU) 2020/852
 - In EU funds and budget**
 - EU budget 2021-2027
 - Communication on Better Regulation
 - Climate Mainstreaming Architecture '21-'27
 - RRF - Regulation (EU) 2021/241
 - Common Provision - Regulation (EU) 2021/1060
 - Social Climate Funds – Regulation (EU) 2023/955
 - InvestEU - Regulation (EU) 2021/523
 - General Budget of the Union – Regulation 2024/2509
 - Others**
 - 8th Environment Action Programme to 2030
 - Environmentally Harmful Subsidies
 - Environmental and Social Standards

- ### The DNSH principle in federal initiatives
- Budgetary instruments**
 - Federal Resilience and Recovery Plan
 - Federal financial vehicles and instruments**
 - Green OLO Framework
 - Fiscal measures**
 - Law on various tax provisions (2024)
 - Regulatory instruments**
 - Regulatory Impact Analysis
 - Law & RD of the federal climate policy
- 



Hannouf, M. B., Padilla-Rivera, A., Assefa, G., & Gates, I. (2022). **Methodological framework to find links between life cycle sustainability assessment categories and the UN Sustainable Development Goals based on literature.** Journal of Industrial Ecology, 1–19. <https://doi.org/10.1111/jiec.13283>

SDGs/LCSA categories	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	Number of indirect linkages	Number of direct linkages	
Environmental																				
Human health particulate						O	O											O	7	1
Smog formation							O	O										O	7	1
Ozone depletion							O	O						O				O	7	1
Human health (cancer)							O	O						O				O	7	1
Human health (non-cancer)							O	O						O				O	7	1
Global warming									O										11	1
Water use				O						O				O					6	2
Ecotoxicity							O							O					1	2
Eutrophication				O										O					6	2
Acidification							O							O					2	1
Land use transformation				O															6	4
Resource depletion – fossil fuels										O									8	2



totem
CREATE | EVALUATE | INNOVATE

EPBD revision

- └ EPBD (Energy Performance of Buildings Directive) validated in **March 2024**
- └ Article 7.2:
 - / EPBD includes a **mandatory calculation of the global warming potential (GWP)** over a building's whole life cycle :
 - From January 2028 for new buildings with a useful floor area larger than 1000 m²
 - From January 2030 for all new buildings.
 - / The information about the life-cycle GWP should be provided **in the energy performance certificates.**
- └ Article 7.5:
 - / **By January 2027** : Member States shall publish **a roadmap** detailing the introduction of limit values on the cumulative life-cycle GWP of all new buildings and the targets for new buildings from 2030.

Inspiration from other countries

- └ EPBD => will influence all European countries
 - / For now: Belgium has no LCA-regulation yet
 - / LCA regulations since 2013 in the Netherlands & since 2022 in France



NEW SITUATION

LCA/EPD are entering rapidly in EU legislation and policy:

- Ecodesign for sustainable products regulation
- Construction products regulation
- EU Taxonomy for sustainable activities
- Energy performance of buildings directive (2028!)
- Green claims Directive
- Carbon removals certification framework

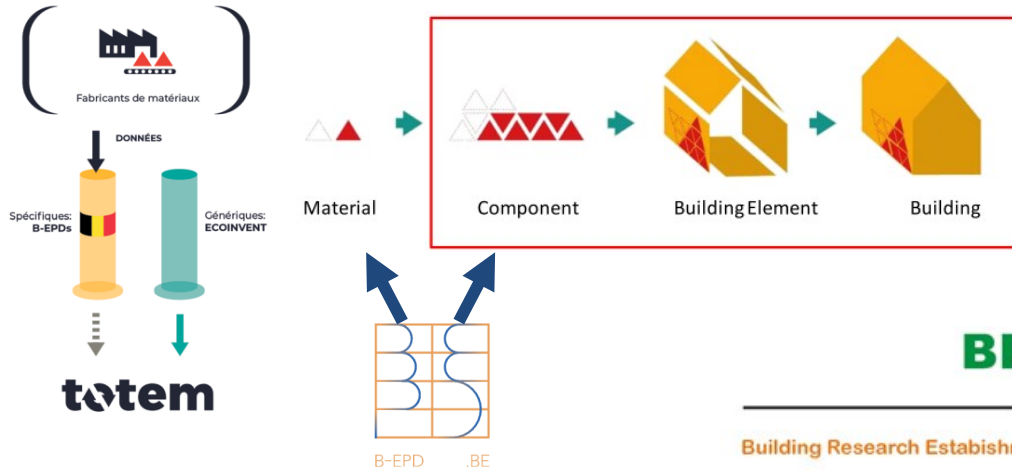
- LEVEL(s)
- Building logbooks, renovation passports
- Green public procurement
- ETS for buildings



	Eu context	the Netherlands	France
Current regulation	/	< 2013 – all new buildings > 100m ² (2025 : 50m ²)	<2022 – all new buildings > 50m ²
Future regulation	<2028 – new buildings < 1000m ² <2030 – all new buildings		
Indicators	GWP No limit values (< 2030)	Aggregated € EPB and LCA limit values separated	GWP + additional EPB and LCA limit values separated
Tools	Private/public	Private	
Databases	EPB & LCA not integrated		
Method	EN15804:A2 EN15978 (50y) Integrated method LCA & Energy	EN15804:A1 - 2025 : 15804:A2 EN15978 (50y/75y) Non integrated method LCA & Energy Specificities for small and non-compact buildings	EN15804: A1 (temporary) & A2 EN15978 (50y) Integrated method LCA & Energy Specificities for small buildings/type of data/infrastructures, climate zone, ...
Framework	Building level Mandatory phase : as built (certif). Reuse factor : /	Building level Mandatory phase : urban permit Reuse factor « 0,2 »	Building level Mandatory phases : Urban permit + as built Reuse factor « 0 »
Various	/	No agreement for 'LCA experts' (3 references are requested).	- No agreement for 'LCA experts' : <i>ongoing analyse to add it</i> - integrated method/tools (Cible 2026) - Roadmap with thresholds > 2031

86

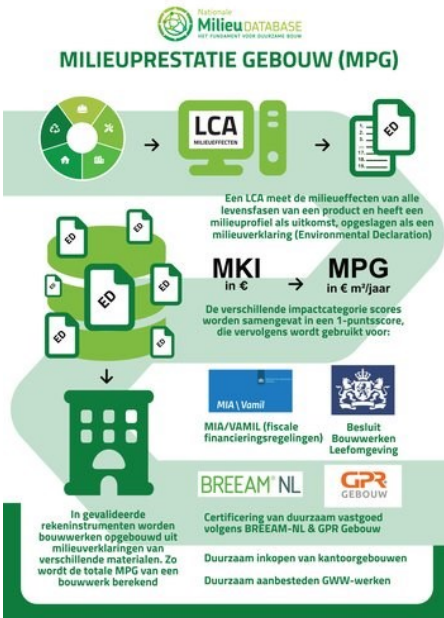
EPBD & Public procurements: how?



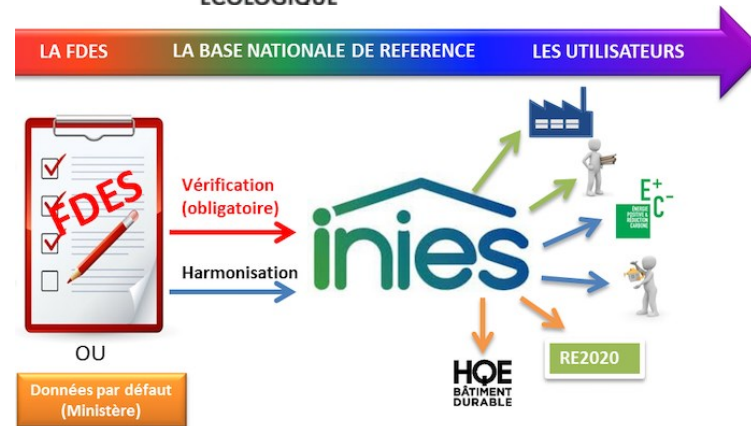
BREEM

Stands for

Building Research Establishment Environment Assessment Methodology



MINISTÈRE DE LA TRANSITION ÉCOLOGIQUE

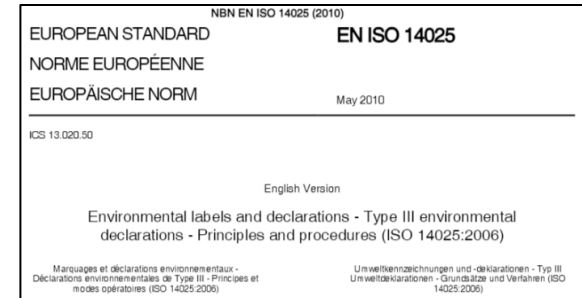


DGNB

Deutsche Gesellschaft für Nachhaltiges Bauen
German Sustainable Building Council

Three types of labels

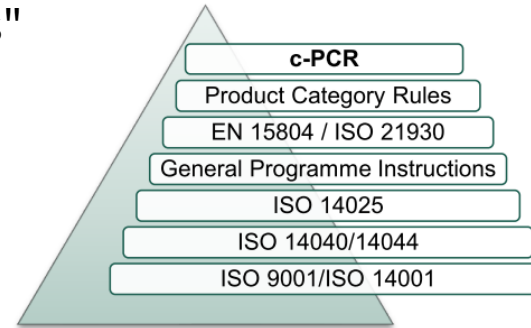
ISO 14024 – Type 1	ISO 14021 – Type 2	ISO 14025 – Type 3
Ecolabel	Self declaration	Environmental declaration Ecoprofile
Criteria fixed by a competent agency	Fast, partial (mono criteria)	Complex and complete
Multi steps Multi criteria LCA not mandatory	One or two criteria One step (end of life, ...)	LCA = mandatory



EPD – Type III



- ▶ Environmental declaration type III
 - ▶ Ensure comparability
 - ▶ Same framework, same methodology
 - ▶ + "National additional rules"



Belgian Standard

EN 15804:2012+A2:2019 NBN
NBN EN 15804:2012+A2:2019

Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products

B-EPD – CONSTRUCTION PRODUCT CATEGORY RULES

Complementary to NBN EN 15804+A2

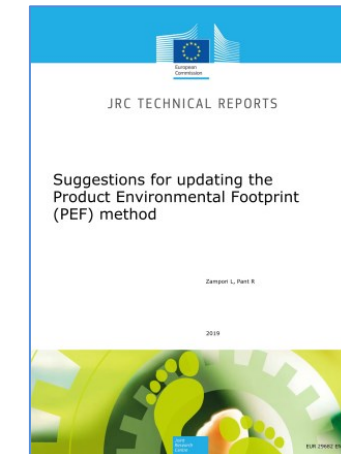
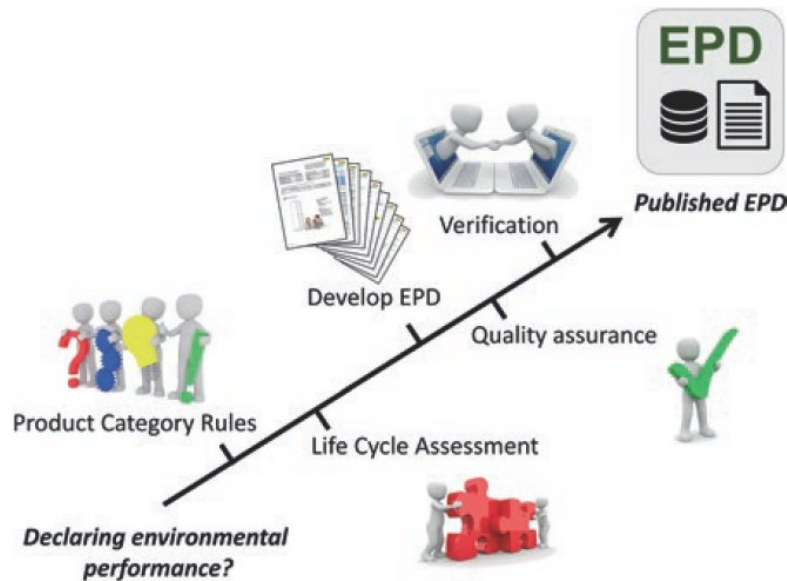
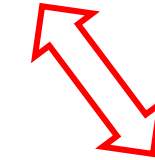
norme française **NF EN 15804+A2/CN**
 Octobre 2022

Indice de classement : P 01-006/CH

ICS : 13.020.20 ; 91.060.01 ; 91.100.01

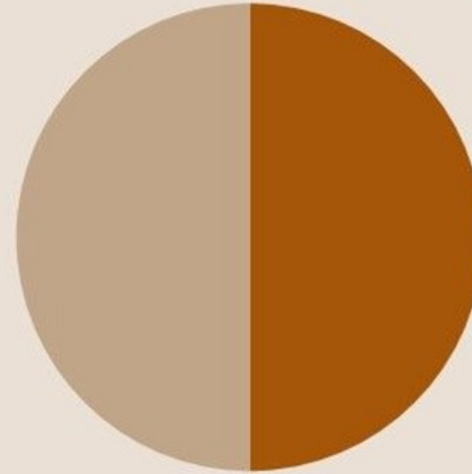
Contributions des ouvrages de construction au développement durable – Déclarations environnementales sur les produits – Règles régissant les catégories de produits de construction – Complément national à la NF EN 15804+A2

E : Sustainability of construction works – Environmental product declarations – Core rules for the product category of construction – National addition to NF EN 15804+A2
 D : Nachhaltigkeitsangaben über die Umweltwirkungen von Bauprodukten – Regeln für die Produktkategorie Bauprodukte – National Ergänzung zur NF EN 15804+A2



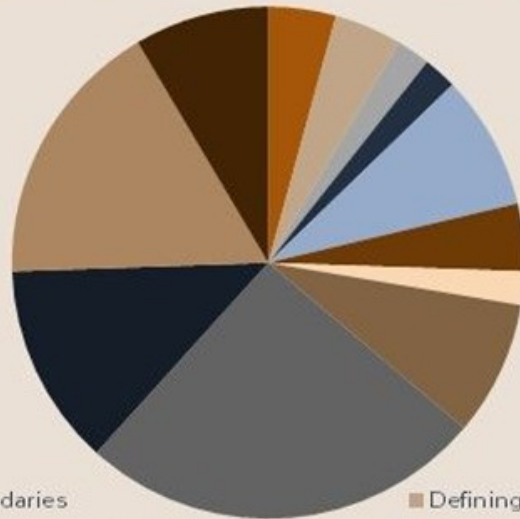
Common ground ... LCA!

What people think environmental footprint calculation (LCA) is

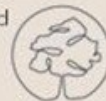


■ finding Activity data kg and mj ■ Multiplying emission data with activity data

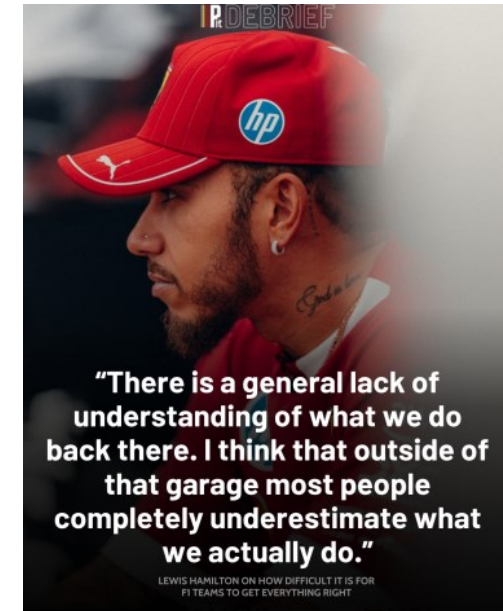
What it actually is



- Setting system boundaries
- Defining allocation method for the study
- Defining right impact assessment method
- Choosing righth data base
- Finding emission data
- Creating the right scenario and functional unit
- Choosing the right standard
- Research data gaps
- Compiling activity data
- Modelling data gaps
- Discussing the study with your colleagues
- Explaining what you actually did



unfold
life cycle design consulting





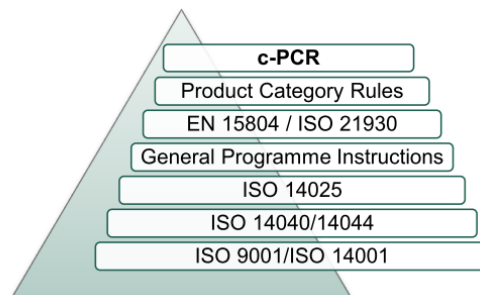
- ▶ Complexity!
- ▶ Feedback: "uninformed" public (administration, industry, consultants, etc.)
 - ▶ Confusion in concepts, terminology, ...
 - ▶ Demand for standardisation – particularly of methods
 - ⇒ EXISTS! (ISO, EN15804, PEF/EF, ...)
 - ▶ Setting up of working groups for harmonisation
 - ⇒ EXISTS! (EC, JRC, ...)
 - ▶ Pool of experts
 - ▶ "Simplified" toolboxes



Atelier 2 :
Analyse du Cycle de Vie (ACV) des matériaux circulaires
Événement annuel de DISI relatif aux matériaux circulaires

Cet atelier a pour objectif d'aider les participants à appréhender l'ACV dans le cas spécifique des matériaux circulaires, avec ses particularités méthodologiques.

Animation : Mecatech (Valérie Spaeth/Laetitia Zacheo) + GreenWin (Tara McCarthy)
Experts : Angélique Léonard (ULiège), Sylvie Gros Lambert (ULiège), Benjamine Bellonde (Materia Nova)
Rapportage : WIN4C (Laurent Fraikin, CRM), Valbowal (Benoît Michaux, Buildwise)



European Commission

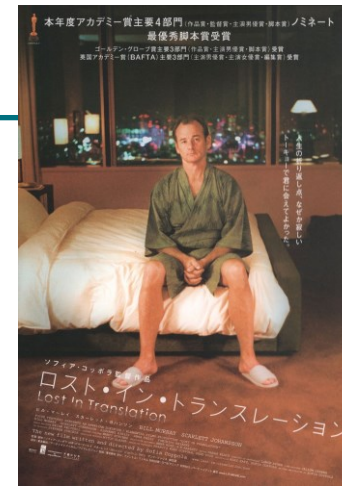
European Commission | EU Science Hub | EPLCA

European Platform on LCA | EPLCA

Life cycle assessment/EPD/FDES/CF/...

► Industry/Manufacturers: interpretation of EPD

- Own EPD
- Commercial competitor/rival products

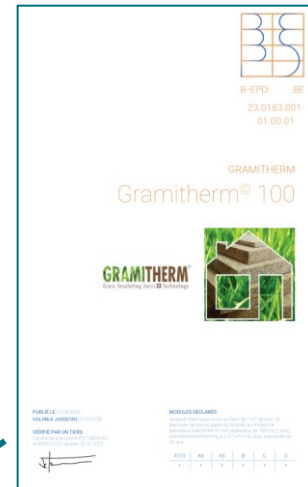


Belgian Standard

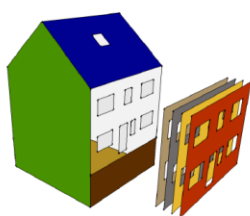
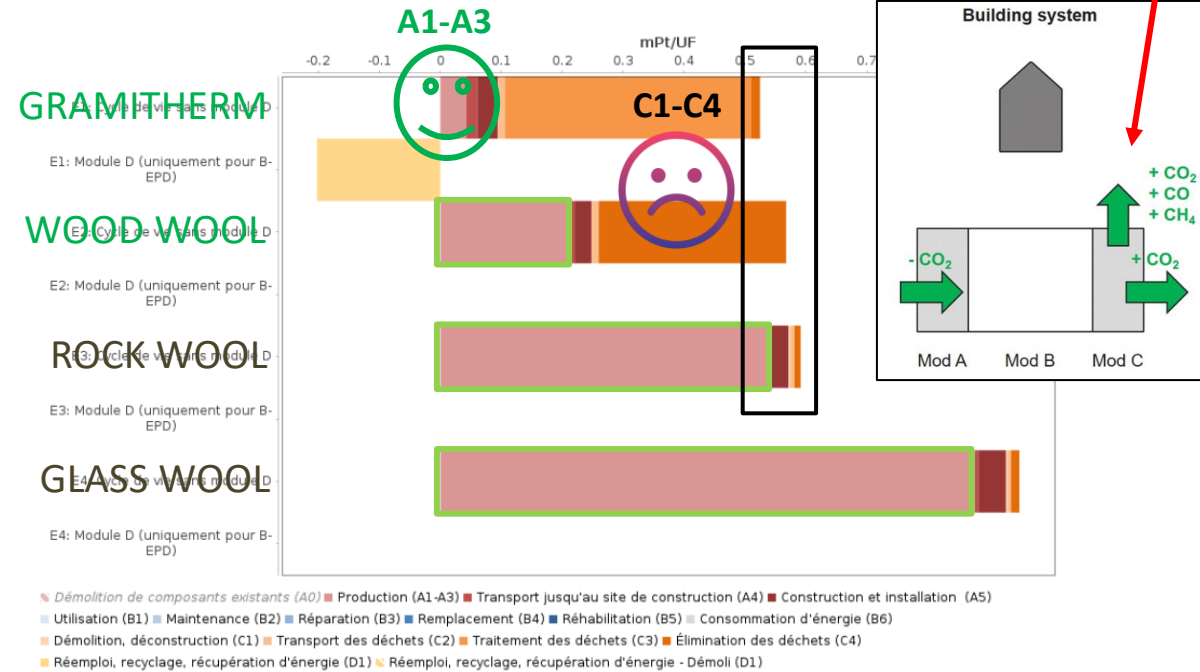
EN 15804:2012+A2:2019 NBN

NBN EN 15804:2012+A2:2019

Sustainability of construction works - Environmental product declarations - Core rules for the product category of construction products



Comparaison de 'Gramitherm' avec 'Laine de bois - Houtwol', 'Laine de roche - Rotswol' et 'Laine de verre - Glaswol'



E1 = Gramitherm | E2 = Laine de bois - Houtwol | E3 = Laine de roche - Rotswol | E4 = Laine de verre - Glaswol

- ▶ ⇒ **Need** for experts / insiders
- ▶ Understanding and/or conducting of LCA/EPD
Support and/or consultancy

- ▶ Training

- ▶ Industrials
 - ⇒ SME?
 - ⇒ Subsidies?

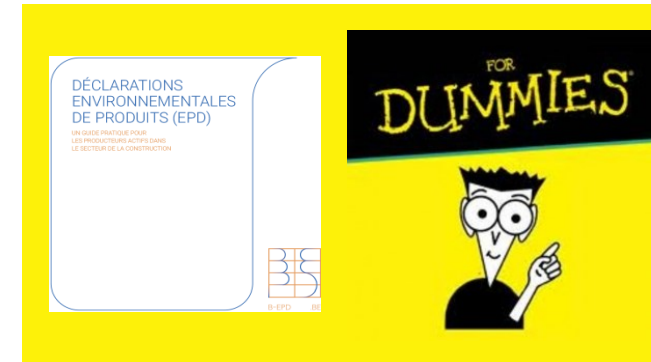


- ▶ Students



- ▶ Creation of formation centres, online courses – various levels

- ▶ Dissemination of information on those already organised
 - ⇒ Centralisation of information?





▶ Ongoing training

- ▶ **Tailor made/"private:** university and high school, research centres, consultancies, tool developers, AFNOR, ...
- ▶ **Variable duration and skills:** 2h (intro) → several days (use of tools and practice)
- ▶ Online / MOOC
- ▶ Organised by public authorities: eg. BE : Sustainable development
<https://developpementdurable.wallonie.be/soutien/outils/repertoire-formationen>

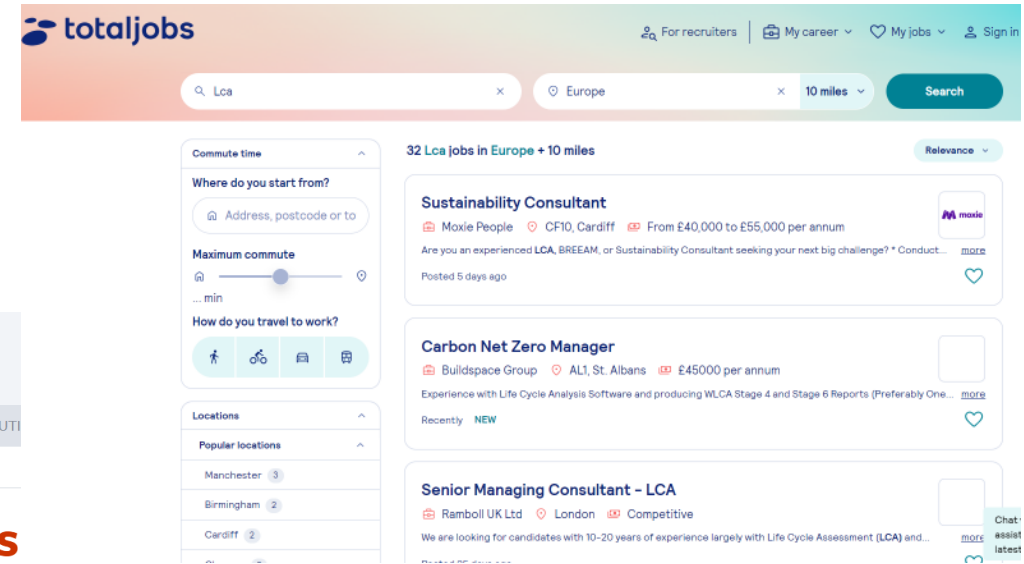
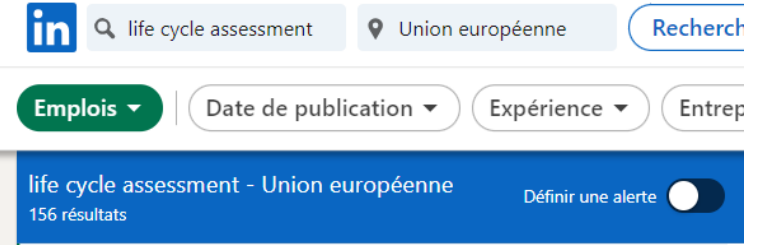
▶ University – High school

- ▶ **LCA courses:** introduction → demonstrations → practice → Master thesis → PhD thesis
- ▶ Bac, Masters (bio)engineer, business (HEC), sciences, (engineer) architect, ...
- ▶ <https://www.educations.com/sustainability-studies/> → Belgium (14), France (61), Spain (62),...
- ▶ <https://education4climate.be/?lang=en>
<https://www.studyrama.com/formations/specialites/environnement-developpement-durable#:~:text=Il%20existe%20plusieurs%20formations%20permettant,le%20d%C3%A9veloppement%20des%20%C3%A9nergies%20renouvelables.>

LCA practitioners



- ▶ Chemeng ULiège : 4 (2022) → 18 (2024)
- ▶ Reviewers (LCA/EPD)
 - ▶ Belgium (B-EPD) : 7
 - ▶ France (FDES) : 48



One Click LCA

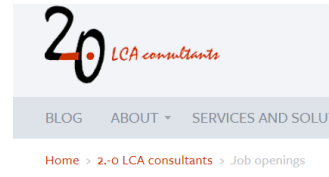
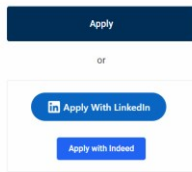
EPD Customer Success Specialist - German/French speaking



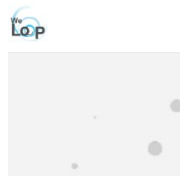
Job description

The Energy Policy, Innovation & Circularity team (EPIC) in EnergyVille/VITO provides science and fact-based advice in four expertise areas: Energy and Climate Policy Evaluation, Building Assessment and Circularity, Policy Innovation in the Built Environment and Societal Aspects of the Energy Transition. The EPIC team is part of EnergyVille, a collaboration between the Belgian research partners VITO, KU Leuven, IMEC and UHasselt.

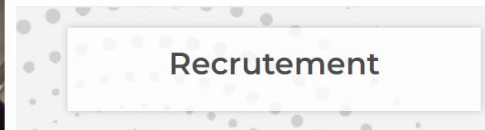
We are looking for a driven **Life Cycle Assessment and Circularity expert** to support our interdisciplinary team. Within our experienced and motivated EPIC team, we conduct research in the field of life cycle



Job openings



Alternance / stage –
Ingénieur(e) en Analyse du
Cycle de Vie



Solvay

Life Cycle Manager (F/M/X)

Lyon, Auvergne-Rhône-Alpes, France · Republiée il y a 1 semaine · 31 candidats potentiels

Take home message

Industry/Manufacturers

- ▶ **Pressure** from public authorities (EU, national, regional, international, ...)
- ▶ **Pressure** from customers (B2B, B2C)

Service providers

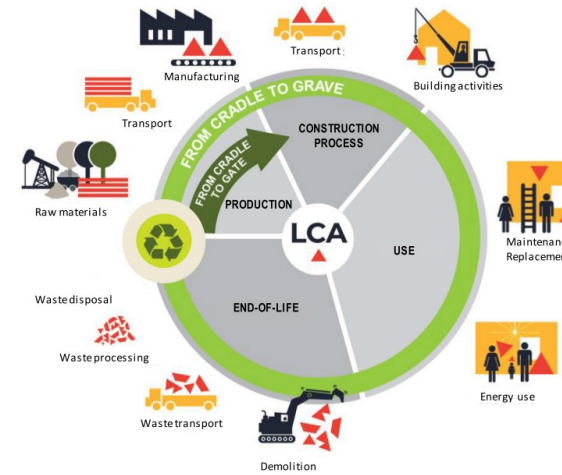
- ▶ Strong demand for services/**experts**
- ➔ Recrutement

Universities, High schools, ...

- ▶ Need for **training**: development of programmes, MOOC, ...
- ➔ teaching resources

Public authorities

- ▶ DIFFUSION of information
- ▶ Subsidies, **support**
- ▶ Consistency



Coming soon



Congrès
Management
du Cycle de Vie
2025

**Rendez-vous les 18 et 19 novembre 2025
à Bordeaux au Centre de Congrès Cité Mondiale**



<https://www.mcv2025.com/>

<https://www.linkedin.com/company/mcv-conference/>

SESSION

Intégration de la pensée en cycle de vie
dans la prise de décision

**Analyse du cycle vie,
écoconception, criticité des
matériaux : état des lieux et
challenges au niveau de la formation**



Angélique Léonard
Université de Liège



Nicolas Youssef
JUNIA HEI

