



LIFE CYCLE INITIATIVE PROGRESS REPORT 2024



Life Cycle Initiative

WHAT IS THE LIFE CYCLE INITIATIVE?

The Life Cycle Initiative is a public-private, multi-stakeholder partnership enabling the global use of life-cycle knowledge by private and public decision makers.

Hosted by the United Nations Environment Programme (UNEP), the Life Cycle Initiative is at the interface between users and experts of life-cycle approaches. It provides a global forum to ensure a science-based, consensus-building process to support decisions and policies towards the shared vision of sustainability as a public good. It delivers authoritative opinion on sound tools and approaches by engaging its multi-stakeholder partnership (including governments, businesses, scientific and civil society organizations and individuals).

The Initiative facilitates the application of life cycle knowledge in the global sustainable development agenda in order to achieve global goals faster and efficiently.

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FOREWORD

2024 continued to be a critical year for sustainable development. At COP29 in Baku, Azerbaijan, nearly 200 countries took a historic step by agreeing on [a global climate financing target of \\$300 billion annually by 2035](#) to support climate action. Submissions of National Biodiversity Strategy and Action Plans (NBSAPs), as well as the adoption of the multilateral mechanism on benefit-sharing from the use of digital sequence information on genetic resources at CBD COP 16 in Cali, Colombia, provided highlights for the biodiversity agenda. Similarly, at INC-5 in Busan, Republic of Korea, negotiations for a global plastics treaty ended up with countries agreeing that a ‘[Chair’s Text](#)’ will serve as a solid foundation for a resumed session in 2025. The session fostered a greater convergence on the structure and elements of the treaty, while advancing understanding of country positions and shared challenges, paving the way for decisive progress in 2025. These milestones demonstrate collective commitment to addressing the triple environmental planetary crisis.

Amidst this momentum, the Life Cycle Initiative continued mainstreaming life-cycle approaches and strengthening its practice in high impact sectors. Notably, the Policy Brief “[A Policymakers’ guide to Life Cycle Assessment](#)” was launched in November. It focuses on the application of Life Cycle Assessment (LCA) studies to inform problem and policy framing.

Significant advancements have also been made on the enabling conditions for supporting robust LCAs, through existing activities such as [GLAM](#) and [GLAD](#). The year marked a major milestone with the launch of the first version of GLAM, GLAM1.0.2024.10, allowing more accurate and reliable sustainability assessments to drive initiatives worldwide. Developed over a decade through a global collaborative effort, GLAM provides a standardized framework for assessing ecosystem quality, human health, and socio-economic assets (natural resources and ecosystem services) across product life cycles.

A key highlight of GLAD was the establishment of an Open Scientific Data node, inviting academic institutions to participate in collaborative data sharing, furthering GLAD’s commitment to data accessibility and interoperability. Additionally, the GLAD team

continued to lead efforts in developing a Blueprint for a Common Governance Nomenclature System, a key first step towards bringing interoperability in LCA data.

2024 also marked the launch of new initiatives where the Life Cycle Initiative demonstrated its thought leadership, for example in the application of life-cycle thinking to UNEP’s work in textiles as well as in the mining value chain. In 2024, textiles SMEs of the UNEP InTex Project exhibited their work at UNEA6, explaining to governments how LCA is now helping to inform their business decisions. The publication of the working paper [Critical Transitions: Circularity, Equity, and Responsibility in the Quest for Energy Transition Minerals](#) shone a light on the importance of securing that the growing need for critical energy transition minerals leads to sustainable development opportunities in resource rich countries. Further, the launch of the [10 Whole Life Cycle Recommendations for the Buildings Breakthrough](#) marked the institutionalization of the use life-cycle thinking and approaches in the buildings sector.

As we look to 2025, the Initiative is committed to further expanding its scope, engaging a broader range of stakeholders, and aims to deepen the integration of life-cycle approaches into global sustainability solutions in high impact sectors.



A handwritten signature in black ink, which appears to read 'Elisa Tonda'.

Elisa Tonda

Chief, Resources and Markets Branch, UNEP

OUR ORGANISATION

The Life Cycle Initiative partners with governments, businesses, academia, science and civil society to support public and private decision-makers. Its primary objectives include fostering consensus on life cycle assessment data and methodologies and offering technical and policy support. It has also worked on applying life-cycle thinking and approaches in various industrial sectors and policies. Life-cycle approaches benefit organisations as they can see the impacts at each stage along their value chain and identify strategies accordingly to improve their efficiency and reduce their negative environmental and social impacts. For policymakers, this approach is beneficial as it gives a holistic view of their country or region and the sectors which need most attention. The Initiative is guided by a Steering Committee and supported by a wide and diverse membership base.

Steering Committee and General Assembly

The Initiative's Steering Committee provides guidance and technical advice. It is comprised of ten members from the Life Cycle Initiative's membership and includes UNEP. Each year, members elect three new representatives to the Steering Committee at the annual General Assembly. The General Assembly is an opportunity to showcase the Initiative's achievements to all members, to get feedback from members, and to discuss future activities and vision. Like every year, in 2024 the General Assembly was held online, showing great engagement with the elections, with approximately 80 members participating on the day. Additionally, four new steering committee members were elected, with unprecedented interest from individual constituency members in steering committee nominations. Over 250 votes submitted for the 16 candidates. Table 1 provides information on the Steering Committee members.

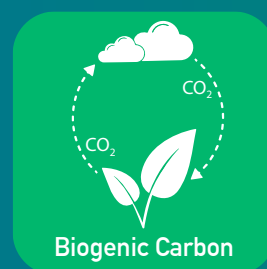
2024 HIGHLIGHTS

February | The [UNEA-6](#) took life-cycle approaches one step further through the ministerial declaration, calling for "life cycle assessment of the environmental and sustainable development impacts of specific technologies to make informed decisions".

[SCP-HAT 3.0](#) with modelled data until and including 2024 was also updated in the session. A side event on "[Connecting the Threads: A coordinated policy response to transform textiles and preserve nature](#)" discussed coordinated policy responses and solutions for transforming the textile value chain while preserving nature and textiles SMEs from Kenya showcased their LCA results.



May | The [beta version of the Global Guidance for Life Cycle Impact Assessment Method \(GLAM\)](#) launched during the SETAC Europe Annual Meeting on May 8.



June | The first workshop on [Biogenic Carbon in LCA](#) were successfully completed in Bath, generating useful discussions from different Working Groups.

Region	Government	Business	Science/Civil Society/ Individuals
Africa			
Asia and Pacific	Thailand – The National Science and Technology Development Agency (NSTDA) [re-elected in Oct 2024 & mandate until 2027]	SustainAble Solutions [mandate until 2025]	Dewi Permatasari [mandate until 2027]
Europe	European Commission – Directorate-General for Environment [mandate until 2026]	Unilever [mandate until 2026]	
Latin America and the Caribbean		CLC Latam EPD System [mandate until 2027]	Red Iberoamericana De Ciclo De Vida [mandate until 2025]
North America	United States - Department of Energy [mandate until 2025]		CIRAIG [mandate until 2026]

Table 1: Composition of the Life Cycle Initiative Steering Committee for September 2024 – 2025



October | The Life Cycle Initiative hosts its 8th General Assembly, welcoming new partners and updating members on past and future activities of the Initiative.

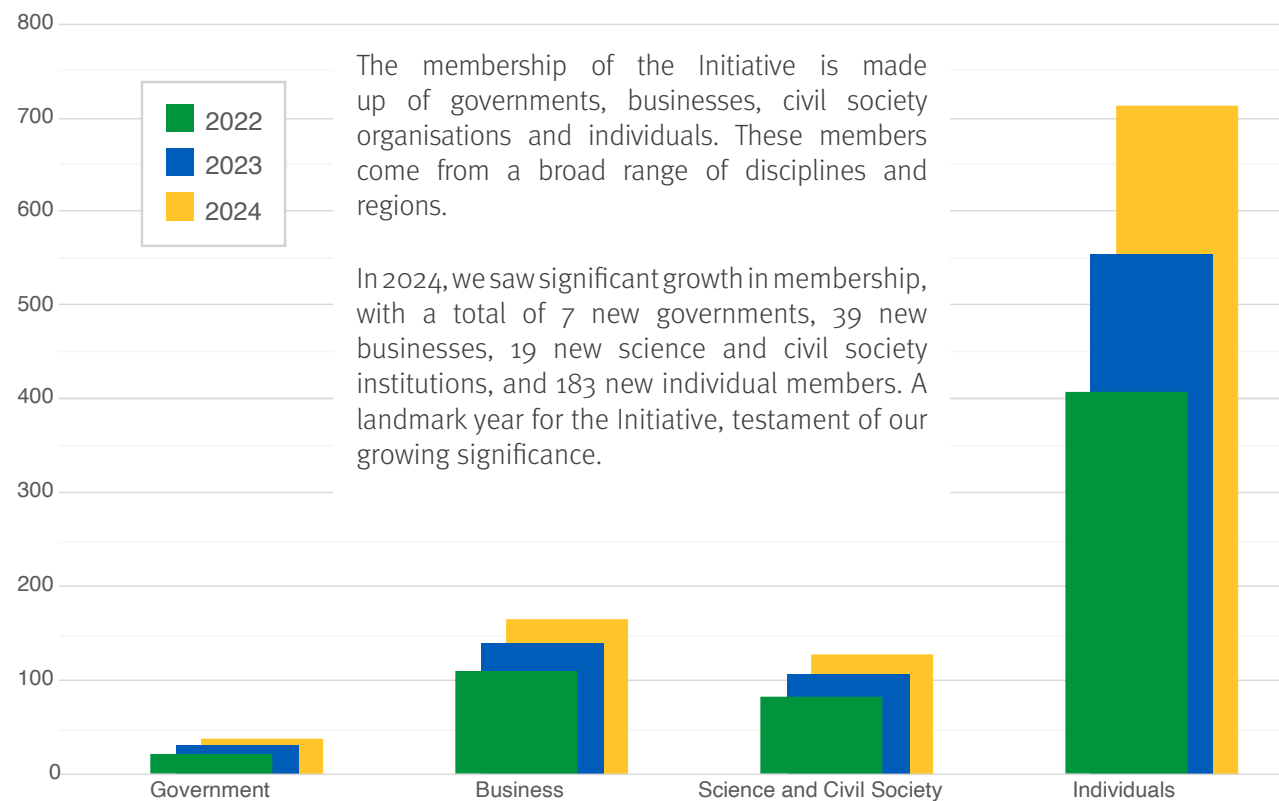


September | The workshop on Utilizing LCA and EPD to promote sustainable construction, held on the 15th in Saudi Arabia, contributed to strengthening the regional life cycle networks.

October | GLAM: The launch of GLAM V1.0.2024.10 in October opens a new era where Life Cycle Assessments are more transparent and enable consistent evaluation across environmental impact categories.

November | UNEP's Policy Brief "[A Policymakers' guide to Life Cycle Assessment](#)" was launched. It focuses on the application of Life Cycle Assessment (LCA) studies to inform problem and policy framing.

Members



JOIN US!

Join the Life Cycle Initiative: be a part of the membership!

We welcome participants from governments, businesses, civil society institutions and individuals and the unique experience and perspective you all can bring to the Life Cycle table! Active in-kind contribution is all that is required to be a member and benefit from networking opportunities, access to the latest information and events on Life Cycle Thinking and be part of a community driving this science-based approach.

[Become a member](#)

The Life Cycle Initiative relies on generous funding partners and projects to support our Initiative and activities. Core funding is crucial for running the Secretariat of the Initiative as well as to provide seed funding for its projects. Direct project funding constitutes the major portion of the budget. Join us as a Funding Partner today and contribute to advancing projects that promote the uptake of sustainable consumption and production patterns worldwide.

Benefits of being a Funding Partner

- » Gain VISIBILITY as a supporter – through conferences, reports, our website and newsletters.
- » Exert INFLUENCE – maintain close links to the debate, the discussion spaces and Assembly.
- » Access ADVICE and EXPERTISE – through a global forum of experts and practitioners.

[Become a Funding Partner](#)

COMMUNICATIONS ENGAGEMENT

The engagement from the community and the interest in our information and project activities continued to rise throughout 2024. We utilised the LC Net newsletter, our website, and LinkedIn page to share important news, webinars, reports and upcoming publications.

Social media networks

In 2024, the team focused its social media activity on the Initiative's [LinkedIn profile](#), where the number of followers grew to over 8385, an increase of 31% over 2023. Posts typically achieved impressions in the thousands and clicks in the hundreds, making LinkedIn an effective and important supplemental way of sharing the Initiative's information.



The 8th General Assembly

The [8th General Assembly of the Life Cycle Initiative](#) was held on October 2, 2024, engaging over 80 members globally. The keynote address by Elisa Tonda, Chief of the Resources and Markets Branch, UNEP, on “Advancing Sustainable Consumption and Production with Life Cycle Approaches,” and the panel discussion on “Leveraging LCA to Drive the Transition to a Sustainable Economy” garnered significant interest from the members.

Selected 2024 LinkedIn user statistics

IMPRESSIONS 184,323

REACTIONS 2,873

TOP PROFILE VISITOR JOB FUNCTIONS

RESEARCH, OPERATIONS, EDUCATION

TOP VISITOR GEOGRAPHIES

FRANCE, NETHERLANDS, GERMANY, SAUDI ARABIA



LC Net newsletter

Interest in the Initiative's newsletter “[LC Net](#)” also grew over the year, with a 22% increase in subscribers (+465), open and click rates consistent with the previous year (~50%), and (~ 12%).

Selected 2024 Website user statistics

TOTAL WEB PAGE VIEWS +23%

PAGE VIEWS PER VISIT +10%

MOST VISITED PAGE OF THE WEBSITE:

“SOCIAL LCA” WITH OVER 20,600 VIEWS

TOP VISITOR GEOGRAPHIES

USA, INDIA, UK, GERMANY, ITALY

Selected 2024 LC Net newsletter statistics

AVERAGE OPEN RATE 47%

AVERAGE CLICK RATE 14%

TOP THREE ARTICLES IN 2024:

- 1. GLAM LAUNCH**
- 2. SOIL ORGANIC CARBON AS SOIL QUALITY INDICATOR IN LCA**
- 3. BIOGENIC CARBON PROJECT LAUNCH**

2024 ACTIVITIES

The Life Cycle Initiative delivers on two broad activity areas:

1. Enabling conditions for LCA use

The Life Cycle Initiative facilitates science-based, global consensus building to establish the fundamental knowledge required for life-cycle approaches. Governments, industries, and consumers benefit from enhanced access to Life Cycle Knowledge, LCA data, and standardized methodologies. To foster widespread adoption of life-cycle approaches, there is a concerted effort to enhance skills and capacity through reinforced LCA Networks and e-learning modules.

2. Enhance the application of LCA

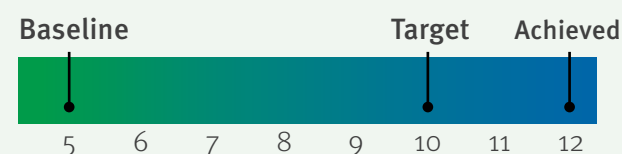
The Initiative collaborates with a broad spectrum of public and private stakeholders, including those within UNEP (MEAs and high impact sectors), to mainstream life-cycle thinking and approaches into decision and policy-making, with a focus on high-impact sectors.

The following sections outline the progress made in each of these two areas in 2024.

1. Projects related to the enabling conditions for LCA use

Progress on targets set for the period until 2027 as of the conclusion of 2024

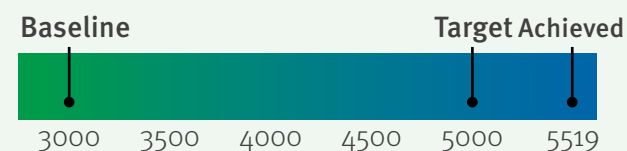
Global guidelines and tools



Regional events held with Life Cycle Initiative support



Trained individuals (businesses, governments and UNEP)



a. Global Guidance for Life Cycle Impact Assessment Method (GLAM)

GLAM, the Global Guidance for Life Cycle Impact Assessment Method, aims to enhance global consensus on environmental life cycle impact assessment indicators. The project, carried out with the leadership of Norwegian University of Science and Technology (NTNU), and Denmark's Technical University (DTU), and collaboration from hundreds of



GLAM's first version, GLAM1.0.2024.10, was finally launched in SETAC symposium in October

scientists worldwide, witnessed substantial progress in 2024 towards GLAM's final release.

The beta version was launched on May 8th at the SETAC Symposium in Seville, followed by two workshops to finalize recommendations and make updated characterization factors available to

select industries in July, marking the beginning of a comprehensive testing phase.

GLAM's first version, [GLAM1.0.2024.10](#), was finally launched in SETAC symposium in October. This is a milestone achievement in life cycle assessment, developed through over a decade of collaborative efforts engaging over 200 contributors worldwide.

b. Global Life Cycle Assessment Data Access network (GLAD)

In 2024, GLAD achieved several significant milestones, enhancing its role as the world's largest directory of LCA datasets. The integration of the upgraded Lavoisier Conversion Tool, marked a major advancement in facilitating conversions between ecospold2 and ILCD formats, aligning with nomenclature resources on GitHub. The Lavoisier conversion framework has been developed by the Federal University of Technology - Paraná (UTFPR) and the Brazilian Institute of Information in Science and Technology (IBICT), with funding from the [European Union](#).



A key highlight was the establishment of an Open Scientific Data node, inviting academic institutions to participate in collaborative data sharing, furthering GLAD's commitment to transparency and interoperability.

Additionally, a Blueprint for a Common Governance Nomenclature System, was developed in partnership with IBICT, and consulted extensively through the year.

The blueprint aims to address the governance needs for interoperability and elementary flow nomenclature.

c. A Policymakers' guide to Life Cycle Assessment

In November, the Life Cycle Initiative launched "[A Policymakers' guide to Life Cycle Assessment – Policy Brief](#)". The policy brief focuses on the application of generic Life Cycle Assessment (LCA) studies to inform problem and policy framing. It provides guidance for policy makers to distinguish robust science-based LCAs including:

- » Adherence to recognized standards and methods
- » Goal and scope alignment
- » Comprehensiveness of LCA
- » Critical review and transparency

On November 19th 2024, a [webinar](#) introduced the guide to more than 160 participants, with government representatives sharing examples of leveraging LCA to address environmental hotspots and reduce environmental impacts through policies.



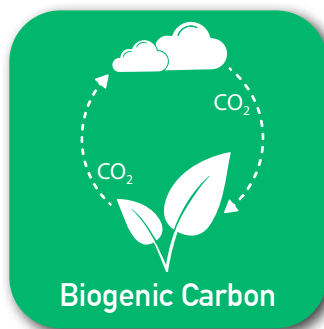
Co-funded by:



d. Biogenic Carbon Project

Last year, the Life Cycle Initiative introduced the [Biogenic Carbon Project](#), to address gaps in internationally recommended approaches to account for biogenic carbon in LCA. This initiative aims to bring harmonization, stability, verifiability, and enhanced credibility to LCA results for bio-based products through recommendations developed via an expert-led multistakeholder process.

In 2024, the Biogenic Carbon Project held two hybrid workshops to address critical challenges in modelling biogenic carbon in Life Cycle Assessment (LCA). The [first workshop](#) took place on July 8th at the University of Bath, UK, with 23 participants attending in person and 67 joining online. The discussions focused on reviewing the progress of working groups, clarifying



issues, and exploring desirable features for handling biogenic carbon in LCA.

The second workshop was held on October 23rd in Gothenburg, Sweden, following the [SETAC Europe 26th LCA Symposium](#). This session examined topics such as transferring biogenic carbon across life cycles, allocating biogenic uptake, and accounting for additional uptake in biomass systems. The insights gathered during this workshop contributed to drafting a Paper exploring science-based options for modelling biogenic carbon and their implications for decision-making.

These activities will continue in 2025-26 to develop the consensus around the guidelines for accounting biogenic carbon in LCA.

e. Social-LCA (S-LCA)

The application of the Social Life Cycle Assessment work developed by the Life Cycle Initiative in 2009 in conjunction with the [Social Life Cycle Alliance](#) and revised in 2020 was applied not only in a growing number of studies but also taken up by the ISO community. At the [9th Social LCA Conference](#) held in Curitiba in May 2024 (supported by the Social Life Cycle Alliance), about 80 S-LCA application cases were presented with the prominent participation of the Latin American region, Europe and Africa.

A milestone was the publication of the [ISO 14075](#) on Social LCA which referenced the 2020 UNEP Guidelines for Social LCA as the basis for its development. Other standards published under the Circular Economy TC Committee (TC323) (such as the ISO 59004 on Terms and definitions of circular economy and ISO 59014 on sustainability and traceability of secondary materials), acknowledged the value of ISO 14075 when implementing circular economy.

f. Marine Impacts in LCA (MarILCA)

The Marine Impacts in Life Cycle Assessment (MarILCA) project aims to harmonise the development of environmental impact pathways and characterisation factors of marine impact assessment in LCA, specifically from marine litter.



In 2024 the MarILCA Project continued its activities to develop novel methods to assess the environmental impacts and damages of plastic emissions. By the end of the year, the first impact categories on plastic emissions were made available in environmental assessment methods. The Global

Guidance for Life Cycle Impact Assessment Indicators and Methods (GLAM) includes an impact category on microplastics based on the characterization factors (CFs) developed in 2022 and updated in 2024 (under review); this includes the impacts of the microplastics in the water compartment and in the top layer of the

sediments while they continue to expose marine (benthic) species. [Version 2.1](#) of the Impact World+ assessment method, launched in December 2024, also includes the impact of plastic resins released into aquatic environments (both freshwater and marine) on biota, expressed in PDF-m²-yr.

Two new papers were published in international journals that advance new insights on how to model the wide array of impact pathways related to plastic emissions.

1. Casagrande, N., Silva, C. O., Verones, F., Sobral, P., & Martinho, G. (2024). Ecotoxicity effect factors for plastic additives on the aquatic environment:

a new approach for life cycle impact assessment. *Environmental Pollution*, 341, 122935.

2. Hajjar, C., Bulle, C., Boulay, A.M., 2024. Life cycle impact assessment framework for assessing physical effects on biota of marine microplastics emissions. *The International Journal of Life Cycle Assessment*, 29(1), 25-45.

Currently, based on work developed during 2024, three manuscripts are under review and four in preparation, including a case study applying the published methods to the fishing industry, one covering effects of MP on human health and one quantifying tirewear particles emissions.

g. SCP Hotspots Analysis Tool (SCP-HAT)

The latest version, [SCP-HAT 3.0](#) was presented at UNEA-6 in February 2024. The tool now entails data until and including 2024, featuring both updated datasets and modelled data for the most recent years. It enables more accurate country-specific and more refined sector-based analyses along various value chains. This allows hotspots of environmental and socio-economic impacts to be identified, trends of environmental pressures to be traced, and paths to sustainable production and consumption to be unveiled.

In April, SCP-HAT was used for supporting the Brazilian government's development of a national



circular economy strategy, and it continues to inform updated NDCs for Ecuador, Brazil, Zimbabwe, South Africa and Viet Nam through the "[Building circularity into NDCs](#)" project with UNEP One Planet network, UNDP and UNFCCC Secretariat. Additionally, SCP-HAT was selected as a key digital tool from UNEP for the "SDG Digital Session" during the UN General Assembly's "Summit of the Future" in September, which underscored SCP-HAT's potential to foster inclusive, science-based approaches for sustainable development

h. USEtox

Widely applied to assess human toxicity and ecotoxicity impacts of chemical emissions and chemicals in products along their life cycle, [USEtox](#) continues to be a useful tool for policy makers, industry and researchers to compare and identify more environmentally sound alternatives to harmful chemicals across sectors and applications.

An [updated framework](#) for assessing freshwater ecotoxicity effects in USEtox was developed under the UNEP GLAM project. This update incorporates additional chronic data and evaluates chemicals at concentration levels closer to environmental conditions. USEtox is formally included in the GLAM



method providing factors for human toxicity and ecotoxicity impact categories.

A high-level user manual and flyer have been produced to introduce the 'chemicals in products' component in the upcoming USEtox release version – both are available at <https://manual.usetox.org> (Figure 1).

In 2024, the USEtox model and its applications garnered even higher interest, as demonstrated by a series of impactful publications. These studies focus on advancing the understanding of human and environmental toxicity impacts.

- » Human toxicity machine-learning prediction model for oral exposure: Kvasnicka, J., Aurisano, N., von Borries, K., Lu, E.-H., Fantke, P., Jolliet, O., Wright, F.A., Chiu, W., 2024. Two-stage machine learning-based approach to predict points of departure for human non-cancer and developmental/reproductive effects. *Environmental Science and Technology* 58: 15638-15649. <https://doi.org/10.1021/acs.est.4c00172>
- » Local environment in USEtox fate model: Cappucci, G.M., Neri, P., Ferrari, A.M., Fantke, P., 2024. Evaluating toxicity impacts of local chemical emissions in life cycle assessment. *The International*

Journal of Life Cycle Assessment 29: 669-682. <https://doi.org/10.1007/s11367-023-02262-x>

- » Application of USEtox in LCA case studies: Mankong, P., Fantke, P., Ghose, A., Soheilifard, F., Oginah, S.A., Phenrat, T., Mungkalasiri, J., Gheewala, S.H., Prapasongsa, T., 2024. Assessing life cycle impacts from toxic substance emissions in major crop production systems in Thailand. *Sustainable Production and Consumption* 46: 717-732. <https://doi.org/10.1016/j.spc.2024.03.013>.
- » Application of USEtox for sustainable chemicals design: Söderberg, E., von Borries, K., Norinder, U., Petchey, M., Ganapathy, R., Chavan, S., Holmquist, H., Johansson, M., Cotgreave, I., Hayes, M.A., Fantke, P., Syrén, P.-O., 2024. Toward safer and more sustainable by design biocatalytic amide-bond coupling. *Green Chemistry* 26: 11147-11163. <https://doi.org/10.1039/D4GC03665D>



Figure 1: What are the USEtox interfaces and how do they work?

i. E-learning modules

The attendance for the Life Cycle Initiative's E-Learning web-based courses has remained consistent over the past two years. The success seen in 2023, with a high completion rate of virtual learning programs, was replicated in 2024, boasting over 1053 course completions.

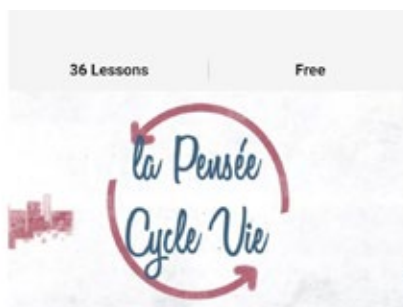
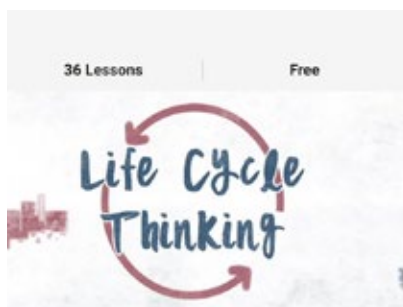
Overall, the learning resources have shown high attending rates across all versions: Introduction to Life Cycle Thinking, Life Cycle Thinking in Business Decision Making, and Life Cycle Thinking in Public Policy Formulation, easily accessed through [Learn Life Cycle Thinking](#) website.



Thanks to our Funding Partners, especially the European Commission, for their dedicated support which enabled the dissemination of life-cycle thinking in academic and educational environments. By supporting [university programs](#) that offer life-cycle courses, the Secretariat is confident that its free online courses will continue to reach even larger audiences.



Produced with financial support
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j. Strengthening the LCA Networks: Community of Practice

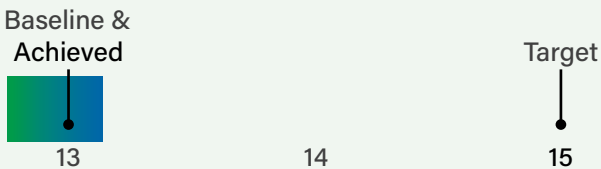
Life Cycle Networks have been the driving force in bringing life-cycle approaches to the forefront globally, regionally, and nationally. Last year, as part of the "Community of Practice" many LCA Networks were spotlighted in the bimonthly newsletters of the Life Cycle Initiative. In September, the Initiative engaged two events promoting life-cycle approaches in addressing environmental issues in Bangkok, Thailand: 1) co-hosted a seminar titled "[Dialogue on Life Cycle Approach to Addressing](#)

[Plastic Pollution](#)"; and 2) organized a [plenary session](#) on Life-cycle approaches to Circularity at the SEA of Solutions 2024. In addition, the Initiative supported the launch of the [MENA LCA Network](#) and the [African Life Cycle Assessment Initiative \(ALIES\)](#). The Initiative participated in the LCA workshops organized by MENA LCA Network and EDP International in Jordan (April 21st), Tunisia (November 29th), and Saudi Arabia (September 15th), as well as the launch of ALIES on December 5th.

2. Projects (or activities) to enhance the application of LCA

Progress on targets set for the period until 2027 as of the conclusion of 2024

Regional, national or subnational efforts integrate life-cycle approach with UNEP's support

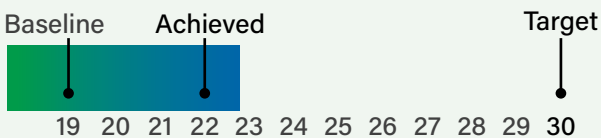


UNEP/MEAs' workstreams use/integrate Life-cycle thinking, approaches, data, and/or tools



Success Stories on positive impact of Life-cycle thinking in business decisions

[at least 2 stories feature an application led by a woman]



a. Life-Cycle Thinking in Buildings and Construction Sectors

In March, the “[10 Whole Life Cycle Recommendations for the Buildings Breakthrough](#)” was officially launched at the [Buildings and Climate Global Forum](#), with the ambition to promote Whole Life Cycle (WLC) policy thinking on a global stage, and to raise awareness on the significance of addressing Whole Life Cycle impacts in implementing the Buildings Breakthrough objectives. Additionally, two side events titled “[Accelerating the buildings breakthrough: tools and solutions for addressing whole life carbon, circularity, and shifting to bio-based materials](#)” and “[Gaming for near zero buildings: policy game to exemplify the 10 whole life cycle recommendations for the buildings](#)

[breakthrough](#)” were held at COP29. The former showcased key tools and case studies such as the Circularity Assessment Framework, Circular Transition Indicators (CTI), Bio-Based Materials Compendium, 10 Recommendations for Whole Life Carbon, and [Minoro](#), all aimed at advancing near-zero emission buildings. While the Policy Game helped participants address implementation challenges.

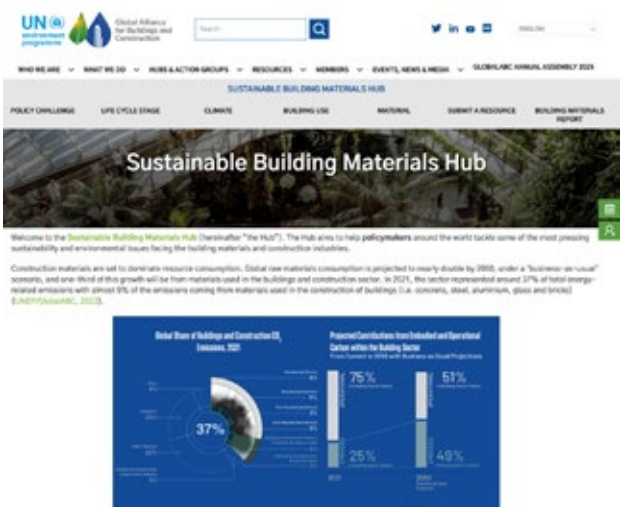


Figure 2: The Sustainable Building Materials Hub aims to help policymakers around the world tackle some of the most pressing sustainability and environmental issues facing the building materials and construction industries.

The Materials Hub of the GlobalABC, co-led by the Life Cycle Initiative, [One Planet Network](#) and the [Global Building Council Costa Rica \(GBCCR\)](#), has three sub-groups: Circular Built Environment (CBE) co-led by the [Finnish Ministry of Environment](#), and [RMIT University](#), Whole Life Carbon Policy Coalition (WLCP.Co) co-led by [UK Department for Energy Security and Net Zero \(DESNZ\)](#) and [World Business Council for Sustainable Development](#), and Bio-based Materials led by [Argentina's institute of engineers](#) and the Centre for Natural Material Innovation, University of Cambridge. CBE focuses on the assessment and advocacy of circularity in the buildings and construction sector, WLCP.Co targets the upskilling of policy makers to consider embodied emissions for decarbonizing the built environment. Lastly, the Bio-based Materials working group is responsible for supporting and accelerating the transition to bio-based, cost-effective, healthier, and innovative building materials.

b. Life-Cycle Thinking in Plastics

Building on the growing relevance of life-cycle approaches in addressing plastic pollution, in 2024 the Life Cycle Initiative continued to strengthen the capacity of governments and other actors to integrate a life-cycle approach to tackle plastic pollution.

In 2024, the Life Cycle Initiative, in collaboration with Thailand's National Science and Technology Development Agency (NSTDA), organized two key events focused on enhancing capacity in managing plastic pollution through life-cycle approaches. In July, the [virtual event](#) brought together participants from government, academia, and industry to explore how LCA can be



used to inform decisions, including assessing alternatives to single-use plastic products. On September 17, 2024, Thailand's National Metal and Materials Technology Center (MTEC), National Science and Technology Development Agency (NSTDA), and UNEP collaboratively hosted a seminar titled "[Dialogue on Life Cycle Approach to Addressing Plastic Pollution](#)" in Bangkok. The session, facilitated by the Government of Thailand, equipped Thai industries and entrepreneurs with Circular Economy knowledge and practical tools to implement it in their businesses, including LCA and USEtox as tools to avoid regrettable substitutions.

c. Life-Cycle Thinking in Textiles

Following the successful implementation of the [InTex project](#) in African countries, the Life Cycle Initiative proudly supported the launch of UNEP [InTex India](#) project in February 2024. This four-year project, funded by the Ministry of Foreign Affairs of Denmark, aims to accelerate the transition of the Indian textile sector towards circularity by focusing on both policy development with the Ministry of Textiles and practical implementation of life-cycle approaches and circular business models with Indian brands and manufacturing SMEs in textile clusters. The Surat, Karur and its adjoining clusters of Salem, Dindigul, and Perundurai, will receive technical assistance. The project will enable these stakeholders to adopt circular business models.

The InTex project also showcased its success at the UNEA-6 in a week-long expo and at a side event "[Connecting Threads](#)" from February 26 to March 1, 2024. This event highlighted how SMEs in Kenya, supported by InTex, have successfully scaled up and integrated circular solutions into their production processes, starting from assessing and reducing



their product environmental footprint using the [PEF methodology](#).

The UNEP InTex project has driven impactful change across the textile sector. Through collaborations at national, regional, and international levels [South Africa](#) is more and more transitioning to circularity and sustainable practices in the sector.

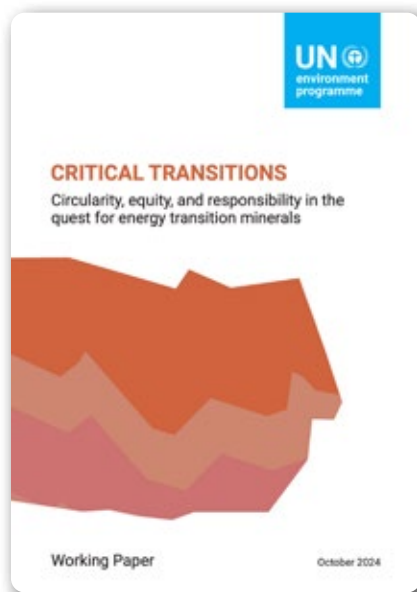
Similarly, in [Kenya](#), thanks to the LCA skills acquired through the project, partners are exploring the viability of alternative fibers such as banana stems. In [Tunisia](#), the InTex project is transforming the textile sector through sustainable approaches, including LCA and innovative solutions. [Testimonials](#) from stakeholders further highlight the positive impact of the project, underscoring its contribution to fostering sustainability in the global textile industry.

Looking ahead, the Life Cycle Initiative remains committed to fostering circularity in the textile sector through innovative projects, global collaboration, and evidence-based tools that drive sustainability and transparency.

d. Life-Cycle Thinking in Mining

In 2024, UNEP continued working on mining and minerals, addressing important topics such as how to sustainably harness critical energy transition minerals for sustainable development. UNEP provided secretariat and technical support to the [United Nation's Secretary General's Panel on Critical Energy Transition Minerals](#). The panel proposed seven voluntary Guiding Principles, building on existing norms, commitments and legal obligations outlined in United Nations texts and identified five Actionable Recommendations along the full life cycle of minerals.

Central to this work is the application of life-cycle thinking to analyze critical mineral value chains, ensuring a comprehensive approach to



sustainability. In November, the first working paper, [Critical Transitions: Circularity, Equity, and Responsibility in the Quest for Energy Transition Minerals](#), was published. The paper outlines a transformative vision for the future: achieving a more efficient, circular, and responsible use of energy transition minerals to advance the green transition while simultaneously addressing climate, biodiversity, and pollution goals, and highlights important questions to be addressed in future work.

The mining and minerals workstream will continue to expand its scope by actively engaging a broader range of stakeholders to address equity, biodiversity, and circularity challenges across the entire life-cycle of the mining sector.

e. Digital Product Information System (DPIS)

In 2024, the Life Cycle Initiative, in collaboration with the [One Planet Network](#), launched a research project to develop a global framework for Digital Product Information System (DPIS). Recognizing the transformative potential of DPIS in advancing the circular economy, this initiative seeks to establish a universally accepted blueprint that enhances transparency, accountability, innovation, efficiency, and sustainability across diverse sectors.

Significant milestones were achieved in May–June 2024, highlighting the project's early progress. To gauge regional awareness of DPIS, the team participated in ICT sector consultations organized

by the International Telecommunication Union (ITU) on “[Environment, Electromagnetic Fields \(EMF\), and Circular Economy](#)” for Africa and the Arab Region. Additionally, the project was showcased to stakeholders during the [World Summit on the Information Society \(WSIS\)+20 High-Level Event](#), ensuring visibility among global decision-makers. On October 30 and 31, [two consultations](#) were held, featuring presentations on various DPIS approaches.

Organizations with expertise in DPIS are encouraged to contribute their insights and explore potential partnerships to advance this collaborative effort toward creating a globally unified framework for Digital Product Passports.

2025 OUTLOOK

Following the strategy of the Life Cycle Initiative (2022-2027), in 2025 we aim to keep advancing our work on providing enabling conditions for LCA as well as enhancing its application in high-impact sectors.

WHAT YOU CAN EXPECT TO SEE IN 2025

New projects

- » LCA in Textiles
 - » Implementation of the InTex project in India, Indonesia, and several other countries to accelerate the transition to a circular textile sector through the integration of life-cycle approaches.
- » Generative AI and LCA Research paper

GLAM

- » Software Integration:
 - » Integration with key LCA software tools to facilitate the adoption and practical use of the GLAM.
- » Method Adaptation and Stewardship (2025 and beyond):
 - » Strong demand for reinforcing and offering a midpoint GLAM version. Introducing the missing midpoints, especially for the impacts of climate change, is a top priority.
 - » Support revisions and error correction based on user inputs.

GLAD

- » Bringing interoperability to LCA databases (2025 and beyond)

Biogenic Carbon Project

- » Advance Phase 2 with development of consensus on the recommendations.

USEtox

- » Public release of USEtox 3 combining human toxicity and ecotoxicity impact characterization of both chemical life cycle emissions and chemicals in consumer products.
- » Broadening the use of USEtox toward a wider set of decision contexts and application areas, including chemical substitution, chemical footprinting, risk prioritization, safe and sustainable-by-design, and cost-benefit analysis.
- » Advancing chemical footprinting approaches in the context of the [Global Framework on Chemicals](#), with USEtox as one of the core assessment tools.

MarILCA

- » Publication of regionalised factors covering all environmental compartments for microplastics impacts on ecosystems, of human health effect factors and of a case study on fisheries using all latest methodologies developed.

Capacity development

- » Continue supporting existing and new LCA Networks
- » Continue the dissemination efforts of [A policymakers' guide to LCA](#).

A Life Cycle Approach to Buildings and construction

- » Continue supporting the Buildings Breakthrough Agenda, through ensuring a life-cycle perspective is incorporated in the definitions and metrics.

A Life Cycle Approach to Mining

- » The integration of life-cycle approaches to minerals and metals in the Digital Knowledge Hub and its Online Communities of Practice, under development as part of United Nations Environment Assembly (UNEA) resolution 6/5 on Environmental Aspects of Minerals and Metals.

THANK YOU TO OUR FUNDING PARTNERS!

Work under the Life Cycle Initiative would not be possible without our funding partners.

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