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Swiss Activities in 2023

IEA EBC ANNEX 72/89



The 2226 Office, in Lustenau, Austria, serves as one of the reference buildings in EBC Annex 72.

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The author of this report bears the entire responsibility for the content and for the conclusions drawn therefrom.



Zusammenfassung

Die Schweiz leitet den IEA EBC Annex 72 und ist an der Vorbereitungsphase des neuen IEA EBC Annex 89 zu Ökobilanzen von Gebäuden beteiligt. Die Schweizer Aktivitäten 2023 umfassen das Fertigstellen der offiziellen Berichte und das Abschliessen des IEA EBC Annex 72 und andererseits auf die aktive Mitgestaltung des Inhalts des Annex 89 Texts sowie die Teilnahme an je einem Meeting des EBC ExCo und der Annex 89.

Résumé

La Suisse dirige l'Annexe 72 de l'EBC de l'AIE et participe à la phase préparatoire de la nouvelle Annexe 89 de l'EBC de l'AIE sur l'analyse du cycle de vie des bâtiments. Les activités suisses pour 2023 comprennent la finalisation des rapports officiels et la conclusion de l'Annexe 72 de l'EBC de l'AIE et, d'autre part, la participation active à l'élaboration du contenu du texte de l'Annexe 89 ainsi que la participation à une réunion de l'EBC ExCo et de l'Annexe 89.

Summary

Switzerland is leading the IEA EBC Annex 72 and is involved in the preparatory phase of the new IEA EBC Annex 89 on Life Cycle Assessment of Buildings. The Swiss activities in 2023 include the completion of the official reports and the finalisation of the IEA EBC Annex 72, and on the other hand, the active contribution to the content of the Annex 89 text as well as the participation in one meeting each of the EBC ExCo and the Annex 89.

Main findings

- When assessing environmental performance of buildings, the complete building in its entire life cycle must be considered, including all upstream and downstream processes. For the planning and assessment, suitable building and life cycle models with a high degree of transparency are needed to make model and data uncertainties visible and able to reduce.
- LCA databases for the building sector should cover construction materials, building technologies, energy supply, transport and waste management services. It should address life cycle related GHG emissions as well as other main environmental challenges. Extensive documentation, independent review and full data transparency are considered main features.
- Currently, benchmarks based on technical and/or economic feasibility are increasingly complemented by target values derived from planetary boundaries, taking into account the GHG emissions budget still available to meet defined global warming limits. With “(net) zero GHG emission”, the first universal benchmark exists.
- The environmental impacts of the building should be followed and reduced throughout the design process. Guidelines and recommendations help integrating the LCA into the design process and design tools and to visualize and communicate the LCA results to support the stakeholders involved in the building design process.
- The IEA EBC Annex 89 will contribute to the transition of the building and real estate sector towards net-zero whole-lifecarbon (NetZ-WLC) with guidelines, Paris-goal compatible assessment frameworks, an assessment of tools, aids and instruments, understanding the conditions for in-practice uptake and implementation of context based solutions and with engagement and knowledge exchange with diverse stakeholder groups.



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Abbreviations

EBC	Energy in Buildings and Communities Programme
GHG	Greenhouse gas
IEA	International Energy Agency
LCA	Life Cycle Assessment
PED	Primary Energy Demand
TCP	Technology Collaboration Programme



1 Introduction

1.1 Motivation

In the IEA EBC Annex 72, which is currently being finalized, the aim was to provide an overview of the current assessment approaches (especially focusing on Life Cycle Assessment methods - LCA) and to provide suggestions for the methodologies' further development and harmonization. During the work, several topics have been identified that have a big impact on the assessment of possible solutions on how to achieve net zero emissions in the construction and real estate sector. Rules and recommendations have been developed for these topics. In the new IEA EBC Annex 89 these must now be reviewed in terms of their practicality and implemented.

1.2 Purpose of the project

The implementation of the harmonised approaches in combination with practical strategies that should lead to the rapid decarbonisation of the building and real estate sector should be a priority since without this it will not be possible to limit the temperature increase to 1.5 degrees Celsius by 2050 (IPCC). Therefore, a new follow-up annex should be launched to build upon the harmonized methodology proposed by IEA Annex 72. The new annex aims to support decision makers in fulfilling decarbonisation roadmaps for single buildings and whole building stocks and policy makers in future-proof legal requirements.

This gives rise to the following questions:

- How can methodological principles and assessment tools be further developed to full application maturity and become generally accepted aids?
- What are the requirements for action for investors/builders and planners?
- How and where should requirements for limiting GHG emissions in the life cycle be integrated into the legislative process and what interactions arise with energy codes, among others?
- Should specific requirements for limiting embodied impacts (especially embodied carbon / upfront impacts) be developed?

1.3 Objectives

The focus of the follow up Annex 89 is the implementation of the theory to the practice. Due to the limited time available for reaching the climate mitigation goals it is necessary that there is enough information about potential mitigation options and that they are implemented timely. Moreover, the quest for reducing GHG emissions shall be accompanied by the estimation of other, equally important, environmental impacts, to avoid future burden-shifting. The aim is to further develop the methods and tools and to establish them in practice in such a way that, among other things, questions of resource use can also be mapped in the context of a circular economy. The methodology should be scientifically sound and robust enough to deliver adequate information that is capable to support decisions making and integration into the planning process. The new annex will serve as a proof of concept of the methodological guidelines developed within IEA EBC Annex 72 to support design decision makers into reaching climate targets. This includes the further development of BIM. In this context, questions of commissioning, remuneration and the training and further education of planners are also to be dealt with.

Important decisions in the life cycle of buildings are made by individual and institutional clients. This raises questions as to whether, where and how (net) zero emission buildings play a role in the task definition, financing (taxonomy), value assessment and in letting and marketing. The aim is to take greater account of the perspective of these stakeholder groups.



1.4 Scope

The object of the investigation would be the global/national building stock as well as single buildings (new construction and larger refurbishment of residential and non-residential buildings).

2 Results

2.1 IEA EBC Annex 72

The official deliverables have been reviewed by members of the Executive Committee, revised by the responsible lead authors and finally approved by the reviewers. The deliverables were published on the [IEA EBC Annex 72 website](#).

On 21 June 2023, the Executive Committee decided unanimously to close the IEA EBC Annex 72.

2.2 IEA EBC Annex 89

Since the Executive Committee meeting in November 2022 in Istanbul the IEA EBC Annex 89 core team prepared the Annex text. Two preparatory meetings (the first one online in February 2023, the second hybrid one in April 2023 in Vienna, Austria) were held to discuss the contents. The final Annex text was submitted to the Executive Committee with the request to approve the Annex text and to officially launch the working phase. The Executive Committee approved both requests unanimously on 20 June 2023. At that time, 12 letters of participation were signed (and another 5 were orally announced) and 24 Technology Readiness Assessments were completed.

3 Outlook and next steps

The official deliverables were revised based on the comments received from the Executive Committee reviewers, submitted for final approval and approved. They were published on 15 May 2023. The background reports are ready except for administrative matters (ISBN- and DOI numbers).

In parallel to the finalisation of the Annex 72 work, first ideas, topics and research questions were collected in view of a follow up Annex. The project concept was presented by the designated new Operating Agent, Prof. Alexander Passer and unanimously approved by the Executive Committee as Annex 89 ("Ways to implementation of whole life cycle based net zero greenhouse gas emissions buildings - Implementing net zero emission buildings"). The new Annex 89 held its preparatory meetings and will submit the Annex 89 text to the Executive Committee by 30 May 2023 latest.

4 National and international cooperation

On a national level cooperation took place between the Swiss organizations participating in Annex 72. We were coordinating the national surveys for the architects and planners and the buildings LCA experts with three Swiss member organisations (University of Applied Sciences of Western Switzerland (HES-SO), ETH Zurich and Paul Scherrer Institute). These were mainly conducted until the end of 2019. PSI joined in fall 2019 and focuses its work on Subtask 1 Methodology (uncertainty in construction material LCIs related to the evolution of the electricity mix used in construction material manufacture). It is likely that several Swiss partners will also join the IEA EBC Annex 89.



24 different countries (16 from Europe, 5 from Asia/Oceania and 3 from North and South America) are participating in the IEA EBC Annex 72. The IEA EBC Annex 72 fosters international cooperation and functions as a platform to exchange experience and knowledge. We use this to support the application of LCA on buildings in countries with yet little experience. We particularly support the Indian expert in IEA EBC Annex 72 in the development of guidelines to establish an easy-to-use LCA database for the construction sector profiting from the long-term experience with the KBOB recommendation 2009/1 (KBOB et al. 2022).

In the IEA EBC Annex 89 most countries and organisations continue to contribute. Further countries are considering to join, namely Egypt, Finland, Greece, Japan and Turkey while South Korea and The Netherlands step out. Currently 27 countries are expected to join IEA EBC Annex 89.

5 Communication

A combined event (special session) about the work of the IEA EBC Annexes 72 and 89 is planned to be held during the WSBE online conference (12-14 June 2024).

6 Publications

6.1 IEA EBC Annex 72

Eight official deliverables and the project summary report were established within IEA EBC Annex 72 (see Table 1). They are published on the official Annex [website](#).

A number of background reports are being prepared which allow the interested reader to get more information and find further thoughts and discussions about selected topics. They will be made available on the official Annex website too after the administrative issues (ISBN and DOI numbers) are resolved.



A	IEA EBC Annex 72 Website (https://annex72.iea-ebc.org/)
B	<u>Context-specific assessment methods for life cycle-related environmental impacts caused by buildings</u>
C	<u>Guidelines for design decision-makers</u>
D	<u>World Building life-cycle based Databases and Repositories for Building and Construction Sector</u>
E	<u>Assessing life cycle related environmental impacts caused by buildings –Case Study Collection</u>
F	<u>Benchmarking and target-setting for life cycle-related environmental performance of buildings</u>
G	<u>Guidelines for establishing an easy to use National LCA Database for the Construction Sector</u>
I	<u>Life-cycle optimization of building performance: a collection of case studies</u>
J	<u>Understanding the impact of individual, industry & political decisions on transitions towards environmental sustainability</u>
	<u>IEA EBC Annex 72 Project Summary report</u>

Table 1 List of official deliverables developed in IEA EBC Annex 72

6.2 IEA EBC Annex 89

No Annex related publications are available yet.

7 References

KBOB, ecobau and IPB (2022) KBOB-Recommendation 2009/1:2022: Life Cycle Assessment Data in Constructon, Status as at February 2022. Koordinationskonferenz der Bau- und Liegenschaftsorgane der öffentlichen Bauherren c/o BBL Bundesamt für Bauten und Logistik, retrieved from: https://www.kbob.admin.ch/kbob/it/home/publikationen/nachhaltiges-bauen/oekobilanzdaten_baubereich.html.