

CEN Workshop Methodology for Early-Stage Sustainability Assessment and Efficient Energy by Design

Workshop description form

- PART A – Workshop Summary
- PART B – Project Plan

PART B – Project Plan

Abstract

There is a gap between the start of any new chemical and biochemical process development project and full life cycle assessment (LCA), where a simple, non-expert assessment methodology would help better focus the project time on sustainability by design from the start.

Using a Multicriteria Decision Analysis (MCDA) based methodology in a facilitated study with the project team can ensure that environmental and social criteria are considered and scored for all process alternatives.

Further consideration mass intensity of the process routes will help select options to reduce GHP Scope 3 emissions, through reduced material consumptions and similarly considering energy efficiency can reduce GHP Scope 2 (Direct) emissions.

The Workshop will generate a methodology enabling project teams to make an early-stage sustainability assessment.

By detailing the assessment steps, we aim to provide a robust methodological framework that can be adopted across chemical and biochemical process development projects. This standardization is expected to facilitate the consistent and reliable early assessment of the relative sustainability of different process route options.

This CWA will be developed in the framework of ETERNAL European research project.

1 Status of the project plan

Draft project plan for public commenting (Version 1.0)

This draft project plan is intended to inform the public of a new Workshop. Any interested party can take part in this Workshop and/or comment on this draft project plan by sending an email to the WS secretary.

All those who have applied for participation or have commented on the project plan by the deadline will be invited to the kick-off meeting of the Workshop on 2025-06-19.

2 Workshop proposer and potential Workshop participants

This workshop is proposed in the framework of the EU-funded research project ETERNAL (GA 101057668).

More information: <https://www.eternalproject.eu/>

2.1 Workshop proposer

Proposed Chair: Rob Peeling. Technical Services Director at Britest Limited (contact details are provided in Part A of this form).

Proposed Vice-Chair: Dr. John Henderson. Technical Manager at Britest Limited (contact details are provided in Part A of this form).

Britest Limited is a not-for-profit company internationally recognised as one of the leading exponents of complete process design for the manufacturing industries. As specialists in capturing manufacturing process understanding through guided facilitation using proprietary tools and methodologies with project teams, Britest develops its methodologies aimed at enabling research progress, risk assessment and scale-up.

2.2 Potential participants

This CWA will be developed in a Workshop (temporary body) that is open to any interested party. The participation of other experts would be helpful and is desired.

Participation from the following ETERNAL project partners is expected:

- BRITEST LIMITED
- ENVIROEYE ENGINEERING LTD
- QUOTIENT SCIENCES (ALNWICK) LIMITED
- AIMPLAS - ASOCIACION DE INVESTIGACION DE MATERIALES PLASTICOS Y CONEXAS
- Other interested partners in ETERNAL

It is also recommended that:

- Environment and sustainability academic and research bodies
- Pharma Industry
- Biotechnology Industry
- Fine Chemicals Industry
- Policymakers focused on sustainability and innovation
- Standards application

take part in the development of this CWA.

3 Workshop objectives and scope

3.1 Workshop background

Life cycle assessment (LCA) is a detailed methodology which requires a significant investment of time and resource to carry out. In the early stages of chemical or biochemical process development there may be multiple route options to consider and the quality of, and uncertainty in the data available. Nevertheless, project teams need to make decisions on comparative sustainability at this early stage to focus effort on the more promising alternatives and minimise abortive work on less sustainable options. In essence, the team needs to be able to quickly judge, “Which alternatives are most likely to turn out to be more sustainable?”

Multicriteria Decision Analysis (MCDA) and other decision analysis tools developed within the field of operational research do not in themselves assist with defining appropriate decision-making criteria. Sustainability is a complex topic, and there are many factors that need to be considered. Within ETERNAL, Britest has developed a Framework for Early-Stage Sustainability Assessments (FESSA), developing a standard set of criteria to apply to the most sustainable route selection problem. The structure of the MCDA computed uncertainty range (CURE) calculation method enables the adoption of a multi-level/nesting approach with decision criteria. This fits well with the two-level system of criteria developed within FESSA, rendering the method practical for use as a

facilitation aid with teams seeking to make an assessment of the relative sustainability credentials of different process options at an early stage in the project (pre-LCA).

At the top level, there is a short list of criteria required when assessing the sustainability of a proposed process route. The three pillars of sustainability are central: *Environmental Impact*, *Social Impact* and *Economic Impact*. All are essential for a process to be sustainable. Two further high-level criteria are included in FESSA: *Technical Feasibility* and *Supply Chain Feasibility*. Each top-level criterion score is derived from the team's assessment of a set of weighted sub-criteria falling under the top-level topic.

Two key areas for improving the sustainable performance of processes are in terms of mass intensity and energy efficiency. Better outcomes are again possible if these are addressed very early in a project's lifecycle. Considering these two aspects ensures a project is addressing GHG Scope 3 emissions through better mass intensity and Scope 2 emissions through energy efficient design.

The Workshop aims to provide inputs compatible with the Irish standard (IS 399:2021) for Energy Efficiency Design. The standard embeds consideration of energy from the start of new investment projects minimising energy consumption through their lifecycle.

This is further underpinned by the SSbD European commission JRC report - Caldeira, C., Garmendia Aguirre, I., Tosches, D., Mancini, L., Abbate, E., Farcas, R., Lipsa, D., Rasmussen, K., Rauscher, H., Riego Sintes, J., Sala, S. *Safe and Sustainable by Design chemicals and materials. Application of the SSbD framework to case studies*, Publications Office of the European Union, Luxembourg, 2023, doi:10.2760/329423, JRC131878

The methodology, while derived within the framework of the ETERNAL green pharmaceutical manufacturing EU project, it is transferable to other manufacturing industries once the specific criteria for assessment have been defined and agreed.

The work was carried out within the ETERNAL Research and Innovation Action. This project has received funding from the European Union's Horizon Europe Framework Programme (HORIZON) under grant agreement No 101057668. The work of UK-based Associated Partners has been funded by UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee [Grant Number 10040111]. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or European Commission. Neither the European Union nor the European Commission can be held responsible for them.

4 Workshop programme

4.1 General

The kick-off meeting is planned to take place on 2025-06-19, online as virtual meeting. A draft for public commenting will be published for 30 days.

After the kick-off meeting, the necessary number of Workshop meetings (kick-off meeting and Workshop meetings) and web conferences will be held, during which the content of the CWA will be discussed, agreed and approved. The number of agreed meetings will be arranged as needed in the drafting and agreement process. Online work will be preferred to improve the sustainability of this work.

The working language (language of meetings, minutes, etc.) of the WS will be English. The CWA will be written in English.

4.2 Workshop schedule

A tentative timeline is described in the Figure below.



Table 1: Workshop schedule (preliminary)

CEN/CENELEC Workshop	Apr 25	May 25	Jun 25	Jul 25	Ago 25	Sep 25	Oct 25	Nov25	Dec 25	Ene 26	Feb 26	M12 Mar 26	
Initiation													
1. Workshop description form submission													
2. Open commenting period on draft project plan													
Operation													
3. Kick-off meeting													
4. CWA(s) development													
5. Open commenting period on draft CWA													
6. CWA(s) finalized and approved by WS participants													
Publication													
7. CWA(s) publication													
Dissemination													
Milestones													
				K	V	V	V	V				M/A	P D



Legend

- K** Kick-off
- M** Workshop meeting
- V** Virtual Workshop meeting
- A** Adoption of CWA
- P** Publication of CWA
- D** Online distribution of CWA

5 Resource planning

Registration and participation at this CEN Workshop are free of charge, but each participant shall bear his/her own costs for travel, accommodation, and subsistence in the case of on-site meetings (at the moment of writing this document most meetings are planned to take place on-line).

The administrative costs of the CEN Workshop Secretariat will be financed within the framework of a research project: European Union's Horizon Europe Framework Programme (HORIZON) funded project ETERNAL under grant agreement No 101057668.

The copyright of the CWAs shall be with CEN. 8% secretariat costs will be provided by UNE to CCMC to cover the free download of the published CWA.

6 Workshop structure and rules of cooperation

6.1 Participation in the Workshop

The Workshop will be constituted during the kick-off meeting. By approving this project plan, the interested parties declare their willingness to participate in the Workshop and will be formally named as Workshop participants, with the associated rights and duties. Participants at the kick-off meeting who do not approve the project plan are not given the status of a Workshop participant and are thus excluded from further decisions made during the kick-off meeting and from any other decisions regarding the Workshop.

As a rule, the request to participate in the Workshop is closed once it is constituted. The current Workshop participants shall decide whether any additional members will be accepted or not.

Any new participant in the Workshop at a later date is decided on by the participants making up the Workshop at that time. It is particularly important to consider these aspects:

- a. expansion would be conducive to shortening the duration of the Workshop or to avoiding or averting an impending delay in the planned duration of the Workshop;
- b. the expansion would not result in the Workshop taking longer to complete;
- c. the new Workshop participant would not address any new or complementary issues beyond the scope defined and approved in the project plan;
- d. the new Workshop participant would bring complementary expertise into the Workshop in order to incorporate the latest scientific findings and state-of-the-art knowledge;
- e. the new Workshop participant would actively participate in the drafting of the manuscript by submitting concrete, not abstract, proposals and contributions;
- f. the new Workshop participant would ensure wider application of the CWA.

All Workshop participants who approved the publication of the CWA or its draft will be named as authors in the European Foreword, including the organizations which they represent. All Workshop participants who did not approve the publication of the CWA will not be named in the European Foreword.

6.2 Workshop responsibilities

The Workshop Chair is responsible for content management and consensus building. The Workshop Chair is supported by the Workshop Vice-Chair (if any) and the responsible Workshop secretariat, whereby the Workshop secretariat will always remain neutral regarding the content of the CWA(s). Furthermore, the Workshop secretariat shall ensure that CEN-CENELEC's rules of procedure, rules of presentation, and the principles governing the publication of CWA(s) have been observed. Should a Workshop Chair no longer be able to carry out her/his duties, the Workshop secretariat shall initiate the election of a new Workshop Chair. The list below covers the main tasks of the Workshop Chair. It is not intended to be exhaustive.

- Content related contact point for the Workshop
- Presides at Workshop meetings
- Ensures that the development of the CWA respects the principles and content of the adopted project plan
- Manages the consensus building process, assesses when the Workshop participants have reached agreement on the final CWA, on the basis of the comments received
- Ensures due information exchange with the Workshop secretariat
- Represents the Workshop and its results to exterior

The Workshop secretariat, provided by a CEN and/or CENELEC Member, is responsible for organizing and leading the kick-off meeting, in consultation with the Workshop proposer. Further Workshop meetings and/or web conferences shall be organized by the Workshop secretariat in consultation with the Workshop Chair. The list below covers the main tasks of the Workshop secretariat. It is not intended to be exhaustive.

- Administrative and organizational contact point for the Workshop
- Ensures that the development of the CWA respects the principles and content of the adopted project plan and of the requirements of the CEN-CENELEC Guide 29
- Formally registers Workshop participants and maintains record of participating organizations and individuals
- Offers infrastructure and manages documents and their distribution through an electronic platform
- Prepares agenda and distributes information on meetings and meeting minutes as well as follow-up actions of the Workshop
- Initiates and manages CWA approval process upon decision by the Workshop Chair
- Interfaces with CEN-CENELEC Management Centre (CCMC) and Workshop Chair regarding strategic directions, problems arising, and external relationships
- Advises on CEN-CENELEC rules and brings any major problems encountered (if any) in the development of the CWA to the attention of CEN-CENELEC Management Centre (CCMC)
- Administrates the connection with relevant CEN or CENELEC/TCS

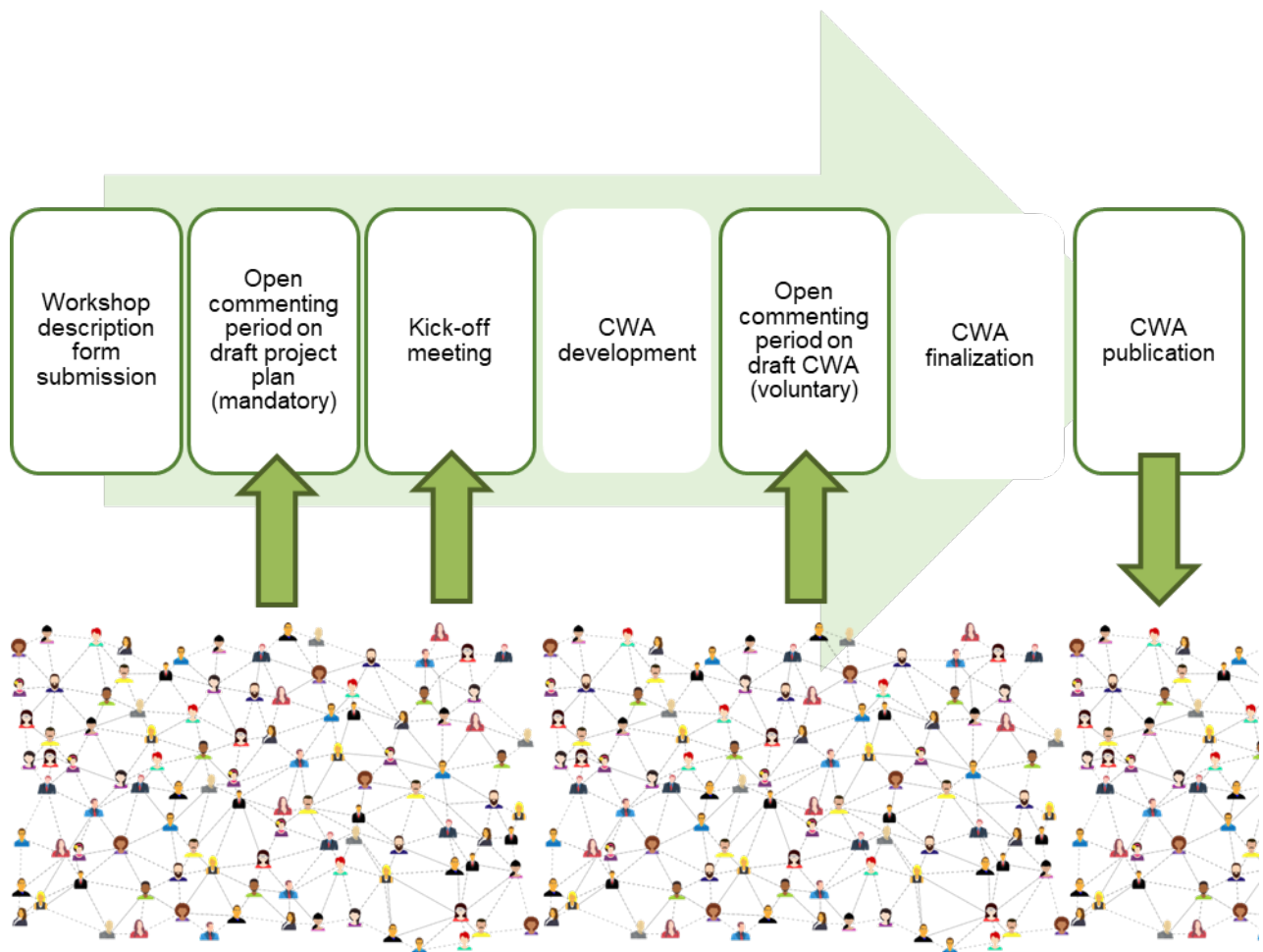
6.3 Decision making process

The CEN and/or CENELEC Workshop Chair is responsible for ensuring that the development of the CWA follows the principles and content of the project plan described in this document and the requirements of CEN-CENELEC Guide 29. The CEN and/or CENELEC Workshop Chair may take decisions on the conduct of the CEN and/or CENELEC Workshop on the basis of the comments expressed by the participants and of CEN-CENELEC Guide 29.

Decisions shall be taken based on consensus of the WS participants.

7 Dissemination and participation strategy

Potential participants identified in section 2.2 and potential interested stakeholders identified in Part A should be informed of the open commenting phase, if any, and of the publication of the CWA.



In addition to the CCMC website, the final CWA might be advertised on:

- sector specific newsletter
- social media, such as
 - Facebook
 - Instagram
 - LinkedIn
 - X
- Research Gate
- EC Newsroom
- Others