
**Draft Project plan for the CEN
Workshop on “SEA4VALUE -
Brine mining- Recovery of
minerals and metals from
brines of seawater desalination
plants”**

**Requests to participate in the Workshop
and/or comments on the project plan are
to be submitted by 22nd January, 2024 to
mario.gallo@uni.com¹**

Recipients of this project plan are kindly requested
to name all patent rights known to them to be
relevant to the Workshop and to make available all
supporting documents.

Milano, 11th December, 2023 (Version 1)

¹ Applications for participating in the Workshop and comments on the project plan that are not received by the deadline do not need to be taken into consideration. Once constituted, the Workshop will decide whether or not to consider the comments received in good time.

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Summary

The EU-funded Sea4Value project (GA no. N°869703) is the first attempt to recover minerals and metals from brines produced in seawater desalination plants in a cost-effective way. The main focus will be on separating, concentrating and crystallising Molybdenum, Magnesium, Scandium, Vanadium, Gallium, Boron, Indium, Lithium, Rubidium and Calcium from brines, where they can be found in low concentrations. To do that, a multimineral and modular process is developed for brine mining. The implementation of brine mining in seawater desalination plants offers new business opportunities, which can bring value to markets, environment, and society. The CWA which will be developed by this CEN/WS aims to provide guidance and recommendations on best practices for sustainable brine mining to ensure transfer of innovation into practice.

Moreover, the document will provide recommendations on good practice approaches, advice on the requirements of circularity in SWDP as well as considerations on environmental and economic impacts and evaluation. Besides the recommendations for the process of brine mining, recommendations will also be made for the recovered product, the minerals and metals, to ensure that the new products meet the market demand.

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. Please send any requests to participate or comments by e-mail to mario.gallo@uni.com.

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 **2024-01-31**.

2 Workshop proposer and Workshop participants

The main workshop participants will be the partners of the EU funded Horizon 2020 project SEA4VALUE- Brine mining- Recovery of minerals and metals from brines of seawater desalination plants ², under grant agreement N°869703.

The project consortium comprises 16 partners from 8 different European countries: Spain, Germany, Italy, Belgium, Ukraine, Netherlands, Finland and Switzerland.

Workshop proposer will be DECHEMA e.V. one of the project partner, which is in charge of the market analysis reports for the minerals and metals that are going to be recovered and involved in the implementation of the brine composition catalogue and database.

<u>Person or organisation</u>	<u>Short description and interest in the subject</u>
<u>Ramona Simon, DECHEMA e.V.</u>	DECHEMA e.V. is the expert network for chemical engineering and biotechnology in Germany. As a non-profit professional society, we represent these fields in science, industry, politics and the public. In projects, DECHEMA works on future tasks across disciplinary boundaries. DECHEMA e.V. identifies new trends in research and technology. DECHEMA e.V. aim is to translate research findings into technical applications. This is how DECHEMA e.V. shape progress in chemical engineering, biotechnology and related fields of research.

² <https://sea4value.eu/>

	<p>DECHEMA e.V. is partner of the EU-funded Sea4Value project. Sea4Value aims to develop technologies to recover minerals and metals from brines produced in seawater desalination plants.</p> <p>Sea4Value has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 869703</p>
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2.1 Other 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. It is recommended that:

- Operator of seawater desalination plants
- Engineering companies
- end-users , traders, distributor of M&M
- Governments and environmental authorities
- Research projects dealing with brine mining

take part in the development of this CWA.

2.2 Participants at the kick-off meeting

The following persons or organisations already signed up to the kick-off meeting prior to the publication of the draft project plan.

Person	Organisation
Workshop proposer and Chair - Ramona G. Simon	DECHEMA e.V.
Workshop Vice-chair - Maria Salud Camilleri-Rumbau	Fundació Eurecat
Workshop Project Leader - <u>Naiara Hernández Ibáñez</u>	FCC Aqualia, S.A.

2.3 Registered Workshop participants

The following persons or organisations have registered as Workshop participants at the kick-off meeting and will actively participate in the development of the CWA.

Person	Organisation/Role
Ramona G. Simon	Workshop Chair
Maria Salud Camilleri Rumbau	Workshop Vice-Chair
<u>Naiara Hernández Ibáñez</u>	Workshop Project Leader

Heike Glade	University of Bremen, Germany
Clio Deferm	KU Leuven
Arto Pihlajamäki	LUT University, Finland
Ramón Pericet	Técnicas Reunidas SA
Alexandra Scherer	European Science Communication Institute gGmbH
<u>Aina Amengual Oliver</u>	<u>Catalan Water Partnership</u>

3 Workshop objectives and scope

3.1 Background

According to the Critical Raw Material Act, the diversification of raw material supply chains is fostered.

The Sea4Value project contributes to the diversification of raw materials sourcing and aims to secure the supply of raw materials from already existing sources.

Brines produced in Seawater desalination plants are multi-mineral and are an enormous potential source of minerals and metals as 19,744 plants are installed worldwide. By now, these brines are not broadly used for the extraction of (critical) raw materials, instead the brines are discarded. See figure 1.

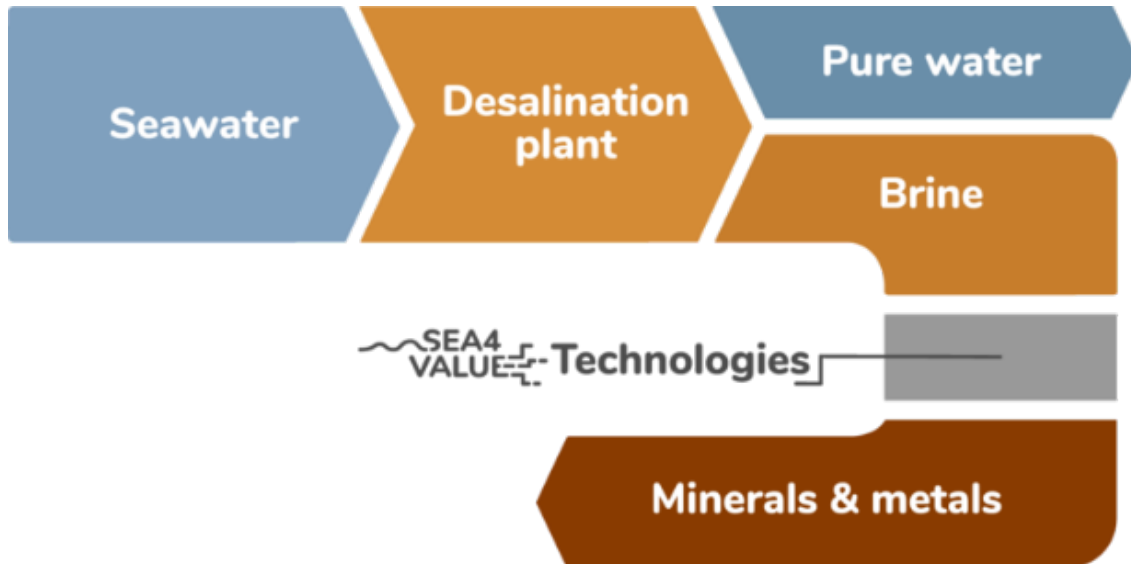


Figure 1 Applying a circular supply model: Seawater brines as a resource of raw materials recovery

The EU-funded Sea4Value project is the first attempt to recover minerals and metals from brines produced in seawater desalination plants in a cost-effective way. The main focus will be on separating, concentrating and crystallising Molybdenum, Magnesium, Scandium, Vanadium, Gallium, Boron, Indium, Lithium, Rubidium and Calcium from brines, where they can be found in low concentrations. To do that, a multimineral and modular process is developed for brine mining. The implementation of brine mining in seawater desalination plants offers new business opportunities, which can bring value to markets, environment, and society.

With this CEN Workshop, brine mining is to be standardised so that it can serve as a building block for a secure supply of raw materials in the future. To achieve this, it is necessary to remove the barriers to the introduction of a new process and new raw materials by ensuring reliability, knowledge transfer, and quality. Common standards help remove technical barriers to trade, open up markets and make businesses more competitive. Standardisation

can act as a catalyst for innovation. To the best of our knowledge, there are no standards on brine mining from seawater desalination plants (SWDP).

The Sea4Value process is novel and planning, designing, implementing and operation needs to be guided to secure and ease the application of this process in practice. Moreover, the recovered M&M are a new raw materials source in the EU. With regularization quality requirements of these products need to be assured, so that industries can rely on safe and reliable raw materials.

3.2 Scope

The planned CEN Workshop Agreement (CWA) which will be developed by the CEN/WS aims to provide guidance and recommendations on best practices for sustainable brine mining to ensure transfer of innovation into practice. The guidance refers on the processing of brines to recover minerals and metals and on the properties of the recovered minerals and metals.

In order to achieve a common understanding, a language for describing brine mining needs to be developed as well as terms and system boundaries of brine mining need to be defined.

Moreover, it is planned to describe, explain, and agree on the core elements of brine mining. This will include advice on the fundamental prerequisites, pre-treatment, key (technologic) elements/methods and post-treatment will be specified and recommendations for planning, design, implementation and operation will be given.

The CWA will provide recommendations on good practice approaches, advice on the requirements of circularity in SWDP as well as considerations on environmental and economic impacts and evaluation. Besides the recommendations for the process of brine mining, recommendations will also be made for the recovered product, the minerals and metals, to ensure that the new products meet the market demand.

The planned CEN Workshop Agreement is intended to be used by operators of seawater desalination plants, engineering companies, end-users, traders and distributor of recovered minerals and metals as well as government and environmental authorities.

The proposed CWAs will not provide guidance and recommendations for sustainable mining of brines that are not produced in Seawater desalination plants.

3.3 Related activities

The subject of the planned CWA is not at present the subject of a standard or is covered by a specific CEN/TC. However, there are some standards and/or other technical specifications that deal with related subjects and thus need to be taken into account during this Workshop.

In particular, the following documents will be considered during the development of the CWA:

- EN 12901:1999 (WI=00164184) Products used for treatment of water intended for human consumption - Inorganic supporting and filtering materials – Definitions
- EN ISO 21078-1:2008 (WI=00187110) Determination of boron (III) oxide in refractory products - Part 1: Determination of total boron (III) oxide in oxidic materials for ceramics, glass and glazes (ISO 21078-1:2008)
- CEN/TR 16928:2016 (WI=00165270) Guidance for the implementation of environmental aspects in product standards and system standards in the field of wastewater engineering
- EN 12255-13:2023 (WI=00165330) Wastewater treatment plants - Part 13: Chemical treatment - Treatment of wastewater by precipitation/flocculation
- CWA 17354:2018 (WI=WS093001) Industrial Symbiosis: Core Elements and Implementation Approaches Water reuse regulation

4 Workshop programme

4.1 General

The kick-off meeting is planned to take place on-line on 2024-01-31. A draft for public commenting will be published for 30 days.

At least 6 workshop meetings (kick-off meeting and Workshop meetings) and web conferences will be held, during which the content of the CWA(s) will be presented, discussed and approved.

The CWA will be drawn up in English (language of meetings, minutes, etc.). The CWA will be written in English.

4.2 Workshop schedule

Table 1: Workshop schedule (preliminary)

CEN/CENELEC Workshop	M0 1	M02	M03	M04	M05	M06	M07	M08	M09	M10	M11	M12
Initiation												
1. Proposal form submission and TC response												
2. Project plan development												
3. Open commenting period on draft project plan (mandatory)												
Operation												
4. Kick-off meeting												
5. CWA(s) development												
6. Open commenting period on draft CWA(s) (optional)												
7. CWA(s) finalised and approved by Workshop participants												
Publication												
8. CWA(s) publication												
Dissemination (see 7)												
Milestones												

- B** CEN/CENELEC BT meeting deciding on establishment of a CEN/CENELEC Workshop
- K** Kick-off
- M** Workshop meeting -Virtual Workshop meeting
- A** Adoption of CWA
- P** Publication of CWA
- D** Online distribution of CWA

5 Resource planning

The registration and participation at this CEN Workshop is free of charge, but each participant will bear his/her own costs for travel and subsistence.

The administrative costs of the Workshop Secretariat and other logistical support are financed within the framework of SEA4VALUE research project (GA No 869703).

6 Workshop structure and rules of cooperation

6.1 Participation in the Workshop

The Workshop will be constituted during the course of 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 voted for the publication of the CWA or its draft will be named as authors in the European Foreword, including the organisations which they represent. All Workshop participants who voted against the publication of the CWA, or who have abstained, will not be named in the European Foreword.

6.2 Workshop responsibilities

The Workshop Chair is responsible for content management and any decision-making and voting procedures. The Workshop Chair is supported by the Workshop Vice-Chair and by the Workshop Project Leader, 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, decides 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/CENELEC national member, is responsible for organising and leading the kick-off meeting, in consultation with the Workshop proposer. Further Workshop meetings and/or web conferences shall be organised 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.

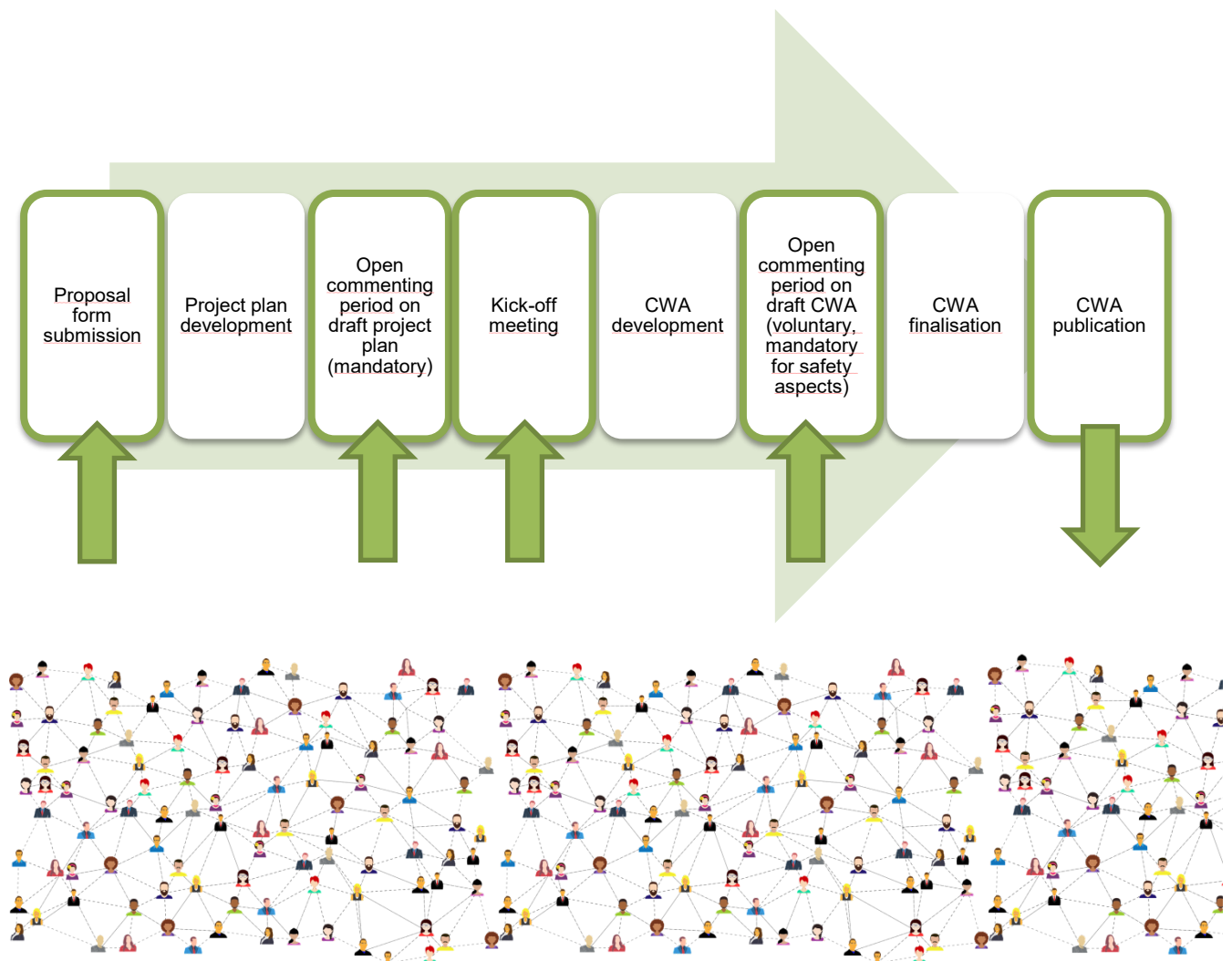
- Administrative and organisational contact point for the Workshop
- Ensures that the development of the CWA respects the principles and content of the adopted project plan and of the requirements of the CEN-CENELEC Guide 29
- Formally registers Workshop participants and maintains record of participating organisations and individuals
- Offers infrastructure and manage documents and their distribution through an electronic platform
- Prepares agenda and distribute information on meetings and meeting minutes as well as follow-up actions of the Workshop
- Initiates and manage CWA approval process upon decision by the Workshop Chair
- Interface with CEN-CENELEC Management Centre (CCMC) and Workshop Chair regarding strategic directions, problems arising, and external relationships
- Advises on CEN-CENELEC rules and bring 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

Each Workshop participant is entitled to vote and has one vote. If an organisation sends several experts to the Workshop, that organisation has only one vote, regardless of how many Workshop participants it sends. Transferring voting rights to other Workshop participants is not permitted. During voting procedures, decisions are passed by simple majority; abstentions do not count.

If Workshop participants cannot be present in the meetings when the CWA or its draft is adopted, an alternative means of including them in the voting procedure shall be used.

7 Dissemination and participation strategy



Proposal form submission

The Workshop proposal will be disseminated to the following relevant stakeholders and bodies for consultation:

- standards committee, working group etc.
- Operator of seawater desalination plants
- Engineering companies
- end-users , traders, distributor of M&M
- Governments and environmental authorities
- Research projects dealing with brine mining

Open commenting period on draft project plan

The project plan will be disseminated to the following relevant stakeholders and bodies for commenting:

- standards committee, working group etc.
- Operator of seawater desalination plants
- Engineering companies
- end-users , traders, distributor of M&M
- Governments and environmental authorities
- Research projects dealing with brine mining

In addition to the CCMC website, the project plan and the date of the kick-off meeting will be advertised on social media raise awareness. Interested parties are requested to contribute either through commenting of the project plan (short term) or through Workshop participation (long term).

Open commenting period on draft CWA (if any)

In case the draft CWA will be submitted to public commenting period, it will be disseminated to the following relevant stakeholders and bodies for commenting:

- standards committee, working group etc.
- Operator of seawater desalination plants
- Engineering companies
- end-users, traders, distributor of M&M
- Governments and environmental authorities
- Research projects dealing with brine mining

In addition to the CCMC website, the draft CWA will be advertised on UNI website and social media to raise awareness. Interested parties are requested to contribute through commenting of the draft CWA (short term).

CWA publication

The final CWA will be disseminated to the following relevant stakeholders and bodies:

- standards committee, working group etc.
- Operator of seawater desalination plants
- Engineering companies
- end-users , traders, distributor of M&M
- Governments and environmental authorities
- Research projects dealing with brine mining

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

- sector specific newsletter
- social media, such as
 - Facebook
 - Instagram
 - LinkedIn
 - Twitter
- Newsletters

8 Contacts

- Workshop Chair:

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