

# DESAL+ STARTUPS PROGRAMME

Instituto Tecnológico de Canarias, S.A.

**FINAL REPORT OF THE PRELIMINARY MARKET CONSULTATION WITHIN  
THE FRAMEWORK OF THE DESAL + STARTUPS INITIATIVE  
"PROGRAMME FOR THE SUPPORT OF STARTUPS INVOLVED IN THE  
DESALINATION OF WATER AND THE  
DESALINATED WATER-ENERGY NEXUS KNOWLEDGE".**

**FEBRUARY 2021**

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## 1. Introduction

This report summarises and analyses the proposals received in the preliminary market consultation carried out by Instituto Tecnológico de Canarias, S.A. (hereinafter referred to as ITC), within the framework of the **DESAL+ Startups Programme**, intended to obtain technological solutions applicable to the local industry and to foster entrepreneurship within the framework of the DESAL+ LIVING LAB Platform. The consultation was launched in order to learn the state of the art of pre-commercial disruptive desalination technologies and to increase the value of the brine generated throughout the desalination process.

ITC is a public company of the Canary Islands that, for over 25 years, has been supporting science and technology as essential elements for the social-economic transformation and for the sustainable development of the Canary Islands. ITC is a separate entity providing technical services to the Public Administration of the Autonomous Community of the Canary Islands and to the entities that are linked to or under the umbrella of the said Autonomous Community. Besides, ITC acts as an awarding entity in public procurement procedures and its business purpose includes "to foster and coordinate research applied to the Canary Islands" as well as "to boost the development of the productive system of the Autonomous Community", "to promote the business training level of the Autonomous Community" and "to boost and facilitate the creation, the development and the assimilation of technology by the companies in the Canary Islands in order to improve their competitiveness".

The **DESAL+ Startups Programme**, funded by Cabildo de Gran Canaria (Government of the Island of Gran Canaria) – Sociedad de Promoción Económica de Gran Canaria (Society for the Economic Promotion of Gran Canaria), aims to attract and generate knowledge and (pre-commercial) disruptive technology in the desalination industry in Gran Canaria, with a high international projection in some pre-established specific topics. For this purpose, the DESAL+ Living Lab aims to support the entrepreneurial ecosystem in order to develop technologies and business models in desalination, facilitating investments and the testing of the solutions presented by innovative start-ups.

## 2. Description of the DESAL+ Startups Programme

The preliminary market consultation (PMC) of the DESAL+STARTUPS is intended to deal with the following challenges:

- **CHALLENGE 1. Circular Economy Strategy:** Exploitation of the brine generated by the desalination plants: solutions and processes increasing the value of brine on the path to minimising the discharge of brine as much as possible.
- **CHALLENGE 2. Emerging desalination:** new desalination projects, whether alternative or supplementary to reverse osmosis (SL9), including new non-commercial sub-processes or changes of the current technology, improving the energy efficiency of the desalination process.

Based on these goals, a preliminary market consultation (PMC) on the need for pre-commercial innovative solutions on sea water desalination (focused on the said strategic lines and the R&D&i goals) was launched on the 20<sup>th</sup> of November 2020 ([for detailed information, please refer to the Terms & Conditions of the Preliminary Market Consultation](#)).

### 3. Methodology used in the PMC

The PMC was developed by the team of ITC that is responsible for the direction of the **DESAL+ Startups projects**, as well as by several engineers involved in each of the areas covered by this initiative.

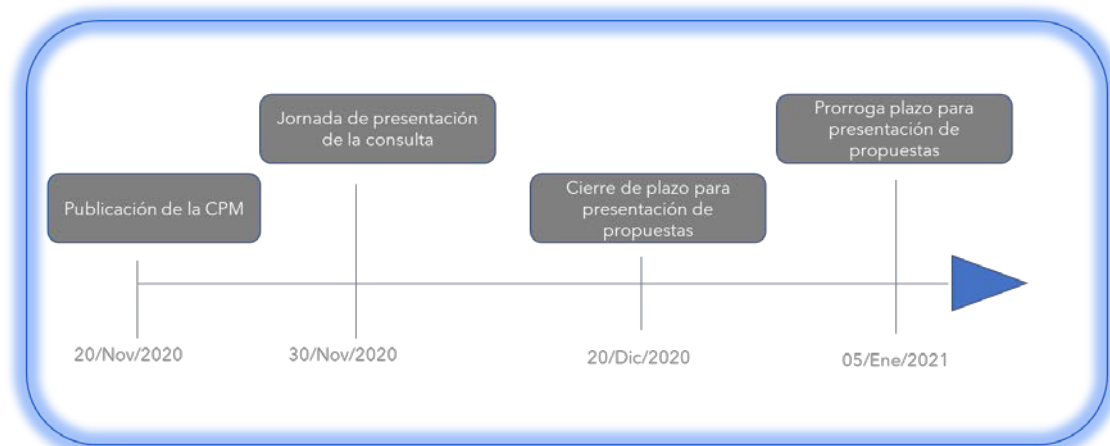
Additionally, ITC also received advice from Knowsulting, S.L., a company specialised in the development of Preliminary Market Consultation and Pre-Commercial Public Procurement procedures, in accordance with section 115.1 of the Spanish Public Sector Procurement Act (LCSP).

Knowsulting's expert advisers that participated in this project were:

- Mr Manuel Varela, Director of the Public Sector Area
- Mr Carlos Jiménez, Managing Director of the Public Sector Area

These expert advisers accompanied the ITC's team in the information events, contributing with their knowledge and expertise in the field of Public Innovation Procurement and PMC procedures, supporting the operational and administrative tasks in the development of the works, spreading the announcement of the call for proposals, organising and participating in the presentation events, supporting the assessment of the proposals received, participating in internal follow-up meetings, etc.

The following timeline shows the development of the PMC, explained in detail below:



## Publication of the Terms & Conditions of the PMC

The document with the Terms & Conditions of the call for proposals of the PMC of the **DESAL+ Startups Programme** was published, in Spanish and English, on the **20<sup>th</sup> of November 2020** both on the [platform for public sector contracts](#), and on the website of the [DESAL+ LIVING LAB platform](#). The call for proposals was aimed at international start-ups with disruptive technological solutions not available in the market that respond to the two challenges mentioned above: valorisation of brine and emerging desalination technologies.

The information and the application form to be completed in order to submit proposals is still available on the [Programme's website](#).

## Information sessions and workshops

On the 30<sup>th</sup> of November 2020, a webinar was held to present the Market Preliminary Consultation within the framework of the "DESAL+ Startups" initiative, introducing and explaining the process in accordance with the specific procedure.



The image shows a screenshot of a presentation slide. The slide has a blue background with white and yellow text. The main title is "DESAL+ Startups PRE-COMMERCIAL PUBLIC PROCUREMENT". Below this, it says "Preliminary Market Consultation on SEAWATER DESALINATION processes:". There are two challenges listed: "CHALLENGE1: valorisation of desalination brine" and "CHALLENGE2: emerging desalination technologies". A URL "desalinationlab.com/technological-challenges" is provided. The slide also features a large graphic on the left with the words "BRINE", "LOW ENERGY CHALLENGES", "DESALINATION", "EMERGENT", "PRE-COMMERCIAL", "IDEAS", and "DESAL+" arranged in a circular pattern. At the bottom, there are logos for "DESAL+ DESALINATION LIVING LAB", "itc", "Gobierno de Canarias", "Cabildo de Gran Canaria", "spegc", and "GOBIERNO DE ESPAÑA MINISTERIO DE CIENCIA, INNOVACIÓN Y UNIVERSIDADES". A timestamp "2020-11-30 10:01:20" is visible in the bottom right corner.

Such presentation event was recorded and is available on the following link:

[Presentation session of the Preliminary Market Consultation PMC | DESAL+ Startups - YouTube](#)

[A Frequently Asked Questions \(FAQs\) document](#), containing the questions answered during the presentation session or received by email by ITC, is also available.

## Management of answers to the PMC

The deadline for the submission of proposals was planned for the 20<sup>th</sup> of December 2020, but it was extended until the 5<sup>th</sup> of January 2021. The deadline was extended because several entities interested in submitting their proposals asked for a longer term, in order to be able to submit a more complete proposal.

At the end of the extended term, 10 proposals from different entities had been received. Such proposals were filed and the appropriate assessment and analysis started.

## Interviews with participants

The terms and conditions of the call for proposals envisaged the possibility to develop interviews with the participants, in order to discuss in depth the information provided, clear up doubts regarding the proposals, etc.

However, ITC did not use this possibility, since the answers provided in the application forms were adequate and were sufficiently detailed.

## 4. Conclusions of the PMC

### Conclusions regarding the participation

A total of 10 proposals were received to respond to each of the challenges presented by ITC. Out of the 10 proposals, 2 were presented by the same entity.

Regarding the challenges that the proposals may respond to, out of the 10 proposals, 8 proposals were received to respond to challenge no. 2: emerging desalination. 1 proposal was received to respond to challenge 1: circular economy. 1 proposal may respond to both challenges.

For the **countries of origin of the entity** submitting the proposal (9), they can be classified as follows:

- 5 from Spain
- 1 from the Netherlands
- 1 from Austria
- 1 from the United Kingdom
- 1 from Iran

It must be emphasised that only one proposal was submitted from the entity based in the Autonomous Community of the Canary Islands (Spain), the region where ITC is located.

For the **type of entities** submitting the proposals, they come from:

- 2 Higher education institutions (universities) with leading knowledge applicable to the challenges.
- 3 European technological centres of reference in R&D&i
- 3 Startups.
- 1 Company.

Most proposals have been presented independently (7 out of 10) and 3 have been presented by joint entities.

For the **activity sectors** of the entities submitting proposals, they can be classified as set out in the following chart:



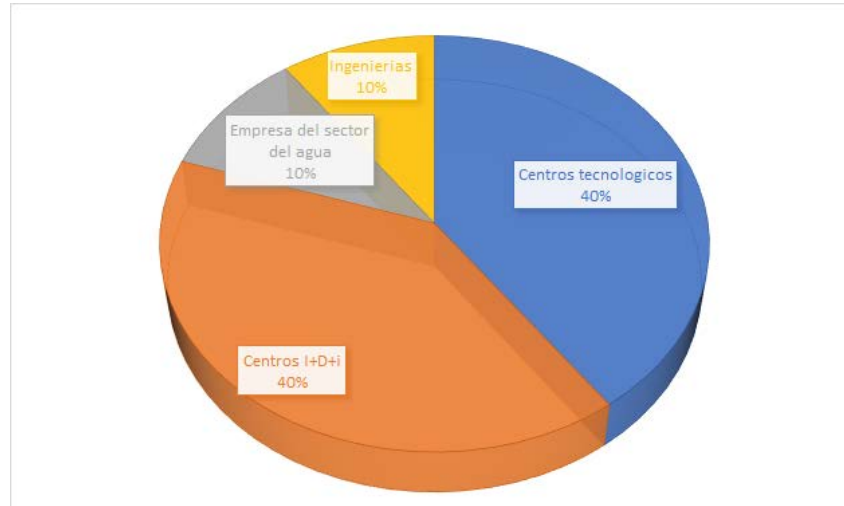


Chart 1: Participation in the PMC according to their type. Own preparation.

For the type of solution put forward, the proposals can be classified as follows:

- 2 software-related proposals.
- 8 hardware-related proposals - pilot plant.

Regarding the existence of patents and IP protection, the proposals can be classified as follows:

- 5 proposals are protected by patents.
- 5 proposals are not covered by patents.

All the participants claim having expertise in research related to the challenges, as well as in the development of solutions appropriate for the challenges.

For the participation, it can be concluded that:

- The topic of **CHALLENGE 2 – emerging desalination** attracted more interest and the market response was more successful.
- With regards to the profile of the entities interested, it must be emphasised that most proposals were not submitted by companies, but from research institutions: technology centres and research centres, including universities.
- Specifically, for the 4 companies submitting proposals, it must be emphasised that 3 of them are start-ups.

- For the contribution with innovative solutions, the participation of technology and research centres was especially significant. These entities have a deep knowledge and a backup of sound knowledge that is very appropriate for the underlying issues of each challenge.
- Most of the entities and the research staff submitting proposals consider they are qualified and experienced in the problems and technologies presented and in the management of R&D projects.
- Some proposals suggest the possibility to establish synergies with ongoing projects, in order to supplement R&D budgets.

## Conclusions on the state of the market in pre-commercial solutions and the scope of the proposals submitted

As mentioned above, there is a higher interest in CHALLENGE 2 - emerging desalination. Therefore, in the case that a potential pre-commercial public procurement procedure is finally launched, more participation and competition in this challenge is expected.

In general, the proposals' TRL range from 3 to 5, so they fit into the usual standards of pre-commercial public procurement procedures. Some proposals and some elements of the system start from a TRL 2. However, at least two of the proposals submitted have a TRL above 7 (presented for challenge 2), outside of the innovation development goals expected for the pre-commercial public procurement procedure.

To deal with challenge no. 1 - circular economy, the proposals submitted can be described as follows:

- Big-data systems, based on the collection of georeferenced information obtained from the processes of desalination and valorisation of brine, analyse such data and use artificial intelligence in order to make decisions (this can be also applied to challenge no. 2).
- Disruptive solutions for the valorisation of brine based on the ZLD concept.

And, for challenge no. 2:

- Thermal systems of renewable energies (solar concentration), to be combined with or to increase the efficiency of conventional desalination.
- Disruptive solutions in forward osmosis (FO) and in capacitive deionisation (CDI) desalination.
- Hybrid desalination solutions.
- Proposals for the improvement (software, control) of the operation and design of RO desalination osmosis, in order to reduce the power consumption, fouling, etc.

For the implementation requirements, in general, the access to equipped infrastructure with sea water, brine and/or energy (whether renewable or not) is required. Some cases need access to existing desalination plants and to the operational data of the desalination plants. Two of the solutions submitted require large plots of land. These needs must be taken into account due to this limiting factor.

Regarding the budget and the implementation term, the proposals received, both for challenge no. 1 and for challenge no. 2, are compatible with the initial specifications of the project and no significant deviations have been found.

- The budget estimated by the companies ranges between €150,000 and €300,000, The average budget is €196,000.
- The term required to implement the proposals ranges from 15 to 24 months, with most proposals (6 proposals) requiring a term of 18 months.

Within those terms, the proposals comprise a plan of 2 and 3 stages (Planning, design-construction and pilot testing).

Besides, the call for proposals has drawn the interest of entities from outside of the Canary Islands, indicating the successful spreading of the information about this initiative.

It must be noted that, during the public invitation to tender in the public procurement procedure, the spreading of the information should be strengthened, in order to increase the participation of start-ups. Out of the 10 proposals, only 4 were presented by corporate bodies.

## Map of early demand.

According to the conclusions above, ITC aims to announce, between March and April 2021, the invitation to tender of a pre-commercial public procurement procedure (PCPP) with an approximate value of €440,000, focused on the procurement of emerging desalination solutions. This budget will be distributed between several stages and winners, in accordance with the good practice in pre-commercial public procurement procedures.

The project aims to attract and generate knowledge and disruptive (pre-commercial) desalination technology, with a high international projection, in Gran Canaria. The project is especially aimed at start-ups and/or research centres with the possibility to transfer the development to start-ups or spin-off companies.

Based on the analysis of the proposals received, the presentation of both disruptive desalination solutions and of modified solutions (whether in terms of processes, control or hybridisation of

existing desalination technologies) would be accepted. In any case, the proposal should be considered as pre-commercial (at least TRL4) to reach a pilot concept within a term of 18-20 months, showing the benefits claimed, in order to reach a significant improvement in the power efficiency of the process and to reduce the impact of the current technologies.

Although the systems using renewable energy will not be a priority in this invitation to tender, they can be considered to be assessed in the first stages of the procedure. Such systems must be assessed on a per case basis, because they require large plots of land and also because they must present energy efficiency improvements in order to ensure that, from the energy standpoint, they provide high efficiency processes.

Using the existing infrastructure and capacities of the DESAL+ Living Lab platform, tenderers will have to develop technology feasibility, business model and competitive advantage studies. Those passing the first stages to be established in the procedure will be able to run a pilot test.

This information will be set out in detail in the terms and conditions that will be specifically prepared for the Pre-Commercial Public Procurement procedure.

Las Palmas, 16<sup>th</sup> February, 2021

On behalf of the evaluation committee,

Baltasar Peñate Suárez  
Head of Water Department - ITC  
DESAL+ LIVING LAB Technical Coordinator

## Appendix 1: Entities submitting proposals to the consultation

Entities submitting proposals to deal with **CHALLENGE 1:**

NAME OF THE ENTITY	ACRONYM
<b>INSTITUTO TECNOLÓGICO DE GALICIA</b>	DESBRIM*
<b>FUNDACIÓ EURECAT</b>	INNOBRINE

\*This proposal can be applied to both challenges.

Entities submitting proposals to deal with **CHALLENGE 2:**

NAME OF THE ENTITY	ACRONYM
<b>TECNALIA RESEARCH &amp; INNOVATION</b>	BATESAL
<b>DESOLENATOR</b>	DESOLENATOR
<b>EMSC GLOBAL WATER SOLUTIONS S.L.</b>	DSSTOI
<b>FLUVICON GMBH</b>	IONOSMOSIS
<b>DESALINATION TECHNOLOGIES SL</b>	KMP
<b>FUNDACIÓ EURECAT</b>	NEXT DESAL
<b>CRANFIELD UNIVERSITY AND SOLAR WATER PLC</b>	NILDESAL
<b>K.N.TOOSI UNIVERSITY OF TECHNOLOGY, TEHRAN, IRAN</b>	POLYGENRO

## Appendix 2. Links of interest

- The information and the application form: [www.desalinationlab.com/technological-challenge](http://www.desalinationlab.com/technological-challenge)
- Session for the presentation of the information: [Presentation session of the Preliminary Market Consultation PMC | DESAL+ Start-ups - YouTube](#)
- Frequently Asked Questions: [FAQs-PCP-CPP-v1.1-1-1.pdf \(desalinationlab.com\)](#)