

PRIMA – SECTION 1

Topic 1: Water reuse and water desalination for agricultural and food production

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| Overall budget: € 6,1 million 3 projects are expected to be funded | Submission deadline Stage 1: 17th April, 2018. 17:00h CET. Stage 2: 15th September, 2018. 17:00h CET |
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01. List of countries, Consortium conditions, Guidelines for Applicants, and Proposal template

EU Countries: Croatia, Cyprus, France, Germany, Greece, Italy, Luxembourg, Malta, Portugal, Spain, Slovenia.

Non EU Countries: Israel, Tunisia, Turkey, Algeria, Jordan, Egypt*, Lebanon* and Morocco.*

*These countries agreements with PRIMA Foundation did not enter into force yet. Although it is expected to do during the current year, it is advisable to fulfil the consortium admissibility requirements without these countries partners.

Consortium must present at least three eligible partners from three different countries, being at least one EU country and one non EU country.

Stage 1 proposal template:

<http://prima-med.org/wp-content/uploads/2018/02/PRIMA-Pre-proposal-Template-Stage-1.docx>

Guidelines for Applicants 2018: Very similar to H2020 in terms of kind of actions, funding schemes, participant's eligibility, evaluation criteria, etc. Please check the official Guidelines for Applicants in the following link:

<http://prima-med.org/wp-content/uploads/2018/02/PRIMA-Guidelines-for-Applicants-Section-1.pdf>

02. Challenge

In a scenario where the fresh water available for agriculture and food processing industries is not enough to cover the current demand and additional gains in the water use efficiency are difficult to achieve, re-using water for multiple purposes is a possible solution. The challenge, in this sense, is to provide end-users with new more economically feasible water treatment technologies, taking into account the main environmental, socio-economic and legal and/or institutional constraints regulating the adoption of these technologies.

03. Scope

The reuse of wastewater is one of the main options available for water-supply decision-makers in the field of a sustainable water and soil management, of agro-food chain production and agriculture. However, in the Mediterranean, water reuse faces numerous barriers. Among them, regulatory, safety risks, economic including

energy concerns and social acceptance can be currently defined as the main barriers considering that 1) safety risks (environment, human health) have been linked to the use of improperly treated wastewater; 2) treatment costs particularly linked to the energy and 3) public acceptance of reclaimed water varied according to its potential use. In addition, in the Mediterranean area treated wastewaters usually have the drawback of their salinity levels, which might limit the mid, long-term crop productivity. As a consequence, energy-efficient desalination and other treatments, comprising technological and nature-based solutions (NBS), should be developed for treating both wastewater from municipal and industrial use. The seawater desalination is an important source of water resources in certain areas of the Mediterranean region. Issues regarding the disposal and treatment of brines after seawater or wastewater treatment should be considered to ensure a low impact of water treatment on the environment, or in the fishery practices. On the other hand, treated wastewater can be also a source of nutrients, particularly for crop production, which should be better valorised and wastewater treatment technologies able to selectively maintain important macro-nutrients should be promoted. Innovative technologies, including those based on bioengineering and advanced materials such as nano-materials, and techniques like NBS and ecosystem-based approaches, may be developed to increase energy efficiency reduce pollutants loads including pathogens and emergent pollutants (i.e. pharmaceutical residues), in order to produce water of appropriate quality regarding the uses. For irrigation, appropriate practices and techniques should also be promoted to ensure good water reuse applications conditions at field level, to avoid clogging of drip irrigation systems, soil degradation and nutrient leaching to the environment. In addition, wastewater treatment techniques have to be developed not only for a direct reuse of water for agriculture, but also for an indirect use, considering hybrid approach including aquifer storage recovery. The recharge of reclaimed water into the subsoil can be considered as an additional treatment, reducing the cost and energy needs. Recharge into coastal aquifers may be considered as a hydraulic barrier against salt water intrusion. Finally, multidisciplinary studies should be enriched by analysing the economic and environmental suitability of the current implementation of the system, taking also into account the agronomic and food processing validation needed for its implementation, as well as the public acceptance. Under this proposed multi-actor approach, different type of entities should be involved in the proposals; industrial entities (including SMEs) should play an important role, having a great potential for further replication and market uptake of the solutions developed. Innovative development of circular economy (i.e. zero waste concept, nutrients reuse) could also be proposed in the field of agro food chain production, considering the recycling of production water, in terms of quantity and quality.

Technology Readiness levels (TRL): 3 to 5

04. Expected impact

Depending on the specific approach to be defined by the submitted proposal, some of the specific expected impacts should be achieved:

- Increasing the quantity, quality and safety of non-conventional water use for agriculture and food processing (direct use and indirect use of reclaimed water, i.e. artificial recharge, aquifer storage recovery approach)
- Increasing the efficiency of water management systems with particular regard to energy and water smart infrastructures
- Decreasing the cost of treating wastewater and, particularly, desalination by using more energy-efficient processes
- Obtaining socio-economic, environmental (soil conservation and nutrient pollution in particular) and technical information to influence Mediterranean countries policies in terms of wastewater use
- Deriving new solutions for brine disposal considering a holistic approach for desalination water