



**REGIONE
PUGLIA**

**AREA PER LO SVILUPPO ECONOMICO, IL LAVORO E
L'INNOVAZIONE**

SERVIZIO RICERCA INDUSTRIALE E INNOVAZIONE



OPENLABS

Call for expressions of interest issued within the preliminary market consultation of a Pre-Commercial Procurement for research and development services (Art.40, Directive 2014/24/EU, 28th February 2014)



Forward

Regione Puglia, within the “Regional Smart Specialization and Social and Environmental Sustainability Support Programme” – named OPENLABS – and in compliance with the guidelines outlined in the regional regulation DGR 477 of 17th March 2014, announces an experimental preliminary market consultation phase (the “Consultation”) of a pre-commercial procurement for research and development services in accordance with Art.40 of the Directive 2014/24/EU (28th February 2014). The consultation does not aim to award any contract.

This open consultation is preliminary to the subsequent phases of a multi-stage pre-commercial procurement procedure to purchase industrial research and experimental development services, including prototypes aimed at increasing efficiency of products and services for water resources management, specifically with regard to the following needs:

- A. Adaptive Water Management Platforms
- B. Treatment, reduction and re-use of sludge from urban wastewater treatment processes
- C. Detection and monitoring of water losses in water distribution networks

More detailed descriptions in Annex D.

1. Eligibility

Eligible participants need to be located in a EU Member State and to belong to one of the following categories:

- Enterprises, individually or grouped in temporary associations
- Research institutions
- Independent workers

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2. Time schedule

30/04/2015 at 12.00 CET – Deadline for requests of clarifications

05/05/2015 at 12.00 CET – Deadline for submission

13/05/ 2015 at 17.30 CET – Admission notice

19/05/2015 at 9.30 CET – Public hearing at Regione Puglia

26/05/2015 at 17.30 CET – Publication of the Public Hearing report and kick-off online forum

08/06/2015 at 17.30 CET - Closing Online Forum

3. Expression of interest

Eligible subjects are invited to express their interest to participate by accessing the portal www.empulia.it and following the instructions below within the deadline indicated in the time schedule.

4. Clarifications

Any request for clarifications concerning the procedure should be submitted through the dedicated section “Bandi di gara” (Tenders) on the website www.empulia.it.

5. Documentation for the expression of interest



Participants need to upload in the dedicated section www.empulia.it/pcp the following documents, in electronic format and electronically signed by a legal representative:

A1: Expression of Interest (Annex A) concerning the topic/s (maximum 2 topics, otherwise the expression of interest will be excluded) related to the needs addressed by this call;

A2: Declaration of confidentiality (Annex B)

A3: Disclaimer to authorize photo/video/audio recording from Regione Puglia staff for the whole duration of the Consultation (Annex C).

Successful participants (see item 8) will receive an admission notice within the deadline indicated in the time schedule.

6. Consultation

The Consultation will be carried out according to the following procedure:

- Public hearing, with all participant who submitted their expression of interest within the deadline indicated in the time schedule
- On-line forum for further information

Program of the Public Hearing

Registration

Introduction

Opening address

Pre-Commercial Procurement policies

Preliminary market consultation procedure

Consultation (for each of the 3 identified needs)

Explanation of the need

Discussion concerning technologies' state of the art, and innovation and market potential

Discussion of performance requirements

The Hearing and the Forum are meant to be informal and to favour the collaboration between public and private subjects in order to understand in detail innovation needs, to identify innovative performances (to be addressed by pre-commercial research activities) towards the innovation demand expressed by the three needs.

This consultation does not concern sharing specific techniques, design requirements or technical specifications.

A pre-commercial procurement allows procuring a technological issue to be solved, in order to enable suppliers to propose innovative solutions and technological alternatives to address procurer's needs.

At the end of the Public Hearing a report will be published on the website www.empulia.it, in the dedicated section www.empulia.it/pcp.

Not-for-profit audio/video/photo recording of the Hearing, on tape or on any other support, might be performed by the Region with the exclusive purpose to facilitate reporting and communications about the event.



Following the Public Hearing, participants might be invited to private consultations by email with a minimum notice of five days.

These consultations will be reported.

7. Maximum amount

The maximum total amount that can be awarded for the implementation of subsequent pre-commercial procurement/s for research and development services, including prototypes testing with regards to the three identified needs is 9,000,000.00 €, VAT included. Contract/s will be awarded to the most economically advantageous tender.

8. Procedure conditions

This notice does not concern any contest or tender; it is exclusively a preliminary market consultation in order to prepare a pre-commercial procurement for research and development services.

The participation to the Consultation does not affect the participation to the subsequent pre-commercial tender; it represents neither an eligibility condition nor a commitment from the Region with regard to the following phases of the procedure.

Without any claim from the participants, The Region has the right to use the outcomes of the Consultation and of the discussions on the state of the art and on the innovation and market potential to better define research and development areas based on their compliance with Regional innovation policies and public interest.

The Region has also the right to use the Consultation's outcomes in order to prepare a pre-commercial procurement aimed at awarding research and development services.

The Region can stop, suspend or revoke the preliminary market consultation of any subject at any time.

Any subsequent pre-commercial procurement tender is upon the Region's discretion. No compensation is due to participants who expressed their interest in the procedure. Personal data will be processed exclusively for institutional purposes concerned by this notice. Allowing data processing is a necessary condition to participate to this call and to subsequent activities.

Personal data will be processed by Regione Puglia in compliance with the legislative decree D.L. 30 June 2003 n. 196, with electronic and automatic supports.

Whenever Regione Puglia avails itself third parties for data processing, their activities will be carried out according to the law. Personal data can be communicated to third parties, appointed as data managers, who will process personal information exclusively for the same purposes.

9. Exclusion conditions

Expressions of interest can be excluded if:

- a. Submitted after the deadline;
- b. Incomplete in clearly identifying the participating subject and his/her contacts (annex A);
- c. Incomplete in the declaration of confidentiality and/or in the Disclaimer (see items Q1 and A2, paragraph 5).



- d. Submitted by the same participant, with reference to more than two needs, among those mentioned in the Forward.

The person in charge for this procedure is:

Dr. Giuseppe Albanese

Regione Puglia

Area Politiche per lo Sviluppo, il Lavoro e l'Innovazione

Servizio Ricerca Industriale e Innovazione

Ufficio Ricerca Industriale e Innovazione Tecnologica

Corso Sonnino, 177 – 70121 Bari, Italy



**Annex A
Expression of Interest**

I undersigned, _____,
born in _____, on _____ TIN _____,
as (position) _____ of (name of research organization,
temporary association, independent worker,
etc.) _____, VAT ID Number _____,
TIN _____, located in (town) _____,
(address) _____ (post code) _____,
(state) _____

Express

Interest concerning the following area(s):

Adaptive Water Management Platforms

Treatment, reduction and reuse of sludge from urban wastewater treatment processes

Detection and monitoring of water losses in water distribution networks

(Maximum TWO choices)

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Appoint

As reference person for this procedure and for any formal communication, including the invitation to participate to the preliminary market consultation:

(Name and Surname) _____,
born in _____, on _____
TIN _____,
Tel. _____
Email _____ Fax _____
Full Address _____
Certified e-mail _____

Or, in substitution:

(Name and Surname) _____,
born in _____, on _____
TIN _____,

(Name and Surname) _____,
born in _____, on _____
TIN _____,



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(Name and Surname) _____,
born in _____, on _____
TIN _____,

Information concerning Art. 13 D.Lgs. n. 196/2003 "Privacy Law Code".

Personal data in this declaration will be processed by Regione Puglia, exclusively for institutional purposes concerned by this notice, in compliance with the legislative decree D.Lgs.30 June 2003 n. 196., with electronic and automatic supports.

By signing this declaration, the participant states to be aware of D.Lgs n. 196/2003 and authorizes Regione Puglia to process personal information for purposes concerned by this notice.

Date _____

Signature

_____ 7 _____



**Annex B
Declaration of Confidentiality**

I undersigned, _____,
born in _____, on _____ TIN _____,
as (position) _____ of (name of research organization,
temporary association, independent worker,
etc.) _____, VAT ID Number _____,
TIN _____, located in (town) _____,
(address) _____ (post code) _____,
(state) _____

On behalf of the organization I legally represent, including controlled or linked enterprises, their components, directors, staff, consultants and associates (Art. 1381, Italian Civil Code)

Commits

- i. To consider any information obtained through the Consultation as sensitive and adopt any reasonable measure to keep it confidential
- ii. To use confidential information exclusively in relation to declared purposes, without sharing it with any third party, not directly involved in the preliminary market consultation.
- iii. Not to make any use of this information that might damage any subject involved in the Consultation
- iv. Not to use this information for commercial purposes, nor to develop any activity based on it
- v. To assure the highest confidentiality about the acquired know-how, in compliance with laws concerning trademarks, copyright, patents and with the privacy law, D.Lgs n. 196/2003. Information cannot be shared, reproduced, or used for personal profit, under any circumstance and for any reason.

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These commitments do not apply to any information that is of public domain or owned by the subject before the preliminary market consultation.

Information concerning Art. 13 D.Lgs. n. 196/2003 "Privacy Law Code".

Personal data in this declaration will be processed by Regione Puglia, exclusively for institutional purposes concerned by this notice, in compliance with the legislative decree D.Lgs.30 June 2003 n. 196. , with electronic and automatic supports.

By signing this declaration, the participant states to be aware of D.Lgs n. 196/2003 and authorizes Regione Puglia to process personal information for purposes concerned by this notice.

Date _____



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Signature





**Annex C
Disclaimer**

I undersigned, _____,
born in _____, on _____ TIN _____,
as (position) _____ of (name of research organization,
temporary association, independent worker,
etc.) _____, VAT ID Number _____,
TIN _____, located in (town) _____,
(address) _____ (post code) _____,
(state) _____

Authorize

Regione Puglia to perform audio/video/photo recording, on tape or on any other support and to use those recordings, or part of them, on any media (radio, TV, Internet, etc.) in Italy and abroad, for non-profit purposes.

Information concerning Art. 13 D.Lgs. n. 196/2003 "Privacy Law Code".

Personal data in this declaration will be processed by Regione Puglia, exclusively for institutional purposes concerned by this notice, in compliance with the legislative decree D.Lgs.30 June 2003 n. 196. , with electronic and automatic supports.

By signing this declaration, the participant states to be aware of D.Lgs n. 196/2003 and authorizes Regione Puglia to process personal information for purposes concerned by this notice.

Date _____

Signature



**Annex D
Needs Fact Sheets**

Fact Sheet 1

Societal challenge (ref. Regional Decree DGR n,477 17/03/2014): Sustainable cities and territories

The innovation need **Adaptive Water Management Platforms**, concerning the priority intervention area “**water resources**”, was identified by Regione Puglia with the support of Acquedotto Pugliese s.p.a.

A. Adaptive Water Management Platforms

Synthetic need description:

In addition to hardware-based water networks monitoring and management methods, new software methodologies, based on decision-support models, are currently being developed.

Software-based methods, included in Adaptive Water Management Platforms, are easy to integrate with data available in existing information management systems: asset data in SIT platforms, networks management data (flow rates, pressures, smart metering, etc.) in Supervisory Control And Data Acquisition systems, Users databases (type of user, consumptions, etc.) and maintenance history data.

These data can be processed by hydraulics modelling software, data mining (or knowledge discovery in databases) techniques and statistic algorithms, in order to develop decision-support systems to make investments and interventions more efficient in reducing and controlling water losses.

Also data modelling can be ascribed to software-based techniques. Nowadays it can be based on several techniques and paradigms, allowing both to integrate data with hydraulics models and to analyze them independently to support managers in operation and planning.

Adaptive Water Management Platforms represent an interesting perspective for managers. For this reason, considering the ever increasing amounts of data availed by smart measuring devices, these models are expected to develop into commercial solutions, currently not available.

Performance requirements:

Software application to integrate physical and management data in management platforms, in order to automatically provide:

- a) Water budgets by integrating physical data (networks, meters) provided by the SIT with management data in Supervisory Control And Data Acquisition systems (in/out flow rate) and users data (users meters).
- b) Integrated analysis of networks hydraulic models with statistic models, by processing physical data (networks, meters) provided by the SIT with management data in Supervisory Control And Data Acquisition systems (in/out flow rate) and users data





<p>(users meters), in order to: 1) simulate possible reconditioning assets of the existing network; 2) pre-localize water losses, based on variations in management measures.</p> <p>c) Analysis of failures and interventions registers in the SIT for decision-support regarding interventions to be carried out, based on simulation and evaluation models (b).</p>
<p>Use requirements:</p> <p>The prototype solution shall be a stand-alone software model, using static physical and management data to be subsequently integrated with management software applications.</p> <p>The challenge is about developing a new analysis and decision-support framework to integrate different available data sources (e.g. based on multi-agent system theory) in order to plan and manage water resources in complex contexts. This framework shall combine descriptive and prescriptive methods to provide: i- information tools for a realistic representation of the decisional context; ii- decision-support procedures suggesting effective intervention strategies in due time.</p>
<p>Installation requirements:</p> <p>Compatibility with standard IT platforms</p>
<p>Management requirements:</p> <p>The use of a multi-agent framework might allow to represent the ensemble of the agents acting within the system and to coordinate them in order to optimize efficiency in the use of available water resources.</p> <p>By combining multi-agent models with optimization techniques, it shall be possible to monitor the circular feedback between agents' decisions and their effects on the context, also through preventive simulation systems.</p>
<p>Maintenance requirements:</p> <p>Maintenance of the offered software-based solution, open to the market</p>
<p>Certification requirements:</p> <p>None</p>
<p>Experimental context:</p> <p>The water distribution network is the selected operational pilot context. For point a) the pilot could be tested on network covering a whole district. For points b) and c) the pilot could be tested on one or two networks of medium size.</p>
<p>Risk factors to be mitigated:</p> <p>With regard to security standards of software applications</p>





Market context:

The specific market has a considerable size, both at national and international level.

According to a survey published by ISTAT in June 2014 water losses in municipal distribution networks in Italy have increased by 19.7%, from 2.611 to 3.125 billions cubic meters between 2008 and 2012. In the same period water losses rate (ratio between water losses and water intake) increased by 5.3% from 32.1% to 37.4%.

Public data about the total extension of water distribution networks in Italy are not available. According to the first "Catchment Area Plans", their total length can be estimated to be around 350,000 km.

The water supply system in Puglia consists of about 4,500 km of main pipeline, 14,500 of municipal distribution networks and 5,000 km of private connections.

Further applications to other network services are also possible



Fact Sheet 2

Societal challenge (ref. Regional Decree DGR n,477 17/03/2014): Sustainable cities and territories

The innovation need **Treatment, reduction and re-use of sludge from urban wastewater treatment processes**, concerning the priority intervention area “**water resources**”, was identified by Regione Puglia with the support of Acquedotto Pugliese s.p.a.

B. Treatment, reduction and reutilization of mud in the processes of the urban flowing waters depuration

Synthetic need description:

Urban wastewater treatment plants produce 35-50 g of dry solids/(P.E. x d) depending on the presence of primary sedimentation (implying higher values within the mentioned interval) and on the effectiveness of biologic stabilization treatment. Other factors influencing sludge production are effluents standards and, above all, the necessity to remove phosphorus. Nowadays, treatment and final management of sludge represent one of the biggest challenges in purification systems, both for high costs (mainly due to off-site disposal or recycling) and for difficulties in finding suitable available sites within the regional territory. It is therefore important to limit sludge production without compromising the quality of the treated effluent, by using environmentally sustainable techniques and management procedures (energy and chemicals consumption).

In Puglia there are around 190 depuration plants for about 5,5 millions of P.E. Most of the plants (>55%) have a maximum capacity of 20,000 P.E.

In Italy there are around 15,000 plants. On a sample of 12,500 plants, the overall capacity is estimated to be 64 millions of P.E.

Most of the plants have small dimensions (<2,000 P.E) and equipped exclusively for primary sedimentation. Most of the load lies on plants of big dimensions. (>100,000 P.E).

Techniques to reduce sludge production are basically aimed to the containment of disposal costs. It is also important to identify methods for sludge reuse in accordance with law requirements. Generally speaking, this objective includes also techniques aimed at the improvement of sludge quality, in order to allow reuse in agriculture. There are also unconventional systems, still experimental, which can be applied both to the waterline and to the sludge line. These techniques can address biological or chemical/physical interventions.

Performance requirements:

The solution shall assure an annual reduction of biological sludge of 30% or above and specifically:

- volume reduction to obtain a solid sludge.
- putrescence reduction of sludge with high organic content;
- improvement of sludge quality to allow reuse

Use requirements:

The proposed innovation shall have minimum impact on the current management model. Any necessary change shall be clearly identified and described.

Installation requirements:



Existing plants are based on conventional technologies for aerobic and anaerobic treatment. Any proposed innovation shall have minimum impact on the existing infrastructure, even in relation to the context where plants are located.
<p>Management requirements:</p> <p>New technologies are not supposed to imply higher costs and shall be financially sustainable with the current tariff system.</p>
<p>Maintenance requirements:</p> <p>Maintenance shall be affordable and financially sustainable with the current tariff system.</p>
<p>Certification requirements:</p> <p>The new technology shall not imply authorisations and/or opinions from third parties</p>
<p>Context of the experiment:</p> <p>The pilot will be tested on a medium size plant, with a capacity between 50,000 and 100,000 P.E.</p>
<p>Risk factors to be mitigated:</p> <p>Minimal environmental impacts with particular regard to atmospheric emissions.</p>
<p>Market context:</p> <p>Local and national market is characterized by remarkable infrastructural deficits (according to ISTAT, in Italy less than the 60% of sewage effluents are properly managed) and sludge disposal reduction is a common necessity. The sector market potential can be estimated 10 millions € at local level, 100 millions € at national level and around 1 billion € Europe wide.</p>



Fact Sheet 3

Societal challenge (ref. Regional Decree DGR n,477 17/03/2014): Sustainable cities and territories

The innovation need **Detection and monitoring of water losses in water distribution networks**, concerning the priority intervention area “**water resources**”, was identified by Regione Puglia with the support of Acquedotto Pugliese s.p.a.

C. Detection and monitoring of water losses in water distribution networks

Synthetic need description:

Monitoring, detecting and localizing water losses in transport and distribution pipelines are normally hardware-based and rely on field devices with sensors for water losses detection.

A one-size-fits-all solution for water losses detection does not exist. Many environmental and structural factors (noise, materials, etc.) need to be considered in evaluating the appropriateness of different techniques. Nevertheless, these aspects are not sufficient to assure that the final choice fulfils effectiveness, sensitivity (meaning accuracy, reliability and robustness) and costs requirements.

The most appropriate technique for water losses detection shall be identified based on:

1. Extension and typology of the water supply system
2. Materials and diameters of the pipeline
3. Level of accuracy

It is also necessary to refer to the following design criteria:

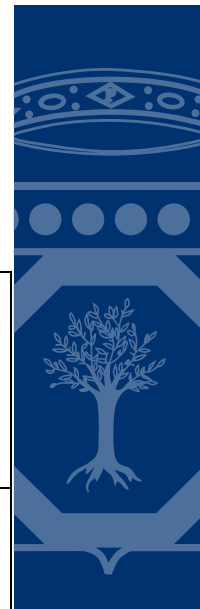
1. Applicability
2. Effectiveness
3. Sensitivity (accuracy, reliability and robustness)
4. Transferability
5. Compatibility
6. Environmental impact

Several technologically sophisticated methods have been developed over the last decades: Termography Remote Sensing, Pressure transistors analysis, Tracer Gas Techniques, Ground Penetrating Radar, Electromagnetic waves propagation, techniques based on internal inspection through smart pigs, etc.

The various methodologies for water losses detection and localization are still matter of scientific research. Normally these techniques do not find wide application in the day-to-day management of water schemes. One of the reasons of their limited diffusion is the unavailability of commercial solutions for managers who need to test these technologies or use them in synergy with traditional methods based on acoustic sensors.

Among the mentioned technologies, systems based on smart pigs are considered particularly interesting. Smart pigs are smart devices moving in the fluid inside the pipeline. They are able to monitor its maintenance state and to localize water losses.

Performance requirements:



<p>Smart device, fix or moving inside a pipeline, using different sensors (e.g. quantity/quality measurements, optical and/or acoustic measurements, GPS, etc.) to provide data about network geo-referencing, and/or maintenance state, and/or water losses monitoring and localization.</p>
<p>Use requirements:</p> <p>The solution shall assure sensitivity, accuracy, reliability, robustness.</p> <p>Sensitivity is defined as the ration between the minimum detectable loss and the time needed to send an alert in case that loss has been detected. This ratio depends on the adopted technique.</p> <p>Accuracy measures the technique’s performances in relation to parameters such as loss flow rate, total volume lost, loss position. A system able to estimate these parameters, within an acceptable margin of error, can be considered accurate.</p> <p>Reliability is the capacity to allow accurate decisions about the existence of a loss. It depends on the probability to detect a loss actually in place and on the probability to erroneously detect a loss that does not exist.</p> <p>Robustness is about the technique’s capacity to keep working upon changes of operation conditions.</p>
<p>Installation requirements:</p> <p>The solution shall ideally require limited installation time and costs with respect to the length of the water supply network.</p>
<p>Management requirements:</p> <p>The solution shall ideally require a little amount of time and reasonable maintenance costs, in relation to the length of the water supply networks. Data collected on the field shall be integrated into the information management platforms.</p>
<p>Maintenance requirements:</p> <p>The solution must entail reasonable maintenance costs, be sustainable and assure low energy consumptions.</p>
<p>Certification requirements:</p> <p>Compatibility with system’s requirements:</p> <p>The compatibility of a technique with a specific water supply system has to be assessed also in relation to the system’s operational requirements (instrumentation, sampling frequency, capacity of the participating subject, etc..).</p>
<p>Experimental context:</p> <p>The pilot operating context consists in the water distribution network or a portion of main pipelines. The network used for the test will be a medium-size urban network or a system supplying few neighbouring towns.</p>



Risk factors to be mitigated:

The solution has to be robust, ideally not vulnerable to theft or acts of vandalism.

Market context:

The specific market has a considerable size, both at national and international level.

According to a survey published by ISTAT in June 2014 water losses in municipal distribution networks in Italy have increased by 19.7%, from 2.611 to 3.125 billions cubic meters between 2008 and 2012. In the same period water losses rate (ratio between water losses and water intake) increased by 5.3% from 32.1% to 37.4%.

Public data about the total extension of water distribution networks in Italy are not available. According to the first "Catchment Area Plans", their total length can be estimated to be around 350,000 km.

The water supply system in Puglia consists of about 4,500 km of main pipeline, 14,500 of municipal distribution networks and 5,000 km of private connections.

Further applications to other network services are also possible