



**“Sensing, monitoring and actuating on the UNderwater world through a federated Research InfraStructure Extending the Future Internet – SUNRISE”**

**Grant Agreement number 611449**

**Announcement of the Second  
Competitive Open Call for Additional Project Beneficiaries**

The SUNRISE project currently active in the Seventh Framework Programme for Research and Technological Development (2007-2013) requires the participation of additional beneficiaries to carry out certain tasks within the project.

**Project acronym:** SUNRISE

**Project Grant Agreement number:** 611449

**Project full title:** Sensing, monitoring and actuating on the UNderwater world through a federated Research InfraStructure Extending the Future Internet

**Project summary:**

As for the terrestrial world, where the Internet has provided the enabling technologies to acquire and share knowledge at levels previously unavailable, Internet Technologies have the potential to take a key role in the technological uptake driving the growth and development of the marine economy, through exploration and understanding of the marine environments. In particular, the combination of an underwater Internet of Things (IoT), implemented through Underwater Wireless Sensor Networks (UWSNs) with underwater robotics technologies, novel underwater communication technologies and paradigms, and the integration of the resulting underwater IoT system into the Future Internet (FI), can provide the missing effective, pervasive means to sense, monitor and control ocean processes to sustainably manage our planet resources. This is the missing technological enabler for the marine sector and the very focus point of the SUNRISE project. In particular, SUNRISE aims to develop:

- Five or more federated underwater communication networks, based on pilot infrastructure already designed, built and deployed by consortium partners, in diverse environments (Mediterranean, Ocean, Black Sea, Lakes), web-accessible to experiment with Future Internet technologies.
- A software-defined open-architecture modem and protocol stack that will empower open collaborative developments.

- Standard platforms for simulation, emulation and testing of underwater networks and systems at a fraction of time, cost, complexity of current at-sea experiments, validated by tests conducted on the SUNRISE networks over a variety of applications and environments.
- A user-friendly interface for diverse users to interact with SUNRISE systems to conduct trials and benefit from databases of underwater Internet of Things performance data gathered over long periods from the SUNRISE infrastructure.

SUNRISE directly addresses FIRE objectives by combining technology with novel paradigms in new, open experimental facilities, integrating physical systems with software development into the Internet of Underwater Things. The objective of the SUNRISE project is to enlarge the scale and scope of the current infrastructure federation for supporting the deployment of FIRE large-scale early trials, experimentation by SMEs and other potential developers that will be involved in the FIRE programme and beyond.

**Objectives of inviting new beneficiaries:**

SUNRISE has devoted around half of its budget to two open calls. A First Open Call was opened during 2014, and its results were made public in May 2015.

The Second Open Call addresses the following objectives through the funding of the five different types of project indicated below:

- The federation of additional sites or experiments on already existing SUNRISE testing facilities to further enhance SUNRISE testing infrastructure (Project “TYPE A”);
- The incorporation of novel algorithms, protocols, sensors, node platforms, communication devices and technologies to be included in SUNRISE facilities (Project “TYPE B”);
- The development of applications and services exploiting SUNRISE technology and deployments (Project “TYPE C”);
- End-user experiments leveraging on SUNRISE permanent testing infrastructures or re-deployable testing facilities (Project “TYPE D”);
- Development of business cases for SUNRISE technologies exploitation (Project “TYPE E”).

Projects may address multiple objectives. In this case the proposal must identify the leading objective, and discuss in the “Concept and Objectives” part of the proposal (namely Part B, Section B1.1) how the secondary objectives are addressed.

The major objective of the Second SUNRISE Open Call is to enlarge the infrastructure capacity of SUNRISE by additional activities and testbeds aiming at achieving:

- balanced geographical distribution of infrastructures across Europe;
- increased heterogeneity of infrastructures and diversity of marine environments, application scenarios, monitoring and service capabilities;
- greater diversity of underwater sensing technologies, supported platforms, underwater communication technologies and protocols, as well as of energy sources used to power underwater assets;
- expanding services and applicability;
- valorisation and exploitation.

To ensure this, SUNRISE is launching the Second competitive Open Call to fund additional sub-project proposals. Independent evaluations of the submitted proposals will be performed, in order to select the most appropriate new sub-projects to be included in the project, considering the aims listed above.

SUNRISE expects respondents to the Open Call to propose solutions that build on and complement the hardware or software platforms being developed and deployed in test locations by the project partners. The proposals should either describe new experimentations (for instance by extending one of the five testbeds) or add significant improvements to existing ones (for instance by hardware components, nodes and platforms, sensing technologies, systems for environmental data recording and characterization functional to accurate channel modelling as well as characterization, communication technologies, protocols, algorithms, devices and technologies to increase the endurance and self-power underwater assets, functionalities and services). Provision of new functions or features could be achieved by developing and integrating new technology modules, or by interconnecting one or several of SUNRISE platforms with other systems.

More explicitly, the proposals can address the following expected outcomes:

- For Type A: SUNRISE infrastructure extensions by means of an additional testing facility, to be federated and made available for core partners and third party experiments, provided that such facility fills a gap with respect to the existing federation (e.g. in terms of functionalities/technologies, application scenarios, and marine environment).
- For Type B: Development of novel technologies to be integrated into the SUNRISE infrastructure, such as low-cost/innovative sensors, systems for a more accurate characterization of the underwater environment in the location of the deployed facilities, breakthrough underwater communication technologies, low-cost/long-endurance underwater vehicles, novel sensor nodes, technologies to increase the endurance of underwater assets and to perform energy harvesting, protocols and algorithms for more efficient, reliable, robust, secure operation and communication of static and mobile assets. The call aims at integrating technologies providing a breakthrough in terms of the trade-off between functionalities, system intelligence, accuracy, performance and cost.
- For Type C: Development of novel applications and services. Activities will:
  - a) include the organisation of end-user community consultation for requirements and evaluation of the end-user experience;
  - b) envision experimental validation in field;
  - c) address the disruptive innovation potential of the proposed applications and services in the proposal (namely Part B, Section B3).
- For Type D: End-user experiments using the existing features of the SUNRISE infrastructure, with a focus on advancing science and knowledge or customizing SUNRISE technologies for specific applications, posing the basis for sustainable use of SUNRISE facilities. In addition to leveraging on permanent testing facilities, it is also possible to envision short term (two-three weeks) experiments with leased re-deployable SUNRISE testing facilities (typically made of 4-5 nodes equipped with SUNRISE communication and networking HW/SW). Costs of shipping assets to the site and insurance costs will have to be included in the subproject budget (Part B, Section B0), as well as costs of extending this basic SUNRISE facilities (e.g., with probes to monitor specific parameters of interest, and with equipment needed to interconnect the re-deployable testing facility to Internet and a remote control room). The Impact section (Part B, Section B3) of such projects should also address how the experiments can create an ecosystem for sustainable use of the SUNRISE facility/facilities in case the system was deployed for a longer timeframe.
- For Type E: business development cases proposed by institutions and consulting companies with expertise in business development, analyzing SUNRISE reference markets and SUNRISE technologies to identify business and exploitation plans, and to provide an exploitation roadmap.

The approach that will be followed, especially for Project Types A to D, encompasses open hardware, open architectures, open access to testing infrastructures and open access to data. It also aims at building ecosystems to provide cutting edge testing facilities to a wide set of users beyond the project lifetime. As

mentioned above, proposals addressing multiple expected targets should select the leading one and explain in the proposal (namely Part B, Section B1.1) how they also address different expected outcomes.

### **Types of new beneficiaries:**

The call explicitly targets the following groups of potential proposers:

- *Research organisations or other types of institutions* able to make available either experts in the application domain (e.g. marine biologists) or in the related technologies (e.g. networking experts, communication and signal processing experts, robotics experts, security experts, etc.) interested in using the experimental facility to validate their research (e.g. a new model predicting the impact of pollutants on the population of fish, a new technology for underwater communications).
- *Technology Providers*: companies or research institutions willing to evaluate prototypes and/or products by using the SUNRISE testing infrastructure.
- *Application Service Providers*: entities – among others innovative companies - which are interested in using the testbeds to evaluate the effectiveness of pre-commercial services in a real environment which is not easily accessible otherwise (for example the monitoring of an underwater pipeline).
- *Organisations and consulting companies* with expertise in business development interested in analyzing SUNRISE reference markets and SUNRISE technologies to identify business and exploitation plans, and to provide an exploitation roadmap.

In consideration of the funding available and the objectives of the call, we encourage focused proposals submitted by a single institution. However for particular reasons, that must be explained and justified, a proposal may involve up to three legal entities. In this case, the splitting of responsibilities, activities, and resources should be made very clear in the project proposal.

### **Tasks of new beneficiaries:**

In addition to joining the technical activities and quantitatively assessing and documenting their results into deliverables, new beneficiaries are expected to contribute to SUNRISE dissemination activities and are strongly encouraged to contribute to SUNRISE open data and open source repositories. For details regarding the dissemination activities, please refer to ANNEX V of the Guide for Applicants.

Furthermore, in order to maximise impacts, sub-projects posing the basis for strong results' exploitation, and which can significantly empower SUNRISE infrastructures, will be strongly encouraged. For this very reason, prospective applicants, especially if applying for Projects TYPE A, B and C, should mention (if applicable) in their project application (namely Part B, Section B3) their availability to continue cooperating with the SUNRISE project also after their sub-project end-date by:

- a) maintaining available and operational prototypes and innovative HW/SW technologies developed in the framework of their funded sub-project;
- b) carrying on their cooperation with the SUNRISE consortium and the SUNRISE federation of users.

### **Obligations of new beneficiaries:**

Proposed solutions must comply with the SUNRISE architecture and interfaces, as well as with additional technical requirements for integration with SUNRISE systems and facilities available as part of the SUNRISE Open Call technical documentation. The final version of the documentation on SUNRISE architecture and interfaces and re-deployable facilities will be made available at least one month prior to the submission deadline.

**Application process:** Proposals for selection as additional beneficiaries in the SUNRISE project are submitted in a single stage, through the preparation of a complete proposal application which is to be assembled by using the templates provided in ANNEXES I and II of the Guide for Applicants.

**Proposal should be submitted via email to:** [sunriseopencall@di.uniroma1.it](mailto:sunriseopencall@di.uniroma1.it) according to the procedure described in the Guide for Applicants (§5.1)

**Submission deadline:** the call closes at 23:59 on July 31<sup>st</sup>, 2015 (Brussels time).

**Expected duration of participation in SUNRISE project:**

Average sub-project duration lies between 6 and 10 months.

The expected start date for selected sub-projects is November 1<sup>st</sup>, 2015 with an end date falling between April 2016 and August 2016.

Below further information regarding the recommended duration for each of the four types of project addressed by the call:

- TYPE A: ten months;
- TYPE B: ten months;
- TYPE C: between six and ten months;
- TYPE D: around six months.
- TYPE E: around six months.

**Call budget:** up to 900K Euro are available to be distributed among 4-6 new beneficiaries (not necessarily evenly).

Participation as a beneficiary in an FP7 project is on cost-shared basis, the Commission making only a partial contribution to the total cost of the work. For further information, please refer to §3 of the Guide for Applicants.

Below details about the maximum contribution recommended for each of the five project types encompassed by the call.

- TYPE A: up to 250K Euro
- TYPE B: up to 250K Euro
- TYPE C: up to 150K Euro
- TYPE D: up to 150K Euro
- TYPE E: up to 50K Euro

The Consortium will ensure to have a good balance among the different project types. Please refer to the Guide for Applicants (§6) for further information on proposals evaluation and selection procedures.

**Language in which the proposal should be submitted:** English

**Web address for further information (full call text/guidelines):** <http://fp7-sunrise.eu/index.php/open-calls2>

**Email address for further information:** [fp7-sunrise@di.uniroma1.it](mailto:fp7-sunrise@di.uniroma1.it) (helpdesk support will be active from June 1<sup>st</sup>, 2015 to July 28<sup>th</sup>, 2015).