



European
Commission

Horizon Prize

**ZERO POWER
WATER MONITORING**

Rules of Contest

Disclaimer

This document is aimed at assisting participants and beneficiaries for Horizon 2020 funding. Its purpose is to explain the Horizon 2020 framework programme and the procedures to be followed.

1. THEME: ZERO POWER WATER INFRASTRUCTURE MONITORING

1.1. Objectives pursued

The objectives of this inducement prize are: to empower the EU water distribution market with solutions based on wireless sensor networks with energy harvesting technologies, designed for real-time monitoring of water management; and, to stimulate broader European efforts in developing solutions for this societal need.

The submitted technological solution should design working prototypes for wireless sensor networks based on energy harvesting technologies to demonstrate positive impact on energy consumption in acquiring, monitoring, communicating and analysing information about water resources in natural or man-made environments.

The emerging issues for smart water monitoring have to be taken into account:

- Software: interoperability of systems, harmonisation of software development, processing algorithms and storage technologies that enable to deal with increasing amounts of data;

- Hardware: rational increasing number of sensors to collect real-time and near real-time information and to its power supply.

This prize is expected to stimulate creative thinking across established industrial and academic research organisations, resulting in breakthrough solutions that can seed and drive the European industry forward by promoting transition of ICT technologies in water sector from pilot scale to wide market uptake to end up with the creation of a European borderless Digital Single Market for water services.

Approaches to be taken by the applicants are not prescribed and may include novel sensing and data processing technologies, among other.

1.2. Expected results

It is expected to provide the EU water utilities (and/or the municipalities) with an ICT prototype for monitoring water. The ICT prototype should be based on wireless sensor networks with energy harvesting technologies. Specifically, it is expected to stimulate the creation of an effective and scalable autonomous, zero-power wireless sensor network platform to monitor water resources.

The prize is open in terms of parameters to be monitored, but as a minimum, the proposed solution should enable the water utilities to monitor in real time the supply and demand of water resources, including leakage management.

The wireless sensor network should be based on energy-autonomous sensor nodes capable of acquiring, monitoring and eventually analysing and cooperatively communicating their data through the network to a main location.

Each energy-autonomous wireless sensor node should be composed of an energy harvesting unit to scavenge energy from the surrounding environment; a power management unit responsible for storing and regulating the voltage/current values required for either supplying the other units directly and/or charging a backup battery; wireless transmission unit to transmit this information to a central base station that operates as a central information node.

For the purpose of this prize, 'energy harvesting technologies' are defined as technologies capable of capturing energy from a system's environment and converting it into usable electric power. In addition, it is expected to consider the circuitry required to store and manage the generated power.

The solution should be based on one, or an innovative combination, of sources of energy available for harvesting: light, radio-frequency (RF) electromagnetic radiation, thermal gradients, and motion, including fluid flow.

2. PRIZE AMOUNT: 2.000.000 EUR

3. DEADLINES & ADMISSIBILITY:

Deadlines

Opening for publication	07 April 2017
Opening for submission:	19 th December 2017
Closing date for submission:	11 September 2018 at 17:00:00 CET ¹
Award of the prize	1 st Quarter 2019

The winner(s) of the contest will be publicly announced in a public award ceremony

Joint applications by a group of participants are admitted. In this case, the participants must appoint a 'lead participant' to represent them towards the Commission. The participants will be jointly responsible and must all fulfil and respect the conditions set out in these Rules of Contest.

Applications including technical specifications of the working prototype must be submitted by the (lead) participant via the Participant Portal Submission Service, accessible via the Prize page.

Applications must be readable, accessible and printable. Incomplete applications may be considered inadmissible if essential elements are missing (see [General Annex B to the Main Work Programme](#)).

The page-limit for the prize application part B is 50 pages.

4. ELIGIBILITY

4.1. Eligibility criteria

The contest is open to any legal entity (including natural persons) or group of legal entities established in an EU Member State or in a [country associated to Horizon 2020](#).

Please note however that special rules apply for Israeli entities² and for Crimean legal persons and that entities from non-EU Member States that are covered by Council sanctions are not eligible to participate³ (see [General Annex C to the Main Work Programme](#)).

Please also be aware that participants that have already received an EU or Euratom prize cannot receive a second prize for the same activities.

¹ Central European Time = Brussels local time.

² See Commission Guidelines on the eligibility of Israeli entities and their activities in the territories occupied by Israel since June 1967 for grants, prizes and financial instruments funded by the EU from 2014 onwards (OJ C 205 of 19.7.2013, pp. 9-11).

³ For the list of persons, groups and entities subject to EU financial sanctions, see http://eeas.europa.eu/cfsp/sanctions/consol-list_en.htm.

4.2. Exclusion criteria

Participants will be excluded if they

- are subject to an administrative sanction (i.e. exclusion)⁴
- are in one of the following situations⁵:
 - bankrupt, being wound up, having their affairs administered by the courts, entered into an arrangement with creditors, suspended business activities or subject to any other similar proceedings or procedures under national law (including persons with unlimited liability for the participant's debts)
 - declared in breach of social security or tax obligations by a final judgment or decision (including persons with unlimited liability for the participant's debts)
 - found guilty of grave professional misconduct⁶ by a final judgment or decision (including persons having powers of representation, decision-making or control)
 - convicted of fraud, corruption, involvement in a criminal organisation, money laundering, terrorism-related crimes (including terrorism financing), child labour or human trafficking it (including persons having powers of representation, decision-making or control)
 - shown significant deficiencies in complying with main obligations under a procurement contract, grant agreement or grant decision financed by the EU or Euratom budget (including persons having powers of representation, decision-making or control)
 - found guilty of irregularities within the meaning of Article 1(2) of Regulation No 2988/95 (including persons having powers of representation, decision-making or control)
- have misrepresented information required for participating in the contest or fail to submit such information
- were involved in the preparation of the prize documents and this entails a distortion of competition .

5. AWARD CRITERIA

The prize will be awarded, after closure of the contest, to the application who in the opinion of the jury demonstrate a solution (which is at least a system prototype demonstrated in an operational environment) that best addresses the following cumulative criteria.

5.1. Positive impact:

The impact of the proposed solutions will be assessed by taking into account the choice of parameters to be monitored, their novelty, environmental relevance and socio-economic benefit.

The proposed solution should demonstrate a novel monitoring capability by either improving the efficiency and accuracy with which known parameters are observed or by permitting the monitoring of parameters which were previously impossible to monitor.

The proposed solution should have a minimal negative impact on the environment; sustainability will be considered throughout the whole life-cycle of the proposed solution from production to disposal.

The proposed solution is expected to be at a working prototype stage and be demonstrated in a relevant environment (Technology Readiness Level > 6). This development stage refers not only to the energy harvesting component of the solution, but to the wireless sensor device as a whole, including data collection, analysis and transmission.

⁴ See Articles 131(4) and 106(1) Financial Regulation.

⁵ See Articles 138(2) and 106(1), 107 of the Regulation (EU, Euratom) No 966/2012 of the European Parliament and of the Council of 25 October 2012 on the financial rules applicable to the general budget of the Union and repealing Council Regulation (EC, Euratom) No 1605/2002 (OJ L 218, 26.10.2012, p.1).

⁶ Professional misconduct includes: violation of ethical standards of the profession, wrongful conduct with impact on professional credibility, false declarations/misrepresentation of information, participation in a cartel or other agreement distorting competition, violation of IPR, attempting to influence decision-making processes or obtain confidential information from public authorities to gain an advantage.

5.2. Reliability:

The proposed solution should operate autonomously throughout the required period of time, accounting for irregularities in the energy source, environmental conditions, and decay of materials.

The proposed solution is expected to be easily deployable, configurable and disposable, with only minimal human intervention required in the operational environment. In this sense, remotely controlled or self-tuning devices will be favored, since the limitations that make water environments unfeasible for battery-operated devices are also likely to be a barrier for maintenance operations.

The energy harvesting device should work under a range of potential energy source levels, including extreme conditions or an intermittent source. Moreover, the robustness of the materials used in each component of the device should be able to withstand the conditions expected in the relevant environment (e.g. temperature, pressure, humidity) for the desired amount of time.

The proposed solution software should work throughout the duty cycle, and the energy requirements of the different software components (e.g. sampling, analysis, transmission) should be adequately satisfied by the energy harvesting technology. Moreover, the ability of the device to reboot/reset itself after occasional energy shortages will also be considered. Entrants should provide a validated model to assess performance in various scenarios.

5.3. Innovative design:

The proposed solution should demonstrate significant improvements in terms of matching the energy provided by the harvesting device with the energy required during the sampling, processing and transmission of the signal, making appropriate use of management and storage techniques (with low rates of energy leakage). It is expected to improve existing energy harvesting efficiencies. Similarly, the solution is expected to lower the energy consumption needs of the individual device components.

The proposed solution should demonstrate significant improvements in terms of portability of the solution both in terms of design (potential for application in different settings e.g. monitor other parameters or operate in different environments) and software compatibility with major operating systems and browsers. Interoperability, such that the infrastructure can be shared across different utilities, e.g. the water utilities, energy utilities, will be an asset.

The solutions should be tested under a wide range of conditions within its setting in order to account for the variability of natural environments and infrastructural differences across EU member states.

6. DOCUMENTS

The mandatory supporting documents are set out in the application form.

Participants may be asked at a later stage for further documents (for legal entity validation, bank account validation, ethics review, declaration of honour on exclusion grounds, etc.).

7. PROCEDURE

If there are more than 20 applications, there will be a pre-selection phase to select the best 20 applications to pass to jury review. Otherwise, all applications will pass directly to jury review.

The pre-selection panel and jury usually have a different composition, but jury members may participate in the pre-selection panel.

The jury evaluation is planned to take place between October 2018 and December 2018.

The pre-selection panel/jury will evaluate each application against the 3 award criteria and score them as follows (half marks are possible, decimals are not):

Criterion	Max points	Thresholds
1. Positive Impact	15	10
2. Reliability	15	10
3. Innovative design	15	10
Total	45	30

For applications with the same score, the pre-selection panel/jury will determine a priority order according to the following approach: The score for the criterion No 1 will be given a weight of 2 and the score for criteria No 2 and No 3 will be given a weight of 1.5. If two applications tie for the first rank, the prize will be divided and awarded to both.

The 5 best applications will be invited to demonstrate their solution which has to be performed remotely including connectivity with the place(s) the demonstration site(s) is/are running.

On the basis of the evaluation by the jury, the Commission will decide on the award of the prize.

All participants will be informed at the end of January 2019 on the outcome of their application.

8. OTHER CONDITIONS

8.1. Payment arrangements

The prize money EUR 2.000.000 (two millions euros) will be paid to the (lead) participant in one instalment after the award ceremony by bank transfer, provided all the requested documents have been submitted.

8.2. Publicity — Promoting the prize — Visibility of EU funding

8.2.1 Publicity by the winner(s)

The winner(s) must promote the prize and its results, by providing targeted information to multiple audiences (including the media and the public) in a strategic and effective manner.

Unless the Commission requests or agrees otherwise or unless it is impossible, any communication activity related to the action (including in electronic form, via social media, etc.) must:

- (a) display the EU emblem and
- (b) include the following text:

“This action/activity/(group of)person/legal entity was the winner of the [ZERO POWER WATER INFRASTRUCTURE MONITORING prize] from the European Union’s Horizon 2020 research and innovation programme”.

When displayed together with another logo, the EU emblem must have appropriate prominence.

For the purposes of their obligations, the winner(s) may use the EU emblem without first obtaining approval from the Commission.

This does not, however, give it the right to exclusive use.

Moreover, they may not appropriate the EU emblem or any similar trademark or logo, either by registration or by any other means.

8.2.2 Publicity by the Commission

The Commission may use, for its communication and publicising activities, information relating to the action, documents notably summaries for publication as well as any other material, such as pictures or audio-visual material that it receives from the participants (including in electronic form).

The Commission will publish the name(s) of the winner(s), their origin, the amount of the prize and its nature and purpose— unless the winner(s) requested to waive this publication (because disclosure risks threatening its security and safety or harm its commercial interest).

Photos and videos taken by the Commission either in preparation of the award ceremony or during the award ceremony are the sole property of the Commission.

8.3. Dissemination and exploitation of results

The winner(s) must comply with the obligations set out in Title III of the Rules for Participation Regulation No 1290/2013⁷

8.4. Processing of personal data

8.4.1 Processing of personal data by the Commission

Any personal data will be processed by the Commission under Regulation No 45/2001⁸ and in accordance with the [Participant Portal privacy notice\(s\)](#).

All winner(s) consent that the Commission publishes the following information:

- name
- Member State of origin (address or NUTS 2 region)
- their activities in relation to the award of the prize (via the summary for publication they provided)
- prize amount.

in whatever form and medium.

8.4.2 Processing of personal data by the participants

The participants must process personal data in compliance with applicable EU and national law on data protection (including authorisations or notification requirements, if any).

8.5. Ethics

The activities must be carried out in compliance with:

- (a) ethical principles (including the highest standards of research integrity and
- (b) applicable international, EU and national law.

No prize will be awarded for activities carried out outside the EU, if they are prohibited in all Member States. The participants must ensure that the activities have an exclusive focus on civil applications.

The participants must ensure that the activities do not:

- (a) aim at human cloning for reproductive purposes

⁷ Regulation (EU) No 1290/2013 of the European Parliament and of the Council of 11 December 2013 laying down the rules for participation and dissemination in "Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020)" (OJ L 347, 20.12.2013 p.81).

⁸ Regulation (EC) No 45/2001 of the European Parliament and of the Council of 18 December 2000 on the protection of individuals with regard to the processing of personal data by the Community institutions and bodies and on the free movement of such data (OJ L 8, 12.01.2001, p. 1).

- (b) intend to modify the genetic heritage of human beings which could make such changes heritable (with the exception of research relating to cancer treatment of the gonads) or
- (c) intend to create human embryos solely for the purpose of research or for the purpose of stem cell procurement, including by means of somatic cell nuclear transfer.

Research activities involving human embryonic stem cells (hESC) are moreover subject to the conditions set out in the [Statement of the Commission related to research activities involving human embryonic stem cells](#).

The participants must respect the highest standards of research integrity — as set out, for instance, in the European Code of Conduct for Research Integrity⁹.

For more information and best practice, see the Participant Portal Online Manual, the Guidance — How to complete your ethics self-assessment and the Guidance note — Research focusing exclusively on civil applications.

8.6. Security

The activities must be carried out in compliance with Commission Decision 2015/444, i.e. security-sensitive information must be **EU-classified**, if its unauthorised disclosure could adversely impact the interests of the EU or of one (or more) of its Member States. Applications that are too security-sensitive cannot be awarded a prize.

For more information and best practice, see the [Guidance — Guidelines for the classification of information in research projects](#), the [Guidance — Guidelines for the handling of classified information in EU research projects](#), the [Guidance note — Potential misuse of research results](#) and the [Guidance note — Research involving dual use items](#).

8.7. Conflict of interests

The participants must take all measures to prevent any situation where the impartial and objective award of the prize is compromised for reasons involving economic interest, political or national affinity, family or emotional ties or any other shared interest ('**conflict of interests**').

They must inform the Commission without delay of any situation constituting or likely to lead to a conflict of interests and immediately take all the necessary steps to rectify this situation.

The Commission may verify that the measures taken are appropriate and may require additional measures to be taken by a specified deadline.

8.8. Liability for damages

The Commission cannot be held liable for any damage caused to the participants or to third parties as a consequence of the prize, including for gross negligence.

The Commission cannot be held liable for any damage caused by any of the participants, in the context of the prize.

8.9. Checks, audits and investigations

The Commission, the European Anti-Fraud Office (OLAF) and the European Court of Auditors may carry out checks, audits and investigations in relation to the prize.

8.10. Withdrawal of the prize — Recovery of undue amounts

The/Commission may withdraw the prize after its award and recover all payments made, if it finds out that:

- (a) false information or fraud or corruption was used to obtain it
- (b) a winner was not eligible or should have been excluded

⁹ European Code of Conduct for Research Integrity of ALLEA (All European Academies) and ESF (European Science Foundation) of March 2011 http://ec.europa.eu/research/participants/data/ref/h2020/other/hi/h2020-ethics_code-of-conduct_en.pdf.

- (c) a winner is in serious breach of its obligations under these Rules of Contest

8.11. Administrative sanctions

If a participant has committed irregularities or fraud or has made false declarations, the Commission may also:

- (a) exclude the participants from all future contracts, grants and contests financed from the EU or Euratom budget for a maximum of five years (or 10 years in case of repetition) and/or
- (b) impose a financial penalty between 2% and 10% of the value of the prize (or between 4% and 20% in case of repetition).

8.12. Cancellation of the contest

The Commission may cancel the contest or decide not to award a prize — without any obligation to compensate participants —, if:

- (a) no applications are received
- (b) the jury does not find a winner or
- (c) the winner is not eligible or must be excluded.
- (d) the objective of the contest has already been achieved

8.13. Complaints

Complaints against decisions negatively affecting the rights of a participant can be brought before the General Court — or, on appeal, the Court of Justice of the European Union — under Article 263 of the Treaty on the Functioning of the EU (TFEU).

9. CONTACT

For more information, please see the prize website.

In case of questions, please contact the [Research Enquiry Service](#) and/or the functional mailbox: cnect-zero-power@ec.europa.eu