

Call for proposals.

Research on energy neutrality in urban wastewater treatment in the European Union: European targets and key economic instruments to achieve them.

1. Context

WAREG-European Water Regulators (www.wareg.org) is the association of national and regional public authorities with monitoring and/or decision-making responsibilities on price-setting, quality standards and customers' protection in the drinking water and wastewater sectors in Europe. Established in 2014, today it is formed by 24 Members and 8 Observers from 16 EU Countries, UK and 8 EU candidate or potential candidate Countries. WAREG's legal office is hosted by ARERA, the Italian Regulatory Authority for Energy, Networks and Environment, in Milan (Italy), and its operational office is hosted by BRUGEL, the energy market regulator for the Brussels-Capital Region, in Brussels (Belgium).

The main objectives of WAREG are the cooperation between its Members, the exchange of data and best regulatory practices and the promotion of transparent and stable rules that are compatible with relevant EU Directives and Regulations. WAREG actively promotes the role of public institutions like water regulatory authorities, that use different tariff-setting techniques aimed at recovering efficient capital and operational costs of water services, and at generating incentives for innovation and environmental sustainability. Water regulators also promote uniform quality standards of drinking water and wastewater services for all consumers throughout EU Countries, against the targets set by national and European legislation.

WAREG Members and Observers are represented by officials, who regularly meet to exchange know-how, collect data and provide their expertise in dedicated training programmes. In fact, WAREG is governed by the General Assembly - the decision-making body composed of the highest-level officials of regulatory Authorities - by the Board (President and Vice-Presidents) and by the Secretariat. WAREG participates in experts groups of the European Commission, holds relations with the European Parliament and other EU Institutions and cooperates with international organisations like OECD, WB, EIB. It also has a constant dialogue with the water industry represented by European stakeholder associations.

2. Scope of this proposal

In support of its Secretariat, WAREG is looking for a research partner specialised in researching on the nexus between wastewater treatment and climate neutrality targets addressed by the EU. In October 2022, the European Commission started a legislative procedure to review the Urban Waste Water Treatment Directive (UWWTD) of 1991¹ by sending a proposal² to the European Parliament and the Council of Ministers of the EU. The proposal addresses, among other things, the potential in the wastewater sector for energy efficiency improvements, contributing to EU climate and energy policies, as well as better sludge management and water reuse for improved alignment with the EU circular economy action plan.

Additionally, the proposal of a new UWWTD introduces the binding targets on energy neutrality by requiring that *Member States shall ensure that the total annual energy from renewable sources, as defined in Article 2 of Directive (EU) 2018/2001, produced at national level by urban wastewater treatment plants treating a load of 10 000 p.e. and above is equivalent to at least:*

- (a) 50 % of the total annual energy used by such plants by 31 December 2030;
- (b) 75 % of the total annual energy used by such plants by 31 December 2035;
- (c) 100 % of the total annual energy used by such plants by 31 December 2040.

¹ Council Directive 91/271/EEC concerning urban waste water, adopted on 21 May 1991.

² COM(2022)/541/Final.

The EU Regulation on minimum requirements for water reuse for agricultural irrigation entered into force in June 2020³ to set out different objectives, among which harmonised minimum water quality requirements for the safe reuse of treated urban wastewater in agricultural irrigation. Water reuse often requires lower investment costs and energy, also contributing to reducing greenhouse gas emissions. Additionally, the EU rules promote the use of sewage sludge in agriculture⁴, which can also generate energy sources.

In recent years, efforts have been put in place to reduce infrastructure's energy consumption. Many urban wastewater treatment plants have invested in technologies to better control processes and use less electricity, with non-CO₂ greenhouse gas emissions decreasing by 20% between 2005 and 2017 (EEA, 2019a). The capture of biogas resulting from the processes and the implementation of anaerobic digestion can be used to support the plants' energy needs. Energy efficiency measures include recovering heat from wastewater processes and using space to accommodate wind turbines and solar panels, providing renewable energy.

However, in order to comply with climate neutrality targets of the EU Green Deal, investment solutions may not be necessarily effective, especially in areas where wastewater treatment processes have reached high levels of efficiency. In those cases, alternative solutions may be considered, for instance, by relying on the markets of renewable electricity or CO₂ emission certificates. The expected deliverables will be:

- Drafting a detailed and comprehensive paper – on behalf of Wareg - on "Reaching energy neutrality in urban wastewater treatment: the role of water regulators" (title TBC)".
- Participating as a speaker at the final workshop event in Brussels (exp. November 2023) mentioned above.

The research should include all EU Countries and should cover relevant ministries (environment ministries and agencies, water and sanitation sector line ministries, others relevant), national economic regulators (where such exists), national water associations and/or water utility associations, benchmarking associations and others at national and/or regional level.

3. Main questions to be addressed in the research

Key questions to be addressed in the research paper are:

1. What best practices in energy neutrality (including energy efficiency) processes can be found in the wastewater industry at the European and international (outside EU) levels?
2. Which EU Countries have promoted energy neutrality targets (including energy efficiency) on wastewater treatment so far, and what administrative/regulatory/license/other measures have been introduced to guarantee their achievement?
3. What are the expected actions of the other EU Countries that have not yet promoted such targets?
4. Energy neutrality can be achieved by self-production (ex. physical production, energy community) or market purchase of energy (ex., cap and trade mechanism, energy markets, etc.). Should the policy target of the new European UWWTD include both alternatives? According to current best practices worldwide, which choices can be made at the country level where a national government assigns an energy neutrality goal?
5. How is the process of sludge treatment, disposal and reuse affected by the new energy neutrality requirements, and what measures are suggested?
6. Which role can regulatory authorities play to ensure the achievement of the energy neutrality goal at affordable costs for consumers?
7. Which regulatory tools can be used to achieve the energy neutrality goal (e.g. licensing requirement, KPIs monitoring, reward and penalties, requirements to identify the investments needs, etc.)?

³ Regulation (EU) 2020/741 of the European Parliament and of the Council of 25 May 2020 on minimum requirements for water reuse.

⁴ Council Directive 86/278/EEC of 12 June 1986 on the protection of the environment, and in particular of the soil, when sewage sludge is used in agriculture.

8. How could water regulatory authorities manage the potential cross-subsidies between regulated activities (wastewater treatment) and non-regulated activities (selling sludge, biogas or other by-products of the treated waters) of wastewater companies?
9. How can energy neutrality targets be reached in EU countries without national economic regulators?
10. Is it possible to match the energy neutrality target of the UWWTD proposal with the high energy consumption generated by the new requirements of wastewater treatment processes (ex., quaternary treatment)?
11. What are the advantages and disadvantages of advocating for energy neutrality?
12. Would a green energy pledge be more suitable than an energy neutrality pledge?
13. What are the relevant preconditions to ensure that energy neutrality is feasible? Large spaces for photovoltaic energy production? Large production of biogas? Suppose the treatment plant is not close to an energy network point and requires infrastructures to connect it to a gas network. Is it an option instead of self-consumption? Is this energy produced accountable for energy neutrality purposes?
14. What are the expected impacts of water tariffs for different levels of energy costs?
15. How could water regulatory authorities manage the potential cross-subsidies between regulated activities (wastewater treatment) and non-regulated activities (selling sludge, biogas or other by-products of the treated waters) of wastewater companies?

These questions may be further elaborated and enriched.

4. Information and qualifications required in the application

The following minimum information is required in the application:

- Composition of the research team: private individuals with PhD and at least 5 years of working experience in the wastewater sector. Relevant experience in the energy sector would be considered preferential. Track record of professional experience in institutional environments.
- Individual or joint applications of research institutions or think tanks within or outside the EU, is possible. Track record of relevant publications in the fields of research related to this paper is required.
- Proven capability to address the research questions in point 3 above in all EU Countries.

5. Timeline for the application and the research

Applications for this research paper should be received by 19 May 2023. The proposed timeline for the research is the following:

- Analysis of offers and selection: by 31 May 2023
- Contract award: by 9 June 2023
- Deadline for submitting a final paper: by 30 October 2023
- Participation in a final workshop: November/December 2023 (TBD)

6. Application

Interested candidates should submit the following documents:

- Motivation letter with evidence of the requirements listed in point 4 above.
- Method statement showing the understanding of the scope of work as listed in point 2 above.
- Economic quotation of the proposal.

To submit the offer and/or request additional information, please send an email to secretariat@wareg.org