

REUSE SPECIAL

Waste water reuse in Saragossa

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It is estimated that, in the Ebro River basin a total of 14 hm³/year (2009) are reused, which represents an incidental percentage compared to the own water resources. The future of these reused water amounts is, mainly, farmland irrigation.

Royal Decree 1620/2007 established the legal regime to reuse treated waters, clarifying the legal framework for reuse actions, quality and potential treated water uses.

Up to now, in the Ebro basin there has not been a substantial development of water reuse, caused by its high cost and, in general terms, the abundance of the resource. Nevertheless, these actions are of great interest for the **improvement of the ecological state of the water bodies that receive the final discharge and for higher pollution treatment efficiency**. Urban treated water can be used, at a relatively lower regeneration cost, in agricultural, forestry or garden irrigation as well as golf course irrigation. A very interesting use due to its low regeneration cost and the indirect treatment effect is forestry.

In the case of Saragossa, the use of regenerated water for garden irrigation or the washing down of streets can mean a prohibitive cost if compared to using water from the alluvial aquifer or directly from the *Canal Imperial*, which is also a high efficiency solution in economic and environmental terms.



Picture of the La Cartuja Treatment Plant, 2008, Saragossa. Source: Veolia Agua

However, **other possibilities which are linked to municipal strategies in force could be studied, reinforcing their effects**. In particular, the municipal strategy called "adaptation to climate change in the city of Saragossa" includes reforestation within the municipal area for CO₂ absorption among its action lines. This reforestation might be favoured thanks to irrigation with reused water. It would be a **forestry related use**, and it would not require any regeneration treatment (except for the suspended solids control), also allowing forest management and taking advantage of the resulting biomass for the possible renewable energy production, also according to what has been foreseen in the climate change adaptation strategy.

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Obviously, the feasibility of this solution would be limited by land availability, the location of the plots to be reforested and the energy cost associated to pumping from La Cartuja treatment plant, reason by which it should be located nearby.

There are other possibilities that can be studied or discussed, such as using it for **agricultural irrigation**, which at first sight seems to be more difficult, or for other alternative urban uses, although as it has been said, its cost can be too high.

From the 4th of February onwards, there is a space in the ZINNAE Intranet, called "Reuse Commission", with the purpose of sharing documents and opening a discussion and proposal interchange space on how ZINNAE's partners should tackle Saragossa's wastewater reuse: either with dissemination and/or training activities, and even identifying a project to be carried out in the city with the purpose of improving the discharge quality and the efficient use of water. We encourage all partners interested in this issue to share documents, opinions and proposals and hope to call an on-site commission in March where to collect the main conclusions of this work.

As a conclusion, this paper presents the following aspects that can support ZINNAE's efforts towards the efficient use of water and water-related energy.

- The different calculation methodologies presented establish different limits to the energy costs linked to the urban water cycle. **The operators should establish a common methodology to facilitate data comparative analyses**, allowing them to act in each case on those results that are higher in each stage/process.
- The global figures corresponding to the first two cases illustrate the global dimension of the energy consumption linked to the water management cycle, but it is **necessary to analyze each supply in order to take decisions that should be useful for its management**.
- **Domestic hot water is the greatest energy consumer within the cycle**, and ways to increase use efficiency must be explored.