

# Reuse of water

## A global overview



Lot of the Riachuelo System in Buenos Aires, Argentina (Fisia Italimpianti)

Global water scarcity, droughts, increasing world population and climate change all require technology innovation and new business models for wastewater reutilization

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**N**owadays, water management has gradually become a global issue: even though the total supply of freshwater is supposed to cover human demands, its spatial and temporal distribution is often quite irregular and inadequate. In some regions of the world, the lack of proper clean water (mostly due to human activity and

economic development) affects several applications, such as domestic and environmental aspects. Furthermore, climate changes have a strong impact on water availability, and the unpredictability of the future climate makes water management a high priority issue. This naturally results in water reclamation and reuse, which is a method carried out to recycle treated wastewater and take advantage of it to face water shortages: the potential role of treated wastewater as an alternative source of water supply is remarkable, because it allows to decrease water stress all over the world.

One of the main and more immediate reasons to reuse treated wastewater is



Atakoy Wwtp, Turkey  
(Fisia Italmimpianti & Alkatas).  
MBR Plant

the availability of resources: water scarcity and droughts are current issues, this risks to become more intense in the future due to climate change and increasing population. For this reason, water reuse can provide alternatives to existing water supplies, minimizing the use of conventional water resources, such as surface water and groundwater.

Apart from being fundamental for human surviving, in fact, water adjusts also the Earth ecosystem: every time human beings use, process and take advantage of water, this has a resulting impact on the environmental system, in terms of pollution or water scarcity.

**“ One of the most immediate reasons to reuse treated wastewater is the availability of resources, due to water scarcity, droughts, increasing world population and advancing climate change**

In the last few years, then, most of the governments all over the world are more and more projected towards an eco-friendly policy: a transition to a circular economy represents an advantage from an economic point of view, because wastewater reuse allows to safeguard the environmental system, and this in turns leads to a “waste-free” water management.

In this regard, Fisia Italmimpianti has recently completed a contract for the Municipality of Istanbul (ISKI) ATAKOY WWTP, which included an advanced biological treatment plant (MBR) for the purpose of irrigation/industrial reuse of the water resource deriving from the municipal sewage collection net.

**“ Fisia Italmimpianti has recently constructed for the Municipality of Istanbul a plant with an advanced biological treatment for the purpose of irrigation/ industrial reuse of the water derived from municipal sewage collection**

Nevertheless, also the social aspect plays a relevant role, the public perception may be a difficult obstacle to overcome: in the collective imagination, reused water will have a worst quality if compared to the conventional sources, regardless of the treatment level, so sometimes it is not easy to make people accept it. This is the reason why an awareness campaign is definitely a tool which must be included in the water reuse policy.

In fact, public belief is a factor as important as the other aspects. From a mere technical point of view, the recycled water source could be sometimes better than the incoming raw surface water from surface water, in which several sewage discharges could insist. Everything depends on the required purification degree which in turns affects the employed technologies. For these reasons, the psychological effect plays a relevant role, it is not easy for the average person to accept this aspect, even more so if water is recycled for drinking purposes. Researchers and governments are supposed to adopt strategies to deal with this problem, to give everybody the instruments to understand and accept water reclaiming.

Every wastewater can be reused after an appropriate treatment, everything is based on technical and economical assessments: in several geographical

Atakoy Wwtp, Turkey  
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II Stage Main Plant



areas, water reuse is strongly discouraged, because freshwater collection by conventional methods is operationally easy and cost-effective; instead, in other parts of the world freshwater withdrawal is more difficult, so it is necessary to rely on alternative methods, such as water reclaiming.

A balance between technical and economic aspects is one of the main factors which the

choice is supposed to be based on. Moreover, the designated reuse must be taken into account as well: for example, if the final purpose is to obtain drinking water, the effluent will certainly go through a more intense treatment rather than a water intended for industrial uses, and this definitely has an impact both on economic and technical aspects.



## Emanuele De Mattia

Emanuele De Mattia graduated in Civil Engineering for water management at the Polytechnic of Turin in 2010.

From graduation until 2014 he collaborated with the company Desa S.r.l. of Turin with Mr. Angelo Schiavone, where he dealt with consultancy and design issues in water treatment, aqueducts and sewers. Subsequently, until his entry into Fisia Italmimpianti S.p.A., he worked with various companies, acquiring experience in the design and assistance in the construction, commissioning and start-up phases of civil and industrial water treatment plants.

Since 2016 he has been working in Fisia Italmimpianti S.p.A. and, in the role of Process Engineer, contributed to the implementation of the Atakoy WWTP (Istanbul) contract and launched the advanced biological plant - MBR intended for the reuse of water resources.

Since 2020, he has also held the role of Head of Water Treatment Process.

## Il riutilizzo dell'acqua Una panoramica globale

L'acqua è un bene primario per l'essere umano, un composto fondamentale che regola l'ecosistema. È una fonte rinnovabile, ma la sua gestione è estremamente impegnativa: l'offerta complessiva è in grado di soddisfare la domanda mondiale, ma la sua distribuzione non è uniforme nel mondo, a causa dei cambiamenti climatici e della siccità, ma anche a causa di uno sviluppo economico diseguale. Il recupero dell'acqua è una soluzione per affrontare questo problema, perché permette di riciclare (attraverso opportuni trattamenti e tecnologie) l'acqua già utilizzata per indirizzarsi così verso una prospettiva di economia circolare.