

International Perspective from Spain
Role of Water Reuse for Sustainable Development and Circular Economy

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Good afternoon ladies and gentlemen.

Thank you Jeff (Mosher) for your kind introduction.

It is a great honor and a deep personal satisfaction to be here today celebrating the 11th IWA International Conference on Water Reclamation and Reuse.

When in 1991 we were celebrating the first International Symposium on Wastewater Reclamation and Reuse in Costa Brava, Spain, we could never imagine that it would become the first of a series of very successful international conferences devoted to such a promising and innovative new field in water resources management as water reuse. Congratulations to all those that have made possible our outstanding progress, all along the last 26 years and the 11 editions of this conference.

The 1991 International Symposium was the debut of the newly created Specialist Group on Water Reuse that Dr. Takashi Asano and other international scholars, researchers and practitioners had been promoting for more than 5 years within the International Association on Water Pollution Research and Control that in 2000 became the International Water Association (IWA) at the International Conference in Paris.

Let me say that our exploratory work in water reuse had started about 6 years before, in 1985, when the Costa Brava Water Agency organized the first Workshop on Wastewater Reclamation and Reuse in Spain, with the valuable participation of colleagues and friends like Dr. Takashi Asano, Dr. James Crook and the late Dr. Emmanuel Idelovitch. It was the time of the Monterey project and the Guidance Manual for Irrigation with Reclaimed Municipal Wastewater.

Our relationship with California water reuse projects has been a continued and intense partnership over the last three decades, together with valuable visits to Florida during the late 1990's.

The main driver of our close collaboration with water agencies and water users in California has been the close similarity in climate and water use in both territories.

We do belong to the climatologist's group of "Mediterranean weather regions" and we both experience episodic and intense multiannual droughts, not only at country level but even more so along our coastal areas like the Llobregat and Ter river basins, the main water supply sources for the Barcelona Metropolitan Area.

Right now, the early signs of a large-scale drought episode are affecting most of Spain, in contrast to what is happening in the Northeastern coastal regions, where rain has been surprisingly exceeding all expectations since the end of 2016.

With a similar surface area and population, we devote a significant portion of our water resources to agricultural irrigation, particularly along the fertile agricultural areas of the Mediterranean coastline that resemble so much those of Central and Southern California.

We have a strong and similar size agricultural industry, with 3.9 and 3.6 million hectares of irrigated land, and a similar economic output, with \$45,000 million and \$40,000 million respectively. However, we seem to be more economical in the use of water for irrigation, with mean allocations of 4,400 m³/ha-y in Spain vs 11,000 m³/ha-y in California, most likely due to historical limitations in water supply from our small river flows.

There is a significant difference on legal status of water resources: while the California mining background has resulted in more than 50% of water resources being private, Spain has a century's long legal tradition of water as a public good, with the exception of the Canary Islands. As a result, our regulations for water reuse have to cover in all cases both water rights legal permitting issues and reclaimed water quality and distribution issues.

Our water policy highlights that there is no such a thing as "water market". Instead, we strive for a transparent and efficient water services market.

In those conditions, and since 1985, water reclamation and reuse appeared to us as a very valuable strategy (a necessity as a matter of fact) for accessing to a more reliable, self-sufficient, local and sustainable water supply, particularly in Mediterranean coastal areas, where treated effluent and nutrient discharges could also be reduced.

In 1989, the Costa Brava water agency authorized the first golf course under the condition of using reclaimed water for irrigation. That requirement has become applicable to existing and new golf courses.

In 1994, the first Title 22 facility went into operation in Vitoria, the Basque country, for irrigation of 10,000 ha during summer months. We immediately learned that the cost of a new

dual distribution system, plus a seasonal storage reservoir, amounted to about 9 times the cost of the reclamation facility itself.

In 2007, two large water reclamation facilities were completed in Barcelona, inspired by the model established by Orange County Water District. A 70 mgd for unrestricted irrigation plus a 4 mgd of advanced reclamation to supply a nearby sea water intrusion barrier.

In 2007, in the middle of the severe national drought of 2006-08, our first regulations for reclaimed water were approved, based on both World Health Organization recommendations and California regulations. After more than 20 years of extensive debates, we were able to produce a leading and useful piece of regulations that has allowed us to advance in numerous reclaimed water uses. However, we have to renew our efforts to adapt those regulations to scientific and technical progress made at home and abroad.

A new set of water quality regulations is being prepared at European level, specifically for agricultural irrigation and groundwater recharge with reclaimed water. It is taking some time to reach consensus and approval among interested parties. In addition, water reuse is clearly a “necessity” mostly for Southern European Members.

Spanish regulations emphasize terminology as a way to clarify responsibility and cost issues: those assigned to produce reclaimed water and those attributed to distributing reclaimed water. We certainly appreciate international efforts in terminology for advancing public information and outreach.

In 2011, Barcelona organized the 8th edition of the IWA International Conference on **water reuse** and we were happy to welcome distinguished members of the new generation of water scientist, engineers, managers and practitioners... in addition to distinguished Young Water Professionals...

Since 2012, we expanded our initiatives into the urban and industrial sectors.

The town of El Prat de Llobregat, near Barcelona international airport, adopted a dual distribution network for toilet flushing, covering up to 200 new homes from the 1,650 homes planned. That project resulted in the finding that 25% of the home water use (100 L/per.day) is reclaimed water.

The industrial sector covers paper production in Madrid and cooling and boiler feed water production at a petrochemical park in Tarragona, a project that will be described at a technical session of this conference.

The Tarragona water reuse project was inspired by the centralized and satellite facilities of West Basin Municipal Utility District. As of today, advanced reclaimed water is further purified at onsite facilities, to produce water for high-pressure boilers feed.

To finalize this brief history, in 2015, the town of El Port de la Selva began operating an indirect potable reuse project, sponsored by European Union research funding. The town is near the Spanish-French border, in an area where surface water sources are very limited and where promoting water self-sufficiency is the most sustainable option. There is no question that sustainability and the circular economy approaches are helping the promotion of this IPR project. The technical details of the project will be presented at a session of this Conference.

In summary, promoting water reuse in Spain and particularly at its coastal and Island areas has been a challenge and a great satisfaction, since we began in the late 1980's. We wanted to incorporate sustainable strategies, even if we were not explicitly counting with the powerful message of the “circular economy”.

During our 32-year history in water reuse, we have covered a wide diversity of water reuse options, from unrestricted irrigation, to urban and industrial uses, and to indirect potable reuse. We are very grateful for the valuable inspiration and collaboration offered by colleagues and institutions from California and Florida.

In a time of “circular economy” proclamation, we have to emphasize that, here also, its effective implementation requires more than technical excellence; we have to “elaborate and present our results” in a more meaningful manner, as to further intensify the balance already favored by sustainability and education, in a planet with finite water resources.

We are aware of the real need to advance in two basic methodological tools, as to overcome current regulatory challenges and economic roadblocks: 1) to document in detail the advancement of our water reuse projects and 2) to realize that “expert and advisory panels” are very effective ways to overcome current regulatory challenges.

We are determined to continue our information and outreach efforts through the Spanish Association for Sustainable Water Reuse (ASERSA), in collaboration with the IWA Specialist Group on Water Reuse, the American Water Reuse Association, the Water Environment and Reuse Foundation and other leading international water agencies and districts.

We certainly believe that the Mediterranean Region is still in need of water reuse leaders and visionaries, and we feel Spain qualifies for the job.

However, we may have to wait until the next national or regional drought, for that process to reach its full potential.

Thank you all for your attention.