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## Challenges and Opportunities for Desalination and Reuse: Perspectives from Water Leaders



The Carlsbad Desalination Plant will be commissioned in late 2015. Photo courtesy of Poseidon Water

One of the highlights of IDA's November/December issue is its annual feature that presents insights from some of the world's most respected authorities in desalination and water reuse. This year, the following individuals have agreed to share their perspectives about the challenges and opportunities that our industry will face in 2016.

In alphabetical order, they are: Benedito Braga, President of the World Water Council; Mike Dixon, PhD, IDA Director and Director of Engineering, Alberta WaterS-MART; Emilio Gabbrielli, IDA President and Director, Overseas Business Development – Global Sales

of Water Treatment for Toray; Fady Juez, Managing Director, Metito Overseas Ltd; Professor John H. Lienhard V, Massachusetts Institute of Technology; Maurice NEO, Director of the Industry Development Department (IDD) in PUB, Singapore's National Water Agency; Vahid Ownjazayeri, President Civil & Infrastructure Division, AECOM Technology Corporation; and Neil Palmer, Chief Executive Officer, National Centre of Excellence in Desalination Australia.

We invite our readers to share their thoughts by posting comments to our LinkedIn group page at <http://tinyurl.com/ol6kk19>

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# message

from the Secretary General

Patricia Burke



***"All our dreams can come true, if we have the courage to pursue them." — Walt Disney***

This New Year marks more than a transition from one calendar year to another. The start of 2016 signals a new day for IDA, with the systematic implementation of a new vision that came out of our rigorous strategic planning process undertaken last year. That exercise has reinvigorated our organization. It has set forth a roadmap for us to follow as we pursue our dream – and our commitment to – a new, revitalized and ever stronger IDA that has commenced with a rebranding of our Association.

"Branding" involves far more than a logo or tagline or words we use to describe IDA. A brand is an implicit "promise" to all our stakeholders to perform in a certain expected and predictable way. It is the essence of who we are, our "persona," our organization's "personality" that is reflected in what we say, how we present ourselves, and most importantly, in what we do.

One of the key aspects of our research was identifying IDA's true brand essence and with that, confirming and articulating the value proposition that makes us unique and relevant to our constituents. Like many of my colleagues, I assumed that we'd find that people placed the highest value on our events and in our publications. We learned that, while those are important activities, our true value runs much deeper.

Over the past 40+ years, IDA has become the point of connection for the global desalination and reuse industry. Today, our membership comprises the world's leading authorities in all aspects of our field of endeavor. As a result, our World Congress proceedings represent an unparalleled treasure trove of information that is available to our members. Our events, our programs, our educational initiatives all serve to connect people not only with others in the industry, but with fresh new ideas that will help shape the future of water for our planet. IDA is the facilitator of this process.

Our repositioning includes a reorientation of how we describe ourselves and also includes the integration of water reuse into our mission and activities. Perhaps one of the most important tasks is the updating of our organization that includes a review of our Constitution to ensure that the evolution in external factors like changes in technology and/or today's communication dynamics, and the growth in new geographies and markets, are adequately represented. This process also looks at the internal evolution of our organization to ensure that it remains on a trajectory that will best propel us into the future.

***"The way to get started is to quit talking and begin doing." – Walt Disney***

So what are we doing to achieve these goals?

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# Message from the Secretary General

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Over the past year, following the acceptance of our Strategic Plan, we have undertaken a number of steps:

- We've begun including the water reuse sector in our activities and our publications. Notably, IDA's inaugural international conference on water recycling and reuse will take place September 25-27 in beautiful Nice, France. We plan to present a conference focused on water reuse every two years, in the years between our World Congresses. You will see regular and dedicated coverage of water reuse in our newsletter, and we plan to add specific information about reuse to our website, which is scheduled to be refreshed this year.
- We've increased the attention on reuse in our World Congress Technical Program. This year, the Technical Program included 29 oral and digital poster presentations and panels covering topics ranging from A Discussion of Innovative Recycle/Reuse Programs from around the World to Current Challenges and Future Needs for Desalination and Water Reuse in Industrial Applications.
- We have made water reuse and its role in an integrated water resources management strategy a key part of our positioning as part of our media outreach program. This strategy was launched in the media relations run-up to the 2015 World Congress that

included a series of interviews with leading print, online and broadcast media as well as a very successful webinar organized by IDA and presented by Bloomberg BNA prior to the World Congress. It was front and center of our media relations activities at the World Congress, which generated very strong coverage in both news and trade media. In fact, almost three dozen media from around the world were credentialed to cover the World Congress – an exceptional turnout.

- We are integrating the new value proposition into our overall positioning, new membership and event marketing collateral, and additional marketing initiatives. We are introducing a new tagline, "Connecting People and Ideas to Water Solutions," that sums this up.
- We have reached out to other complimentary organizations to forge new alliances that will help us expand our reach. We are developing plans to reach out to new markets and create deeper connections with the reuse community. Over the coming months, you will see the results of these efforts.

While we have begun this process, there is still much to do, and we look forward to your support as we move forward. With that said, on behalf of all of us at IDA, I wish you all a prosperous, healthy and happy 2016.

# Challenges and Opportunities for Desalination and Reuse

## Perspectives from Water Leaders

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### 1. What do you think are the greatest challenges for the desalination and water reuse industry?



**Gabrielli:** The greatest challenge for our industry is probably to live up to its potential in contributing to the solution of the water resources challenge within well-planned water

resources policies. Often, desalination and reuse become the “flavor of the month” because of a crisis, and there is a high risk that non-optimal solutions are adopted outside a well-planned strategy, where the right solutions would fit. This is because, apart from the cost now being competitive with traditional sources, there is the unpredictable climate change challenge, of which desalination and reuse can be pillars in adaptation and an insurance policy to safeguard water resources for society, economy and the environment.



**Dixon:** More intense scrutiny on environmental issues and impacts will be an ongoing challenge for desalination around the globe. Connected with this is a need to develop

more cost effective methods to mitigate environmental risks when building new desalination plants. Australia set a new standard for environmental stewardship in desalination; however, this process meant these plants were double the cost of earlier plants around the world.

The development and application of new technologies to alleviate environmental costs is another challenge. For instance, reuse and desalination may become more acceptable in

the broad public if more reuse and desalination plants were powered or supplemented by green energy sources. Our industry must rise to this challenge to seek out the most effective green energy production technologies.

A third challenge is that both reuse and desalination need a new step change technology to take us to the next level. For desalination “thin film composite” or “pressure exchanger” type developments are needed to make our industry more economical and environmentally viable.



**Ownjazayeri:** Affordability is at or near the top of the industry’s challenges, due to the high cost of desalinated water. While the source of supply for desalination (the oceans!) is more plentiful, the cost of pretreating and then desalting that water continues to remain high, giving desalination the moniker of “water for the rich.” As raised by several speakers at the IDA Congress in 2015, this is a challenge that all of us in the water industry must work to solve.



To hear more on this topic, please visit [youtu.be/TIG8-SUu1EQ](https://youtu.be/TIG8-SUu1EQ)

Following close on the heels of affordability is water supply integration. Integration of water

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# Challenges and Opportunities for Desalination and Reuse

## Perspectives from Water Leaders

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supply, treatment, conservation, wastewater treatment and reuse into the infrastructure of our existing global city infrastructure is essential. World-class cities no longer think of public services such as energy, transportation, water, housing and recreation as separate components. Today they are planned and designed to work together more efficiently. Last century's "hub and ring" city model must be replaced by newer, more efficient models, like "spine and node," and take advantage of integrated infrastructure, including seawater desalination.

Solving environmental impacts of desalination is a costly challenge. The trends towards more creative thinking that blends the advances in desalination technology with our increasing understanding of the world's complex, changing environment will ultimately solve this challenge.



**Palmer:** There has been some damage done to the image of seawater desalination by the emotive resistance to the technology in Southern California. Many of the attacks have been

based on misinformation and fear that the operation of the plants might harm the marine environment, notwithstanding the fact that there are many thousands of seawater desalination plants around the world that operate sustainably without adverse environmental impact.



To hear more on this topic, please visit [youtu.be/EmZ4y7DoF0Q](https://youtu.be/EmZ4y7DoF0Q).

I think these fears will be alleviated by the impending full operation of the Carlsbad Desalination Plant in San Diego, the first large installation on the California coast. Based on well documented international experience, it is unlikely that it will have any adverse impact on the marine environment. I think acceptance of desalination will probably be much easier for subsequent plants in the region.

The benefits of a climate-resilient water supply will be appreciated by the consumers of San Diego. I think they will also feel a better sense of self-reliance as they reduce their dependence on inland water supplies. This will enable farmers to benefit as they can keep more of their water instead of sending it to the cities.

Curiously, water reuse, which also depends on reverse osmosis desalination as a critical process step, seems to enjoy much broader media and public support.

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# Challenges and Opportunities for Desalination and Reuse

## Perspectives from Water Leaders

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**Lienhard:** Two challenges that are receiving increased attention are reduction in carbon footprint and reduction of environmental concerns related to brine discharge. We have seen

increased attention to the first issue as concerns about climate change have risen – even statements that desalination plants, by contributing to carbon emissions, will themselves cause droughts.

On this front, I think two points are important to make

First, the energy requirements of state-of-the-art plants are substantially lower than some of the still quoted numbers for older technology, and they are still falling. Second, some alternative sources of water, such as long aqueducts, require similar amounts of energy and are responsible for enormous environmental damage in the areas from which water is removed. Solar power at grid scale is certainly desired long-term solution for this, and many other, industries.

On the question of brine discharge, this is an area where more research and continued engineering will go a long way. For seawater systems, most of the required technology is well understood already (diffusers, for example), so it's a matter of having cost-effective designs that do not overwhelm marine ecosystems. There's also a need to have scientific clarity as to which impacts are significant and which are more hypothetical. Partnership with marine scientists should be part of the solution.

Behind both of these concerns is a probably a broader discomfort with the idea that costly engineering interventions will be adopted when simple measures, such as conservation and water-efficiency, should come first and will have lesser environmental impact. But I don't think anyone in the industry is arguing against conservation and reuse as options that should precede desalination.

This entire area is one where good communication by the industry can help a lot. It's clear that the end objective for all parties is to avoid the social, economic, and environmental damage that water scarcity brings.



**Juez:** Desalination carries enormous economic and environmental challenges. It costs approximately US\$1 to desalinate a cubic meter of seawater to produce potable water,

which is a major obstacle for growing the desalination market.

For reuse, the biggest challenge is public perception, as there is still a stigma attached to reused water, especially from citizens who are resistant to accepting it as the source for their daily water needs. With the latest technology and innovative treatment solutions available, this is really something that must be further challenged and more seriously advocated.

There is trust in the tried and tested desalination having being used for years without fail, so industry experts must work together, harder, to educate the public and engage with decision makers to try and educate all of the tangible cost saving implications, and the environmental

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# Challenges and Opportunities for Desalination and Reuse

## Perspectives from Water Leaders

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benefits to water reuse as another viable solution that is worth more attention.

I must say another challenge to the industry as a whole is the speed by which technology is being developed. We need new ideas, pilot plants and technologies that can be backed up and tested for future benchmarking. There is also the challenge of convincing people to conserve water, as no solution can be forever sustainable without the buy-in from people / users at all levels.



**Neo:** The industry needs to make the technology more economically and environmentally appealing to places that are hesitant in adopting it. Reverse Osmosis, MED and MSF are the incumbent technologies, but there have been advancements in electrochemical desalination, membrane distillation and PRO. There have also been initial steps to utilize renewable energy to power desalination plants, and Saudi Arabia has announced the world's first utility-scale 60,000m<sup>3</sup> solar powered desalination plant. This could be the start of a new era for desalination.

Singapore has also been focusing our R&D efforts on electrochemical desalination and biomimetic membrane research, and we are optimistic about new low energy breakthroughs in the near future.

With regard to the environment, the concern that has been expressed by the general public could have been due to a lack of understanding of the technology. There should be

enhanced communication between governments with stakeholders about the results of environmental impact assessments, so that there is better understanding of the impact on marine life for the intake and outfall processes.



**Braga:** For desalination and water reuse, I can see two overarching challenges that lie ahead. First, we need to meet a rising global demand for water. While the global population continues to grow, climate change means that our world – and water supply – is changing very quickly. In addition, crises relating to cities, food, energy, and climate threaten the security of our water resources, our access to water, and our ability to make water available to all in a sustainable way.

Connected to this is our second major challenge: to meet a rising urban demand for water. More than half the world's population now lives in cities, and this proportion is expected to grow in coming years. To effectively address rising demand for water globally, and in cities in particular, we need to tackle challenges within the desalination and water reuse industry.

Three issues are most prominent here.

First, we need to make desalination more affordable for public authorities, operators and end users. Second, we need to ensure that desalination is a sustainable option. This means developing our technology to make desalination less energy intensive, and to mitigate its environmental impact. Third, we need to

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# Challenges and Opportunities for Desalination and Reuse

## Perspectives from Water Leaders

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address the negative public perception of reusing wastewater as drinking water.

### 2. What do you think are the greatest opportunities for our industry in the next couple of years?

**Ownjazyeri:** Fortunately, those of us in the desalination industry are up to solving challenges, and one of the greatest opportunities is to innovate. By coupling academia, investors, engineers, planners, operators and owners, we need to create innovation clusters that will break boundaries of desalination as a recognized water supply alternative. A key area is the coupling of renewable, sustainable energy with renewable, sustainable seawater desalination. Solar, wind, stored energy coupled with desalination represent a new frontier that opens doors for projects previously thought undoable.

Desalination, perhaps more than any other water supply and treatment option, presents the opportunity to supply clean, safe potable water to the global community. Water, like many other commodities, is something that those in the lower economic brackets struggle to obtain – disease, hardship, and shorter life expectancy are the result. We now have the opportunity to reverse this trend and promote & enhance public health.

If we are to bring “new water to a thirsty world,” we have the challenge and opportunity to recognize that water has a cost – to source, treat, distribute, collect, and reuse. We trade oil, grains, metals, and ore on the global market – why not water? For too long we have allowed water to be treated as a “local” commodity, not subject to the world’s rules of

supply, demand and regulation. Water is global and our economic models must begin to reflect this.

**Juez:** There are vast opportunities in water reuse and water recycling, and I am confident we will see a growing trend adapting nonconventional solutions to sustainably secure water supply. We can also see a growing market for PPP projects with more focus on optimization and cost reduction which is crucial to establish sustainable water projects especially in developing countries where the access to capital investments is a challenge.

Desalination already plays a critical role in MENA’s water supply, particularly for countries in the Gulf region, and will remain so for the foreseen future.

I expect Industrial wastewater reuse to pick up and show a rapid expansion in the next few years. Power & water companies will also continue benefitting from advanced analytical tools such as smart metering, which opens a whole range of new possibilities and markets for growth.

**Braga:** I see four major opportunities ahead for the desalination and water reuse industry. First, the industry is well-placed to serve coastal cities. This applies particularly to cities located in brackish coastal deltas and with arid climates – in North Africa, for example. But as water sources become more and more scarce per capita, desalination is becoming a credible option for other coastal cities, too.

Our second opportunity is to foster community resilience in the face of climate change. If implemented with environmental and

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# Challenges and Opportunities for Desalination and Reuse

## Perspectives from Water Leaders

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economic sustainability in mind, desalination and water reuse can strengthen communities in dealing with new problems brought about by climate change.

Our third opportunity is to bridge the gap between water users and decision makers. The desalination and water reuse industry has the power to reach across sectors to strengthen shared responsibility. This can help ensure that decisions on social and economic issues are informed of the implications for water resources, and vice versa.

Our fourth opportunity is to scale up existing solutions while also tailoring them to local situations. In Qatar, for example, carbon-neutral desalination schemes powered by solar farms are in operation; we should strive to scale up solutions like this, working with communities to make sure that any one approach is appropriate to the local context.

**Dixon:** China and India are demanding better drinking water quality and wastewater treatment methods. China is viewed as the largest emerging opportunity overall, with opportunities in desalination as well as municipal and industrial water treatment projects. In February 2012, China's State Council announced the 12th Five-Year Plan for desalination, establishing a higher than expected target of 2.2 - 2.6 million m<sup>3</sup>/day of online capacity by 2015, versus less than 1 million m<sup>3</sup>/day in 2013. For industrial water treatment in China, brine concentration systems will be a major focus. China is also expanding petrochemical and Coal-to-X production facilities, and effective water treatment will be required.

Due to the number of delocalized water treatment opportunities, India is viewed as the second largest emerging opportunity. For wastewater, India's National Ganga River Basin Authority steering committee has agreed to 14 wastewater treatment plant projects under a clean-up program for the country's iconic river.

Both these countries, and a number of other nations with a rising middle class, have the opportunity to leapfrog. They can learn from what's been done in the past (good and bad), and use that to develop the best approach for their needs, essentially accelerating innovation.

**Lienhard:** The greatest opportunities include bringing young participants into the field, especially those who are entrepreneurially minded. It's hard to understate the passion and creativity that younger people bring to solving the world's great challenges, of which water is certainly one.

The industry is poised for continuing growth, especially around reuse, which is very often a lower cost option than desalination. And because every setting is different, the optimal solution in each case will differ, meaning ongoing invention and development are likely. I think it remains an open question what this industry can do for the water needs of the agricultural sector, which represents most of the world's consumptive water use, but which has very low price-points and is dispersed over vast land areas.

**Gabbrielli:** Sadly the massive displacement of people in the Middle East, North Africa and Europe is creating the conditions where some countries, like Jordan, will not have enough

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# Challenges and Opportunities for Desalination and Reuse

## Perspectives from Water Leaders

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water provide the huge surge in population. It can be expected that reuse and desalination will play a part in alleviating the water crisis. Indeed, the next two years will probably see opportunities in areas affected by extreme drought, which affect large parts of the world, from Southern Africa to several regions of Latin America, from large parts of China to the southwestern part of North America.

The Gulf region will keep offering interesting opportunities. However, should the pace of change in Iran quicken and should sanctions be lifted soon, this country will quickly offer very significant opportunities. There are predictions that show that it would not take many years for Iran to develop a desalination capacity similar to that of Saudi Arabia.

**Neo:** The ongoing droughts in California and South Africa have reminded the world again about the strategic value that desalination and water reuse can play in a country's water management approach. It has been reported that there is a high chance that the current El Niño would continue into 2016, and a 2014 study reported that the world will likely see more frequent extreme El Niños. This climatic trend, coupled with improvements in technologies that make desalination and water reuse more economical, will push the industry ahead in the next couple of years.

Singapore currently has two desalination plants and four NEWater (high-grade reclaimed water) plants. The third desalination plant will be built by 2017, while the fifth NEWater plant will be operational next year. We will progressively review our needs and leverage on

desalination and water reuse to ensure our water sustainability.

**Palmer:** Energy consumption in seawater desalination is a concern to the media and public. I am not sure why. Other common activities like driving cars, heating water and reverse cycle air conditioning use much more energy but no one seems to worry about these. However, in Australia, all major urban seawater desalination plants purchase renewable energy to offset their total energy consumption. While it increases the cost of water, it is appreciated by consumers. In Perth, Western Australia (population 2 million), seawater desalination supplies half of the city's water and has almost complete public acceptance.

It should be remembered that in fact that virtually all the world's freshwater originates from natural desalination that occurs when seawater evaporates. I believe a great opportunity for our industry is to develop better and more affordable desalination technologies that use renewable energy.

New ways of growing food combining renewable powered desalination and high tech greenhouses stacks up economically. I believe the \$160m Sundrop Farm greenhouse in South Australia is the world's first such development at commercial scale.

### 3. **What one word would you use to describe outlook for the desalination and water reuse industry, and why?**

**Gabrielli: *Mainstreaming.*** Already from the start of the new millennium, desalination and reuse have become a mainstream water supply alternative, which in planning and managing

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# Challenges and Opportunities for Desalination and Reuse

## Perspectives from Water Leaders

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water resources should be considered together with all the traditional natural resources such as surface and groundwater. These have become often less reliable in quantity and quality and available further and further away. However, the effect of unprecedented drought conditions in many parts of the world in recent years has accelerated the awareness about the technology and its application, often in regional clusters of small applications both in the industrial and in the municipal sector in countries as diverse as Nigeria, Brazil or Kazakhstan. I was reflecting on this recently while walking among the booths of Aquatech in Amsterdam where the word “desalination” seemed to be omnipresent.

**Neo: Optimistic.** I would describe the outlook for the industry as “optimistic.” Constraints that have propelled the industry forward – climate change, industrialization, growing population, rising water demand and water pollution – are still at work. In addition, tighter environmental regulations all round, for instance in China, would drive industry take-up of water reuse solutions. Technological improvements would lower cost and increase efficiency. IDA stands at the forefront of facilitating this growth of the industry.

**Palmer: Very positive.** Frost and Sullivan’s Analysis of the Global Desalination Market published on 7 September predicts that the world’s investment in desalination capacity will double by 2020. The United Nations estimates that the proportion of the world’s population receiving water from desalination will increase from 1% currently to 14% by 2025. NASA reports that 21 of the world’s 37 major

freshwater aquifers have passed the tipping point where extraction exceeds recharge.

This is a massive increase in capacity and will require a very large investment from all facets of the industry from R&D through financing, design, construction and operation. We need to be working hard now to attract young people to take up careers in the industry to help deliver new, climate resilient sources of fresh water to people, industry and agriculture.

Three quarters of the world’s surface is covered with water. There is no scarcity. We have come a long way in developing desalination technology in the 50 years since the very first spiral wound reverse osmosis element was made. Converting saline water to fresh water and delivering it to where it is needed, at low cost and powered with renewable energy, remains a challenge to the industry.

**Dixon: Promising.** The world’s growing demand for food and energy will only be met through sustainable water treatment. An estimated population of 9 billion in 2050 means the world has to address the limiting factor of fresh water for producing food. As freshwater supplies are consumed for irrigation and other food production, there will be an increasing emphasis on municipal and industrial water reuse, and producing water from our oceans. The desalination and reuse industry is integral to the future prosperity and survival of communities around the world and we have the knowledge and expertise to rise to this immense challenge.

**Ownjazayeri: Resurgence.** Why? The global recession 6-8 years ago, coupled with a plateau

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# Challenges and Opportunities for Desalination and Reuse

## Perspectives from Water Leaders

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in innovation in the global desal industry stifled the impact and reach of desalination. The world's economic rebound, and a renewed interest in innovation, conservation and global cities provides a strong platform for a resurgence in the desalination industry. We cannot follow; we must lead and show the world the way forward. Today, with a resurgence of the economy, the impact of climate change on rainfall patterns with increasing drought, and continued global population growth, most notably in arid regions – there is a strong and necessary requirement for the resurgence of “new water for a thirsty world.”

**Lienhard: *Splashing!*** There's a real renaissance around the entire field of water technology, which had come to be seen as something of a solved problem (at least from the perspective of many US universities) after we had gotten reliable water and sewer systems installed in essentially every home in this country. But the world has changed a lot in recent decades, with rising populations, increased urbanization, rising living standards and an increasingly warm climate, and new solutions are needed for today's reality.

**Juez: *Sustainable.*** I believe that explaining and advocating sustainability is key for a better outlook for the industry. It's our role to keep people abreast of the latest technology and smart/intelligent water management solutions out there that can make communities and water resources more sustainable. “Sustainable” means cost efficient; it means environmentally friendly; it means intelligent and able

to stand the test of time and the ever-challenging climate changes. We must prep people to adopt better water habits and be open to the more advanced sustainable solutions that can close the gap between dwindling natural water supply sources and growing demand.

**Braga: *Auspicious.*** I believe that the outlook for the desalination and water reuse industry is “auspicious”. By this I mean that the time is ripe for desalination and water reuse to become more widespread. With rising water demand, particularly in cities, and changing conditions brought about by climate change, more and more governments and water authorities are starting to consider or adopt this approach.

Desalination may not be a panacea: there are issues of cost and environmental sustainability that must always be addressed, and we cannot take a one-size-fits-all approach. But as the global and urban water situation becomes more critical, desalination and water reuse are poised to come into their own as an innovative solution to a serious problem.

Experiences across the world, for example in the Middle East and in Singapore, demonstrate that desalination can offer real hope to water-starved communities. For other countries suffering similar problems today, this approach could be the solution they are looking for. And as climate change continues to affect global water supplies, so desalination and water reuse will play a key role in rising to meet new challenges in the future.

# The Global Water Desalination Alliance (GWDA)

## Focusing on Reducing Carbon Emissions



**By Leon Awerbuch,  
IDA Director**

IDA's Secretary General Patricia Burke and I actively participated in the efforts to form the Global Water Desalination Alliance, an international Initiative led by MASDAR to reduce carbon dioxide (CO<sub>2</sub>) emissions in the desalination industry. The Initiative was launched at the 2015 United Nations Climate Change Conference COP21 on December 7-8 in Paris, which aims to achieve a legally binding and universal agreement on climate, with the aim of keeping global warming below 2°C above pre-industrial levels.

IDA is one of the founding members of GWDA, fully supporting this initiative.

The negotiations on climate during COP21 seek to seal an alliance based on four pillars: (1) a legal framework (text of a treaty); (2) national contributions; (3) a financial chapter; and (4) the Lima Paris Action Plan (LPAA).

Many areas are today covered by such initiatives. However, very little has been undertaken on the water-energy nexus, despite the fact that we know that the worldwide demand for potable water is going to increase further and become even more important in the light of global warming. From that perspective, it is critical to substitute conventional fossil fuel-based desalination with highly energy efficient desalination powered by clean energy resources. This will ensure that the promising efforts done in other areas to reduce CO<sub>2</sub> emissions are not compromised by emissions in the desalination sector.

The Initiative will not be based on a legally binding framework agreement, but more on morally

and politically binding commitments on actions and on their coordination for more coherence and effectiveness, and on the facilitation of sharing of solutions (such as knowledge platforms, capacity building actions, etc.).

The proposed Initiative sets up a framework for action aimed at fostering a speedier transition to use clean energy for the production of desalinated water, capable of meeting the growing needs of potable water worldwide.

Desalination enables the production of water from different water sources that would otherwise not be fit for human consumption or for use in industrial processes. There are several proven and well established water desalination technologies. These technologies provide water for populations in regions lacking sufficient access to fresh water sources, as well as for industrial activities that rely on clean water. We know that currently there are more than 18,400 desalination plants in operation worldwide in over 150 countries, with a maximum production capacity of around 92 million cubic meters of water every day, according to the IDA Desalination Yearbook 2015-2016/GWI DesalData.

Global cumulative contracted and commissioned capacity, 1965-2015 (Source: GWI DesalData/IDA Desalination Yearbook

The Global Water Desalination Alliance ("the Alliance") brings together key desalination and clean energy stakeholders with the goal to reduce the CO<sub>2</sub> emissions of the world's desalination plants. Collaborative action is essential to accelerate development and uptake of related environmentally friendly desalination technologies.

Desalination, which has become an increasingly important part of water resource management strategies, belongs at the forefront of today's

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# The Global Water Desalination Alliance (GWDA)

## Focusing on Reducing Carbon Emissions

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global water, energy, and climate dialogue. The Alliance advocates actions to reduce CO<sub>2</sub> emissions stemming from desalination by:

- Powering new desalination plants by clean energy sources;
- Replacing fossil fuel-based energy sources of existing water desalination plants with clean energy sources;
- Retrofitting existing desalination plants with more energy efficient technologies; and
- Attracting investments in the desalination sector for CO<sub>2</sub> emission reduction purposes.

The overall objective of the Alliance is to stimulate a reduction of CO<sub>2</sub> emissions from desalination through advocating enabling actions and policies.

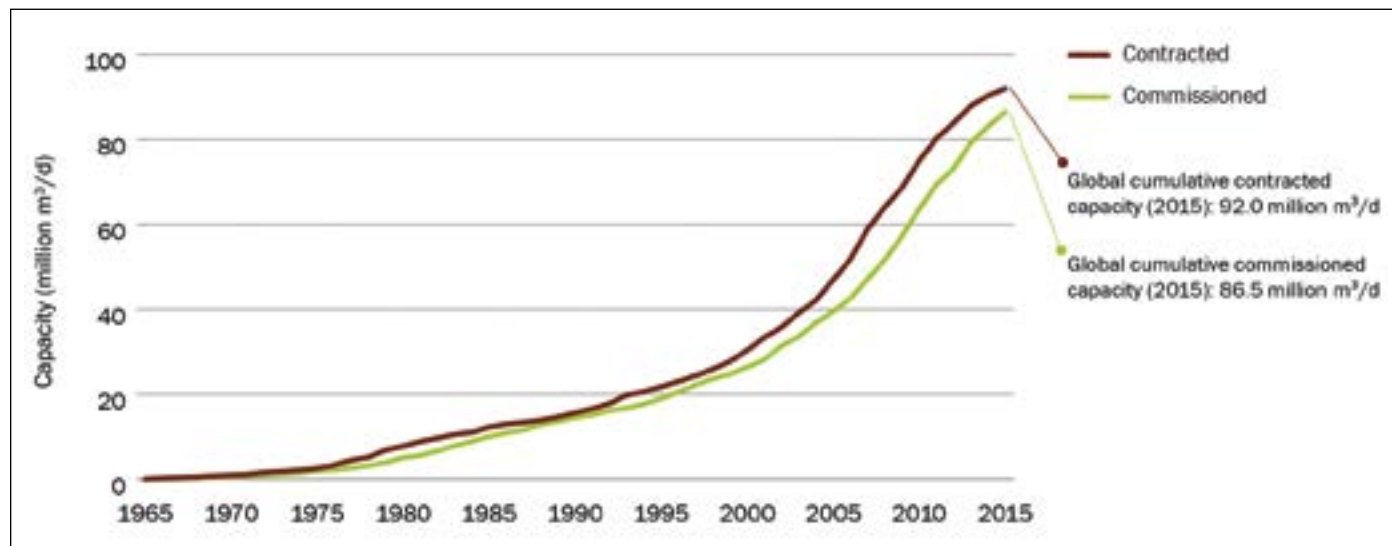
In this regard, the Alliance calls on governments, industry, non-governmental organizations, utilities and other stakeholders to support efforts towards achieving CO<sub>2</sub> emission reductions in the water sector. The Alliance advocates implementing the following specific actions:

- Requirement for clean energy supply
- Promotion of enhanced energy efficiency and demand response

- Investment in additional research, development and demonstration (RD&D)

The Alliance plans to work with members to implement enabling mechanisms to support the development and deployment of solutions that can reduce CO<sub>2</sub> emissions in desalination. The activities will focus on areas such as advocating the implementation of support mechanisms allowing a transition toward water desalination plants that emit less CO<sub>2</sub>; the demonstration, scale-up and/or adaptation of successful technologies, business schemes, financing instruments and risk mitigation instruments; the formulation of national CO<sub>2</sub> emission reduction policies, strategies and targets for desalination; and the streamlining of processes for the financial and/or technical integration of clean energy and desalination.

I believe the Initiative has significant importance to the future development of our industry and to IDA's members, who will play the key role in implementing its goals and objectives. The full text of the Global Water Desalination Alliance agreement will be published on the IDA website once the final version is approved by its founding members.



# GWl Q4 Desalination Market Review and Forecast Points to Some Improvement in Contracted Capacity



## By Francisco Virgili

*DesalData Editor Francisco Virgili recently presented GWl's eagerly anticipated Fourth Quarter Desalination Forecast webinar. He shares his insights into the latest trends in the global desalination market. Francisco can be reached at [fv@globalwaterintel.com](mailto:fv@globalwaterintel.com)*

During this year's sweep of the desalination market conducted by GWl DesalData for the compilation of the IDA's Desalination Yearbook, participants reported 1.7 million cubic meters per day (m<sup>3</sup>/d) of new contracted capacity in the first half of 2015, which is an improvement of 570,000 m<sup>3</sup>/d over mid-2014. Although not a large increase in capacity, this offers a small indication that the market has possibly slowed its decline after reaching a 13-year low in 2014 (2.4 million m<sup>3</sup>/d), although it may take until at least 2021 for the market to return to peak levels not seen since 2007.

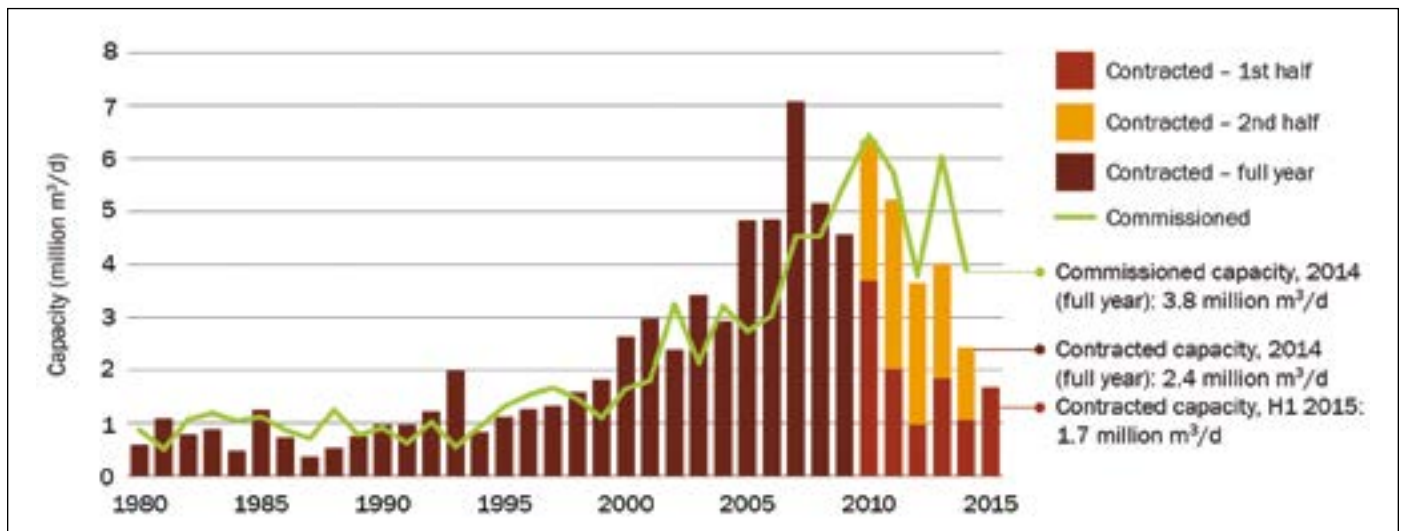
Low demand in the Middle East has helped dampen the market for seawater desalination after rapid and large-scale investment in the region. As oil prices languish and capacity that was awarded comes online and helps satiate demand, additions to capacity are increasingly incremental. This region is still a significant market, and future

growth is expected in emerging markets such as Egypt and Iran.

In Egypt, ambitious plans have been laid out for increasing water infrastructure, including desalination capacity, particularly in the Suez Canal area and the newly planned administrative capital. Estimates indicate that nearly 3.8 million m<sup>3</sup>/d of water treatment capacity may be needed for the Suez region alone by 2050.

The situation in Iran is delicate and depends largely on the final outcome of political negotiations over international sanctions, but the demand is apparent. Widespread and long-lasting drought has affected large areas of the country, and plans call for a build-up of desalination capacity along the Persian Gulf, to the tune of approximately 2.8 million m<sup>3</sup>/d. Not only will this serve communities on the coast, but is envisioned as part of a transfer project serving provinces further inland. Further capacity is foreseen to be developed on the Sea of Oman.

Asia, most notably industrial markets in China, fared the best in 2014, and this is expected to continue. A combination of new environment legislation,



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# GWQ Q4 Desalination Market Review and Forecast Points to Some Improvement in Contracted Capacity

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tougher wastewater discharge, and more effective enforcement could see an increase in the use of desalination technologies for wastewater treatment in industries such as coal-to-chemicals and refining, as well as in centralized facilities for industrial parks. This is also an opportunity for international suppliers of specialty advanced water treatment technology to capitalize on their expertise.

Low commodities prices have not only affected oil-related industry but also the mining sectors of countries like Chile and Peru. There has been one example of two mining projects combining their planned desalination facilities as a way to share the burden and keep water projects, even if smaller in scale, in the pipeline. Elsewhere in the Americas, the US market is largely sluggish but saw a small increase in municipal spending, which coupled with continued drought in California could be beneficial for the brackish water and water reuse markets.

The data this year continue to show the continued trend in the decrease of thermal contracts. The year 2015 had only one major contract, the 91,200 m<sup>3</sup>/d Shoaiba 2 expansion in Saudi Arabia, while 2014 had no large-scale thermal contracts. Concerns over the amount of oil used for water production as well as general concerns over the domestic energy mix in the traditionally thermal

desal-intensive Gulf region, even during persistent low-oil prices, is making membrane technologies a lucrative alternative. Thermal technologies like MED may see resurgence in the future as part of direct solar desalination solutions as communities look for ways to expand renewable energy use.

Including the new additions from 2014 and 2015, the total cumulative awarded desalination capacity has reached 92 million m<sup>3</sup>/d in 18,611 plants globally.

## Market Overview

Total installed capacity June 2015 = 22.9 BGD (25.7MAF/Y or 86.8 million m<sup>3</sup>/d) in 18,426 plants

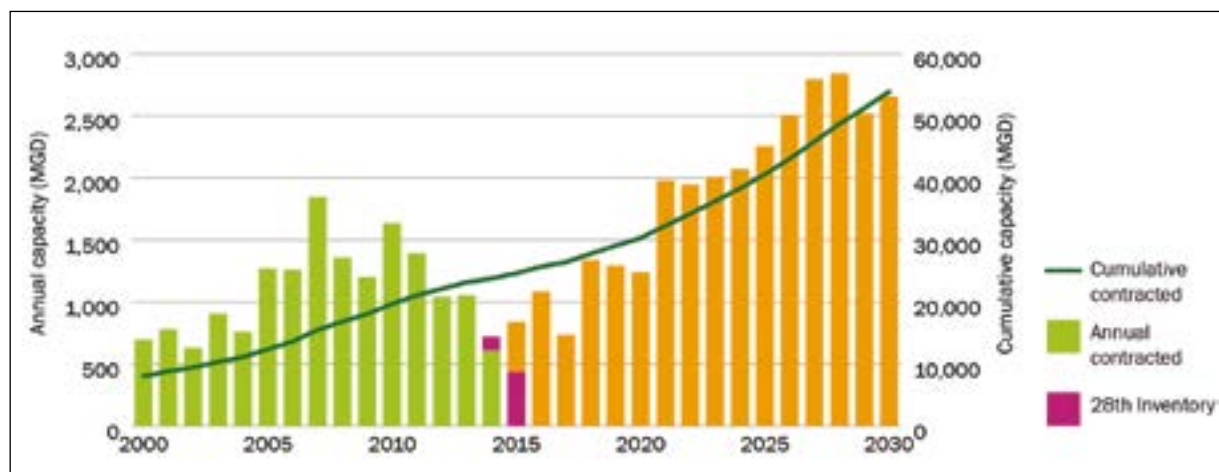
Total contracted capacity June 2015 = 24.3 BGD (27.3 MAF/Y or 92.3 million m<sup>3</sup>/d) in 18,611 plants

CAGR of total cumulative contracted capacity 2000 – 2015 = 8.1%

Estimated annual output 2015 = 16.4MAF/ year (20.1km<sup>3</sup>)

Desal market value 2015 = \$5.2bn capex + \$7.6bn opex = \$12.8bn total

Expected desal market value 2020 = \$8.6bn capex + \$11.3bn opex = \$19.9bn total





# Markets & Opportunities

## The Outlook for U.S. Wastewater Reuse



### By Reese Tisdale

Bluefield Research's President Reese Tisdale takes a look at the outlook for the USA's wastewater reuse market.

Paralyzing drought and environmental impacts on water supplies across the US sunbelt have thrust wastewater reuse into the spotlight as a critical solution to minimize long-term risks to municipal water supplies. Within an extremely mature municipal water sector, wastewater reuse is proving to be key driver of change.

Bluefield Research forecasts wastewater reuse for municipal utilities to increase 61% by 2025, requiring more than \$11.0 billion of capital expenditures. The lion's share of the activity, or 94%, is expected to take place in nine states, headlined by Florida and California. Today only 6.4% of wastewater flows in the US are reused. Irrigation and industrial off-takers currently account for 69% and 16% of reuse, respectively.

However, a major shift in planning is underway and impacting the market's overall profile. Potable reuse – treating wastewater to drinking water quality – currently makes up 15% of the total capacity, but is expected to increase to 19% of total water reuse by 2025. The expected jump in potable reuse stems largely from heightening pressure on policymakers and utilities to stay ahead of scaling urban populations, anticipated future droughts, and limited water supply alternatives.

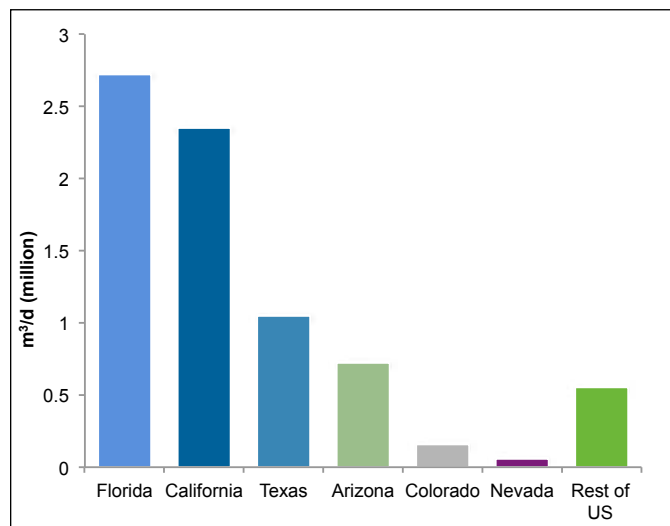
Bluefield's recently published report, *U.S. Municipal Wastewater & Reuse: Market Trends, Opportunities and Forecasts, 2015-2025*, details 247 reuse projects in the U.S. project

pipeline. This bottom-up analysis demonstrates a solid foundation for growth going forward in terms of supplier opportunities and capital investment.

### All Eyes on California

After four years of drought and mixed results from efforts to roll back water use, the scale of California's water crisis has brought the state to the brink of massive investments in water supply, including desalination, water diversion and water treatment.

### Reused Wastewater Flows in the US by State



Source: Bluefield Research

At the forefront of future change are 372 urban water suppliers in the state. These suppliers were recently mandated by Executive Order in April 2015 to reduce water usage by an average 25%. Urban water suppliers currently source 3% of their water from reclaimed sources.

However, regulators' previous inability to rein in demand by voluntary measures – demonstrated in 2014 by the 20% voluntary target that

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## Markets & Opportunities

### The Outlook for U.S. Wastewater Reuse

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achieved only an 8.8% reduction – is weighing heavy on utilities and policy makers' longer-term positions. The drought is certain to come to an end, but concerns about a return to wasteful water practices without penalties are driving more proactive, supply-side solutions such as wastewater reuse. We are already witnessing a change with more than US\$1.9 billion of reuse applications submitted to state agencies for approval.

Bluefield's market analysis shows that only one-third of California's wastewater treatment plants provide treated water that is re-used for industrial, agricultural, or municipal purposes. Wastewater re-use in the state stands to double just based on projects already in the pipeline, most of which were conceived before the current crisis.

Indicating further potential to harness reclaimed water are the 479 operating wastewater treatment plants in California analyzed by Bluefield Research. Only 160 of the plants

are outfitted with the capability to reuse wastewater effluent.

Through plant-by-plant analysis, the municipal wastewater reuse project pipeline is centered in southern California counties, Los Angeles and San Diego, where extreme water scarcity and rising population are greatest. As the drought conditions persist, project timelines will increasingly be pulled forward.

Change is in the air and water players should look no further than the U.S. power sector for optimism. In less than a decade, this mature industry rapidly scaled additions of wind and solar while pivoting away from coal-fired generation to combat climate change and environmental impacts. If anything, the impact of drought is more tangible in the short-term and reason to move quickly.

*Reese Tisdale is President of Bluefield Research, an independent market research firm based in Boston, Massachusetts. Visit [www.bluefieldresearch.com](http://www.bluefieldresearch.com) for more information on Bluefield's coverage of global water markets & strategies.*

## Announcing the First IDA Desalination Academy / MASDAR Course “Renewable Energy and Environment in Desalination”

The IDA Desalination Academy and MASDAR have formed a collaboration to conduct training courses focused on the development of seawater desalination technologies that can be powered by renewable energy sources and planning desalination systems with minimal environmental impact.

The first IDA Academy/MASDAR course, “Renewable Energy and Environment in Desalination,” will be conducted on two days, January 20-21, 2016 at the Crowne Plaza Abu Dhabi, Yas Island, during the International Water Summit (IWS).

### Day 1 – January 20

#### Morning

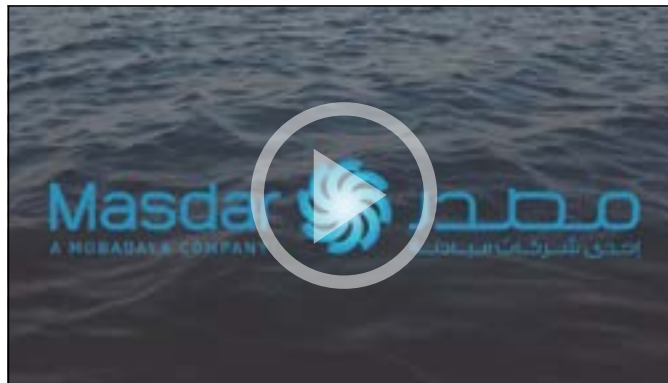
**Course Title: Review of Desalination Technologies and Economics**

**Lecturer: Dr. Corrado Sommariva, Past President of IDA**

Dr. Sommariva is a consultant of international reputation. He is presently the Managing Director of ILF Consulting Engineers Middle East and the head of the company’s worldwide desalination activities. He joined ILF in 2009 after working nine years with Mott MacDonald,

where led the desalination and water treatment group as Managing Director of Generation Middle East. He has experience in thermal, reverse osmosis and wastewater systems and served in all the major desalination developments in the Middle East in various roles. Dr. Sommariva has a PhD in Chemical Engineer-

ing from Genoa University and a diploma in Management from Leicester University. He has published over 50 papers on desalination covering leading edge research and economics, and has authored two books on desalination management and economics and project financing.



*The site visit to Ghantoot is one of the highlights of the Masdar/IDA Desalination Academy course being held on January 20-21 in conjunction with the International Water Summit in Abu Dhabi. We invite you to get a closer look at this renowned project, courtesy of Masdar, at [youtu.be/HTzRwSowUb4](http://youtu.be/HTzRwSowUb4)*

#### Afternoon

**Course Title: Environmental Aspects of Desalination**

**Lecturers: Prof. Dr.-Ing. Tobias Bleninger, Federal University of Parana (UFPR), Curitiba, Brazil and Dr. Riaan van der Merwe, Assistant Professor, The Petroleum Institute, Abu Dhabi, UAE**

Dr. Jose Pereira received his PhD in Physical Oceanography at the Universidade de São Paulo in 1999, with a collaborative period in Proudman Oceanographic Laboratory. His postdoctoral work (2010-2014) in Oceanographic Institute included specializing on seawater movement and interaction of the ocean with the atmosphere. He is currently working on a study to analyze the impact of desalination on the Arabian Gulf in the context of

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climate change. He will review the research activities involved in his study, "Desalination and Climate Change."

## Day 2 – January 21

### Morning

#### **Course Title: Technology Options for Renewable Desalination**

**Lecturer: Dr. -Ing Joachim Koschikowski of Fraunhofer Institute for Solar Energy Systems ISE**

Dr. -Ing Joachim Koschikowski joined Fraunhofer Institute in 1996. Since 1999, he has been working in the field of solar desalination with a focus on development, design and simulation of membrane distillation (MD) systems, which was also the subject of his PhD thesis. He is involved in several national and international research projects on solar driven desalination. Since 2014 he has been head of the group "Water Treatment and Separation" at Fraunhofer ISE.

### Afternoon

Students will go on a site visit to Ghantoot where MASDAR, in partnership with international companies, is piloting an advanced concept of solar desalination. MASDAR will brief the students about goals of their program as well as provide opportunity to review the pilot plants constructed by Abengoa, Suez Environment, Veolia Water and Trevi Systems.

Please visit the IDA website, <http://idadesal.org/>, for more information or to register for this course.

## Learn More about Two of the IDA Desalination Academy's Flagship Educational Programs

### **IDA Academy's International Reverse Osmosis Certification (IROC) Program**

One of the IDA Academy's most popular courses is the International Reverse Osmosis Certification (IROC) Program for individuals involved in the RO membrane business.

Offered as an online program in collaboration with industry-leading training company David H. Paul, Inc. (DHP), the IROC program consists of several RO courses that may be taken online as standalone training modules. In addition, the IROC program offers RO Specialist Certification Level 1 that requires the completion and passing of these four courses: Introduction to Water Treatment (8 hours), Water Treatment Plant Fundamentals (9 hours), Piping and Instrumentation Diagrams (3 hours) and RO Operation & Maintenance (11 hours).

The online format eliminates the need to travel, and because it is a self-paced open enrollment program, participants may begin whenever it is convenient for them, although it is required that the Certification Level 1 Program is completed within one year of enrollment.

IDA members are eligible for a 15% discount on the IROC courses. For a complete IDA Academy course listing, please visit [www.idadesal.org/academy](http://www.idadesal.org/academy). For general inquiries, please contact IDA at [academy@idadesal.org](mailto:academy@idadesal.org).

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# IDA Desalination Academy News

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## **IDA Desalination Academy and Heriot-Watt University Postgraduate Degree**

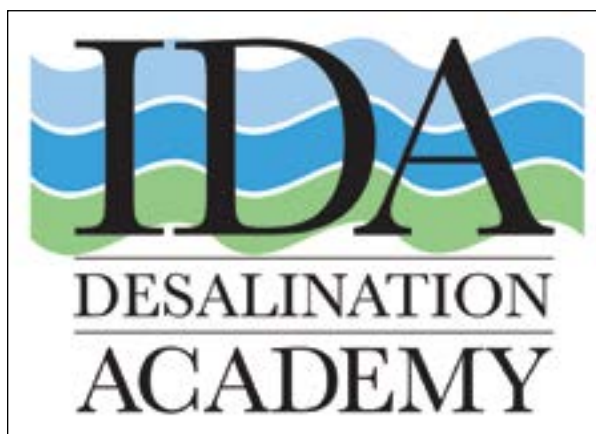
The IDA Desalination Academy and Heriot-Watt University (HWU) have formed a collaboration offering a postgraduate program in MSc degree in Water Technology and Desalination.

HWU, which will award the degree, will offer one or more desalination-focused courses per semester. The IDA Desalination Academy will develop the content and materials for the desalination courses, which will include Membrane Processes; Thermal and Hybrid Processes; Intake, Pre-treatment, Post-treatment and Environmental Issues; and Desalination Economics and Management.

Courses will be offered in an online distance learning format as well as on-site HWU's state-of-the-art campus in Dubai. HWU has an active online learning program whereby students learn using a range of online resources and have an opportunity to connect with their tutors and peers for weekly tutorials, which take place in a virtual learning environment.

In addition to its Dubai campus, HWU has three campuses in the United Kingdom as well as one in Malaysia. The university enjoys an established reputation for world-class teaching and practical, leading-edge research, and is ranked among the top international universities worldwide.

For more information, please contact IDA at [academy@idadesal.org](mailto:academy@idadesal.org)



# Young Leaders Program Spotlight

## Meet Blanca Salgado and Naomi Jones, IDA's Young Leaders Program Committee Co-Chairs



Blanca Salgado



Naomi Jones

IDA's Young Leaders Program (YLP) continues to grow and flourish, creating opportunities for emerging leaders in desalination, 35 years of age or less, to connect, advance their careers and promote interest in desalination around the world. We are pleased to announce the YLP's new Committee Co-chairs, Blanca Salgado and Naomi Jones.

Salgado is a Technical Service and Development Engineer for Dow Water and Process Solutions, a division of The Dow Chemical Company. Her role is mostly technical. She provides support to customers in relation to Dow's filtration technologies (Fine Filtration, Ultrafiltration, Reverse Osmosis) for them to optimize their water treatment schemes and achieve the lowest total cost of water.

Her first direct interaction with the IDA dates back to 2009 during the World Congress in Dubai, where she was one of the members of the first IDA YLP Committee (2009-2011 term).

"The IDA is an organization committed to discuss and endorse the future of our industry and the technologies that serve it. As a passionate

advocate of water technologies related to desalination, reuse, water scarcity and water preservation, I enjoy being part of its community," said Salgado.

She strongly believes in the value of the YLP. "We young professionals have here an extraordinary space to exchange, network and support our common goal of promoting desalination and water reuse as a potential solution to our world's water scarcity problems," she noted. "I see it as an opportunity to serve the YLP's goal to try to build bridges between young water professionals in the industry/academia and the general public.

"We will be counting on a strong YLP Committee this year, and work together to gather our young water professionals and students – the future of our desalination community – around our common goal of ensuring that water reuse and desalination are globally recognized as part of the solution to our world's water thirst," Salgado added.

As a System Sales Engineer for H2O Innovation, Inc., Co-chair Naomi Jones engages in a technical sales role for capital equipment projects. The company specializes in the integration of water treatment process equipment, specifically membrane-related applications, with most projects involving reverse osmosis/desalination, nanofiltration and microfiltration/ultrafiltration. Her position entails working with engineering firms and end users to provide customized solutions to their water treatment needs.

Jones became involved in IDA in 2012 through the introduction to YLP from her colleagues, Guillaume Clairet (one of the YLP's founding

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# Young Leaders Program Spotlight

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team members, its first Committee Co-chair, and a former IDA Director) and Ryan Furukawa (past YLP Regional Coordinator).

"I was previously aware of IDA, mostly through the biennial World Congress, but did not take advantage of the resources IDA has available to its members. Keeping up with the technical advancements in the industry and the increasing growth of desalination, particularly in the US, is what has kept me focused on being an active member of IDA," said Jones.

She sees the mission of YLP as inspiring young professionals' interest to retain talent and expertise within the industry to advance both technical and commercial platforms for desalination.

"Challenging young and emerging leaders to step up and become involved creates a passion to continue pursuing careers within the industry. Young professionals have a strong drive to make a difference, and providing opportunities where they can display their talents is paramount to success," Jones added.

She chose to become more involved in YLP because she saw it as a great opportunity to network with other young professionals and to be a part of a program that helps shape the future of the industry.

"As Co-chair, I am responsible for ensuring that the Committee provides networking and leadership opportunities and maintains regular

communication and involvement with our members. My counterpart, Blanca Salgado, is based in Spain, and we coordinate with Committee members from around the globe to achieve our term goals. We work under the direction of the IDA Board of Directors to carry out our programs in line with their overall mission. We are lucky to have a very driven and talented group of YPs on the Committee who feel as passionate as we do about the program," commented Jones.

Although the Co-chairs are still putting together their strategic view for this term, they already know they would like to enhance our communication channels to the YLP community and young water professional community in general.

"We would like to continue pushing for some of the initiatives already in place, such as the webinars or the Mentor Program, maybe complemented by others soon. Our purpose is to engage young water professionals and ensure that we create value to their membership," said Salgado.

The pair is currently working on setting up several YLP events at some of the IDA affiliate conferences. The AMTA/AWWA 2016 Membrane Conference & Exposition is coming up February 1-4 in San Antonio, Texas, and the YLP is planning a networking event. Details are to be determined, so please visit the IDA YLP website at <http://idaylp.org/> for more information.

## IDA Announces Program for the International Conference on Water Reuse and Recycling



“Turning Vision into Reality” is the theme for IDA’s upcoming International Conference on Water Reuse and Recycling at the Hyatt Regency Nice Palais de la Méditerranée, September 25-27, 2016 in Nice, France. The conference – IDA’s first focused on reuse – will cover leading edge strategies and technologies for advanced municipal and industrial water reuse programs. A Welcome Reception will take place on September 25 followed by a two-day Technical Program on September 26 and 27.

At press time, the IDA Nice Conference Steering Committee, led by Leon Awerbuch, IDA Director and Dean of IDA Desalination Academy, is refining the program, which includes two plenary panels and two parallel sessions with a keynote speaker for each session, covering such topics as:

### Plenary Sessions

Global Water Reuse Advances and Success Stories: The Key to Success and Vision for the Future

Key to Success of Water Reuse and Vision for Future

### Categories/Topics

Advanced Technologies for Joint Desalination and Water Reuse

Cutting-Edge Technologies for Water Reuse

Direct and Indirect Potable Reuse: Global Issues and Advances

Industrial Water Reuse and Recycling

Non-potable and Agricultural Water Reuse: Challenges and Successes

Water Quality Monitoring: Control and Solutions

### Panels

Regulation, Funding and Public Acceptance of Water Reuse: Lessons Learned Worldwide

Role of Water Reuse in Solving the Water-Energy and Food Nexus

The Call for Papers will open in February and registration will open in March. Please check the IDA website at <http://idadesal.org/> for details and further updates.

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# Focus on IDA Events

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## Global Water Summit 2016 Plans Underway



Plans are well underway for the Global Water Summit 2016 on April 19-20 at the Jumeriah Etihad Towers in Abu Dhabi. IDA is once again a co-sponsor of the Global Water Summit, which attracts high-level executives from industry, municipalities and international water companies around the world.

Day One Opening Plenary, "Water 2050: Doing Business with Scarcity," features a select panel of thought leaders who will address the competing demands of industry, energy and urbanization and discuss business models, financial structures and technological innovations that can create the turnaround needed to bring growth back to the water industry.

Confirmed speakers are:

4. **Junaid Ahmed**, Senior Director, Water, Water Global Practice (GP), World Bank
5. **H. E. Dr. Hazem Al-Naser**, Jordanian Minister of Water and Irrigation

6. **Manuel Pulgar-Vidal**, Peruvian Minister of State for Environment and President of the COP20/CMP10

7. **Marie van der Hoeven**, former Executive Director of the IEA

Day Two's Opening Plenary explores opportunities for cooperation on industrial water treatment and re-use as a key component for sustainable development and promoting cross-regional investment and financing projects.

Confirmed speakers are:

- **Ahmed Bin Abbood Al Adawi**, Head of TAQA, UAE
- **H. E. Eng. Khaldon H. Khashman**, Secretary General, Arab Countries Water Utilities Association (ACWUA)
- **Dr. Michael Prange**, General Manager, German Water Partnership

The Summit also includes the ever-popular rotating roundtables; one-to-one networking meetings; strands on Technology, Industry and Global Water Leaders; workshops on Utilities, Technology and Infrastructure; GWI Business Insights Workshops on water treatment technology for upstream oil and gas production; and the Global Water Awards Gala Dinner at Emirates Palace.

IDA members receive a 10% discount and are eligible to vote for the Global Water Awards. Learn more at [www.watermeetsmoney.com](http://www.watermeetsmoney.com)

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# Focus on IDA Events

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## IDA Supports International Water Summit

IDA once again will support the International Water Summit (IWS), to be held at the Abu Dhabi National Exhibit Centre (ADNEC) January 18-21, 2016. Now in its fourth year, the IWS is a global platform for promoting water sustainability and addressing water challenges across the region. IWS brings together world leaders, field experts, academia luminaries and business innovators to accelerate the development of new sustainable strategies and technologies in the Water Industry.

Held under the patronage of H.H. General Sheikh Mohammed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Deputy Supreme Commander of the UAE Armed Forces, IWS will continue to foster innovation, best practice and collaboration to offer tangible solutions to the pressing issue of water scarcity.

IDA's role as a Supporter is multi-level. IDA Director Leon Awerbuch is a member of the International Advisory Board for IWS, as is former 2nd Vice President Miguel Angel Sanz.

In addition, several current and former IDA Directors and Past Presidents will speak at the Summit, including Dr. Abdullah Al-Alshaikh, IDA's immediate past President and now Chief Executive Officer of Advanced Water Technologies; Leon Awerbuch, who also serves as President of Leading Edge Technologies; Dr. Adil Bushnak, Past IDA President, former IDA Director, and Chairman of Moya Bushnak; Carlos Cosín Fernandez, IDA Director, Chairman and Chief Executive Officer of Abengoa Water;

Miguel Angel Sanz, Director of Strategic Development for Suez Environnement; and Dr. Corrado Sommariva, Past IDA President, former IDA Director, and Managing Director of ILF Consulting Engineers.

In 2015, the conference attracted over 9,700 attendees from 76 countries as well as 180 exhibitors. Delegates for 2016 can expect to gain insights gained from:

- Dedicated content and insight across four core themes – Policy & Strategy, Finance & Funding, Technology & Innovation, Projects & Investment – all in one place
- Joint sessions with the World Future Energy Summit
- Special sessions bringing together global experts in water and energy
- An expanded agenda
- More networking opportunities that provide enhanced opportunities to make new connections
- More relevant content
- A unique opportunity to see the UAE's Renewable Energy Water Desalination pilot project at Ghantoot

IDA members receive a 15% discount on registration. To learn more, visit <http://iwsabudhabi.com/>



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# Focus on IDA Events

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## IDA Participates in International Water Association World Congress in Jordan

Leaders from IDA traveled to Jordan in October to join over 1000 water professionals at the International Water Association (IWA) World Congress. IDA was a strategic partner of the event.

Representing IDA were Emilio Gabbrielli, IDA President; Patricia Burke, IDA Secretary General; Shannon McCarthy, IDA 1st Vice President; and Leon Awerbuch, IDA Director and Dean of the IDA Desalination Academy, who met with Ger Bergkamp, IWA Executive Director; Keith Robertson, Innovation & Learning Director at IWA; and João Grilo, IWA Conference Programme Manager. «We had a very successful session yielding great conversation and collaboration,» said Awerbuch.

IDA leaders also presented several sessions at the Congress including:

“Water Security: Desalination and Water Reuse,” Leon Awerbuch

“Introduction of the IDA and the status and trends of Desalination and Water Reuse industry,» Emilio Gabbrielli

“Water Security and the Role of Non-Conventional Water Resources in National Water Sustainability Programs,” Shannon McCarthy

“Different Procurement Models for Desalination Projects (DBO vs BOT, etc.), with Advantages and Disadvantages,” Borja Blanco, IDA Director

“Lessons Learned from Desalination and Advance Water Reuse Projects in Emerging Economies,” Leon Awerbuch

“Issues and Considerations for Selecting Pre-treatment of Desalination Plant in Aqaba,” Nikolay Voutchkov, IDA Director

“The use of FRP-Fiberglass Pipe System in Water Applications and Brine Discharge,” Ziad Salibi, IDA Director

“Water-Energy Nexus, New Solutions for Solar Desalination,” Leon Awerbuch

“It was a pleasure to attend the IWA World Congress, meet with their leadership and create another opportunity for IDA leaders to present to a global audience. Jordan is a country in need of water, which underscored the importance of international collaborations. IDA was glad to be part of the conversations,” said Patricia Burke, IDA Secretary General.

# IDA Welcomes New Members

## Corporate Members

Applied Membranes, Inc., United States  
Arbok Water, United States  
Beijing Origin Water Membrane Technology Co., Ltd, China  
Gradiant Corporation, United States  
Klaren International BV, Netherlands  
KmX Corporation, Canada  
Nikuni America Inc., United States  
Otay Water District, United States  
Water Planet, United States  
Water Technologies de México S.A. de C.V., Mexico

## Individual Members

Abdullah M.A. Alakasi, Saudi Arabia  
Ahmed Elsheshtawy, Cayman Islands  
Ahmed Shawky, Egypt  
Alberto Castañeda, Mexico  
Aleksey N. Pisarenko, United States  
Anthony Koh, United States  
Antonio Alonso Martinez, Spain  
Benjamin Freeman, United States  
Bob Kennedy, United States  
Calvin Lai, Australia  
Castor Criado Madrigal, United States  
Cesar Eduardo Bejarano Vela, Mexico  
Chirag Hadvani, India  
Christopher Hertle, Australia  
Collins Balcombe, United States  
Conor Thomas Wilson, United States  
Daniele Ciferri, Italy  
Darren Williams, United States  
David Cohen, France  
David Furukawa, United States  
David Shin, United States  
Dian Tanuwidjaja, United States  
Doug Brown, U.S. Virgin Islands  
Dr Roderick Sih, Singapore  
Dr. Daniel Cartamil, United States  
Dr. Gustavo Adolfo Fimbres Weihs, Mexico  
Dr. Shuren Chou, China  
Dr. Yong Lin, China  
Eric Siebert, United States  
Erin Bonney Casey, United States  
Faris J.H. Algahtani, Saudi Arabia

Gasser E. Hassan, Ph.D., Egypt  
George Manuel Euan, United States  
German Eduardo Devora Isiordia, Mexico  
Gil Dhawan, United States  
Graeme Skivington, United Kingdom  
Han Zhuang, Singapore  
Harvey George Swain, United States  
Hilla Shemer, Israel  
Hoon Hyung, United States  
Imran Umar, United States  
Jahan Asgari, Iran  
James Swantek, United States  
James Temple, United States  
Javier Casas, United States  
Javier Fernandez Ruiz, United States  
Jayaprakesh Pa, Pakistan  
Jayesh C. Shah, United States  
Jerome Leparc, France  
Jill Watz, Canada  
Joel Gay, United States  
John Tracy, United States  
Julien Ogier, Germany  
Jurgen Scharfe, Germany  
Justin Doyle, Australia  
Kazuhisa Takeuchi, Japan  
Malik Akhtar Husain Altaf Husain, India  
Marc Petry, Republic of Korea  
Marcelo Moacyr, United States  
Marco van Beek, Netherlands  
Maria Dolores Kennedy, PhD, Netherlands  
Mark Hughes, United States  
Mark Watton, United States  
Marshal Deane, United States  
Maximus Gladstone St. John, United States  
Megan Su Lee, United States  
Michael Cole, Austria  
Michael Fox, P.E., United States  
Michael S. Malo, United States  
Mike Witmer, United States  
Mohamed Ali Darwish, Qatar  
Mr Alvaro Riveros, Chile  
Mr Cyril de Vomecourt, United Arab Emirates  
Mr Ismail Yahya ElSaie, Egypt  
Mr Kent Goh, Singapore

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# IDA Welcomes New Members

*continued from page 28*

Mr Philip Thompson, Bahamas  
Mr Pierre Venter, South Africa  
Mr Rick Lesan, United States  
Mr Robert Drane, Australia  
Mr Takumi Echigo, Japan  
Mr Yoshiya Takami, Japan  
Mr. Amin Shawky Elsayed, Egypt  
Mr. Balakumar Ramanathan, United Arab Emirates  
Mr. Chi Hong Lee, Hong Kong  
Mr. Clemens Wolters, Netherlands  
Mr. Daniel Catanzaro, Spain  
Mr. Harry Hagiwara, United States  
Mr. Hubert Fleming, PhD, Canada  
Mr. James S Grace, United States  
Mr. Jesus Alvarez-Sanchez, Mexico  
Mr. Jia Lin, China  
Mr. Jonn-Ross Andrews, United States  
Mr. Mahmoud Roshdy Younis, Egypt  
Mr. Mike Buxkemper, United States  
Mr. Natheer Al Malalla, Germany  
MR. Ricardo B. Yupari, Peru  
Mr. Rizwan Malik, United Arab Emirates  
Mr. Russ V Semeran, United States  
Mr. Safwat Nabil Gergis, PE, BCEE, United Arab Emirates  
Mr. Talal Mohamed Elnady, Egypt  
Mr. Tamer Ahmed Shaaban, Egypt  
Mr. Xiaoshui Wang, China  
Mrs Gill Bavister, United Kingdom  
Ms Julie Kimmel, United States  
Ms. Femke Verhaart, Netherlands  
Nehad Shawki, Italy  
Nicholas Charles Nelson, Switzerland  
Othman Ahme Othman Assweni, Saudi Arabia  
Rami Abdullah Matar Alsuwat, Saudi Arabia  
Rod Posada, United States  
Rodney E. Herrington, United States  
Rodrigo Gonzalez-Enriquez, Mexico  
Ronald Wen-Jung Chang, United States  
Sara Pietsch, United States  
Satoshi Shimoyama, Japan  
Seokwon Yun, Republic of Korea  
Shing Tim Lam, Hong Kong

Shohei Goda, Japan  
Shreenah Mohamed, United Arab Emirates  
Steven Lam, United States  
Sujandi Sujandi, Singapore  
Taeko Nakamura, Japan  
Tak Yeung Chan, Hong Kong  
Takuto Ishimatsu, United States  
Ted Ayash, United States  
Thomas Orth, Germany  
Thomas Sephton, United States  
Tobias Haarbuerger, Germany  
Torben Vadgaard, Denmark  
Trent Weber, United States  
Udo Kolbe, Germany  
Wenjuan Peng, China  
William "Hob" McPherson, United States  
Winson C. L. Lay, Singapore  
Wojciech Golembiewski, Germany  
Xinyan Cheng, China  
Yili Chen, China  
Yoshihiko Kondou, Japan  
Young Un Kim, Republic of Korea  
Yousef Alanezi, PhD, Kuwait  
Zachary Roy Hudson Helm, United States  
Zhuodan Liao, United States

## **Student Members**

Alexander Prabst, Germany  
Ali Amiri, United States  
Almotasembelleh Abushaban, United States  
Anditya Rahardianto, United States  
Azadeh Hemati, United States  
Dr. Said M. Abusada, United States  
Han Gu, United States  
Maria Elena Lopez-Mercado, Mexico  
Maria Magdalena Armendariz Ontiveros, Mexico  
Miranda Federico, United States  
Mohammad Tanhaemami, United States  
Mohammed Bin Eabood Al Shehhi, United Arab Emirates  
Nirajan Dhakal, Netherlands

# Calendar of Events

## January 18-21, 2016

International Water Summit  
Abu Dhabi, UAE

## February 1-4, 2016

AWWA/AMTA 2015 Membrane  
Technology Conference &  
Exposition  
San Antonio, Texas, USA

## February 7-9, 2016

Saudi Water & Electricity Forum  
Riyadh, Saudi Arabia

## February 11-13, 2016

InDA-APDA Conference  
Chennai, India

## February 29 – March 2, 2016

WEX Global 2016  
Lisbon, Portugal

## April 19-20, 2016

Global Water Summit 2016  
Abu Dhabi, UAE

## May 10-12, 2016

Ozwater 2016  
Melbourne, Australia

## May 22-26, 2016

Desalination for the Environment,  
Clean Water and Energy  
Rome, Italy

## May 31-June 3, 2016

CaribDA 2016 Biennial Conference  
& Exposition  
Trinidad

## July 10-14, 2016

Singapore International Water Week  
Singapore

## September 26-27, 2016

IDA International Conference on  
Water Reuse and Recycling: Turning  
Vision into Reality  
Nice, France

## October 4-6, 2016

WETEX 2016  
Dubai, UAE

## October 5-7, 2016

DESAL 2016  
5<sup>th</sup> Latin American Congress on  
Desalination and Water Reuse  
Santiago, Chile

## October 9-13, 2016

IWA World Water Congress  
Brisbane, Queensland, Australia

## November 6-9, 2016

Membranes in Drinking and  
Industrial Water Production  
Leeuwarden, The Netherlands

## October 16-20, 2017

IDA World Congress on  
Desalination and Water Reuse  
Sao Paulo, Brazil

## May 6-10, 2018

Desalination for the Environment,  
Clean Water and Energy  
Nantes, France



## SAVE THE DATE!

### 2017 IDA WORLD CONGRESS on Desalination and Water Reuse

Mark your calendars now for IDA's first World  
Congress in Latin America.

**When:** October 16–20, 2017

**Where:** São Paulo World Trade Centre  
(adjacent to the Sheraton Hotel)

For details, visit [www.idadesal.org](http://www.idadesal.org)