

Remarks Delivered at the Opening Ceremony for the 2013 IDA World Congress in Tianjin by  
His Excellency Abdullah A. Al Hussayen, Minister for Water and Electricity,  
Kingdom of Saudi Arabia

**Excellencies, Distinguished Guests, Ladies and Gentlemen:**

I am indeed delighted and honored to be here in Tianjin in the always amazing and inspiring People's Republic of China, addressing this distinguished audience. Some of you may remember that four years ago to this day, when addressing the IDA World Congress in Dubai, most of my address was centered around the water shortage and the daunting challenge and monumental task that the world is facing. I also warned the audience that in four years from that date, if age, health and IDA invitations keep up, chances are I will be repeating the same concerns again. And so, Ladies and Gentlemen, as all three prerequisites were met, so here I am, fulfilling my promise and here I go again.

So to start, please allow me to remind you of the concerns that I have outlined four years ago in Dubai, and in Singapore before that, as unfortunately little has changed since, to give us any assurance that we have a firm grasp on the extent and depth of the impacts of the shortfall in potable water and sanitation. In fact, things related to water, or rather lack of it, have indeed gotten worse.

- (1) Water, as all experts still agree, will be the resource that defines the 21st century.

While in the year 1800 AD, it took more than 2000 years for the world population to reach one billion, it took only 11 years to add another billion inhabitants between 1999 and 2010. In the last century, the world's population has tripled. It is expected to rise from the present 7.0 billion to 9.0 billion by 2050. What makes matters worse is that water use is growing at more than twice the rate of population growth in the last century, and by 2025, which is just around the corner, close to 2 billion people will be living in countries or regions with absolute water scarcity, and two-thirds of the world population could be under condition of water stress.

- (2) The World Health Organization estimates that 1.1 billion people do not have access to improved drinking water and that 2.6 billion people (40% of the world population) live in families with no proper means of sanitation and half the hospital beds are filled with people suffering from water-borne and water-related diseases. Lack of water and sanitation services kills about 4500 children every day of the year. Moreover, water scarcity is poverty issue. Unclean water and lack of sanitation are the destiny of poor people across the world. Lack of hygiene affects poor children and families first, while the rest of the world's population benefits from direct access to the water they need for domestic use. One in five people in the developing world lacks access to sufficient clean water (i.e., a minimum of 20 L/D) while average water use in developed world ranges from (200 to 600 L/D). What makes it more ironic, is that the poor pay more.

A recent report by the UN Development Program shows that people in the slums of developing countries typically pay 5 to 10 times more per unit of water than do people with access to piped water. Various estimates indicate that under the business-as-usual scenario, 3.5 Earth-planets would be needed to sustain the global population with a life-style equal to the one in developed countries.

Moreover, the UN, in their 2013 World Water Day, has the following stark warnings.

- More than 85% of the world population lives in the driest half of the planet, and with the expected increase in population, food demand is predicted to increase by 50% by 2030 and 70% by 2050, while energy demand from hydropower and other renewable energy resources will rise by 60%. These issues, the report stresses, are interconnected. Increasing agricultural output, for example, will substantially increase both water and energy consumption, leading to increased competition for water among water-using sectors.
- If all the fresh water on the planet were divided equally, there would be 5000-6000 m<sup>3</sup> of water available per person, every year. Experts consider that people experience scarcity below a threshold of 1700 m<sup>3</sup>/person. This global calculation gives an impression of abundance. However, the world's fresh water resources are distributed very unevenly, as is world population. The areas with the most severe water scarcity are those where high population densities converge with low availability of water.  
  
In fact, many countries are already below the threshold value. In fact, several countries in the Near East have to survive with less than 200 m<sup>3</sup> per person, per year.
- The amount of water used for agriculture, industrial and domestic activities will increase by 60 to 90% by 2050.

In agriculture alone, the total volume of water used in crop production would be 11,000-13,500 km<sup>3</sup>, almost double the 7,130 m<sup>3</sup> of today. The world's population is growing by about 80 million people a year, implying increments of fresh water demand of about 64 billion cubic meters a year. To put this number into perspective, adding this quantity by desalinating seawater, we would need annually 60 times the total desalination production of Saudi Arabia itself, the largest desalination producer in the world.

**Ladies and Gentlemen**, with these stark statistics and dismal outlook for the world's water future, what can we do?

Well, first and foremost, we need to properly manage our use of water. You see, water need in all sectors is so elastic that it is nearly impossible to put a lower limit on the needed quantity. In fact, today, assisted by low-tech tools, we can sometimes halve the daily consumption of water without feeling the difference. In domestic use for instance, Germany, the first economy in Europe, uses per-capita 1/3 of the water used by the US.

So, common sense dictates, that before we go for any solution, we should regulate our behavior. Unfortunately, common sense is not always common.

Beyond conservation, the ultimate savior, of course, is obviously desalination, as desalination taps on an unlimited water source.

In just 45 years, the desalination industry went from virtually zero to over 60 million m<sup>3</sup> of treated water per day, which is produced by more than 16,000 desalination facilities world-wide. In the 2010-2011 period alone, over 700 new plants with a combined capacity of 5.2 million m<sup>3</sup>/day were contracted world-wide; 3800 plants are now thought to be offline or decommissioned, making up 6.4 million m<sup>3</sup>/d of old capacities ready to be replaced by a much higher capacities. Moreover, contracted desalination capacity has been growing at a compounded annual growth rate of 16.8 percent since 1997.

The total contracted global desalination capacity is predominantly RO (59%), Thermal Desalination (36%), EDR (4%) and other (1%), making up the balance. And also, as lower cost alternatives to seawater and brackish water desalination diminish worldwide, industry growth is expected to remain strong at the same or even higher growth rates.

According to the University of Chicago Center for Technology Development, it is estimated that, by 2016, the world desalination market is expected to reach an astonishing \$88.00 billion. Along with remarkable growth rates, the industry over the last 40 years has accomplished equally remarkable achievements in areas of longevity, unit sizes and energy consumption that have positively impacted production cost,

With better management of corrosion and scaling, desalination plants now can have a life-span of over 40 years. The unit size in thermal desalination has grown 10 fold, from 2.5 MIGD in the 1970s to over 20 MIGD now.

Efficiency and power consumption in RO plants, due to development in membrane technology and energy recovery, have improved tremendously since the advent of RO in the early '60s. That allowed salt rejection rate of 99.7% and flux rate that is eight times more compared to 1978, and last, but not least, energy consumption, which accounts for approximately 40% of the operation cost. The first Jeddah RO was consuming power at a rate of 9.8 KWHR/m<sup>3</sup> compared to less than 3 KWHR/m<sup>3</sup> achieved today in some sites.

**Ladies and Gentlemen;**

With all the improvement in the aforementioned areas, significant, as they are, it doesn't put desalination within reach of most of the world's inhabitants. In fact, less than 1% of world population can afford it, implying that we still have a long way to go, and that is why your meeting here is indeed timely and important.

*"Build a better mousetrap and the world will beat a path to your door"* goes the old saying.

**Ladies and Gentlemen;**

I am sure, that building a better desalination plant, that will avail the technology to the masses, will not only leave one rich beyond imagination, but it will be an invention that will dwarf all historical man-kinds inventions, and will avert a looming world catastrophe.

**Ladies and Gentlemen;**

Before closing, I would like to leave you with the following intriguing and astonishing sources:

**ONE** : 1/3 of what the world spends on bottled water per year would pay to provide water to everyone in need.

**TWO**: In the developing world, there are by far more mobile telephones than there are toilet seats.

**THREE**: For every \$1.00 invested in water and sanitation, the UN Development Program estimates a return of up to \$9.00, depending on the region and technology.

Thank you for your attention and patience.

Thank you very much.

**SPEECH DELIVERED BY:**  
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