



# The 10<sup>th</sup> Gulf Water Conference

22-24 April 2012, Doha - Qatar,



# Water in the GCC States

The Water-Energy-Food Nexus



Secretary General of the GCC



Water Science &  
Technology Association





Unlike other natural resources, water has great importance as indispensable for human survival, and a strategically vital resource and essential input for most of the various aspects in the development process for nations. In the GCC countries, which are situated in one of the driest region of the world, water management and its sustainable provision to these development activities has grown to be one of the most important and challenging tasks faced by the water authorities. This is due to the limited available natural water resources on one side, and the growing demands and competition from the consuming sectors resulting from unprecedented population and economic growth on the other.

Currently, the water challenge in the GCC countries is considered as one of the major and most critical challenges facing these countries, and is expected to grow with time. This is due to the scarcity and rapid depletion of freshwater resources, the heavy financial and economic burden to be borne in the provision of non-conventional water resources (represented mainly in desalination and reuse of treated wastewater), and due to the direct links between water and the accelerating socio-economic development efforts in these countries. Furthermore, the water challenge is compounded by its multiple nexuses with the various development components, such as water and human health, water and environment, water and food, water and energy, and many other interdependencies, which carry within them many cross-cutting issues of social, economic, legal, technical, and political nature.

Amongst the most important inter-dependencies in the GCC countries is the water-energy nexus, where all the sectors of the development process rely on the sustainable provision of these two resources. In addition to the central and strategic importance of water and energy in the GCC countries, these two resources are highly inter-dependent and inter-related, especially in the field of water production and supply, where the scarcity of natural freshwater resources is considered amongst the major factors for the increase in energy demand, and the availability of fossil fuel resources in the GCC is the most important factor in providing water in these countries through

desalination, in addition to that supply and demand for water and energy are inextricably linked in these countries. Furthermore, it is expected that the water-energy nexus becomes more complicated and more challenging in the future due to the expected impacts of climate change, where available water resources will be further reduced and water demands will be increased in the region, while the GCC are working towards meeting their obligations in reducing their emissions of greenhouse gases.

On the other hand, the water-food/agriculture linkage represents another important and vital nexus in the GCC countries, where the agriculture sector in these countries consumes more than 80% of the total water consumption and more than 90% of groundwater uses. Despite these high percentages of water consumption and agricultural support and subsidies programs in most of the GCC countries, the agricultural sector contribution to GDP remains very low, and these countries remain highly dependant on food imports. The growing challenge in this nexus is that agricultural expansion and production is being stimulated by the increase in food demand in the region and growing international food prices on one hand, while on the other hand this will contribute even further to the over-exploitation of natural water resources and their depletion and quality degradation. This trend not only threatens the sustainability of natural water resources, but also imposes higher threats on the future of the agriculture sector itself. Furthermore, it is expected that this issue will be exacerbated due to the growing pressures on agricultural production due to the expected impacts of climate change represented by changes in the region's climate patters, expected to generally increase evaporation rates, reduce rainfall rates, and increase the frequency of extreme events.

Undoubtedly, the sustainable provision of water, energy, and food under the current accelerating population and economic growth rates in the GCC countries represents one of the major challenges faced by these countries, and the ways and approaches in which these challenges will be faced will have a significant impact on the living standards, human development, and sustainable development of these countries for decades to come. Therefore, in view of the increasing demands on these three resources in the GCC and due to the strong inter-dependencies and relationships between them, an integrated planning and management approach for water, energy, and agriculture, becomes an important and vital task to meet the demand on these resources and their future sustainability in these countries.

Through addressing the topics of sustainable water resources management and in its various sectors in the GCC countries, the Tenth Gulf Water Conference focuses on the water-energy-food nexus, as well as other water inter-relationships such as water, health, and environment. The conference looks at and considers best practices, experiences and models of the sustainable planning and management for water, energy, and food, and the necessary social, economic, legislative, and technical considerations.

### **Conference Objectives**

1. Raising awareness to the importance of considering and dealing with the strong inter-sectorallinkages between water, energy, and agriculture, and identifying the major inter-relations, inter-dependencies, challenges, and opportunities of these resources today and in the future in the GCC countries.
2. Facilitating an open discussion platform to share knowledge and experiences between researchers, ex-

ecutives, decision and policy makers, and other stakeholders, on modern methodologies and techniques used in the planning and preparation of medium- and long-term national strategies for the sustainable management of water, energy, and food in the GCC countries, and other dry regions.

3. Formulating a research framework and strategy for the needed research in the field of identifying the role and value of energy in the various water sectors in the GCC countries.
4. Formulating a research framework and strategy for the needed research in the field of rational and efficient water use in the agricultural sector and maximizing its value added.
5. Building a network between individuals, institutes, NGOs in the GCC countries, the Arab countries, and other countries that are interested in scientific research in the water-energy-food nexus.

## Main topics

### 1. Sustainable planning and management of water and energy resources

Case studies of planning and management of water and energy resources on the national and regional levels; GCC fresh water and energy demands forecasts; approaches to close the demand-supply gap for water and energy; role of energy, energy demands, and energy use efficiency in the various water sectors; policies, legislations, institutional roles and capacities, and financial and economic considerations required for the sustainable management of water and energy; expected impacts of climate change on the use of water and energy, carbon trade, tools and technologies for increasing the efficiency of energy use in the water sector.

### 2. Water security and food sustainability

Water security versus food security in arid regions; demand management and water conservation strategies in the agricultural sector in arid regions; modern agricultural technologies (biosaline, soilless, ...), modern irrigation techniques, and protected agricultural; the principle of virtual water and its role in agricultural policies and water resources management in the GCC countries.

### 3. Management of natural resources (groundwater and surface water)

Strategies for integrated management and sustainable planning of water resources (renewable and non-renewable); water harvesting and artificial recharge; water protection and monitoring strategies; economical, legislative, and technological tools for managing demand.

### 4. Management of the municipal water sector

Demand management and conservation strategies in the municipal sector; management of non-revenue water; quantitative and qualitative management of water supply systems (Production, treatment, transmission, and distribution); role and efficient usage of energy in the municipal sector.

### 5. Desalination technologies

Current trends and recent and future developments in desalination technologies and alternative energy sources; design, operation, and management of desalination plants; Innovative desalination plants design and modeling; economics and financing of desalination; desalination and renewable energy sources;

minimizing the environmental impacts on the coastal and marine environments; green house gases emission and their mitigation.

#### 6. **wastewater sector management and reuse**

Integrated management strategies for wastewater; current trends and developments in wastewater treatment and reuse in arid regions; modern treatment technologies and energy recovery; design, operation, modeling, and management of wastewater treatment systems; economics and financing alternatives of wastewater treatment; techniques, experiences, and constraints in the reuse of treated wastewater in the agricultural, municipal, and industrial sectors

#### 7. **Water, health, and the environment**

Environmental considerations in water development and management and environmental impact assessment of water development projects; environmental impacts of desalination; strategies for the protection of desalination plants and drinking water from marine pollution and required legislative measures; environmental impacts of the reuse of municipal and agricultural wastewaters; environmental legislation for the reuse of treated wastewater and its implementation; groundwater pollution and its effect on health; environmental and health impacts of agricultural, urban, and industrial activities.

## Conference Language

Arabic and English will be used in the conference. Research papers in both languages are accepted. In either case, an additional abstract in the other language must be submitted along with the full text of the research paper.

## Deadlines

- Abstracts should be sent to WSTA office in Bahrain by **31 October, 2011**.
- Authors will be notified of acceptance of abstract by **15 November, 2011**, by fax or preferably by email address provided by authors.
- The deadline for full text submission is **31 January, 2012**.
- Notification of final acceptance will be faxed or emailed to authors by **29 February, 2012**.
- Deadline for receiving the final text (camera ready) is **15 March, 2012**.
- Conference dates are **22-24 April, 2012**.

## Submission Format

Abstracts should not exceed 300 words and are sent along with the filled "Abstract Submittal Form". Abstracts should clearly state the objectives, methodology, results, and conclusions. Abstracts should be typed on an A4 white paper, single-spaced with double space between paragraphs, 12 characters per inch. The title should be placed at the top and typed in bold. The title is followed by a single space and then the author(s) name(s) in ital-

ics. In the case of more than one author, the name of the author to whom correspondence should be addressed should be underlined. The authors' affiliation and complete address should be typed in the line directly below the author(s) name(s) in italics. The authors' affiliation is followed by a space and then the abstract text is typed in normal.

Abstracts and any further information on the conference topics should be directed toward to the Chairman of the Conference Scientific Committee at the following address:

**Prof. Waleed K. Al-Zubari**  
**Chairman of the Scientific Committee**  
**The 10th Gulf Water Conference**  
**Water Science and Technology Association**  
PO Box 20018, Manama, State of Bahrain  
Tel: +973 1731 1351 / 17239880 , Fax: +973 1731 1352  
Mobile: +973 39433811  
Email: waleed@agu.edu.bh

# The Water Science and Technology Association (WSTA)

The concept of formation of Water Sciences and Technology Association (WSTA) was the result of individual efforts of some of those concerned with water affairs in the Gulf Cooperation Council (GCC) Countries. The Government of Bahrain consented to register the Association in Bahrain, and the Association was formally founded in September 1987, to be the first scientific association in the field of water sciences and technology in the Arabian Gulf region. The WSTA is a non-government organization and its WSTA membership is open to all water professionals in the GCC, water-related national and international organizations, educational institutes, consultants, and companies.

WSTA aims at encouraging and promoting interest in water sciences and strengthen scientific ties among water professionals in the GCC countries, and encouraging scientific research, training programs, and the development of local capabilities in the different fields of water sciences and technology.

## Achievements

- WSTA organized the **First Gulf Water Conference** 10-13 October 1992 in Dubai, UAE, under the theme **“Water and Development in the Gulf Region, Challenges of the Nineties”**. Following the success of its first conference, WSTA decided to organize this Regional conference biannually alternating in one of the GCC countries.
- **The Second Gulf Water Conference** was held in the period 5-9 November 1994 in Bahrain under the theme **“Water in the Gulf...Towards a Total Management”**.
- The Third Gulf Water Conference was held in the period 8-13 March 1997 in Sultanate of Oman under the theme **“Towards Efficient Utilization of Water Resources in the Gulf”**.
- The Fourth Gulf Water Conference was held in Bahrain, in the period 13-19 February 1999, under the theme **“Water in the Gulf...Challenges of the 21st century”**.
- The Fifth Gulf Water Conference was held in Doha, Qatar, in 24-28 March 2001, under the theme **“Water Security in the Gulf”**.
- The Sixth Gulf Water Conference was held in Riyadh, Kingdom of Saudi Arabia, in 8 – 12 March, 2003, under the theme **“Water in the GCC...Towards Sustainable Development”**.
- The Seventh Gulf Water Conference was held in Kuwait, in 19-23 November, 2005, under the theme **“Water in the GCC ... Towards an Integrated Management”**.
- The Eighth Gulf Water Conference was held in Bahrain, in 3-6 March, 2008, under the theme **“Water in the GCC...Towards an Optimal Economic and Planning Perspective”**.
- The Ninth Gulf Water Conference was held in the Sultanate of Oman, in 22-25 March, 2010, under the theme **“Water Sustainability in the GCC...the Need for a Socio-Economic and Environmental Definition”**

In addition, the association has conducted several seminars and symposiums, e.g., “Symposium on Water Supply Fluoridation” held in October 1996 in Kuwait, “Future of Desalination in the GCC Countries” held in March 2002 in Bahrain. WSTA also co-organized the following workshops with the European Desalination Society (EDS):

- “The Future of Desalination Research Workshop”, held during 8-11 September, 2002, in La Quilla, Italy.
- “Desalination Plants, Operation and Maintenance Workshop”, held during 24-27 August, 2003, in Amsterdam, Holland.
- “Capacity Building workshop”, held during 1-2 December 2004, in Bahrain.

### **Affiliations**

The society is affiliated with international societies and associations related to the field of water sciences such as the European Desalination Society (“EDS”) and the International Desalination Association (IDA).

For further information please visit [www.wstagcc.org](http://www.wstagcc.org)

# Qatar General Electricity and Water Corporation (KAHRAMAA)

## Mission:

Our Mission is to provide our customers with high quality electricity and water services, whilst creating value for our shareholders.

## Objectives:

Our objectives are to:

- 1- Efficiently meet our obligations to supply Qatar's needs for electricity and water.
- 2- Operate on a commercial basis
- 3- Comply with local and international health, safety, and environmental standards.
- 4- Maximise the employment of capable Qatari nationals, and develop them to the competence level of employees in leading international companies.

## Values:

In carrying out our business we will:

- Always remember that we are providing a vital service to the public, and that we are here to serve our customers.
- Be open, honest and responsive in our dealings with our stakeholders.
- Continuously seek to raise our performance standards and hold ourselves publicly accountable against these standards.
- Work as a team in which everyone shares concern for KAHRAMAA's performance of its responsibilities and takes collective pride in its achievements.

## KAHRAMAA Brief Statement:

Qatar General Electricity & Water Corporation "KAHRAMAA" was established in 2000 in terms to regulate and maintain the supply of electricity and water to customers. KAHRAMAA has the privilege of being the sole transmission and distribution system owner and operator (TDSOO) for electricity and water, and for customer services in Qatar.

## Core Areas of Business:

KAHRAMAA buys, distributes and sells electricity and water as follows:

- Formulates Power & Water Purchase Agreements (PWPA) and provides necessary technical and corporate support for the establishment of generation & desalination ventures.
- Owns, constructs and operates electricity & water transmission and distribution networks in Qatar.
- Sets-up plans and programs for development of electricity & water transmission and distribution networks.
- Lays out regulations, standards and codes of practices for electricity & water supplies to buildings and facilities.
- Provides consultancy services related to its activities and operations.





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