

United Nations, New York

Program October 14th, 2009

“Affordable Desalination as a Sustainable Solution”

On October 14th, 2009, NGO Sustainability hosted a program with Energy Recovery Inc. (ERI) on “Affordable Desalination as the Sustainable Solution.” This event held at U.N. Headquarters in New York, was co-sponsored by United Arab Emirates and Sri Lanka Permanent Missions to the U.N. The speakers were Hans Peters Michelet and Gonzalo G. Pique from ERI, a company which specializes in the production and distribution of water desalination devices. Such devices have the potential to revolutionize methods of water purification by making it energy efficient and affordable, offering a solution to increasing water scarcity.

Roma Stibravy, chairperson of NGO Sustainability, in introducing the program referred to a PBS broadcast the night before on Kenya’s drought and the consequent devastation, a striking example of diminishing water resources and its relevancy to our discussion today.

His Excellency, Palitha Kohona, the ambassador of Sri Lanka, in his presentation, referred to the unfortunate predicament of water scarcity that distresses so many countries today. Due to ongoing climate change, Sri Lanka in particular suffers unpredictable and problematic changes to the monsoon season causing water shortages. Importing water can be very costly and is an added burden. Mr. Mohamed Issa Hamad Abushahab, UAE, spoke about the issues concerning water scarcity in his country, and said that he was pleased his mission could make this event possible. Both emphasized the need to find effective solutions to the rapidly escalating water scarcity problem.

Mr. Michelet, Executive Director of ERI and Mr. Pique President/CEO of ERI, spoke about modern desalination techniques to serve as a solution to water supply that is both sustainable and affordable. Mr. Pique said the drought problem was caused by climate change, which in addition puts a burden on increasingly limited supply. Today, 1 in 8 people do not have access to clean drinking water. Making due with what is available, a child dies ever 15 seconds due to water sanitation issues. Implementation of modern desalination techniques could drastically reduce this number, and do so affordably.

Desalination has been a highly successful method of water filtration over the past several decades. Hundreds of desalination plants across the Middle East work through Seawater Reverse Osmosis, or SWRO, to supplement the region’s water supply. Although

in the past desalination has been an expensive process, new technology from ERI has, in revolutionizing the process, made it affordable.

This new technology is called a PX Pressure Exchanger, a device that more than doubles the efficiency of desalination while lowering the cost. Mr. Pique explained that the Pressure Exchanger is built to harness the pressure of the water that it filters. By recycling the high-pressure brine to power the water movement, it facilitates desalination. Older desalination plants would pump forty gallons of seawater in order to produce one gallon of drinking water, which is a huge loss of energy. The PX Pressure Exchanger has reduced that energy use by 60%, producing forty gallons of drinking water for every forty gallons pumped. Furthermore, the Pressure Exchanger has raised the efficiency of desalination plants to 98%. This represents near-perfect efficiency. The technological improvement has enabled providers to decrease their prices. Now at a market price of \$0.70 per cubic meter, desalinated water is more affordable than it has ever been, making it a viable solution to the world-wide water scarcity. The desalination plant of Perth, Australia represents a prime success story.

In recent years, a combination of increased water usage and low rainfall in Australia caused a drop in water supply requiring immediate attention. State governments responded by building a number of desalination plants, the first of which was built in Perth Australia in 2006. The Kwinana plant was subject to much questioning as countless environmentalists doubted the efficacy and sustainability of this plant. By the time it opened, Pique explained, even the most vehement of the opposition were impressed by its potential as a dependable and environmentally friendly solution. The plant has since proven successful as the primary water supplier for the area. A number of similar plants are currently under way, and in their production, environmental preservation is given top priority.

With concerns about the environment on the rise worldwide, desalination policies and techniques focus on water filtration as opposed to using chemical means. Along those lines, most plants use little to no chemical processes to filter their water in the desalination process. Also, many plants commission wind farms to provide the energy they need while maintaining carbon neutrality. Plants further benefit by how they use their natural resources. For example in some areas the gravel in a body of water can be used to provide a natural filter for marine life and other contents. This facilitates the filtration process. Such techniques are case-specific, and according to Mr. Pique, provide the most sustainable solution. Another technique is working only with water that is more than forty meters below the surface. Distanced from external pollution, this water is significantly cleaner than that on the surface.

Although desalination plants do have some impact on the ecosystems involved, negative effects are kept to a minimum. The extraction of water and discharge of brine from rivers and lakes can influence marine life, but by and large the ecosystems have comfortably adapted to these changes. Seahorses in Australia, for example, were seen feeding on the brine and discharge of the desalination plant. Chemical use in the water is minimal and includes standard practices of chlorination and coagulation, both of which are harmless in small quantities.

ERI is expecting to see the industry triple in the next five to ten years. Building on a rapid increase in the past decade, the current economic downturn has caused only minimal hindrance to this growth. Although numerous projects have been postponed or temporarily downsized, Michelet explained, no project has been cancelled. From its center in San Leandro California, the company is currently working on projects in Florida, Madrid, Dubai, and Shanghai. Additional target markets include the Middle East, Asia, Australia, and Algeria. India and Asia in particular, explained Michelet, will likely become a big sector of the market because many in rural India still lack access to clean water.

Making desalination a viable solution in the developing world presents a number of unique challenges. In regions where people have depended upon river water to serve their needs for generations it is difficult to convince the population of the dangers of drinking this water. Above all else, education is a necessity to convince locals of the need for a desalination plant. NGOs have been instrumental in providing this education, and many have successfully introduced rural populations to safer water resources. Another shortcoming of desalination is that it does not remove all boron content from the water. While residual boron contents do not harm humans and animals, they render the water unsuitable for agricultural purposes. This problem may be remedied by purifying the water again prior to using it for agriculture.

Thus far, desalination plants have mainly consisted of large-scale, municipally managed projects. Although small-scale, portable plants exist, the industry still needs to standardize regulations for their implementation. This type of small-scale production could be highly beneficial in rural areas where small, spread-out populations do not justify the construction of large plants. A number of NGOs have established distribution methods that ensure the sanitary delivery of water on the individual level. The transportation and overhead costs associated with distribution however, increase the overall cost of desalinated water.

Although desalinated water is now more affordable than ever, it remains subject to a number of market challenges that drive prices up, such as degree of access to water or the cost of transportation.

Large-scale desalination plants have very long lives. Desalination devices can last a lifetime as long as they are properly cared for.

Desalination has proven to be a dependable and affordable solution for water purification. Mr. Michelet and Mr. Pique emphasized that by harnessing the environment's natural resources, desalination holds immense potential to be a sustainable solution to the ongoing problem of water scarcity. We are likely to see immense growth in the desalination industry in upcoming years.