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“Solutions for Future Water Security”

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Abstract Title:

Aquifer Management, Renewable Energy And Desalination For Baja Region, Mexico

Abstract text:

Abstract There has been significant knowledge in the Baja region of Mexico on existing water resources, and regional and municipal water needs now and into the future. Research and analysis was recently conducted by the Centro Mario Molina in partnership with municipal governments and water departments including water scenario planning, economic analysis and modelling. The Centro is engaged in economic and public policy analysis for aquifer management, and impact of electricity rates for agriculture on aquifer depletion. Dr. Muir works extensively on renewable energy, desalination and aquifer management. The aquifers that are the main water sources in the Baja region are being depleted, and also contaminated by saline intrusions. Electricity for the region is predominantly generated by hydrocarbons despite abundant solar and wind resources. The agricultural and tourism sector is growing and the population is increasing, with communities like La Paz and Los Cabos being important and growing government and tourism centres. For the Baja region, aquifers are managed at the state level, while municipalities provide local water services. These municipalities do not have access to sufficient water to meet current or future needs. Water efficiency and pricing approaches have been proposed by Centro Mario Molina to address water shortfalls at a municipal level. However, it is also useful to examine the role of renewable energy and desalination to create additional safe clean drinking, and replenish depleted aquifers. Government owned desalination plants are in operation in Ensenada and other regions of the Baja. Private parties built a large desalination plant in Los Cabos, with water being supplied under a concession arrangement with the municipality. Desalination plants of varying sizes have been proposed in Playas de Rosarito (along with water exports to US). La Paz, San Quentin, near Loreto to support a resort and for the three fishing villages of Puerticitos, Bahia de Los Angeles, and El Barril. One of the proposed desalination plant in Rosarito and another proposed plant in the Gulf of California (Sea of Cortez) are bi-national initiatives where a some of the treated water will be exported to the United States. Aquifers and existing and proposed desalination plants in the Baja region in Mexico - along with

best practices, and municipal water systems - would be evaluated to consider and develop best practices for aquifer management and replenishment, and to assess opportunities for renewable energy and desalination projects to meet regional, municipal and sectorial water needs. The research and analysis would include technologies and facilities design and any required operational and technical equipment, renewable energy-desalination projects, aquifer management approaches that would meet the intertwined energy and water objectives and needs of the Baja region. Innovative financing, public/private partnerships for projects for renewable energy, desalination and aquifer management and replenishment would also be considered. The Centro would apply its water gap methodology to consider those sectors in the Baja region with significant water uses, being the agriculture and tourism sectors. The proposal will be considered for larger and smaller communities in the Baja region. Economic, energy and technical implications of changes to water systems in the Baja region will be considered, including a consideration of population growth and climate change scenarios for the region. Finally research will result in recommendations to strategic actors for public policies necessary to implement or incentivize projects. This research and analysis would be implemented by Dr. Muir and the Centro Mario Molina. The Centro has already conducted water research and analysis in cooperation with local municipalities and actors in the Baja region and other regions in Mexico. Outcomes of the research and analysis would be available as public documents. The research and results would be presented and shared in Baja, Mexico with municipalities and other identified actors and stakeholders. Researcher Magdalena AK Muir. B.A., J.D., LL.M., is trained in geology, engineering and law, and has over 20 years experience in energy and water issues in the Americas and internationally. Dr. Muir has been awarded a Fulbright Scholarship to examine and develop replicable pilot projects for renewable energy and desalination in the Americas which this research is occurring under. Dr. Muir is Research Associate at the Arctic Institute of North America, University of Calgary; Adjunct Professor at Johns Hopkins University in Washington DC, and Associate Professor at Aarhus University. The Fulbright Scholarship is implemented under the Sustainable Energy Development research implemented by the Arctic Institute at the University of Calgary; and as a visiting scholar with Columbia University and the University of Delaware. Institutions such as the Department of Sustainable Development of the Organization of American States, United Nations Department of Economic and Social Affairs, the Coastal and Marine Union (EUCC), and the Sustainable Cities International Energy Lab are involved in the implementation of this Fulbright Scholarship and may be able to contribute to this proposal. José Miguel Molina Munguía, Centro Mario Molina The Centro Mario Molina (CMM) is an independent non-profit, created in 2004 by Dr. Mario Molina to provide continuity and consolidation of his research and activities in Mexico. The main objective of the CMM is to find practical, realistic and substantive solutions related to environmental protection, energy management and climate change prevention by creating consensus among all sectors of society, in order to implement feasible measures (technically and economically) which contribute to increase social welfare. The role of CMM is to bring the on the ground knowledge about realities in the cities, as well as the full context they have acquired from the CONACYT funded project in regards to resilient and sustainable cities. For example, a current CCM water project identifies the most appropriate options to consider and integrate the environmental, social and economic aspects, so that the cities of La Paz, Los Cabos, Mexicali, Tecate, Tijuana and Puerto Peñasco can understand and adapt to scenarios of water scarcity due to climate change.

References

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Supplementary Material

Themes

- 201 THEME 2: Policy & Finance - Optimizing Urban Water and Energy - Cooperation between Water & Energy Utilities
- 203 THEME 2: Policy & Finance - Policy & Regulation Supporting Innovation for Energy & Carbon Neutrality in Utilities & Industries
- 204 THEME 2: Policy & Finance - Institutional Changes/Structures to Support the Transition to Cutting Edge Water/Energy Solutions

Presentation Format:

Oral presentation

Keywords

3-6 keywords (in alphabetical order) which will enable subsequent abstracting or information retrieval systems to locate the paper

Keywords Renewable energy desalination municipalities Baja Mexico

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