Questionnaire
Sunset Review of the
Texas Water Development Board

Name: ___Daniel Bullock_____

Organization you represent: __Gulf Coast Clean Energy Application Center_____

The Gulf Coast Clean Energy Applications Center (GC RAC) is a program of the Houston Advanced Research Center (HARC), an independent 501(c)(3) non-profit organization involved in sustainable development and commercialization of environmentally-promising technologies. The GC RAC program, which was launched in January 2005, is supported by funding from the U.S. Department of Energy. The overall goal of the program is to facilitate greater deployment of clean energy technologies such as combined heat and power (CHP), waste heat recovery, and district energy in Texas, Louisiana, and Oklahoma. The GC RAC supports regional stakeholders, policy makers, and adopters through educational outreach, project support services, and policy development initiatives. The GC RAC works with state agencies on a wide variety of regulatory initiatives relating to energy efficiency distributed generation, and renewable energy.

1. **What changes, if any, should be made to the mission or functions of the Texas Water Development Board?**

The Texas Water Development Board should continue to promote water conservation in its funding programs and state water plans. Projected water shortages in many parts of Texas demand a concerted effort among state agencies to encourage comprehensive water planning, including conservation and reuse. Due to the related nature of water consumption and energy production, the agency should allocate greater resources to considerations of the role of energy production and use in water planning. TWDB should expand its mission to include the implications of energy production and energy-use efficiency in its planning process and funding programs, and where appropriate, give preference to energy technologies that promote water conservation, energy security (i.e., independence from the electric grid) and coastal resiliency.

2. **How well does the Board assist entities in receiving financial assistance and in planning and constructing water and wastewater projects? Besides additional funding, what changes, if any, should be made to the Board's financial assistance programs?**

TWDB's funding protocol should evaluate water and wastewater treatment facility designs for water use in a comprehensive approach including both primary consumption and secondary consumption due to energy consumption. The agency should evaluate technologies that can reduce total water consumption and it should give preference to those wastewater treatment facilities that reduce total water consumption. In addition, the agency should give preference to critical water and wastewater facilities as defined in HB 1831 and HB 4409 and further encourage such facilities to conduct CHP feasibility studies to evaluate the technical and economic viability of CHP as required by law.

3. **In what ways could the Board's financial assistance programs be adapted to address unmet water and wastewater needs, such as in disadvantaged or economically distressed areas?**

Financial assistance programs to areas with water shortage such as West Texas should include energy-water nexus considerations among funding criteria. Eligible programs should include those that promote energy efficiency, energy security, and coastal resiliency.

4. **What changes, if any, should be made to improve the usefulness and accessibility of the Board's water-related data, such as for environmental flow purposes or other data available through the Texas Natural Resources Information System?**

No comment.

5. **How effective is the regional water planning process? What changes, if any, should be made to the Board's role in assisting with regional planning or preparing the state water plan?**

In addition to planning for direct water needs, the state water plan should take into account the indirect water requirements that result from regional energy consumption. Large volumes of water are required to generate electricity[1] and to produce natural gas[2] from shale rock formations. Average water consumption to cool the state's power generators is estimated at 0.4 gal per kWh, while about 3 million gallons of water are required to complete a single horizontal well in the Barnett Shale.

As a result, technologies that reduce electricity and natural gas consumption will also reduce the consumption of water across the state. To better understand these interrelationships and dependencies, the TWDB should commission studies to further evaluate the Energy-Water nexus. Findings from these studies should be incorporated into the development process used to establish the next state water plan.

For example, the combined heat and power (CHP) approach is an alternative electricity generating method that dramatically reduces water consumption required for power generation. As a type of distributed generation, these technologies produce electricity and heat in close proximity to energy consumers, thereby dramatically increasing energy efficiency. By capturing the heat of combustion, CHP projects deliver energy with very high efficiency and low emissions.[3] Furthermore, CHP technologies are air-cooled. As such, they can generate electricity without consuming water, thereby saving 0.4 gal of water for every kWh of electrical energy produced.

The CHP approach is widely used with the state and it represents an important resource to the state. As of November 2008, CHP is estimated to account for more than 17,300 MW or nearly 20% of Texas' installed electric capacity. Furthermore, a 2008 CHP report submitted to the Public Utilities Commission of Texas by Summit Blue Consulting estimated that an additional 13,400 MW could be developed in

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[1] Ashlynn S. Stillwell, Carey W. King, Michael E. Webber, Ian J. Duncan, and Amy Hardberger. The University of Texas at Austin and Environmental Defense Fund. *Energy-Water Nexus in Texas*. April 2009. Available at http://www.edf.org/documents/9479_Energy-WaterNexusinTexasApr2009.pdf. Accessed June 1, 2010.

[2] C. Leon Byrd, P.G., *Updated Evaluation for the Central Texas- Trinity Aquifer – Priority Groundwater Management Area*, Water Rights Permitting and Availability Section, Water Supply Division, Priority Groundwater Management Area File Report, page 42-46, (December 2007) Last accessed on June 4, 2010. http://www.tceq.state.tx.us/assets/public/permitting/watersupply/groundwater/pgma/2007_centex_pgma_report_final.pdf

[3] Daniel Bullock, *Building Green with Combined Heat and Power*, presentation to the Gulf Coast Green Expo, April 16, 2010, Houston, TX. http://www.gulfcoastcleanenergy.org/Portals/24/Events/Gulf%20Coast%20Green_GC%20RAC.pdf. Last accessed June 4, 2010.

Texas economically by 2023[4]*. By any measure, the existing and potential resource provided by CHP is significant to the state. The TWDB should commission a study to evaluate the water savings potential of CHP and other energy efficiency technologies.*

As a result of HB 1831 and HB 4409, which passed the 2009 legislative session, all critical government buildings, including water and wastewater treatment facilities, must evaluate the technical and economic feasibility of using CHP prior to construction or major renovation. The TWDB should evaluate the benefits of CHP for water utilities and provide support for its adoption where warranted, pursuant to HB1831 and HB4409.

6. **How well does the Board provide technical assistance to Groundwater Conservation Districts?**

No comment.

7. **What changes, if any, should be made to improve the usefulness of the Board's water planning data - such as surface and groundwater availability models and managed available groundwater numbers?**

No comment.

8. **How well do the processes for establishing desired future conditions and managed available groundwater numbers coordinate with the regional water planning process? What changes, if any, should be made to these processes?**

No comment.

9. **What changes, if any, should be made to the Board's appeal process for desired future conditions?**

No comment.

10. **Please add any other comments about the Texas Water Development Board. If you suggest any changes, please provide:**

    - **background information on the current situation and a description of what you would like to see changed,**
    - **benefits of your recommendation, and**
    - **any potential difficulties that may arise from implementing your recommendation.**

No comment.

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[4] Summit Blue Consulting. *Combined Heat and Power in Texas: Status, Potential, and Policies to Foster Investment*. December 10, 2008. Available at http://www.summitblue.com/attachments/0000/0525/r4_-_Combined_Heat_and_Power_in_Texas_Status__Potential__and_Policies_to_Foster_Investment.pdf. Last accessed June 4, 2010.