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August 28, 2019

Richard E. Rocheleau, Director  
Hawaii Natural Energy Institute  
1680 East-West Road, POST 109  
Honolulu, Hawaii 96822

Dear Director Rocheleau:

The Hawaii Public Utilities Commission (“PUC” or “Commission”) respectfully requests assistance from the Hawaii Natural Energy Institute (“HNEI”) to conduct a study to provide estimates for the lifecycle greenhouse gas (GHG) emissions of various energy products and production technologies in Hawaii. The objective is to provide a Hawaii-specific quantitative assessment of GHG emissions for the relevant technologies and energy sources for use by the Commission to support its decision making under Hawaii Revised Statutes Section 269-6(b)<sup>1</sup>.

The Commission requests that HNEI assemble an Advisory Group of local and national experts to advise HNEI on this study and to participate in the study planning and analytic work as appropriate. The PUC also asks HNEI to engage collaboratively with a diverse group of local stakeholders during the process. The PUC expects to consult with HNEI on the composition of the Advisory Group but final decisions on participation will be made by HNEI.

Specifically, the Commission seeks recommendations on estimating lifecycle greenhouse gas emissions from the production of currently regulated energy products and energy technologies and those anticipated for commercial applications in the next five years. These may include but not be limited to:

**Electricity** – produced from petroleum fuel products, gas products, coal, biofuel (locally produced and imported), biomass (direct combustion), solar (utility-scale and distributed), wind, and geothermal;

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<sup>1</sup>HRS Section 269-6(b) states, “The public utilities commission shall consider the need to reduce the State’s reliance on fossil fuels through energy efficiency and increased renewable energy generation in exercising its authority and duties under this chapter. In making determinations of the reasonableness of the costs of utility system capital improvements and operations, the commission shall explicitly consider, quantitatively or qualitatively, the effect of the State’s reliance on fossil fuels on price volatility, export of funds for fuel imports, fuel supply reliability risk, and greenhouse gas emissions. The commission may determine that short-term costs or direct costs that are higher than alternatives relying more heavily on fossil fuels are reasonable, considering the impacts resulting from the use of fossil fuels.”

**Gas products** – including synthetic natural gas, liquefied natural gas, renewable natural gas and hydrogen;

**Energy storage systems** – including battery energy storage systems,<sup>2</sup> pumped storage hydroelectric, and hydrogen.

HNEI can amend or add technologies after further review but this initial list is based on energy sources and technologies involved in recent regulatory decisions, that have been proposed in recent utility solicitations, or that are the subject of significant commercial interest.

In consultation with the Advisory Group and PUC, the Commission requests that HNEI develop the ‘boundary conditions’ to explicitly identify processes to be included for the life-cycle analysis appropriate for Hawaii for each of the identified technologies. These processes may include but not be limited to mining, transportation of raw and finished materials, manufacturing, electricity production, and end-of-life disposal. HNEI and its Advisory Group are requested to convene community meetings (number and location to be determined in collaboration with HPUC) to seek comments on the scope of the study.

The Commission asks that HNEI review the current peer-reviewed literature and available life-cycle data bases (US and European), identify the range of potential lifecycle emissions from the selected energy sources and technologies, and propose a reference range specific to applications in Hawaii<sup>3</sup>. Where data is insufficient to determine these values, specific actions to arrive at Hawaii-appropriate values will be identified. While this will be primarily a review of the literature and existing data bases, analysis will be conducted as deemed appropriate. Following completion of this analysis, results will be presented to the community for review and comment. Community engagement may be through community meetings, webinars, or both. It is anticipated that this review will require a number of meetings, and the output of these meetings will lead to appropriate modifications to the study. A draft report will then be prepared and submitted to the HPUC for further review.

The PUC expects to utilize the results of the study in future decision making after appropriate regulatory review. The Commission asks that HNEI utilize local and national experts on this topic and engage collaboratively with local stakeholders during the whole process, but particularly to review the scope of work and results. The Commission understands this is a complex exercise and requests that the data and assumptions are transparent to stakeholders and available for broad review.

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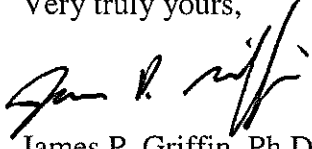
<sup>2</sup>Given the current prevalence of lithium ion systems, the Commission would propose studying this storage technology first and others in future/follow up analyses.

<sup>3</sup>As a reference, the National Renewable Energy Laboratory has produced a meta-analysis comparing lifecycle greenhouse gas emissions from energy sources and technologies - [see www.nrel.gov/analysis/assets/images/lca\\_harm\\_over\\_1.png](http://www.nrel.gov/analysis/assets/images/lca_harm_over_1.png).

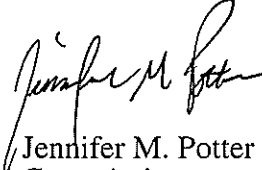
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The Commission will separately request support and participation by the State's electric and gas utilities after receiving an indication of HNEI's interest and ability to support this study. Thank you very much for your time and consideration. This matter is very important to the PUC and continued progress towards the State's clean energy goals.


Very truly yours,



James P. Griffin, Ph.D.  
Chair



Jennifer M. Potter  
Commissioner



Leodoloff R. Asuncion, Jr.  
Commissioner