Matthew Kuperus Heun

Department of Engineering,

Calvin University,

3201 Burton St. SE,

Grand Rapids, MI,

49546,

USA

Email: mkh2@calvin.edu

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Prof. Dr. Enrico Sciubba

Editor-in-Chief

*Energies*

Dear Professor Enrico Sciubba,

**Re: Submission of article to *Energies***

I am writing to submit the article entitled *‘The Energy and Exergy of Light With Application to Societal Exergy Analysis’* for consideration as an original research article in the journal *Energies.*

In this study we build a framework for assessing the energy and exergy efficiency of lamps producing light for illumination from a thermodynamic perspective, with a view to establishing a precedent for the societal exergy analysis community (SEA).

We begin by establishing an energy conversion chain framework for electric lamps, consistent with the energy conversion chain approach utilised in the assessment of other machines which convert energy into useful work in SEA.

We then proceed to examine the spectral power distributions of four lamps, along with the effects of four weighting functions on the efficiency with which electricity is converted into broad-spectrum electromagnetic radiation, or light as determined by the selected weighting functions.

Building on recent work in the thermodynamics of radiation community we then analyse the exergy to energy ratio of electromagnetic radiation and light, which in SEA has previously been assumed to be 1.

We provide recommendations to the SEA community for assessing the efficiency of electric lamps moving forward, proposing the adoption of the universal luminosity function, and providing methods to move from the available published luminous efficacy data to efficiencies based on our recommended methods.

We believe our study fits well within the aims and scope of *Energies,* and we thank you for considering this research article for publication.

Best Regards

Matthew K. Heun, Zeke Marshall, Emmanuel Aramendia, and Paul E. Brockway