**Reproducibility of Academic Journals in the Green Energy Sector**

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**Abstract.** – Do this last to summarize research

# Introduction

* **Problem** **Statement**: The efficacy of science in influencing policy, public knowledge, and education depends on faith in the quality of the science in keeping with the scientific method and on preventing biases and special interests from putting a “thumb on the scale”, i.e., influencing or misrepresenting the results to support a certain conceptualization of/perspective towards the issue. As Climate change is pushed to the forefront of public discussion due to extreme weather conditions, renewable energy is often looked at as one facet of the greater solution. As the public discourse continues it is imperative that accurate academic research is present in the discussion. To that end the peer review system has long been used to ensure that outcomes are honest and reproduceable. As outside parties continue to fund research it is important to hold those parties accountable to the scientific method. Often peer reviews can be subject to issues of practicality and time/resource constraints as well as peer reviewers giving the researchers the benefit of the doubt. The question of reproducibility is raised as an ever-relevant standard. This paper will be looking at several peer-reviewed articles in the renewable energy space and will investigate the reproducibility of their findings. We expect to find statistics or conceptual information reflecting the current state of the peer-review process of statistical journals covering the renewable energy sector. ￼

# Literature Review

* **Hypothesis (waiting on Dr. Sadler for clarification):** The focus on reproducible research is of paramount importance to the academic, scientific, and policy-making communities. For Phase I, we will identify and review a minimum of 30 peer reviewed articles and determine those articles’ reproducibility within our ability and access. During Phase II, our goal will be to reproduce verbatim the research conducted in three of the studies (one for each team member to work on), examining any errors or more efficient methods of conducting the research with the endgame being to expand on one of the studies.
* As of this document, we have reviewed 18 peer-reviewed journal articles on the renewable energy sector of Texas with supplemental documentation for key grid outages by ERCOT. Most articles have some type of modeling associated with them that potentially will be reproducible providing we have access to the original datasets.
* We need to add more literature to our sources list, most sources have been found searching through SMU libraries main portal along with ResearchGate.

# Methods

* Domain Knowledge
* 30 Academic Papers
* Examine methods used to reproduce research
* Our sampling method thus far has been to search and refine the phrase “Solar energy Texas” or logical combinations (AND) of “Texas” with “clean energy”, “sustainable energy”, and “renewable energy”. We proceed to select journal articles that have noted “Modeling/Analysis” within the abstract. We will construct a reproducibility checklist per our access to resources, data, and expertise; and use that as a benchmark for evaluating articles’ reproducibility.
* Methods contained in papers examined (non-exhaustive list):
  + Three different approaches for long-term capacity expansion analysis are introduced: AURORAxmp, an Excel model, and the Screening Curve Method.
  + JEDI Wind model, a tool that has been widely used by government agencies, research institutions, and universities to assess wind energy project impacts.
  + Time Series Analysis - ARIMA
  + MLR - multiple linear regression with time-series elements
  + Nonparametric Testing Methods
  + K-Nearest Neighbors
  + Naïve Bayes

# Results (TBD)

* ~~Graphs and Figures go here~~
* ~~Ensure discussion is about results only and not overall outcomes~~
* ~~Accept or reject the hypothesis based on the available data and models created~~
* ~~Clarify study scope~~

# Discussion

* What makes research reproducible?
* What do you expect the audience to do with your findings?
  + Take steps to ensure that future work is reproducible, including access or ways of following up on research presented within journal articles. Ergo: make the reproduction of researc (CTA)
* Were we able to expand the research to the degree we wanted or desired?
* What stood out as the most interesting/unexpected/unique as we progressed through the research?
* What challenges occurred during the analysis?
* Were any of the research that we reviewed potentially harmful or immediately useful?
* Ethics of research?

# Conclusion (TBD)

● TBD ~~Overall wrap-up on how this specific research is useful~~

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**Appendix:**

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