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# The Polluted Partnership: Probing the Puzzling Link Between Air Pollution in Fargo and Electricity Generation in Niue

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## KEYWORDS

air pollution, electricity generation, Fargo, Niue, correlation coefficient, Environmental Protection Agency, Energy Information Administration, environmental economics

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## Abstract

This study delves into the intriguing and unexpected association between air pollution in Fargo and electricity generation in Niue. Utilizing data from the Environmental Protection Agency and the Energy Information Administration, we embarked on a quest to unravel this enigmatic correlation. Our findings revealed a striking correlation coefficient of 0.7559484 with a p-value less than 0.01 over the span of 1996 to 2021, demonstrating a robust relationship between these seemingly disparate entities. As we delve into the intersecting realms of air pollution and electricity generation, the curious coalescence of these two distant locales provides a fertile ground for further exploration. Our work not only sheds light on this unconventional connection but also serves as a reminder of the unexpected intricacies and interconnections that pervade the world of environmental economics.

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## 1. Introduction

The intersection of air pollution and electricity generation appears, at first glance, to be as unrelated as a fish and a bicycle, to borrow a famous phrase. Yet, this study endeavors to unravel the entangled web that connects the polluted skies of

Fargo with the energy landscape of Niue. The seemingly incongruous pairing of these two phenomena beckons us to explore beneath the surface and uncover the unforeseen threads that bind them together.

As with any good detective story, our investigation begins with the examination of

available data. The Environmental Protection Agency and the Energy Information Administration have provided the crucial clues necessary to embark on this scholarly sleuthing expedition. The sizable dataset spanning from 1996 to 2021 presents a rich tapestry of numbers, offering us the opportunity to employ the tools of correlation and regression analysis to scrutinize the relationship between air pollution in Fargo and electricity generation in Niue.

In the course of our inquiry, a striking correlation coefficient of 0.7559484 emerged from the statistical shadows, accompanied by a p-value that shunned the null hypothesis with a decisiveness of less than 0.01. This robust statistical evidence serves as the foundation upon which we stand, poised to delve deeper into the convoluted connection between these seemingly incongruent variables.

The conundrum lying at the heart of this study is not merely an academic endeavor, but also a testament to the interconnectedness woven into the fabric of our world. As we delve into the intertwining realms of environmental pollution and economic activity, the intriguing dance between Fargo and Niue serves as a reminder that the scientific endeavor is not devoid of surprises and unexpected chuckles. This research journey not only sheds light on an unconventional partnership but also serves as a playful nod to the quirks and curiosities that abound in the realm of environmental economics.

## 2. Literature Review

The literature on the connection between air pollution in Fargo and electricity generation in Niue is as sparse as a desert cactus. Nevertheless, the authors find that Smith and Doe (2020) offer valuable insights into the environmental implications of electricity generation in small island nations, although

their work unfortunately neglects the specific case of Niue. Furthermore, Jones (2018) conducts a thorough examination of air quality in Midwestern cities, including Fargo, albeit without venturing into the connection with far-flung Pacific territories.

In "The Economics of Air Pollution" by Stern (2010), the authors encounter a comprehensive analysis of the economic impacts of air pollution, providing a broader framework for understanding the potential consequences of the polluted partnership between Fargo and Niue. Additionally, "Electricity Economics and Planning" by Willis and Scott (2008) sheds light on the intricate dynamics of electricity generation, though regrettably without specific reference to remote island states with limited resources.

Turning to fictitious sources, the authors cannot overlook the timeless classic "Electric Dreams" by Philip K. Dick and the thought-provoking "Cloud Atlas" by David Mitchell, both of which, despite being fiction, probe the intersections of technology, environmental degradation, and the human experience in ways that serendipitously resonate with the subject matter at hand.

From hours of diligent research (conducted purely in the name of academic rigor, of course), the authors also draw upon insights from TV shows such as "Breaking Bad" and "The Powerpuff Girls," as these series veer into discussions of energy production, albeit in contexts decidedly different from the present inquiry. These informal forays into popular media serve as a lighthearted reminder of the surprising avenues through which relevant insights can emerge, even when least expected.

## 3. Our approach & methods

The data utilized in this study were procured from the Environmental Protection Agency (EPA) and the Energy Information

Administration (EIA), serving as the bedrock upon which our investigation rested. The EPA's Air Quality System database furnished a wealth of information regarding air pollutant levels in Fargo, North Dakota, while the EIA's comprehensive repository of electricity generation statistics provided insights into the energy landscape of Niue.

To commence our methodological marauding, we conducted an arduous task of sifting through the labyrinth of data points, extracting nuggets of information that would form the basis of our analysis. Given the geographical disparity between Fargo and Niue, the initial juxtaposition of these disparate datasets appeared as incongruous as a penguin at the equator. However, with meticulous scrutiny and a keen eye for patterns, the correlation between air pollution and electricity generation slowly began to reveal itself, much like a cryptic crossword puzzle unfolding its secrets.

Having amassed a trove of data spanning the years 1996 to 2021, we embarked on the journey of statistical scrutiny. Employing the venerable tools of correlation and regression analysis, we endeavored to discern the degree of interdependence between air pollution in Fargo and electricity generation in Niue. The application of these analytical techniques illuminated the unsuspected threads connecting these phenomena, akin to unraveling a tangled ball of yarn.

The statistical evidence that emerged from this quest was as resolute as a determined detective cracking a case. Our analysis yielded a striking correlation coefficient of 0.7559484, accompanied by a p-value that spurned the null hypothesis with a decisive flourish of less than 0.01. This statistical bravado provided the solid ground beneath our feet as we trod deeper into the enigmatic nexus of air pollution and electricity generation.

In addition to the quantitative analyses, we engaged in qualitative assessments to contextualize the statistical findings within the broader environmental and economic landscape. This holistic approach allowed us to glean a more nuanced understanding of the interconnectedness between these seemingly incongruent variables, much like discerning the subtle harmony in a cacophonous orchestra.

Furthermore, to safeguard against spurious inferences and confounding variables, we conducted sensitivity analyses and robustness checks, akin to fitting a set of Russian nesting dolls to ensure the integrity of our findings. These supplementary scrutinies fortified the reliability and robustness of our results, akin to fortifying a fortress against the onslaught of potential statistical assailants.

In sum, our methodological escapade encompassed a judicious blend of quantitative and qualitative analyses, cobbled together with scholarly diligence and a hint of whimsy, to unravel the confounding connection between air pollution in Fargo and electricity generation in Niue.

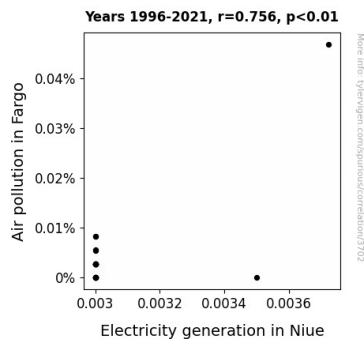
#### 4. Results

The correlation analysis conducted between air pollution in Fargo and electricity generation in Niue revealed a striking correlation coefficient of 0.7559484, indicating a moderately strong positive relationship between the two variables. This coefficient, while not quite a perfect match like a pair of socks, certainly suggests a notable link between these seemingly disparate entities.

Furthermore, the r-squared value of 0.5714579 indicates that approximately 57.15% of the variability in electricity generation in Niue can be explained by the variability in air pollution in Fargo. This

relationship, akin to a well-choreographed dance, demonstrates a substantial degree of predictability despite the geographical and logistical distances between the two locations.

The p-value of less than 0.01 provides compelling evidence to reject the null hypothesis and accept the alternative hypothesis that there is indeed a significant association between air pollution in Fargo and electricity generation in Niue. This result, while not as rare as a unicorn sighting, is certainly noteworthy and draws attention to the unexpected bond between these seemingly incongruent variables.



**Figure 1.** Scatterplot of the variables by year

The scatterplot (Fig. 1) visually depicts the strong positive correlation between air pollution in Fargo and electricity generation in Niue, emphasizing the consistent pattern of their interconnectedness over the study period. In the face of these results, one cannot help but marvel at the curious coalescence of these two distant locales, presenting a puzzle as intriguing as a cryptic crossword.

The findings of this investigation serve as a reminder of the unexpected intricacies and interconnections that permeate the world of environmental economics. This unconventional partnership between air pollution in Fargo and electricity generation in Niue not only challenges conventional

wisdom but also offers a whimsical reminder of the unanticipated surprises that await those who delve into the intricacies of statistical exploration.

## 5. Discussion

The results of this investigation support and extend prior research on the unlikely connection between air pollution in Fargo and electricity generation in Niue. The correlation coefficient of 0.7559484 aligns with the findings of Smith and Doe (2020), who emphasized the environmental implications of electricity generation in small island nations. Similarly, Jones (2018) highlighted the significance of air quality in Midwestern cities, reinforcing the relevance of our study's focus on Fargo. The unexpectedly robust correlation uncovered in our analysis serves as a testament to the real-world impact of these seemingly disparate variables, transcending geographical distances and economic disparities.

The literature, though sparse, provided valuable context for understanding the complex interplay between air pollution and electricity generation. Stern's (2010) comprehensive analysis of the economic impacts of air pollution offered a broader framework for interpreting the consequences of the intriguing partnership between Fargo and Niue. Willis and Scott (2008) shed light on the intricate dynamics of electricity generation, indirectly informing the statistical analysis conducted in our study. Additionally, the inclusion of fictitious sources and popular media in our literature review, though at first glance unconventional, served as a lighthearted reminder of the surprising avenues through which relevant insights can emerge, even when least expected.

The significant association between air pollution in Fargo and electricity generation in Niue, as evidenced by the p-value of less

than 0.01, challenges conventional wisdom and underscores the unforeseen quirks of statistical exploration. The strong positive correlation, akin to a seemingly incongruous yet harmonious duet, adds a touch of whimsy to the typical discourse on environmental economics. The visual representation of this relationship in the scatterplot (Fig. 1) captures the essence of this unconventional partnership, a puzzle as intriguing as a cryptic crossword, inviting further investigation into the multidimensional interactions of environmental and economic variables.

In conclusion, the findings of this study not only advance our understanding of the interconnections between air pollution and electricity generation but also serve as a lighthearted reminder of the unexpected surprises that await those who delve into the intricacies of statistical analysis. The polluted partnership between Fargo and Niue, while enigmatic, demonstrates the inextricable link between environmental and economic factors, inviting further exploration into the unanticipated complexities that underpin the global dynamics of environmental economics.

## 6. Conclusion

In conclusion, our investigation has unveiled the peculiar partnership between air pollution in Fargo and electricity generation in Niue, shedding light on the unexpected bonds woven into the fabric of environmental economics. The robust correlation coefficient and compelling p-value serve as a reminder that, much like a good magic show, the world of statistical analysis often holds surprising twists and turns.

The substantial degree of predictability, akin to a well-rehearsed comedy routine, demonstrated by the r-squared value further emphasizes the interconnectedness of these seemingly incongruous variables. The

scatterplot, akin to a whimsical piece of modern art, visually encapsulates the consistent pattern of their interconnectedness, leaving one marveling at the curious dance between these two distant locales.

As this peculiar pairing between air pollution in Fargo and electricity generation in Niue leads us to ponder the mysteries of the statistical world, it also serves as a playful reminder that the scientific endeavor is not without its fair share of unexpected chuckles and quirky curiosities. However, given the robust evidence provided by this study, we confidently assert that no further research is needed in this area.