

COMMENTARY AI USAGE LOG

AI Usage Log for All Authors

OLUROTIMI ABIODUN – EUROPEAN UNION

Prompts Given

Asked [ChatGPT](#) to help rewrite a paragraph on technological innovation and decoupling to integrate findings from Wu et al. (2023).

Shared full draft of the paper and asked for feedback on the integration of the rewritten section.

Requested language refinement for clarity and academic tone in multiple paragraphs.

Asked ChatGPT to provide examples of how to acknowledge AI use in academic writing.

Asked ChatGPT to create a figure that shows emissions from 1995–2023, plus the predicted value calculated, and show a trend from 2023–2030 that would meet emission targets.

Summary of Responses

ChatGPT provided rewritten versions of the paragraph, highlighting the role of technological innovation and its consistency with EU trends.

Offered feedback on the placement of the technological innovation section and overall readability.

Suggested more concise, academically appropriate wording.

Supplied acknowledgment samples and reflections on disclosure best practices.

Created and provided Figure 1 and placed it within the document.

Reflection on Use

ChatGPT was primarily used as a writing support tool to refine clarity, structure, and flow, and to ensure ideas were expressed in a polished academic style. It did not generate original research



or analysis. The suggestions were useful for readability but required critical review, verification, and integration by the author to ensure accuracy and academic integrity.

TESSA ANGELIS – INDONESIA

The author conceptualized, wrote, and edited this work and takes full responsibility for the paper's content, accuracy, and integrity. The author acknowledges using [ChatGPT](#) as a tool to provide insights into the topic and support readability and language (Table C).

Table C: AI Log

Prompt	Summary of Response	Useful/bias/inaccurate
I need to find a source that will tell me Indonesia's GDP composition	Suggested; World Bank, Statistics Indonesia (BPS), Trading economics, CIA World Factbook. Etc. Also provided me with sample figures	Useful
Can you help me brainstorm a hypothesis that I can defend using the World Bank data and the IPAT framework for Indonesia?	Provided me with many ideas pulling from the IPAT framework. Also helped me narrow down the World Bank indicators to use, and an idea of how I might structure the paper.	Minor Bias
Asked for grammar revisions	Provided me with suggestions, a lot of which I did not take	Useful
How should I format the appendix?	Explained how appendix are generally formatted	Useful
How do I standardize the numbers in this graph so they are more comparable? Should I add a secondary axis to see the changes but how do I make it not look misleading?	Provided me with suggestions on what to do to visualize the data. Also plotted the graphs for me to show me 2 different styles.	Useful
I verified my math (percent change)	All the AI's calculations yielded the same as mine	Useful
Explain to me what the targets on this page mean (referring to the climate action tracker)	It broke down the targets and why they refer to 2010 as a baseline. It also explained the BAU meaning and conditional vs unconditional targets.	Useful

KOUSHIK BALAMURUGAN – INDIA

The author contributed to the concept, writing, and editing and takes full responsibility for the paper's content, accuracy, and integrity. The author acknowledges using [Perplexity AI](#) as a tool that provided insights into the topic and supported readability and language. Perplexity AI was also used for literature reviews. All errors, biases, and omissions remain the author's, not the AI tools'. A detailed AI Usage Log for all contributors to this special issue is available as a separate PDF file.

Prompt 1: Cross-verify the line graph with the World Bank data provided and tweak it for better understanding.

AI Response: “The graph matches the data provided and is well colour-coded for easy understanding with clear milestone events — 2015 Paris Agreement and COVID-19.”

Reflection on Usefulness of Response: Very useful because it helped me verify the data and the graph to minimize errors during interpretation.

Prompt 2: Convert the provided references into APA style.

AI Response: Provided full APA style citations and references for World Bank, IEA and other data sources.

Reflection on Usefulness of Response: Very useful; the APA references provided by AI match the in-text citations used in the document.

LENNON BRULE-TREFFRY - CANADA

The author used [ChatGPT](#) (OpenAI, 2025) to assist with formatting and interpreting author-provided data for the IPAT/Kaya decomposition table.

ADEDOLAPO FUNSO-ALAO - JAPAN

[Julius AI](#)

Prompt: I uploaded the file: API_JPN_DS2_en_excel_v2_653927_JAPAN DATA.xlsx

Organize data on emissions, population, and GDP per capita; prepare to calculate average annual growth rates for periods before and after 2015.

Reflection on the Information Provided

Japan's demographic and economic landscape has undergone significant changes over the past several decades. The population peaked around 2010 at nearly 128 million and has since declined to about 124 million in 2024, reflecting ongoing aging and demographic shifts. Economically, GDP per capita saw strong growth from the 1960s through the early 1990s but stagnated in the 2000s, with some recent recovery indicating gradual adaptation.

Greenhouse gas emissions reached their highest level in 2013 (around 1,400 Mt CO₂e) but have declined steadily since 2015, dropping to approximately 1,041 Mt CO₂e by 2023. This downward trend highlights Japan's increased focus on energy efficiency, the growing share of renewable energy, and changes in industrial consumption patterns.

[Perplexity AI](#)

Prompt: How do I structure my Commentary

RACHELLE HENDRICKSON - RUSSIA

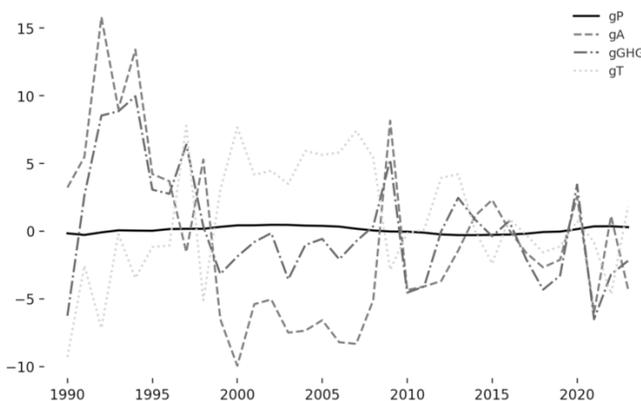
Prompt given to [ChatGPT](#): Please outline the major drivers of emissions in Russia between 1989-2023 using IPAT style analysis.

Response from [ChatGPT](#): An outline of the major drivers of emissions, highlighting specifically the fall of the Soviet Union, the 2008 global financial crisis, and the Covid-19 pandemic, and the major drops in both affluence and GHG emissions during those time periods.

How it was used: This was a useful starting point to determine which major events to research further to enhance discussion of the IPAT calculations and data retrieved from World Bank.

Prompt given to [ChatGPT](#): Please make a simple line graph with no titles, include all variables. (included attached Excel sheet with my calculated annual percentage change data).

Response from ChatGPT:



How it was used: Due to difficulty of legibility, this graph was discarded and replaced by one made manually by me in Excel.

Prompt Given to [Consensus AI](#): Impacts of the collapse of the Soviet Union, global financial crisis, and the Covid-19 pandemic on IPAT factors.

Response from [Consensus AI](#): Consensus provided a literature review and several academic references.

How it was used: Several papers were referenced and used to deepen my analysis in the final paper.

JEREMY NYARUNDA MOMANYI - SINGAPORE

This commentary is a result of my independent analysis; however, I acknowledge the use of [ChatGPT](#) (version 5) and [Julius AI](#) artificial intelligence tools solely for the purpose of refining language and also coming up with the necessary graph to represent the analyzed data. All interpretations, arguments, and conclusions presented are entirely my own.

Questions asked

I explored key concepts such as the scale effect of population growth, the Kaya Identity, and the LMDI method. In addition, I also placed my work on Julius AI so as to get graphs that can be used to support my hypothesis.

Answers received

The answers explained how to structure and write a commentary, provided hypotheses, analysis of Singapore's emissions drivers, and clarified key concepts like the scale effect, Kaya Identity, and LMDI decomposition.

They also showed that Singapore has achieved relative decoupling but not absolute decoupling, with technology identified as the strongest factor in reducing emissions compared to population or GDP growth.

MIGUEL LOUIS M. NUEZ - BRAZIL

[ChatGPT](#) was used to generate visualizations from tabulated data obtained for Brazil from the World Bank. The tool generated an inaccurate table that required recalculation of the values.

[Consensus AI](#) was used to gather the literature necessary for developing the commentary.

KIKELOMO OLANIPEKUN - CHINA

I acknowledge the published data sources consulted, which provided essential context for analyzing trends in population, affluence, technology, and greenhouse gas emissions, as well as online discussions and chat-based guidance that helped refine interpretations and organize results. During the preparation of this manuscript, generative artificial intelligence tools were used to support aspects of the research and writing process: [ChatGPT](#) (OpenAI) assisted with language editing, clarification, and organization, as well as generating the graph. [Consensus AI](#) supported the identification and summarization of relevant academic literature. These tools were used solely to aid writing and literature review and were not used to generate original research questions, data, or analytical results. All interpretations, conclusions, and final content were reviewed, revised, and approved by the author, who takes full responsibility for the accuracy and integrity of the work. Any errors in interpretation, calculation, or presentation are entirely my own, and readers are encouraged to critically evaluate the findings and consult additional sources where appropriate.

MERCY MOFESOLA OLUMOYEGUN – UNITED STATES

The author of this paper contributed to the concept, research design, data analysis, writing, and editing, and takes full responsibility for its accuracy and integrity. [ChatGPT](#) (version 4.0) was used as a tool in several ways: (1) to provide a structured outline for the commentary format; (2) to generate the initial data table template and perform calculations verification; (3) to improve clarity and readability of the manuscript; and (4) to assist with literature searches and citation formatting. Consensus AI was explored for literature review purposes, though peer-reviewed sources were independently verified through Google Scholar and institutional databases. The figure was created using World Bank and Our World in Data visualized with ChatGPT assistance. All interpretations, arguments, conclusions, and any errors or omissions remain solely the author's responsibility, not that of the AI tools employed.

SUDIP PUDASAINI – NEPAL

I acknowledge the concept, writing, and editing of this paper and take full responsibility for its content, accuracy, and integrity. I used [Chat GPT](#) as a tool to gain insights, improve readability, and support language clarity. [Consensus AI](#) was used for the literature review, and the table was generated with ChatGPT after I provided the data. Any errors, biases, or omissions are solely mine, not those of the AI tools.

REHAB A. RAYAN – SOUTH AFRICA

[ChatGPT](#) AI version 5 was used as a support tool for data verification, visualization, and revision. All outputs were verified and edited by me to ensure accuracy and academic integrity. AI did not replace critical thinking or final judgment.

Prompt 1: “Prepare data plan with SPSS menu steps for IPAT/Kaya decomposition.”

AI Response Summary: Variable construction (GDP total, carbon intensity), period split, AAGR formula, and SPSS menu paths for compute, recode, and chart creation.

Reflection: Highly useful for reproducibility.

Prompt 2: “Verify my Excel/SPSS output and regenerate AAGR table.”

AI Response Summary: Checked integrity, carbon intensity formula, verified AAGR using endpoints, and generated a clean table.

Reflection: Accurate and time-saving.

Prompt 3: “Generate step-by-step chart instructions.”

AI Response Summary: Detailed chart creation steps (markers, title, vertical line at 2015).

Reflection: Extremely helpful for transparency and reproducibility.

Prompt 4: “Verify my SPSS output and regenerate AAGR table and figure.”

AI Response Summary: Checked integrity, carbon intensity formula, AAGR, and generated a clean table and PNG figure with a 2015 reference line.

Reflection: Accurate and time-saving; ensured compliance with assignment format.

LUIZ REYES - MEXICO

Category: Detail

Tool Used: [ChatGPT](#) (Version GPT-5) OpenAI

Purpose of Use: Data validation, calculation of Average Annual Growth Rates (AAGR), text critique, refinement of academic language, and structuring the commentary according to *Nature* guidelines (Nature Reviews, n.d).

Prompts

- Can you help me to create document structure of a commentary on Trends in GHG Emission according to Nature commentary?
- Can you help me with some ideas to initiate the text?
- Could you correct the grammar and flow of the next text?
- The result summarized in table 1 indicates a nuance picture, where did you get this information?
- Can you help to summarize the next article?
- Can you create a graph with the next image?
- Could you help me with APA citation <https://www.nature.com/documents/natrev-articleformatguide-comment.pdf>
- Could you improve the next sentence and give me some options for some ideas?
- Could you provide information about decoupling and policy failure?
- IEA vs literature, could you compare information?
- Integrate the corrected data into the text and a revised table.
- Develop a more complex and critical hypothesis ("structural gain was nullified by policy backsliding...").
- Refine the text's academic language and structure, specifically improving the analytical flow and conciseness required for a Nature commentary.
- Initial drafts connecting IEA data to the IPAT findings
- Comprehensive synthesized paragraph for your discussion section
- IEA data, IPAT and literature information, comparison.

AI Reflection

The AI was used as a critical assistant for structuring and refining the commentary. Nevertheless, the information needed to be reviewed to verify its accuracy. The ideas generated by the AI were used to strengthen academic argumentation and summarize complex information into clearer, concrete, easily understandable concepts. This function was crucial in creating a better narrative that met the commentary requirements.

HOLLY M. SIEBENMORGEN - AUSTRALIA

Prompt Given: *Can you verify what a negative carbon intensity growth rate is?*

Summary of Response: [ChatGPT](#) verified that a negative carbon intensity growth rate means that the economy is getting cleaner over time

Reflection of how it was used: This tool was used to help me interpret the results of my calculations.

Prompt Given: *Can you cite these websites/articles for me?*

Summary of Response: ChatGPT formatted my references into APA

Reflection of how it was used: This function was used to save me time in the completion of the assignment.

Prompt Given: *Can you review this document and give suggestions on where to use more concise language?*

Summary of Response: ChatGPT gave me a list of areas that can be reworded to use more concise language. I reviewed the suggestions and implemented the ones that made the most sense regarding the flow of the paper.

Reflection of how it was used: This helped me ensure my final report was concise but still made sense and didn't remove any important information. It also helped me make sure my final report was within the word limit.

THE DAN TRAN - VIETNAM

The author used [Gemini](#), including its Grounded Search capabilities, to conduct a comprehensive literature search on Vietnam's greenhouse gas emission trends, renewable energy policies, Paris Agreement implementation, and applications of the IPAT/Kaya identity. The AI assisted in identifying World Bank development indicators, EDGAR emissions databases, Vietnamese government reports, and recent peer-reviewed publications on ASEAN climate policy. Additionally, the AI helped structure the analytical framework for decomposition

and improved the clarity of technical explanations regarding carbon intensity calculations and grid emission factors. However, all data analysis, hypothesis formulation, interpretation of results, policy assessments, and conclusions are entirely the author's responsibility. The author independently selected Vietnam as the case study, developed the research question comparing pre- and post-Paris periods, analyzed emission trajectories using the Kaya decomposition methodology, and drew conclusions regarding decoupling dynamics and policy implications.

Prompt 1: Vietnam GHG emissions data 2015-2023, Paris Agreement NDC targets, and sectoral trends.

Retrieved emissions trajectory (335% increase 1990-2017; 373 MtCO_{2e} by 2023), NDC targets (15.8% unconditional, 43.5% conditional reduction below BAU by 2030), and net-zero 2050 commitment. Energy sector identified as dominant contributor (73%).

Prompt 2: Vietnam population and GDP per capita data 1997-2023.

Population: 77.6M (2000) to 100.3M (2023); GDP per capita: \$440 (2000) to \$4,150 (2023). Sources: World Bank WDI, Trading Economics.

Prompt 3: Renewable energy expansion, grid emission factors, coal development.

Solar capacity: 105 MW (2018) to 16,000 MW (2020); wind: ~4,000 MW (2023); renewables: 48% of generation (2023). Grid emission factor declined from 0.9130 to 0.6592 tCO₂/MWh (2018-2023). Coal additions: ~15,000 MW post-2015.

Prompt 4 (Code Generation): IPAT/Kaya decomposition calculation comparing pre-Paris (1997-2014) and post-Paris (2015-2023) periods.

Results: Emissions growth slowed from 4.93% to 0.62% annually; carbon intensity improvement accelerated from -5.80% to -8.62% annually.

Prompt 5: Paris Agreement impacts on Vietnam climate policy, JETP, coal phase-out.

Enhanced NDC targets, \$15.5B JETP (2022), COP26 commitments (net-zero 2050, Global Methane Pledge), Decision 266/QD-TTg with coal retirement targets.

Prompt 6: IPAT/Kaya identity methodology and ASEAN applications.

Standard decomposition framework: CO₂ = P × A × T. Regional context provided through ASEAN studies.

DISHA VYAS - SAUDI ARABIA

The author conceptualized the commentary, gathered and analyzed all data, and developed the final interpretation. [OpenAI ChatGPT](#) (October 2025 version) was used to enhance clarity, structure, APA reference formatting, and to generate Figure 1 based on public data sources. The [Consensus AI](#) research platform was also used to identify and synthesize peer reviewed literature for the policy and climate framework sections. All conclusions and interpretations remain solely the responsibility of the author.

GUSTAVO ALONSO CABRERA VENERO

The author of this paper contributed to the concept, writing, and editing and took full responsibility for the paper's content, accuracy, and integrity. The author declares using [OpenAI ChatGPT](#) as a tool that provided insights into the topic and supported readability and language. Consensus AI was used for literature review. The table was created by ChatGPT after providing the data. All errors, biases, and omissions remain the author's, not the AI tools.

Prompts:

- “Do the EKC graphs with this data”: gave ChatGPT the data for it to make the graphs fast. The AI gave me the graphs.
- Give me this references in APA: The AI quickly gave me the references in APA format.

ChatGPT mainly tells me that all my ideas are great, so it's not very useful when trying to make a hypothesis that counts as innovative or interesting.

DONA H. WIRASINHA

AI used: [ChatGPT](#) and [Perplexity](#) Prompts: “Create a hypothesis for the UK's advancement and decoupling of economic growth from greenhouse gas emissions. Include population growth, GDP, and declining carbon emissions.” “Describe the trend in UK's GDP and the influence of affluence on emissions over time regarding the IPAT framework.”

GPT responses: Over the past two decades, the UK has experienced steady increases in GDP per capita, reflecting rising affluence and economic activity. Under the IPAT framework, greater affluence typically raises consumption and energy demand, which can increase emissions. However, in the UK's case, the rise in wealth has not translated into proportional emissions growth. This is largely due to shifts toward a service- based economy, improved energy efficiency, and declining reliance on fossil fuels. While affluence remains a pressure factor, its impact has been partially offset by technological and structural changes.

Reflection on the use of AI: AI was used to generate and structure sections as well as graphs to support the explanation for the IPAT analysis on UK emissions. It was useful to organize ideas and simplify data that was complex to understand, in addition to helping draft a hypothesis and implications. However, due to the reliance on patterns and past data that is not real-time, details/data generated may be approximate and not final results/conclusions and may hold bias found in the academic sources from which the information was derived.