

README for Assessing the Impact of Renewable versus Fossil Fuels Energy on Economic Growth: A Meta-Analysis of the Elasticity across Development Stages

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Contents

1. [Overview](#)
2. [Data Availability](#)
3. [Instructions for Replicators](#)
4. [List of Exhibits](#)
5. [Requirements](#)

Overview

This document provides instructions for reproducing the empirical evidence presented in the paper titled “*Assessing the Impact of Renewable versus Fossil Fuels Energy on Economic Growth: A Meta-Analysis of the Elasticity across Development Stages*”. This study synthesizes findings from 110 studies published between 2008 and 2025, and compiles 888 elasticity estimates examining the relationship between renewable and non-renewable energy sources and economic growth across countries at different stages of development.

The analysis applies several meta-analytical techniques, including Funnel Asymmetry Test (FAT), Precision Effect Test (PET), PEESE estimators, fixed- and random-effects meta-regressions, weighted least squares (WLS) moderator regressions with clustered standard errors.

The replication package includes all data, code, and documentation required to reproduce the evidence presented in the paper.

Folder structure:

Reproducibility Package/

1-Data/

2-Code/

└─ MainStata_EnergyMeta.do

└─ MainPython_Energy_WordCloud.ipynb

3-Output/

README - Impact of Renewable vs Fossil Fuels Energy on Economic Growth.docx

Execution Order:

1. Run MainStata_EnergyMeta.do >> Generates Figures 2,3,4,5,9,10 and Tables 1-8, A1-A2.
2. Run MainPython_Energy_WordCloud.ipynb >> Generates Figure 1

Both scripts automatically save outputs to 3-Output/

Data Availability

All data used in this study is publicly available and included in the repository under **1-Data**. All data are included in the **1-Data folder**.

Statement about Rights

- I certify that the author(s) of the manuscript have legitimate access to and permission to use the data used in this manuscript.
- I certify that the author(s) of the manuscript have documented permission to redistribute/publish the data contained within this replication package. Appropriate permission are documented in the LICENSE.txt file.

Data Sources

Energy Meta-Analysis

- a. Filename: EnergyROR_MetaAnalysis_final.dta
- b. Source: Database of 1,290 observations extracted from 130 studies, of which 888 are elasticity estimates drawn from 110 studies, covering publications from 2008 to 2025.
- c. EnergyROR_forWordCloud_final.csv: Paper titles compiled manually for word cloud analysis (Figure 1).

The dataset was constructed manually following the data collection criteria and methodology described in Section 2 of the paper. Users wishing to access the underlying published studies should consult journal websites, institutional repositories, or open-access archives, as individual papers are subject to copyright restrictions.

GDP per capita (current US\$)

- Filename: API_NY.GDP.PCAP.CD_DS2_en_excel_v2_282967.xlsx
- Source: World Development Indicators
- URL: <https://data.worldbank.org/indicator/NY.GDP.PCAP.CD>

Instructions for Replicators

Replication can be performed using Stata and Python codes, which are provided in **2-Code**. Follow the steps below to reproduce the results.

- Figures 6 – 8 are constructed in Microsoft Excel using summary statistics produced by MainStata_EnergyMeta.do. The relevant Stata code is documented under each figure number in the do-file. GDP per capita values – based on the median sample year of each study, extracted manually from “API_NY.GDP.PCAP.CD_DS2_en_excel_v2_282967.xlsx” in 1-Data.
- Figure 11 is from Tishchenko *et al.* (2025). The full citation of the paper is:
Tishchenko, I., Egorova, Y., Vakulenko, E. 2025. Energy security, environmental policies, and environmental Kuznets Curve for renewable energy development. *Renewable Energy*. Vol.251. <https://www.sciencedirect.com/science/article/pii/S096014812500998X>

List of Exhibits

Exhibit name	Output filename	Script
Table 1	3- Output/Table1_Moderators.xlsx	2-Code/MainStata_EnergyMeta.do
Figure 2	3- Output/Figure2_PublicationByYear.png	
Figure 3. a - b	3- Output/Figure3a_PieChart.png 3- Output/Figure3b_BarChart_EnergyType.png	
Figure 4.a - b	3- Output/Figure4a_Histogram.png 3- Output/Figure4b_BoxPlot_EnergyType.png	
Figure 5	3- Output/Figure5_BoxPlot_FuelSources.png	
Figure 9	3- Output/Figure9a_Funnel_Overall.png 3- Output/Figure9b_Funnel_Renewable.png 3- Output/Figure9c_Funnel_FossilFuel.png	
Figure 10	3- Output/Figure10_FunnelAsymmetryTest.png	
Tables 2 – 8	3- Output/Table2_FAT_Regression.csv 3- Output/Table3_FAT_Heterogeneity.csv 3- Output/Table4_PET_PEESE.csv 3- Output/Table5_Quadratic.csv 3- Output/Table6_Utest.csv	

	3- Output/Table7_Dprobit_Renewables.csv 3- Output/Table8_Dprobit_FF.csv	
Tables A.1 - A.2	3- Output/ TableA.1_Dprobit_Renewables.csv 3- Output/ TableA.2_Dprobit_FF.csv.csv	
Figure 6 - 8	3- Output/Figures6-8.xlsx	Prepared in Excel by hand
Figure 1	3-Output/wordcloud_papers_final.png	2-Code/MainPython_Energy_WordCloud.ipynb

Requirements

Computational Requirements

Software Requirements

- ☐ Microsoft Excel
- ☐ Stata Version 18.0 or 19.0
- ☐ Python