



Estimating Willingness-to-Pay for Emerging Technologies: A Study of Hydrogen Demand in the Ammonia Industry

Second Submission: RR_WLD_2026_557

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March 2, 2026

This review verifies the reproducibility of the exhibits included in the paper “*Estimating Willingness-to-Pay for Emerging Technologies: A Study of Hydrogen Demand in the Ammonia Industry*”.

Contents in this review:

1. Main findings
2. List of exhibits and reproducibility status
3. Reproduction Environment

Main findings

- **Every exhibit in the paper has been reproduced accurately.**
- The code was successfully executed on a new computer after:
 1. Changing the path in the main script and running the code.
- The output demonstrates consistent stability across multiple runs. Specifically, executing the code two times consecutively yielded identical results.
- The code takes approximately 2 minutes to run.
- We conducted our reproducibility analysis based on the paper shared by the authors by email on Thursday February 27th.
- **Verification Process and Data Handling:**
 - The reproducibility package relies on 2 type of data: open and restricted data (available only from the authors).
 - All data is embargoed, and no data is included in the public reproducibility package.
 - Reviewers used restricted data provided directly by the authors to conduct the reproducibility verification, and this is not included in the public reproducibility package.
 - *data_hash_report.csv* lists the SHA256 hashes of all files in the Data folder to support data integrity checks. Users who acquire the restricted data can use this file to verify that the data has not been altered.
- **Reproducibility Summary:**

- **Data:** All data is temporarily embargoed by the authors (expected to be made public in the future).
- **Code:** All code files are temporarily embargoed by the authors (expected to be made public in this repository in the future).
- **Outputs:** All outputs are generated by code included in the reproducibility package.
- **Dependencies environment:** The reviewers created a new environment using the latest versions of dependencies available at the moment of the review.

List of exhibits and reproducibility status

Results in the Main Section of the Paper

- **Figure 1 Reproduced.** Verified.
- **Figure 2 Reproduced.** Figure 2 was produced by the World Bank's Cartography Unit. The team generated the figure by geo-referencing the source raster maps provided by the authors. The source maps were verified against the paper and were found to match the published figure.
- **Figure 3 Reproduced.** Verified.
- **Figure 4 Reproduced.** Verified.
- **Figure 5 Reproduced.** Verified.
- **Figure 6 Reproduced.** Verified.
- **Figure 7 Reproduced.** Verified.
- **Figure 8 Reproduced.** Verified.
- **Table 1** Does not apply. Table does not contain analytical output.
- **Table 2** Does not apply. Table does not contain analytical output.
- **Table 3 Reproduced.** There is a difference in the F statistic in the replicator's computers, but this does not change the interpretation, and the result was verified against the author's result.

Table 3 Upper: Aggregate Regional Analysis Price

✓ #Table 3 Upper Panel: Estimations OLS and GLS for non-EU regions –

Region	APME		NAM		SAM	
Estimator	OLS	FGLS	OLS	FGLS	OLS	FGLS
Intercept	-136.012^{***}	-165.199^{***}	-252.856^{***}	-253.769^{***}	-371.363^{***}	-390.941^{***}
GDP_pop	0.163	-0.257	2.951^{***}	2.948^{**}	8.570^{**}	9.754^{*}
K_util × peHeff	1.027^{***}	0.859^{***}	0.385^{***}	0.348	0.481^{***}	0.505^{***}
peHeff	1.175^{***}	1.275^{***}	1.403^{***}	1.411^{***}	1.692^{***}	1.700^{***}

$\backslash \begin{matrix} \text{begin[table]} \\ \text{caption[Panel OLS vs feasible GLS (GLSAR AR(1)) by region]} \\ \text{label[tab:panel_fgls_vs_ols]} \\ \text{begin[tabular]} \{1111111\} \\ \text{toprule} \\ \text{Region} \& \backslash \text{multicolumn}\{2\}\{c\}\{APME\} \& \backslash \text{multicolumn}\{2\}\{c\}\{NAM\} \& \backslash \text{multicolumn}\{2\}\{c\}\{SAM\} \backslash \\ \text{Estimator} \& \text{OLS} \& \text{FGLS} \& \text{OLS} \& \text{FGLS} \& \text{OLS} \& \text{FGLS} \backslash \\ \text{midrule} \\ \text{Intercept} \& -136.012^{***} \& -165.199^{***} \& -252.856^{***} \& -253.769^{***} \& -371.363^{***} \& -390.941^{***} \\ \text{GDP_pop} \& 0.163 \& -0.257 \& 2.951^{***} \& 2.948^{**} \& 8.570^{**} \& 9.754^{*} \backslash \backslash \\ \text{K_util} \times \text{peHeff} \& 1.027^{***} \& 0.859^{***} \& 0.385^{***} \& 0.348 \& 0.481^{***} \& 0.505^{***} \backslash \backslash \\ \text{peHeff} \& 1.175^{***} \& 1.275^{***} \& 1.403^{***} \& 1.411^{***} \& 1.692^{***} \& 1.700^{***} \backslash \backslash \\ \text{N obs} \& 76 \& 75 \& 57 \& 56 \& 38 \& 37 \backslash \backslash \\ \text{\$R}^2 \& 0.761 \& 0.819 \& 0.796 \& 0.785 \& 0.872 \& 0.870 \backslash \backslash \\ \text{F-stat} \& 229.57^{***} \& 107.40^{***} \& 47.55^{***} \& 61.14^{***} \& 4.20 \& 71.91^{***} \backslash \backslash \end{matrix}$

Results in the Annex

- **Figure 9** Reproduced. Verified.
- **Table 4** Reproduced. Verified.
- **Table 5** Reproduced. Verified.
- **Table 6** Reproduced. Verified.
- **Table 7** Reproduced. Verified.
- **Table 8** Reproduced. Verified.

Reproduction Environment

Paper exhibits were reproduced on a computer with the following specifications:

- OS: MacOS
- Processor: Intel(R) Core(TM) i5-1145G7 CPU @ 2.60GHz
- Memory available: 15.7 GB
- Software version: Python 3.11.14