7QQMM906
Environmental Economics
Group-Assessment
(40% of total module grade)
Technical Report or Data Report

Table of Content

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Submission deadline	Via KEATS by 10:00 on December 18th 2025	Submission Checklist:	1. File saved as [ModuleCode_GroupNumber] 2. Word count (2,000 words) 3. File format for submission (.docx) or PDF (.pdf)

Group-Assessment Milestones

1. Choose whether you are interested in working on a technical report or a data report and submit your response on Keats.

DUE DATE: TUESDAY, NOVEMBER 4th 2025, midnight UK time

2. The module leader conducts a randomized allocation into groups among the students interested in each type of report.

DATE: November 4 – November 11th 2025, midnight UK time

3. Students unite in their groups and select an environmental policy or database(s) and submit their choice on Keats.

<u>DUE DATE: MONDAY, NOVEMBER 17th 2025, midnight UK time</u>

4. Students work in groups on technical or data reports.

<u>Submissions due dates are:</u>

- o Roadmap:[1] latest week 7 (November 27th), 11:00 am (formative)
- o First draft:[2] latest week 10 (December 8th), 11:00 am (formative)
- o Final report: Thursday, 18th December 2025, 10:00 am (summative)

Note: The group assignment grade is only based on the final report – the roadmap and the first draft are NOT marked.

Technical Report: The Tasks

The tasks consist of writing up a report that analyses an environmental policy of your choice and that provides economic-theory informed consultancy to three fictive polluting businesses or households, represented by consumer groups, how to respond to the policy. Finally, you will conclude by providing a general assessment and recommendations to the public about how policymakers should either improve the policy or what alternative environmental policy tool they should use.

Each report should include the following sections and address all the tasks listed in each part.

1. **Cover page**
   a. Title of your report
   b. Abstract [100 words]: A paragraph synthesizing your analysis.
   c. Student IDs of all group members and a date

2. **Part I: Motivation/Rationale & context/background [~300 words]**

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[1] The roadmap sketches out _how_ students intend to conduct the analysis. It is the plan based on which the analysis will be conducted. Bullet points are sufficient, but each section should be covered.
[2] The first draft should contain the actual analysis written up for a first time. It is the basis for final feedback and allow students to correct errors and further improve their product.

a. Motivation/Rationale: Describe why the policy is interesting/important for the world/society and how it relates to environmental economics.

b. Context/Background: Describe the following:

   i. environmental policy objective (e.g., reduce air pollution from traffic) and policy tool (e.g., congestion charge),

   ii. target population (e.g., farmers, industrial plants, drivers, households),

   iii. structure of the market/sector (e.g., who are producers and who are consumers, is the market concentrated or competitive, is consumer demand or producers supply more elastic),

   iv. discuss the market failures that are present in the specific context,

   v. briefly outline the core economic logic how the policy intends to shift the behavior of the target population (polluters/emitters)

3. **Part II: Analysis [~ 1400 words]**

   c. **Part II A: General environmental policy effects**

      i. Based on your description of producers and consumers, outline how the policy will affect aggregate price and quantity demand and supplied considering the expected policy response from target population (see list of policy responses in lecture 3 slides).

      ii. Draw a demand-and supply-curve of at least one industry/product targeted by the environmental policy both before and after policy implementation.

      iii. Explain your reasoning using the demand-and-supply curve shift.

   d. **Part II B: Firm-level responses**

      i. Think of three different types of firms (e.g., different size, age, product/position in the value chain, technology, etc.) or households (e.g., income-level, profession, location etc.) that will be affected differentially by the policy.

      ii. Imagine you are consulting these firms. They ask you to provide them with an assessment of: i) how the environmental policy will affect them and ii) how they should respond to the policy.

      iii. Draw their relative abatement-emission cost curves into a single coordinate diagram (cost on the y-axis and emissions on the x-axis).

      iv. Use their abatement-cost curves, policy response and policy evaluation criteria taught in lecture 3 to consult the firms.

      v. Note: If you want to think about the policy's effect on households rather than firms, imagine you are consulting a consumer protection

NGO and develop scenarios based on specific household profiles, e.g. a family with two breadwinners and three children living in an affluent neighborhood.

4. **Part III: Discussion and Conclusion [~300 words]**
    e. Discuss the advantages and disadvantages of the environmental policy. Briefly contrast the policy with other potential policy tools and take a position if another policy tool would be preferable using your firm-level impact assessments and policy evaluation criteria. You can also refer to scientific studies/evidence of other policies.
    f. Conclude by summarizing your findings on the policy's effectiveness and essential recommendations for the targeted polluters/emitters and the government.

Module Learning Outcomes Assessed

➢ **Apply environmental economics tools** to analyse contemporary environmental issues and policy problems
➢ **Critically evaluate** the limitations of markets, government policies, and economic analysis in addressing environmental challenges
➢ **Solve and manipulate** diagrammatic and algebraic models in environmental economics, and critically assess these models
➢ **Present economic analysis** of environmental policies and topics effectively to diverse audiences
➢ **Prepare data or technical reports** (for those selecting the data option) that use economic tools to analyse environmental policies and policy responses
➢ **Demonstrate strong communication and collaboration skills** through report writing and active participation in discussions

Data Report: The Tasks

The data report provides an assessment of an environmental database of your choice. On the one hand, the data report documents how you proceeded in terms of processing, analyzing, and visualizing the data. On the other hand, it asks you to outline why the data is relevant from an environmental economics and societal viewpoint as well as to interpret the results of your data analysis. In comparison to the technical report, more emphasis lies on the technical execution rather than the depth and rigor of the economic analysis.

The report should consist of the following sections, and each section should respond to the respective tasks as relevant for your specific database.

1. Part I: Motivation & Data Context

a. Dataset Selection and Research Questions

- Identify and justify selection of environmental/economic dataset(s) relevant to course themes

- Formulate 2-3 specific, answerable research questions that can be addressed through descriptive analysis

- Explain the relationship between your research questions and environmental economics theory

b. Data Significance and Relevance

- Describe why the dataset is of interest to the world and environmental economics specifically

- Connect the data to current environmental policy debates or economic challenges

- Explain potential policy implications or academic contributions of your analysis

- Identify the target audience for your findings (policymakers, researchers, NGOs, etc.)

2. Part II: Technical Implementation

Note: In the final data report, please use screen shots, e.g., of code scripts, folders, and version control/reproducibility processes using GitHub to document your approach.

a. Coding Setup and Documentation

- **Master file code structure**: Create well-organized, commented code with clear section headers (templates will be provided)

- **Folder organization**: Establish logical directory structure (data/raw, data/processed, code, output, documentation – templates will be provided)

- **Version control**: Set up a Github repository with regular commits and descriptive commit messages based on a tutorial (will be provided)

- **Reproducibility**: Ensure code can be run independently with clear installation/setup instructions (guaranteed if template is followed)

b. Data Preparation and Management

Note: Document and justify your <u>main</u> data cleaning, aggregation, merging, and transformation decision in the final data report, e.g., via screenshots code scripts and snippets of data before and after processing.

- **Cleaning processes**:
  - Handle missing values, outliers, and inconsistencies
  - Rename variables for clarity and consistency
  - Format data types appropriately (dates, factors, numerics)
  - Describe problems encountered and solutions implemented

- **Data aggregation**:
  - Aggregate data to appropriate temporal/spatial units for analysis
  - Create summary statistics by relevant groupings (country, year, sector, etc.)

- **Data merging**:
  - Connect multiple datasets using common identifiers
  - Handle non-perfect matches and document decisions
  - Validate merge success and identify any data loss

- **Variable transformation**:
  - Generate derived variables relevant to research questions
  - Create categorical variables and binary indicators
  - Apply appropriate transformations (log, winsorizing, standardization)
  - Document theoretical justification for transformations

3. Part III: Descriptive Analysis and Export of Results for Presentation

Note: Please provide a screenshot of the code that you used to generate and export the tables or figures.

a. Summary Statistics Table (will vary depending on the data set you choose)

- **Table 1**: Create comprehensive descriptive statistics table

    o Include relevant measures (mean, median, standard deviation, min/max, observations)

    o Present by meaningful subgroups where appropriate

    o Discuss key patterns and notable findings

    o Highlight any surprising or policy-relevant statistics

b. Data Visualization and Exploration (the below will vary depending on what data set you choose)

- **Distribution analysis**:

    o Density plots, histograms, or boxplots for key outcome and explanatory variables

    o Identify skewness, multimodality, or other distributional features

- **Temporal and spatial patterns**:

    o Time series plots showing evolution of variables over time

    o Cross-sectional comparisons across countries/regions

    o Two-way dot plots or bar charts for categorical breakdowns

    o Facet grid/wrap plots for multiple group comparisons

- **Comparative analysis**:

    o Bar plots comparing different groups, policies, or time periods

    o Scatter plots exploring relationships between key variables

- **Geospatial visualization** (if applicable):

    o Maps showing geographic distribution of key variables

    o Choropleth maps for country/region-level data

c. Optional, only for advanced groups: Introductory Regression Analysis

- Simple bivariate or multivariate regression exploring relationships suggested by descriptive analysis

- Focus on interpretation rather than sophisticated econometric techniques

- Discuss limitations and caveats of findings

- Connect results back to environmental economics theory

4. Part IV: Discussion and Conclusions

a. Key Findings Summary

- Synthesize main patterns and relationships identified in the data

- Address each research question with evidence from your analysis

- Discuss unexpected findings or data limitations encountered

b. Policy and Research Implications

- Connect findings to environmental policy debates or economic theory

- Suggest areas for future research based on data patterns

- Identify data collection improvements or additional variables that would enhance analysis

- Discuss broader implications for environmental economics research

c. Technical Reflection

- Evaluate strengths and limitations of your analytical approach

- Discuss challenges encountered in data preparation and solutions developed

- Assess reproducibility and potential for extension of your work

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Assessment Structure

The data report will be evaluated using the same four criteria framework:

- **Completeness**: All required sections and technical components delivered

- **Comprehension**: Correct application of data analysis concepts and environmental economics principles

- **Presentation**: Clear code documentation, effective visualizations, and professional report structure

- **Originality**: Creative dataset selection, innovative analysis approaches, and insightful interpretations

Module Learning Outcomes Assessed

➢ **Apply environmental economics tools** to analyse contemporary environmental issues and policy problems
➢ **Critically evaluate** the limitations of markets, government policies, and economic analysis in addressing environmental challenges
➢ **Prepare data or technical reports** (for those selecting the data option) that use economic tools to analyse environmental policies and policy responses
➢ **Write statistical software code** collaboratively and conduct data analysis (data report option only)
➢ **Demonstrate strong communication and collaboration skills** through report writing and active participation in discussions

General assignment details and structure (applicable to technical and data report)

- Your submission should include all the sections listed in The Tasks section.
- It is advisable that you set up a Word document on OneDrive (or another cloud-platform that includes version control) to enable group work.

General submission guidelines (applicable to technical and data report)

- Each report must have a cover page with the report title, submission date, word count, student IDs
- The word limit for either report is 2,000 Words. Students can exclude the words on the cover page and figures, and table notes and titles from the word count.
- The report should be submitted in Microsoft Word or PDF format.
- The report file should be named [ModuleCode_group_number].
- Submissions are only received via Keats.
- Late submission penalties are applied as follows:
  o Within 24 hours after the deadline: 10 points deduction.
  o After 24 hours after the deadline: mark set to 0 points.

- Students are allowed and encouraged to use LLMs/AI for their analysis or for reviewing their writing, but not for their original writing. The cover sheet should specify whether AI was used and for what purpose.

Technical Report: Marking Criteria

Assessment Type: Group Technical Report
Marking Scheme: Step-marking
Grade Classifications: First (Distinction) | Second (Merit) | Third (Pass) | Fail

- **Distinction**: 78, 75, 72

- **Merit**: 68, 65, 62

- **Pass**: 58, 55, 52

- **Fail**: 48, 45, 42, 35, 28, 21, 14, 7

Marking Criteria: Completeness, Comprehension, Presentation, Originality

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Marking Criteria Table

Criteria	First - Distinction (72-78)	Second - Merit (62-68)	Third - Pass (52-58)	Fail (0-48)
COMPLETENESS *All questions and tasks are answered and completed*	• All three parts fully addressed with comprehensive responses • Part I: Complete motivation, context, policy objective, target population, market structure, and economic logic • Part II A: Full demand-supply analysis with	• Most parts substantially completed with minor omissions • Part I: Good coverage of key elements, may lack some detail • Part II A: Demand-	• Basic completion of required sections with significant gaps • Part I: Essential elements present but incomplete • Part II A: Basic demand-supply	• Major sections missing or severely incomplete • Failure to address key assignment requirements • Inadequate response to fundamental questions

Criteria	First - Distinction (72-78)	Second - Merit (62-68)	Third - Pass (52-58)	Fail (0-48)
	and analysis• Creative consulting recommendations	• Reasonable connections between theory and practice • Some creativity in policy analysis • Evidence of independent research and thinking	• Superficial connections between theory and practice • Minimal creativity in analysis or recommendations • Over-reliance on course examples	• No evidence of independent thinking • Minimal or no original analysis

Data Report: Marking Criteria

Assessment Type: Group Data Report
Marking Scheme: Step-marking
Grade Classifications: First (Distinction) | Second (Merit) | Third (Pass) | Fail

- **Distinction**: 78, 75, 72
- **Merit**: 68, 65, 62
- **Pass**: 58, 55, 52
- **Fail**: 48, 45, 42, 35, 28, 21, 14, 7

Marking Criteria: Completeness, Comprehension, Presentation, Originality

Assessment Philosophy for Data Reports

Unlike the Technical Report, which emphasizes application of analytical environmental economics concepts, the Data Report prioritizes **correct implementation of data analysis processes**. The quality of technical execution, methodological rigor, and

reproducibility are valued more heavily than the substantive findings themselves. Students are evaluated on their ability to demonstrate competent data science practices and transparent analytical workflows.

Marking Criteria Table

Criteria	First - Distinction (72-78)	Second - Merit (62-68)	Third - Pass (52-58)	Fail (0-48)
COMPLETENESS	• All required technical components delivered (Github repo, master file, folder structure, data cleaning, visualizations, tables) •Complete and well-structured documentation • All sections of report present with appropriate depth • Reproducible workflow from raw data to final outputs	• Most technical components present• Generally complete documentation • Minor omissions in secondary elements • Workflow mostly reproducible with minor gaps	• Basic technical components present • Adequate but incomplete documentation • Some required sections missing or underdeveloped • Reproducibility issues present	• Major technical components missing • Inadequate or absent documentation • Substantial portions of required work missing • Code does not run or cannot be reproduced
COMPREHENSION	• **Flawless execution of**	• **Correct implementation of most**	• **Basic implementation competence**	• **Fundamental errors in implementatio**

data preparation process (cleaning, merging, transformation • Technically sound handling of missing values, outliers, and data issues • **Correct implementation of statistical and visualization techniques** • Appropriate choices justified with technical reasoning • Demonstrates understanding of data quality and limitations • Sound connection of descriptive findings to environmental economics concepts	**data processes** with minor technical errors • Generally appropriate handling of data issues • **Most statistical and visualization techniques correctly applied** • Reasonable justification for methodological choices • Good awareness of data limitations • Reasonable connections to environmental economics	but with notable technical errors • Acceptable but inconsistent handling of data issues • **Some correct application of techniques** but with errors or inappropriate choices • Limited justification for methods • Superficial awareness of data quality • Weak connections to environmental economics	n of data processes • Inappropriate or incorrect handling of data issues • **Incorrect application** of statistical or visualization methods • No justification for choices • No awareness of data limitations • Missing or incorrect connections to environmental economics

PRESENTATION	• **Exceptionally clear, well-commented code** following best practices • Logical and intuitive folder/file organization • **High-quality visualizations** with proper labeling, appropriate chart types, and professional aesthetics • **Well-formatted tables** with clear variable names and units • Github repo demonstrates good version control practices• Professional report structure with clear narrative• Flawless technical	• **Clear, adequately commented code** • Logical organization with minor inconsistencies • **Good visualizations** with appropriate choices and proper labeling • **Well-structured tables** with mostly clear formatting • Regular Github commits with reasonable messages • Competent report structure • Generally good writing with minor errors	• **Basic code documentation** but lacking clarity in places• Acceptable organization but inconsistent• **Adequate visualizations** but with labeling or aesthetic issues• **Basic tables** with some formatting problems• Minimal Github activity or poor commit practices• Acceptable report structure• Frequent grammar errors that may impede understanding	• **Poorly documented or uncommented code**• Disorganized or confusing structure• **Poor quality visualizations** with missing labels or inappropriate choices• **Poorly formatted tables** that are difficult to interpret• No meaningful version control• Unclear report structure• Significant writing issues that impede comprehension

	writing and grammar			
ORIGINALITY	• **Creative and sophisticated approach to data challenges** • Innovative solutions to technical problems encountered • Insightful dataset selection with clear policy relevance • **Advanced visualization or analysis techniques** beyond basic requirements • Thoughtful and novel interpretations of patterns • Evidence of independent problem-solving and research	• **Competent handling of data challenges** with some creative elements • Reasonable solutions to problems • Good dataset selection with appropriate justification • **Some sophistication** in visualization or analysis • Reasonable interpretations • Evidence of independent thinking	• **Basic problem-solving** with conventional approaches • Standard solutions without creativity • Acceptable dataset choice but limited justification • **Minimal sophistication** in technical approach • Surface-level interpretations • Limited evidence of independent thinking	• **No demonstration of problem-solving** • No creative or thoughtful approaches • Poor dataset choice or no justification • **Minimal technical sophistication** • No meaningful interpretation • Over-reliance on templates without adaptation

Key Differences from Technical Report Assessment:

1. **Process over results**: Correct implementation of data workflows is valued more highly than substantive findings or policy insights
2. **Technical rigor**: Code quality, reproducibility, and methodological correctness are central to evaluation
3. **Execution emphasis**: How students handle data challenges and implement techniques matters more than the economic interpretation
4. **Transparency**: Documentation and clear explanation of technical decisions are critical components