Supplementary material

1 Mapping of group members

Section		Contributors
Abstract		Georgios Koliopoulos (2646502)
Introduction		Georgios Koliopoulos (2646502), Seyedpouria Modaresi (2644995)
Related work		Bohao Chen (2729779)
Experimental apparatus		Simone Fisicaro (2641824)
Results	**RQ1**	Fidelis Kamunde (2729385)
	RQ2	Bohao Chen (2729779)
	RQ3	Georgios Koliopoulos (2646502)
	RQ4	Seyedpouria Modaresi (2644995)
	RQ5	Simone Fisicaro (2641824)
Discussion		Each team member wrote a part related to the relevant research question
Conclusion		Fidelis Kamunde (2729385)

2 Source code tree

- consumption_data_preparation.py (Simone Fisicaro- 2641824)
- generation_data_preparation.py (Simone Fisicaro- 2641824)
- download_generators_data.py (Georgios Koliopoulos- 2646502)
- data_analysis_q1_1.py (Fidelis Kamunde- 2729385)
- data_analysis_q1_2.py (Fidelis Kamunde- 2729385)
- data_analysis_q2.py (Bohao Chen- 2729779)
- data_analysis_q3.py (Georgios Koliopoulos- 2646502)
- data_analysis_q4.py (Seyedpouria Modaresi- 2644995)
- data_analysis_q5.py (Simone Fisicaro- 2641824)

3 Summaries of individual contributions

3.1 Bohao Chen (2729779)

1. Revising the work done by others and give suggestions where applicable
2. Worked on question 2, To find the growth rate of different renewable sources in recent three years. Also doing a bit discussion related to the question 2.
3. Worked on Related work of the project, search scientific papers which related to the renewable energy.

3.2 Simone Fisicaro (2641824)

I have strongly contributed to the selection of the research topic and the formulation of the questions. Furthermore, I've also taken part in the organization of the group work by coordinating the tasks and setting up the Git environment.

Even though I have participated in the discussion of the whole report, I've mainly focused on the "Experimental Apparatus" section, studied and answered the fifth question - How renewable electricity production covers the national demand through the year, month by month? -, and discussed the results related to my question. Finally, I have coded the data manipulation scripts for the production and consumption data, and the data analysis script related to question 5.

3.3 Fidelis Kamunde (2729385)

1. Revising the work done by others and give suggestions where applicable

2. Worked on question 1, To find the total amount of renewable energy generated in the UK from 2010 up to date and to determine which renewable source is more productive by finding the percentage contribution from the renewable sources. Also, a brief discussion on the results obtained in question 1

3. Worked on conclusion of the project, this was based on three main categories. First the advantages of the renewable energy, secondly the challenges and limitations of renewable energy and lastly the position of the UK in fulfilling the EU target and if one day it is possible for UK to depend on renewable energy by 100%

3.4 Georgios Koliopoulos (2646502)

I worked mostly with the data from the renewable generators (https://www.ref.org.uk/generators/). As a first step, I created the python script to download the web page table to CSV format using the read_html function and iterate through the pages with the table rows. The table was then converted to CSV format. For the analysis of the data, I created a useful function that takes any data frame column as input and returns a dictionary which has the column's unique values as keys and the sum of installed capacity as dictionary values. This helped in automating the generation of the capacity per technology and capacity per country plots. My code contributed in answering RQ3, including the plots and the analysis.

In the final paper, I was involved in the write up of the abstract, part of the introduction, the results for RQ3 and part of the discussion related to RQ3 comparing the growth for each country.

Finally, I was responsible for formatting the paper according to the ACM style using the LaTeX template.

3.5 Seyedpouria Modaresi (2644995)

1. Working as a group, sharing idea, give suggestions where applicable and, correct our the work done by teammate.

2. I tried to answer question 4, to find the total percentage of renewable energy that will be generated in the UK by 2020 and 2030. For answer this question I used ARIMA method from stats-model package and Linear Regression from skitlearn package. At the end due to the results, I explained the results and gave, some suggestions, which UK government should consider.

3. Work on introduction with Georgios, we tried to give some background about UK countries renewables sources and technologies. Explained why we were interesting about this field and how by analysing data in the energy field, it helped us to have better understanding of any aspects and even problems of renewable sources and technologies in UK countries, how data analysis can develop renewable energy's plans. Finally talking about aim of our research to say how by analysing electricity production and demand data for the UK how each UK country contributes to the 2020 EU target.