Group 4 Project Presentation

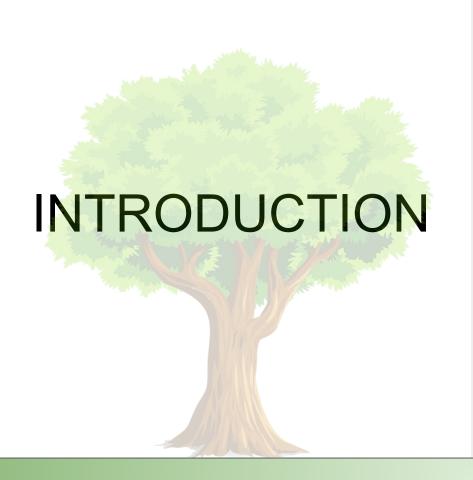Angela YT Chan
Catherine Miao
Diane Walia

Work Green:
Sector responses to
Climate Change
as time spent on
Green Jobs
between 2011 - 2018

INTRODUCTION

About Group 4

Project Aims

Project Objectives

Roadmap of the report

About Group 4

Group 4 consists of three CFG-sponsored Nanodegree students, who are on the Data 2 Spring 2022 cohort.

We are:

Angela YT Chan, independent artist, curator and policy researcher specialising in climate change
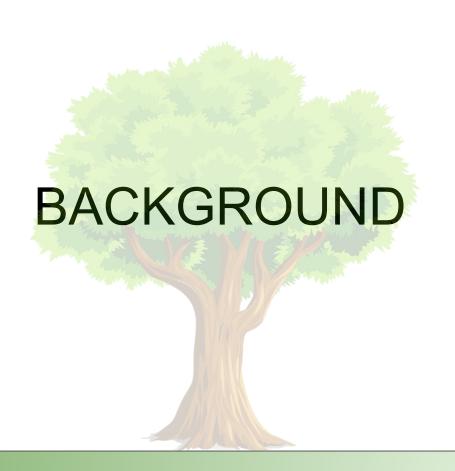
Catherine Miao, Data Analyst

Diane Walia, IT Project Management Coordinator / Web Tester / Admin Support

Project Aims

- to collaborate together as a team
- to explore and analyse our selected datasets
- to produce an informative and innovative approach to current climate change issues
- to implement the data analysis tools and frameworks learned on the CFG Nanodegree

Project Objectives

- to source reliable and suitable data
- to create a meaningful data analysis
- to use data analysis tools (Numpy, Pandas)
- to deploy data visualisation tools (Matplotlib, Plotly)
- to use our soft skills relating to collaborative working
    - project and time management, clear communication, imaginative and critical thinking, domain knowledge, technical expertise

BACKGROUND

Project details and our chosen topic

Nature of our analysis

Our questions

How our findings should be used (target audience)

How our analysis can help

Project details and our chosen topic

Initial ideas

- sentiment analysis
  - public understandings of climate change over time and consumer habits
  - global variances in public climate understandings
  - how the British media has portrayed global climate issues over the recent years

language barriers in the data sourcing, as well as difficulties with open data access (political news censorship)

Project details, our chosen topic and nature of our analysis

- Descriptive Analysis
- UK sectors investing their labour forces in 'green tasks'
  - matched with datasets on:
    - global greenhouse gas (GHG) emissions
    - UK sector specific emissions throughout these years
    - occupation (seniority) levels of the labour force
- how different sectors are responding to climate change and their impacts on GHG emissions

[Environmental Social Governance (ESG) ratings and corporate stock history - economic impact of sectors 'green tasks' over time]

Our question

"How does the time spent on Green Tasks by different industries correlate with their contributions to GHG emissions between 2011-2018 in the UK?"

How our findings should be used (target audience)

- inform a range of audiences that are directly and indirectly impacted by climate and environmental issues
  - institutions, corporations and individual professionals across the UK economy and global economies

How our findings should be used (target audience)

- policymakers, environmental movement builders (such as activists, educators and community leaders), and working people across all sectors at different levels

- public engagement, the results can also inform everyday understandings of climate change (through media such as in a news article, podcast discussion and classroom textbooks, for example)

How our analysis can help

- a general overview offering new avenues for further research
- growing impact of climate change issues how sectors are investing in the way their employees work and if there have been impacts so far on GHG emissions as a result

STEPS SPECIFICATIONS

Pre-project Planning

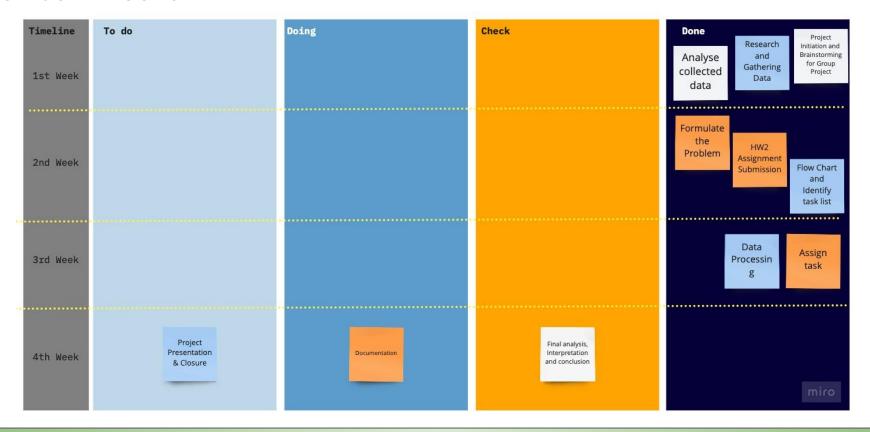## Project Planning

Development

Delivery

- Building the team
- Identify areas of interest for the project
- Brainstorming/concept
- Decide for the particular AOI for the project:
  - Climate Change

- Define a Problem
- Research and Data gathering
- Assess the datasets:
  - Time spent on Green Tasks by different industries
  - Their contributions to GHG emissions between 2011-2019
  - Occupational level and time spent on Green Tasks
- Identify Scope:
  - Occupational level involved in Green Task
  - Industries/Sectors
  - GHG Emissions
  - 2011-2018 time period
  - Location: UK
- Kanban board
- List stories/backlogs
- Assign Tasks

- Actual coding
  - Import Libraries: Pandas, Numpy, Matplotlib, Seaborn
  - Create and read data frame
  - Cleaning data
  - Process and Finding results
  - Visualization
- Data Analysis and Interpretation
  - Conclusion
- Upload files to Github repository

- Project Presentation
- Documentation
- Glossary

Kanban Board

IMPLEMENTATION AND EXECUTION

Development approach and team member roles

- Tasks are equally divided
- Worked according to strengths

Tools and libraries

- Slack and Google Meet
- Google Colab and Jupyter NB
- Pandas
- Matplotlib
- Numpy
- Seaborn

Implementation process

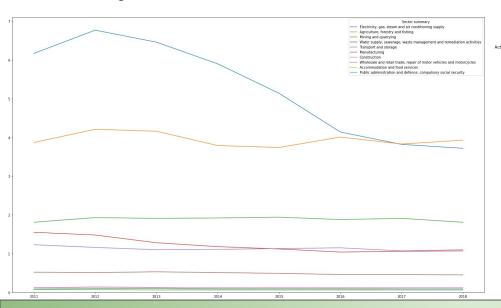- Domain Research
- Datasets searching
- Inspect datasets
- Frame the questions
- HW2 submission
- Tutor Feedback
- Finalize which datasets to use
- Redefine the questions
- Divide the 3 datasets
- Process the data individually
- Share the results
- Document Report
- Submit Files to Github

Agile development

- Use of Kanban
- Good Communication
  - What we did?
  - What are we currently working?
  - What are the impediments?

Implementation challenges

- Trying to ask the right question
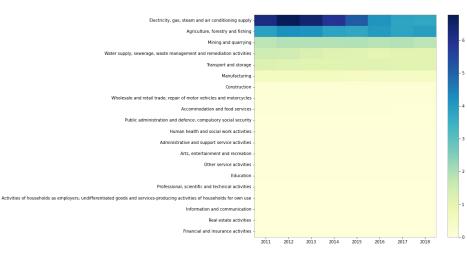- Refine the question into a few small ones
- Setting clear goals and objectives

RESULT REPORTING

The graphs show that the electricity, gas, steam and air conditioning supply industry had the highest GHG emissions among 20 industries

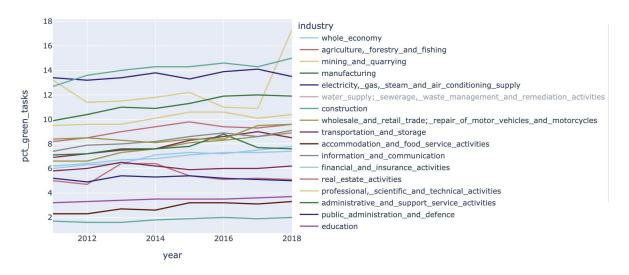However, there has been an overall trend of reducing GHG emissions across all industries in recent years.

Green Task by industry

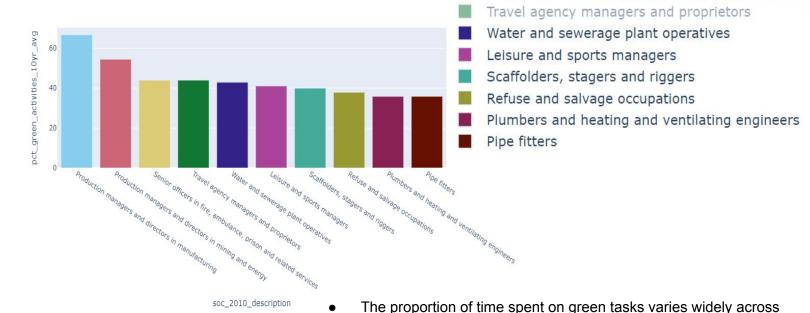Proportion of hours worked spent doing Green Tasks across the Whole Economy

The sector with the highest proportion of hours worked spent doing Green Tasks throughout the time range is 'Construction' and 'Electricity, gas, steam and air conditioning supply' and 'Mining' Industry.

Green Task by occupation

	count	mean	std	min	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%	92%	94%	96%	98%	100%
2011	369.0	5.733604	11.988283	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.06	8.48	21.50	26.604	33.30	36.764	43.1	66.7
2012	369.0	5.903252	12.103547	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.56	8.68	21.82	27.368	33.30	37.224	43.2	66.7
2013	369.0	6.076152	12.246598	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.92	8.92	22.60	27.568	33.30	38.800	43.5	66.7
2014	369.0	6.327642	12.335097	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.48	10.40	24.16	28.012	33.30	37.796	43.8	66.7
2015	369.0	6.261247	12.347990	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.26	9.52	24.12	28.380	33.30	38.240	44.1	66.7
2016	369.0	6.312195	12.422168	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.12	10.46	24.00	28.424	33.30	38.728	44.4	66.7
2017	369.0	6.378049	12.466692	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.26	10.98	23.86	28.356	33.30	39.156	44.7	66.7
2018	369.0	6.443089	12.535888	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.30	11.10	23.84	28.600	33.30	39.540	45.0	66.7

Throughout 369 job categories, the majority (70%) from 2011 to as recently as 2018 have 0% of working time spent on green related activities. The remaining (30%) that do some green related tasks and hours rate are increasing each year. However, this may be because the data has not yet caught up on each sectors' activities on green tasks.
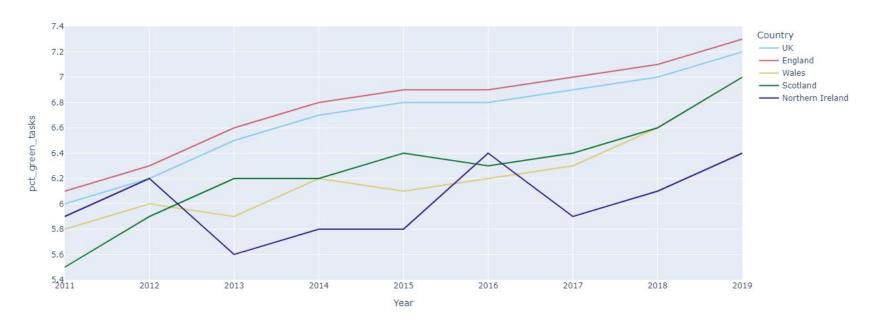
Green Tasks by top 10 workers

Legend:
- Production managers and directors in manufacturing
- Production managers and directors in mining and energy
- Senior officers in fire, ambulance, prison and related services
- Travel agency managers and proprietors
- Water and sewerage plant operatives
- Leisure and sports managers
- Scaffolders, stagers and riggers
- Refuse and salvage occupations
- Plumbers and heating and ventilating engineers
- Pipe fitters

- The proportion of time spent on green tasks varies widely across industries, with production industries tending to have higher proportions.

Time spent on green task by country in the UK

All countries within the UK follow a similar trend in the proportion of workers and hours worked doing green tasks; England tends to have slightly higher levels of time spent on green tasks.

CONCLUSION

Our data analysis shows that sectors that are involved in green tasks have a positive transformation towards the green economy with an upward trend through the recent years.

On the other hand, workers in more senior occupational roles are more likely to be working more hours in green tasks. This indicates a potential for them to assist in the training and education of lower level workers. With this, sectors could be identified to have a high green potential. They can be advised to invest in green education for the development of more green roles.

CONCLUSION

There is still much more room for expansion on these questions to focus more on exploring the specific reasons behind these results.

However, this project has brought together business, finance, environmental science and labour under the greater umbrella of the green economy.

This has increasingly become an important stage for all sectors to cross, which now face the urgent costs (from financial to social) that climate issues are steering towards a greener way of sustaining businesses and their workforces.

CONCLUSION

For us as students building this project, we feel this has been a steep learning curve that has not only aligned our environmental and business domain interests with programming, but has also deepened our practical experiences and skills in seeing a project from initiation, production and reflection.

Thank you for listening!