COP26 Forum Creative Response

I began by selectively choosing a survey that has been recently released, with data freely downloadable online, questions relating to climate change and completion by a large variety of people so that I can draw accurate conclusions. This ended up being the European Social Survey which was completed by 23 European countries with over 50,000 participants. To account for any bias and make the results relevant, I chose to only observe data from Great Britain, which had 1959 responses.

Consequently, I sifted through the 479-page European Social Survey codebook for data that relating to the Environment and Climate Change, which ended up being 25 items. I then imported the data into RStudio for these different variables and wrote a code that I can use to create a bar chart for each one, but also specifically dividing the data according to gender, one for age and another for income decile to clearly find the correlations. Finally, I computed the four graphs for each individual variable through continually amending the code. The entire process took almost 40 hours of concentrating and 2000 lines of code, but hopefully I can leave a positive impact through spreading my findings.

Here is an example of the variations of code I used for one of the variables *ccnthum*:

1. Original

```
ESS$ccnthum
p_ccnthum <- ESS %>%
 mutate(ccnthum_f = to_factor(ccnthum)) %>%
 filter(!is.na(ccnthum) & cntry == "GB") %>%
 ggplot(aes(x = "")) +
 geom_bar(aes(fill = ccnthum_f),
        position = "fill") +
 geom_label(data = . %>%
           group_by(ccnthum_f) %>%
           summarise(count = n()) %>%
           mutate(prop = count / sum(count),
                cum_prop = cumsum(prop)),
          aes(y = abs(1 - cum_prop) + prop / 2,
            label = paste0(round(100 * prop, 0), "%")),
          colour = "black", fill = "white", label.size = 0) +
 coord_flip() +
 scale_fill_brewer("Responses:",
              type = "div", palette = "RdBu",
              direction = -1, aesthetics = "fill",
              guide = guide_legend(reverse = TRUE)) +
 theme_minimal() +
 theme(legend.position = "bottom") +
 scale_y_continuous(labels = scales::percent) +
```

```
  labs(y = "Percentage of Respondents",
      x = "",
      title = "Opinion On The Cause Of Climate Change",
      subtitle = "Do you think Climate Change Is caused by natural processes, human activity
or both?")
p_ccnthum
```

2. Gender

```
p_ccnthum_gender <- ESS %>%
  mutate(ccnthum_f = to_factor(ccnthum),
  gndr_f = to_factor(gndr)) %>%
  filter(!is.na(ccnthum) & cntry == "GB" & gndr != 9) %>%
  ggplot(aes(x = gndr_f)) +
  geom_bar(aes(fill = ccnthum_f),
           position = "fill") +
  geom_label(data = . %>%
               group_by(gndr_f, ccnthum_f) %>%
               summarise(count = n()) %>%
               group_by(gndr_f) %>%
               mutate(prop = count / sum(count),
                      cum_prop = cumsum(prop)),
             aes(y = abs(1 - cum_prop) + prop / 2,
                 label = paste0(round(100 * prop, 0), "%")),
             colour = "black", fill = "white", label.size = 0) +
  coord_flip() +
  scale_fill_brewer("Responses:",
                    type = "div", palette = "RdBu",
                    direction = -1, aesthetics = "fill",
                    guide = guide_legend(reverse = TRUE)) +
  theme_minimal() +
  theme(legend.position = "bottom") +
  scale_y_continuous(labels = scales::percent) +
  labs(y = "Percentage of Respondents",
      x = "",
      title = "Gender Differences In The Opinion On The Cause Of Climate Change",
      subtitle = "Do you think Climate Change Is caused by natural processes, human activity
or both?")
p_ccnthum_gender
```

3. Income

```
p_ccnthum_income <- ESS %>%
  mutate(ccnthum_f = to_factor(ccnthum),
         hinctnta_f = to_factor(hinctnta)) %>%
  filter(!is.na(ccnthum) & cntry == "GB" & !is.na(hinctnta)) %>%
```

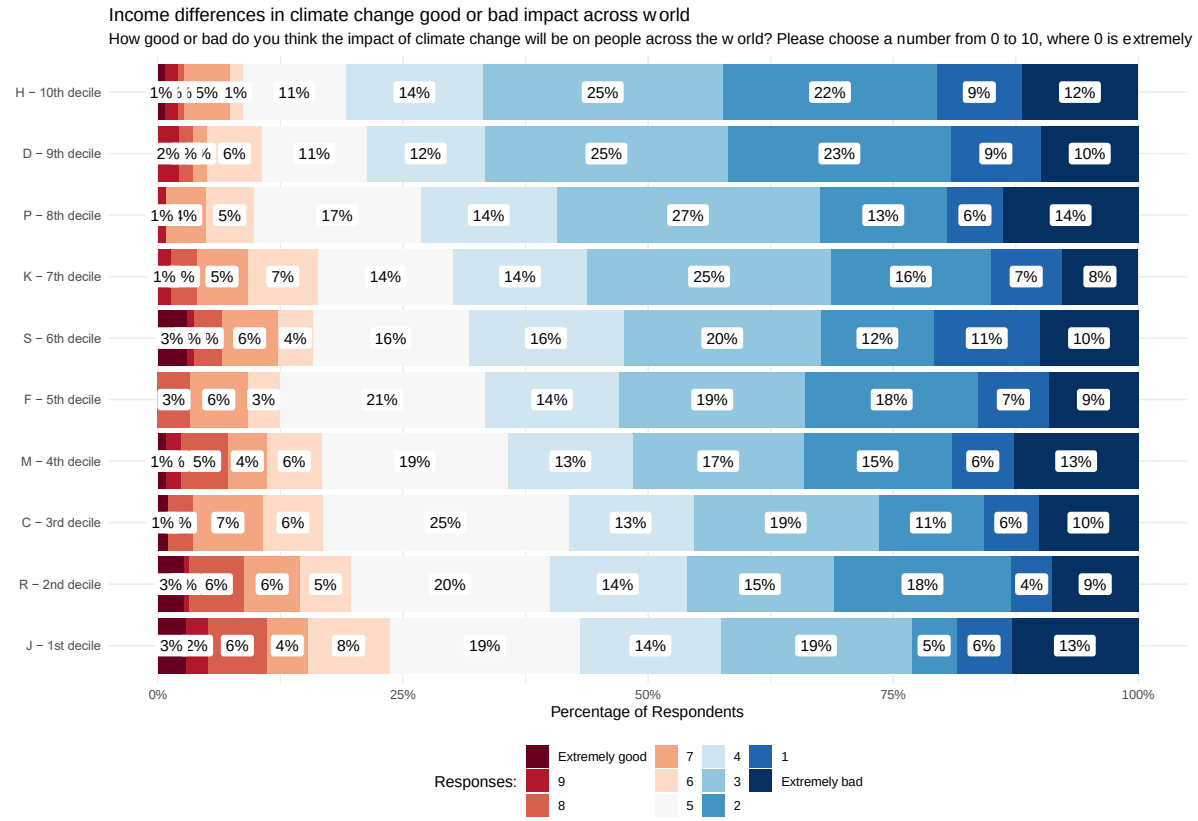
```
 ggplot(aes(x = hinctnta_f)) +
 geom_bar(aes(fill = ccnthum_f),
        position = "fill") +
 geom_label(data = . %>%
           group_by(hinctnta_f, ccnthum_f) %>%
           summarise(count = n()) %>%
           group_by(hinctnta_f) %>%
           mutate(prop = count / sum(count),
                cum_prop = cumsum(prop)),
          aes(y = abs(1 - cum_prop) + prop / 2,
            label = paste0(round(100 * prop, 0), "%")),
          colour = "black", fill = "white", label.size = 0) +
 coord_flip() +
 scale_fill_brewer("Responses:",
                type = "div", palette = "RdBu",
                direction = -1, aesthetics = "fill",
                guide = guide_legend(reverse = TRUE)) +
 theme_minimal() +
 theme(legend.position = "bottom") +
 scale_y_continuous(labels = scales::percent) +
 labs(y = "Percentage of Respondents",
     x = "",
     title = "Income Differences In The Opinion On The Cause Of Climate Change",
     subtitle = "Do you think Climate Change Is caused by natural processes, human activity
or both?")
p_ccnthum_income
```

4. Age

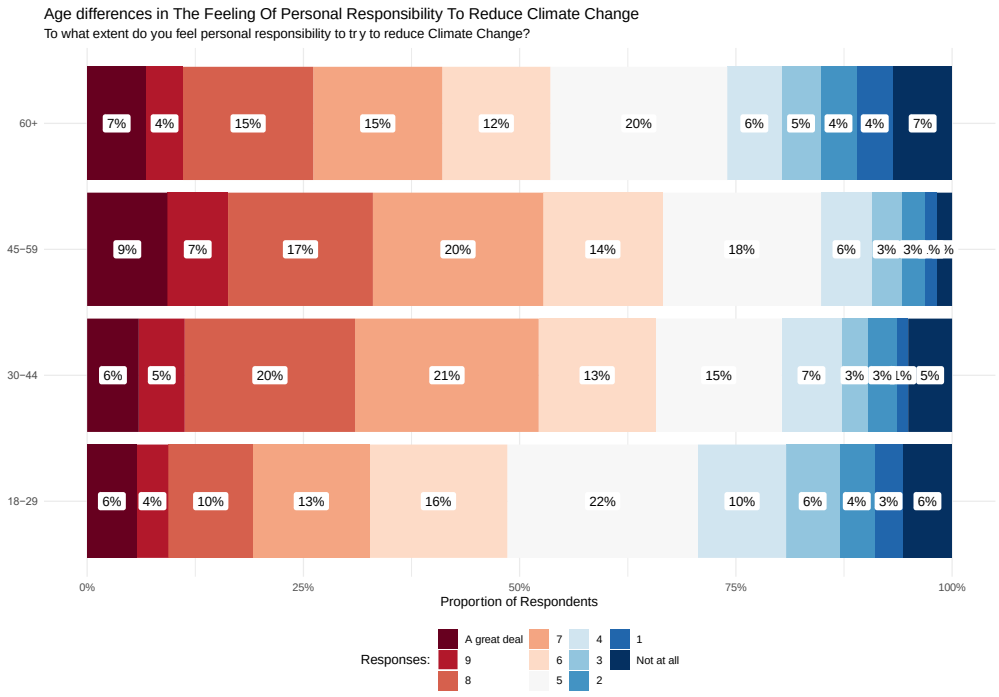
```
p_ccnthum_age <- ESS %>%
 mutate(ccnthum_f = to_factor(ccnthum),
       age_cat_f = to_factor(age_cat)) %>%
 filter(!is.na(ccnthum) & !is.na(age_cat) & cntry == "GB") %>%
 ggplot(aes(x = age_cat_f)) +
 geom_bar(aes(fill = ccnthum_f),
        position = "fill")  +
 geom_label(data = . %>%
           group_by(age_cat_f, ccnthum_f) %>%
           summarise(count = n()) %>%
           group_by(age_cat_f) %>%
           mutate(prop = count / sum(count),
                cum_prop = cumsum(prop)),
          aes(y = abs(1 - cum_prop) + prop / 2,
            label = paste0(round(100 * prop, 0), "%")),
          colour = "black", fill = "white", label.size = 0) +
 coord_flip() +
 scale_fill_brewer("Responses:",
```

```
            type = "div", palette = "RdBu",
            direction = -1, aesthetics = "fill",
            guide = guide_legend(reverse = TRUE)) +
  theme_minimal() +
  theme(legend.position = "bottom") +
  scale_y_continuous(labels = scales::percent) +
  labs(y = "Proportion of Respondents",
       x = "",
       title = "Age differences in The Opinion On The Cause Of Climate Change",
       subtitle = "Do you think Climate Change Is caused by natural processes, human activity
or both?")
p_ccnthum_age
```

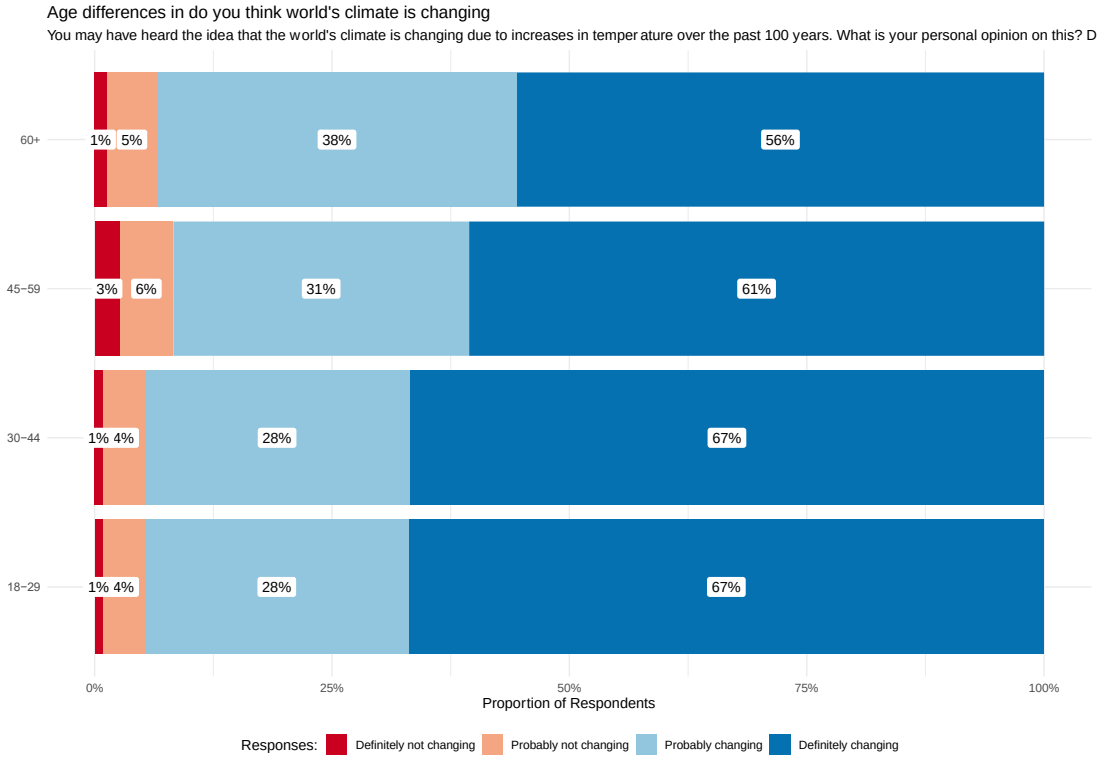
Below are the graphs that I found rather interesting and worth highlighting:



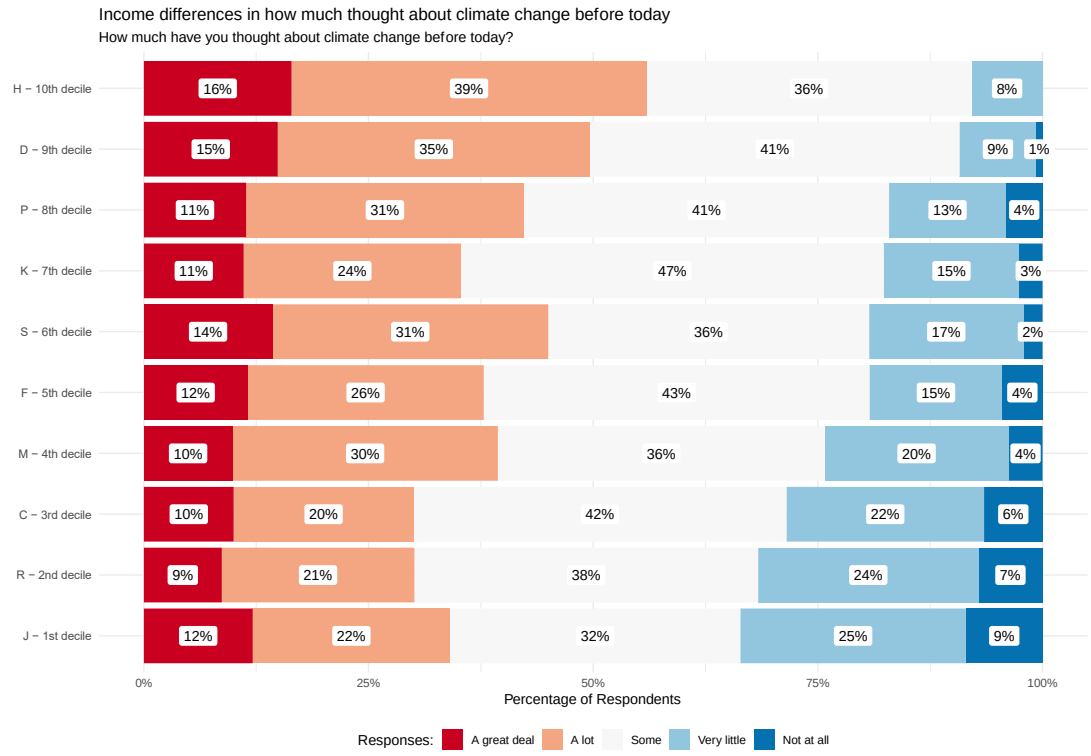
Significantly more higher income individuals believe that Climate Change has a bad impact (82%) than lower income individuals (57%). From the graph you can quite clearly see a positive correlation which seemingly shows that individuals with higher income and potentially higher levels of education are more aware of the severe negative impacts of Climate Change.



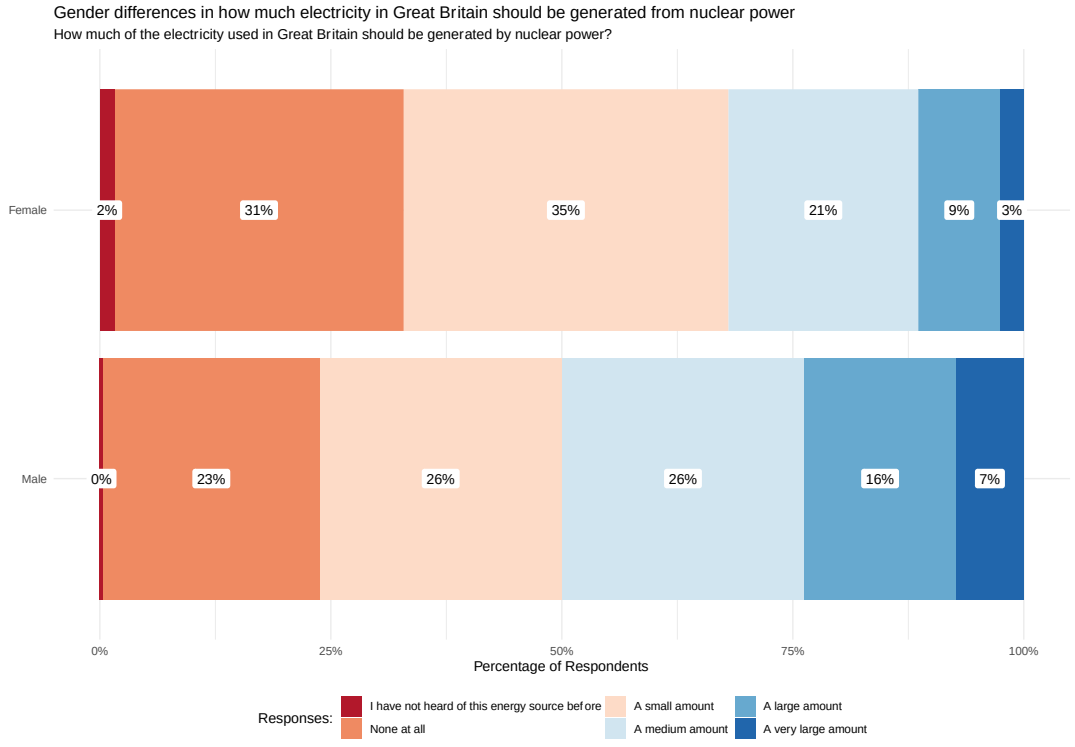
More older individuals feel a personal responsibility to reduce Climate Change (55%) than younger individuals (49%). The 45-59 age category actually feel the most responsible (67%). Even though the younger generations are the most significant in preventing future generations' suffering they unfortunately do not feel as much of a personal responsibility.



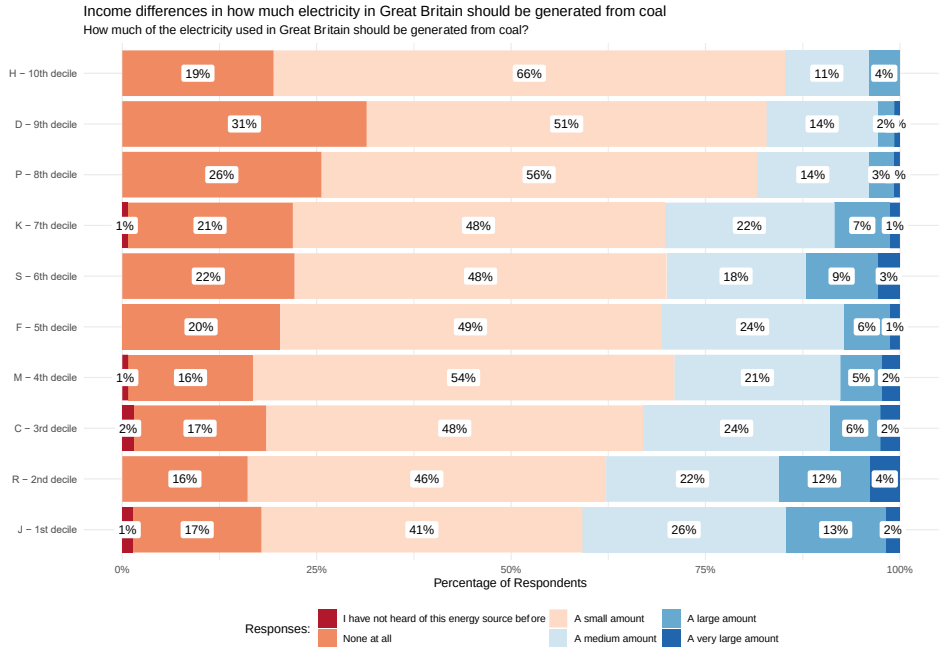
A greater proportion of younger individuals (67%) believe the world's climate is definitely changing compared to older individuals (56%). It is promising to know that younger generations are more aware of this pressing issue that is definitely taking place.



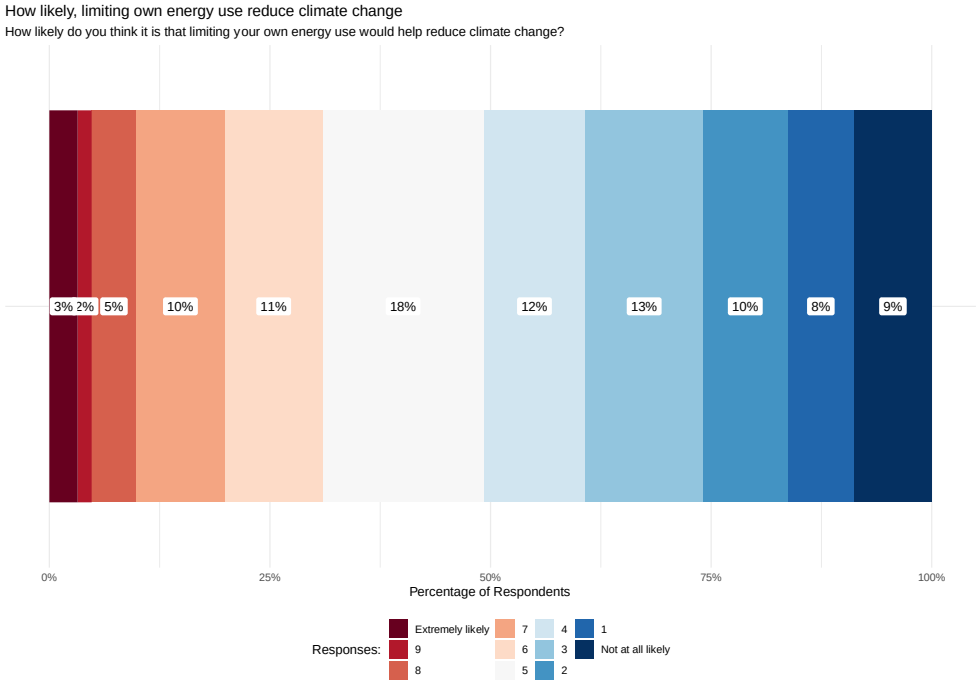
More individuals in the 10th income decile thought at least a lot about climate change before the day of the survey (55%) than those in the 1st decile (34%). This could supposedly be because poorer individuals have greater short-term worries that are more important than the climate or they are simply less aware from a lack of access to information.



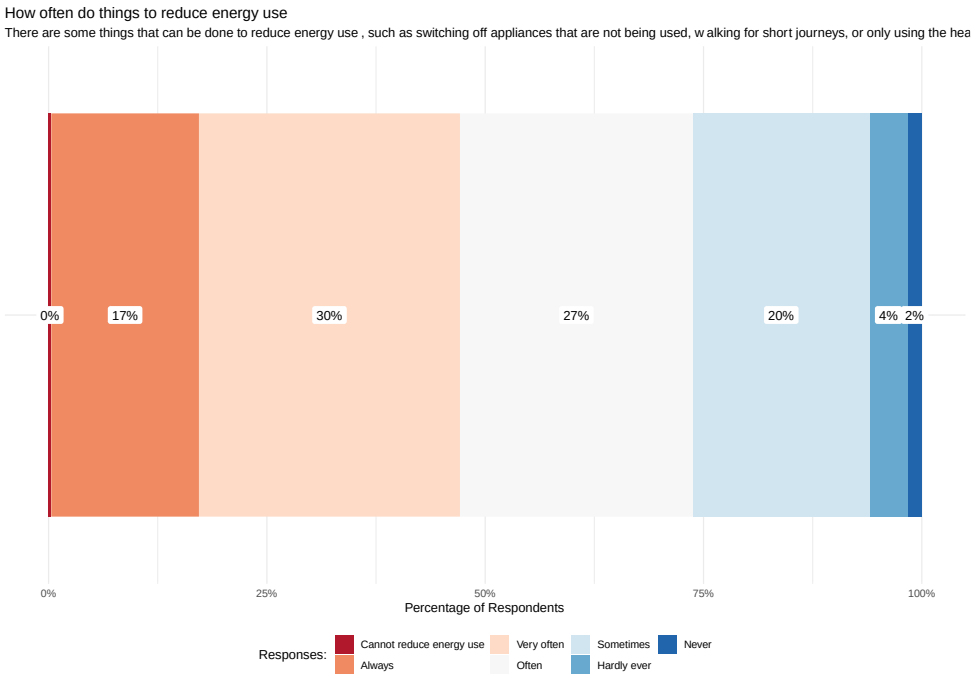
Females are less supportive of a large amount of electricity being generated by nuclear power (9%) compared to men (16%). As seen from the graph this could be because women are less aware of this energy source (2% have never heard about it) or they may be wearier of the dangers associated with this source.



Individuals in the 10th income decile support none/small amounts of electricity being from coal (85%) more than those in the 1st decile (58%). This is most likely because poorer individuals have lower access to alternate energy sources and are dependent on coal due to its abundance and price benefits.

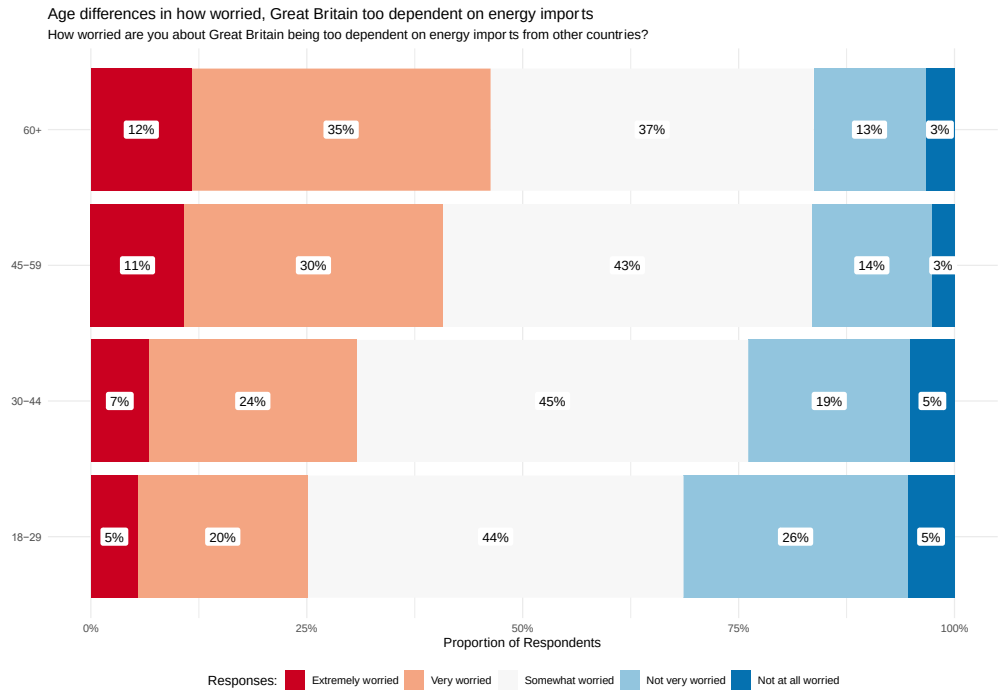


Most individuals are on the fence, giving a 5/10 rating for how likely they believe limiting their own energy use would reduce climate change (18%). The majority of individuals (51%) aren't optimistic about the impact of limiting their own energy use, giving a rating of 4/10 or below. If people have this mindset then of course Climate Change will worsen each year. Every little counts and everyone should strive to do as much as they can to reduce their impact.



The majority of individuals very often do things to reduce their energy use (30%). More individuals do things to always reduce energy use (17%) than never (2%). This is promising information that although we cannot measure, at least individuals are aware of the need to try to do this as often as possible.

The younger generations are the most worried about Climate Change (28%), while the oldest are the least worried (21%). In general, more people are not at all worried (6.5%) compared to extremely worried (5.5%). Even though the younger generation do not feel as much of a personal responsibility to reduce Climate Change as seen before, they seem to be the most worried about it which will hopefully inspire them to do something to combat it.



There is a positive correlation with age and worry that Great Britain is too dependent on energy imports, with the lowest percentage of very worried participants being in the youngest category (35%), and the highest in the oldest category (47%). This could potentially be because the younger generation are not aware or informed of just how much Great Britain is dependent.

Overall, to whoever it concerns, I hope you found this information interesting and helpful. If it gets published hopefully it can inspire policy makers to address any particular concerns or reconsider their target audience.