



Data Glacier

Your Deep Learning Partner

Exploratory Data Analysis

Survey on Climate Change Attitudes:
Presentation for Business Users

March 18, 2022

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EDA Summary


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Executive Summary

- As concerns about climate change increase, customers expect and demand business leaders consider environmental sustainability in company practices. To remain competitive, it will be essential for business leaders to understand the behaviors and views of their customers on climate change.
- We utilized multiple survey formats to collect information about attitudes on climate change. This report details our preliminary findings on attitudes relevant to business.

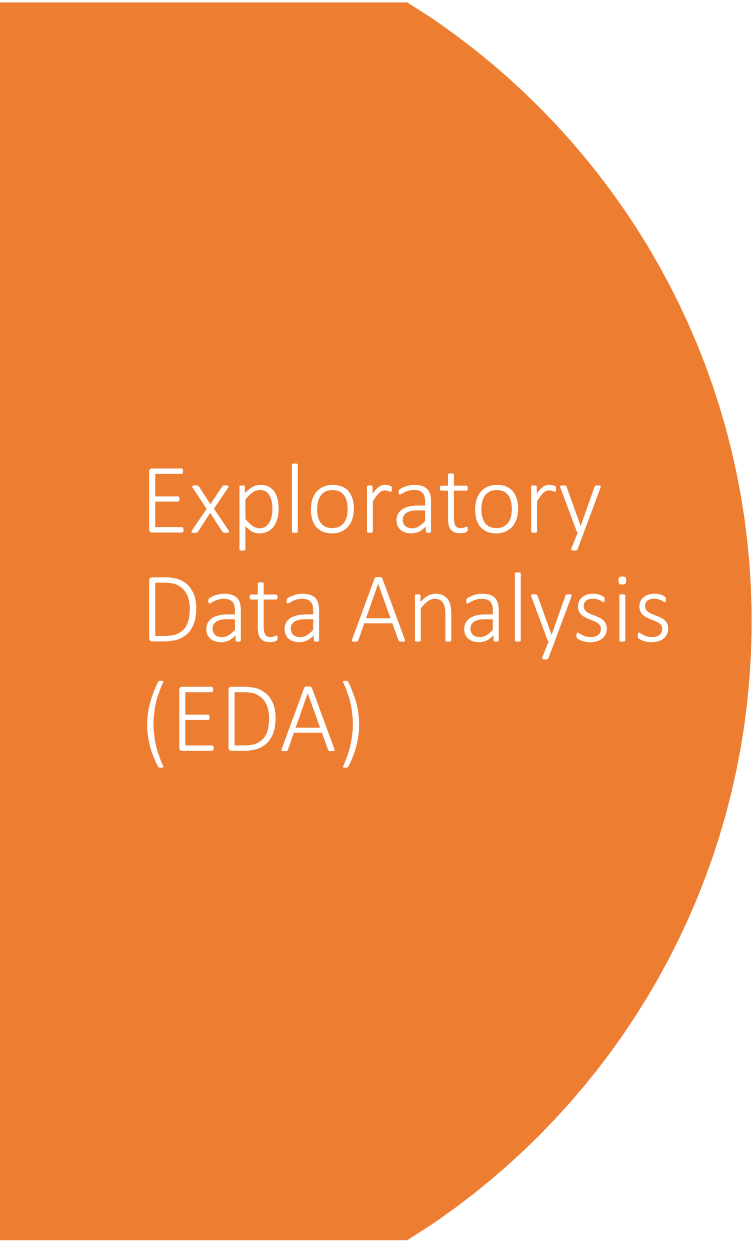
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Problem Statement

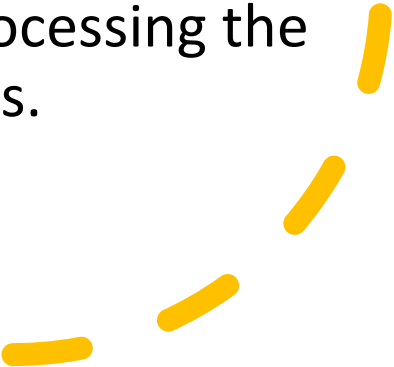
- We collected data using multiple survey formats including Typeform and SurveyMonkey.
 - We had some difficulty obtaining enough responses to make our results meaningful statistically. We are still collecting data. However, even with the preliminary results of about 40 responses, there are interesting patterns emerging in the results.
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Approach

- We sought to make the surveys across different formats compatible so that the results could be integrated into one master data file.
- We limited the length and complexity of surveys so they could be completed easily within 90 seconds. This was meant to encourage as many people as possible to complete the forms.
- We posted links to our surveys on LinkedIn and Facebook, requesting that people complete our survey and share the link with others.

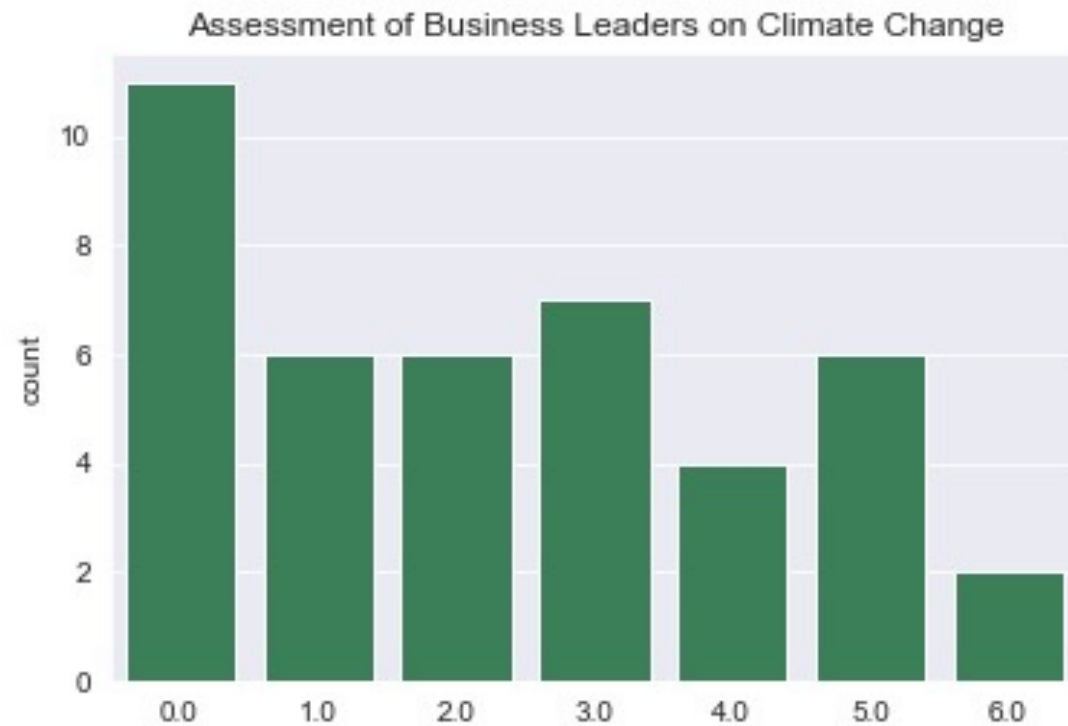
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Exploratory Data Analysis (EDA)

- Our surveys were designed in a way that made none of the specific questions mandatory for a response, therefore there were some empty and NaN values in our data file. In the “birth year” field, there were outliers and non-numeric entries. The non-numeric values were removed before creation of the master file, and impossible outliers were removed before processing the data for interpretation of patterns.
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EDA continued-continued

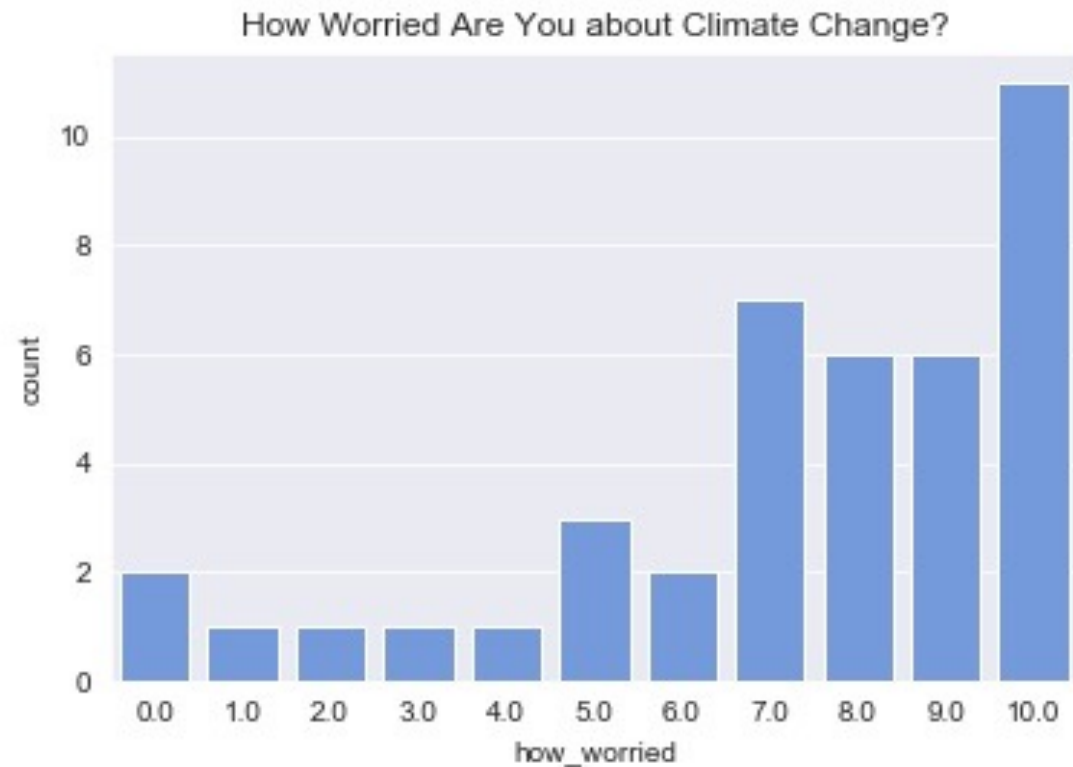
- In response to the question, “Do you believe a majority of business leaders are making adequate efforts toward environmental sustainability?” on the scale from zero (not at all) to ten (absolutely), a majority responded with three or less. The highest score given was six.



EDA

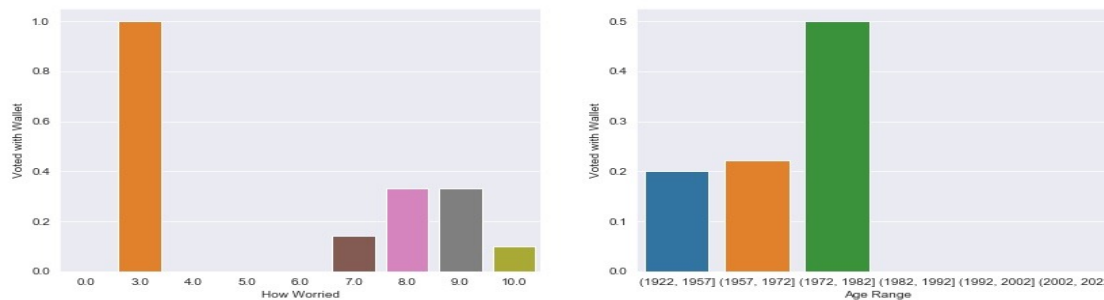
continued

- In response to the question, “How worried are you about climate change?” given a scale from zero (not at all) to ten (extremely), a majority responded with 7 or more. Many selected ten, indicating the highest level of worry.



EDA Continued

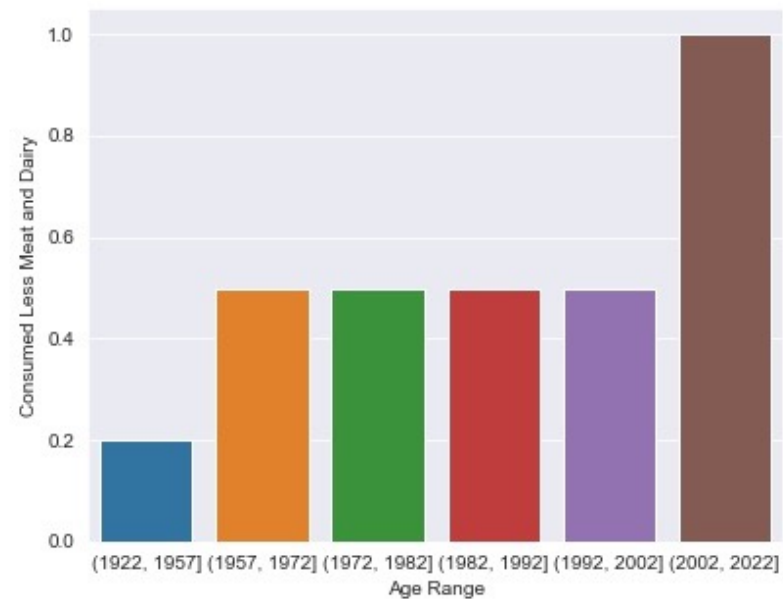
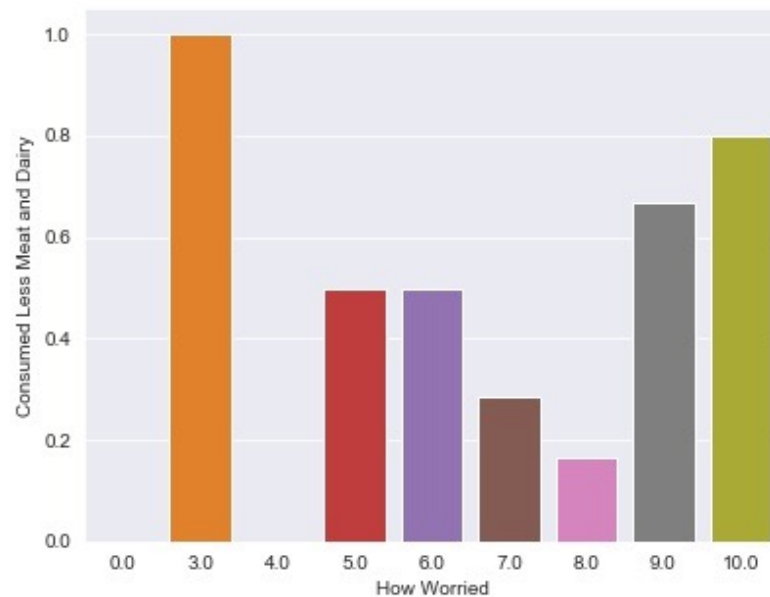
- In response to the Yes/No question, have you 'Voted with your wallet' or in other ways put pressure on businesses to increase their efforts toward environmental sustainability?" the results showing the proportions for "yes" presented by "how worried" and also by age range are as follows:



Those from older age groups were much more likely to say "Yes" to "voting with the wallet" (favoring businesses with good environmental practices in their purchases and other commercial transactions).

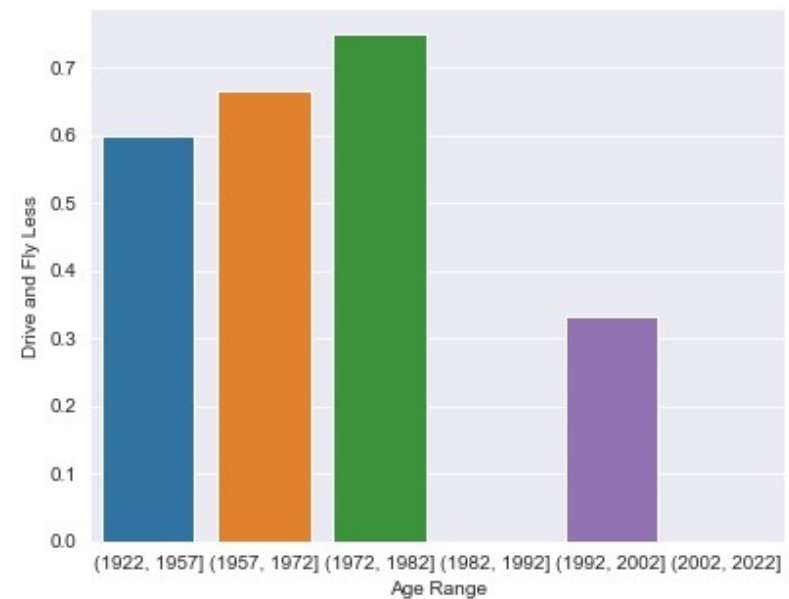
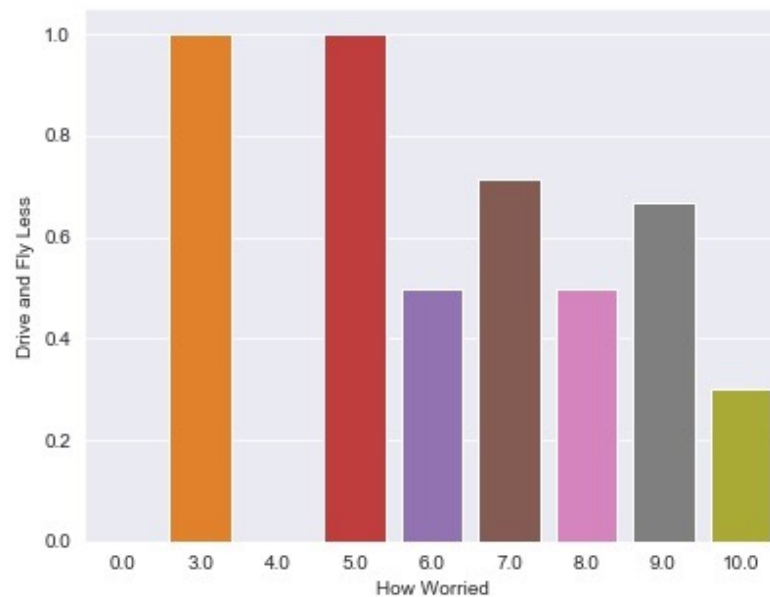
EDA continued

- Businesses should particularly consider views relating to their sector. For example, with regard to farming and agriculture, in response to the Yes/No question, have you “decreased your consumption of dairy and/or meat products” the results are as shown below, where they are split by age range as well as by how worried the person is about climate change. The youngest group responded “yes” 100% of the time to consuming less meat and dairy, while for those with the highest level of worry about climate change (rated at 10), they responded “yes” 80% of the time.



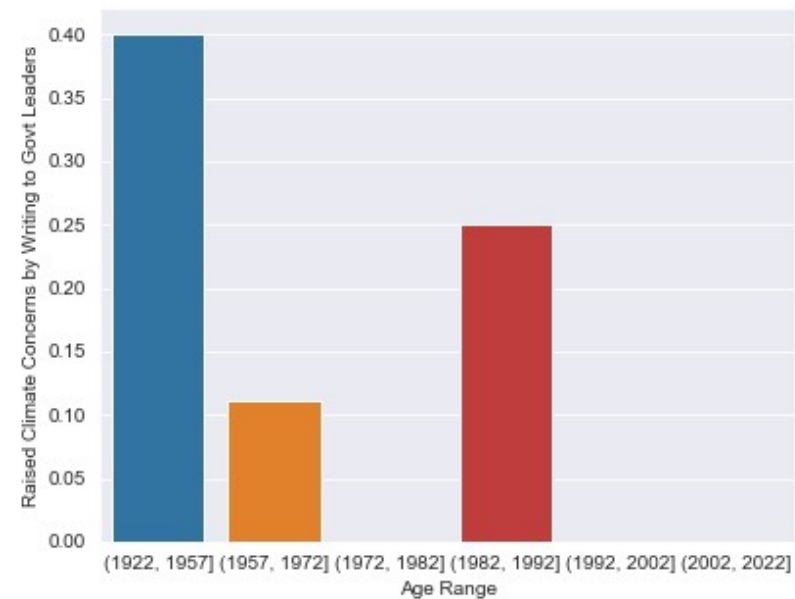
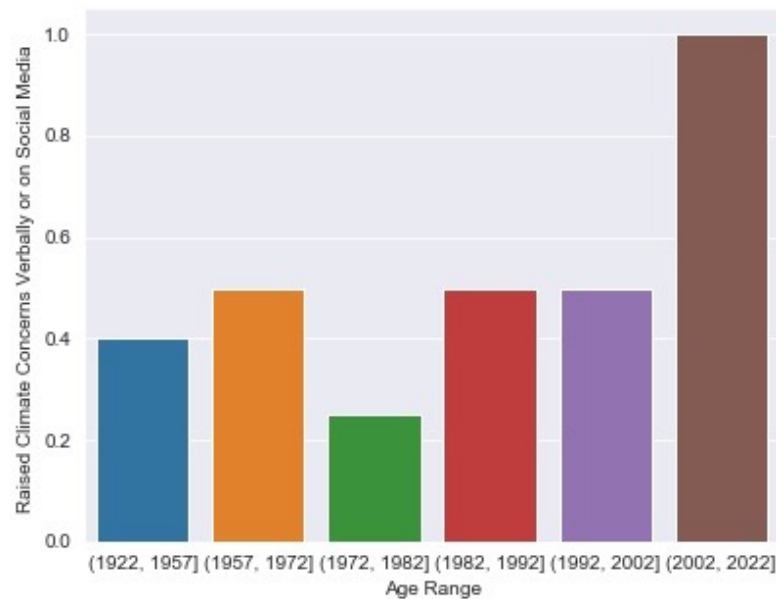
EDA continued

- These bar charts show the proportions of people who have chosen to drive and fly less, shown by degree of worry about climate change (left) and by age range (right).
- One sees the younger survey respondents are much less likely to drive and fly less compared to the older respondents.
- The 100% result for worry level 3 represents a single observation at that level of worry; in general though, level of worry does not appear well correlated with the choice to drive or fly less in response to climate change.



EDA continued

- On the left is the bar plot showing results of responses to the question, have you “talked about climate change or posted about it on social media?” and on the right are results for the question, have you “made your concerns about climate change heard by members of your government?”
- The oldest respondents are doing both, however, the tendency to write to government appears to be diminishing in favor of voicing one’s concerns verbally and on social media.



EDA continued, and some technical comments

- Note on these results: we are still collecting survey responses and are currently less able confidently to draw conclusions from this data given our number of responses .
- There were not many outliers and not much data cleansing was required when creating and preparing the master data file.
- The table included on this page shows some descriptive statistics after this data cleansing was completed.
- **About the Pipeline:** The pipeline consists of two main components: the MasterData class and the DataViz class. Both are coordinated from the pipeline.py, the main script. At its initialization, MasterData uses Typeform and Survey Monkey's API to fetch the data. The "lower-end-programming" needed to extract the usable data from the API's requests is isolated in two files (one for Typeform, another for Survey Monkey), keeping master.py and pipeline.py clean and readable. A MasterData object, after being created, is able to refresh the data from both forms individually. This data is internally saved as Python dictionaries, but MasterData has methods to return it as a Pandas dataframe, which is the expected use. DataViz then uses this Pandas dataframe and does further processing and then produces image files showing relationships of interest.

	how_worried	political_leader_involvement	business_leader_involvement	will_to_improve	birth_year
count	37.000000	38.000000	38.000000	38.000000	38.000000
mean	7.567568	2.842105	2.315789	6.236842	1972.552632
std	2.587798	2.060259	1.904550	2.572560	17.445974
min	0.000000	0.000000	0.000000	0.000000	1931.000000
25%	7.000000	2.000000	0.250000	5.000000	1961.250000
50%	8.000000	2.500000	2.000000	6.000000	1970.000000
75%	10.000000	4.000000	4.000000	8.000000	1990.500000
max	10.000000	10.000000	6.000000	10.000000	2003.000000

EDA Summary

- The level of personal action on climate change correlated moderately well with the expressed level of worry about climate change.
- The type of action on climate change taken varied with the age, with younger respondents being more likely to change their diet and older respondents more likely to drive less and conserve on home energy use.
- Only the oldest respondents, those born before 1958 said they had written to government leaders about climate change. Younger respondents shared their concerns on social media instead.

Recommendations

- Businesses should assess views in relation to their own industry, with special attention to the attitudes and behavioral trends of the youngest group – whose attitudes and behavior probably best represent future trends.
- Young people are reducing their consumption of dairy and meat and they are sharing their concerns about climate change on social media. In other ways they are less inclined to “vote with the wallet.”
- Older consumers are more likely to drive less, to write to government officials, and to spend less on home energy.
- These attitudes and behaviors should be assessed regularly by business leaders, with specific questions targeted by industry. As concerns about climate change increase, staying ahead by understanding current thinking of consumers will be essential.

Thank You