***Repository at:*** <https://github.com/NWF-Carbon-Calculator/NWF-Carbon-Calculator>

***General Technical Requirements and Description***

This Carbon Calculator if completely written in front-end web technologies HTML5, CSS and JavaScript. It requires the use of Bootstrap4, the full JQuery framework, and Google charts AJAX API for display and functionality. Functionality is written in both JavaScript and JQuery.

***File/Folder Descriptions and Functionality***

The HTML is all found in the index.html. The CSS is also all contained in the main.css file found in the Css folder. Placeholder images used for prototyping can be found in the images folder. The JavaScript is split into two files in the Scripts folder, custom.js and methodology-notes.js. Methodology-notes.js is loaded before the custom.js at the end of the index.html. Methodology-notes.js are functions and values that use external values to calculate carbon emissions for the various categories. Custom.js is responsible for the behavior of the site as well as calculating users inputs with the values provided in the methodology-notes.js

***Detailed Breakdown of Individual Files - Index.html***

The index.html is broken down in sections as indicated in the comments of the file.

The “Navbar”, “Banner”, and “Breadcrumb” sections are all purely aesthetic and were designed to be similar to what is currently live on the NWF website.

The “Header Button Content” section holds all the buttons that are used in navigating the various sections of the carbon calculator. They are subdivided into two rows for better spacing during the various bootstrap break points. Functionality for them is defined at the beginning of the custom.js file.

The “Start Div” section is an empty div placeholder that is filled with content corresponding to which button the user selects. The Welcome section is populated in this div by default during runtime. When a user selects a different section the current div container is hidden and the selected section is moved to the “Start Div” section and unhidden. Functionality for this behavior is found at the beginning of the custom.js file.

Various sections and their content. Each section holds the text, tables and inputs needed for their respective calculations. Generally each section has the same template. A div with class of container and content-container that holds all the content of the section. Inside is a another div of class row and content-header that are used for titles. Next is another div with classes row and content-instructions used for text to explain what the user should input. Following that is another div of class container that holds another div with classes of row and calculation-area. This is usually the main body of inputs that the user will interact with. A table of class table-responsive and table-seperator is used to organize all these inputs.

Each section also contains a summary area which is a div of classes table-responsive and table-seperator. Inside is a table of classes table and w-auto which hold the results of the calculations.

After all the various calculated sections is the “Summary Content” section. This generally follows the previously defined template with some exceptions. The first is a section that is devoted to the Google Charts API. All that is required to display the chart in HTML is a div with the id of chart\_div. The chart is created in custom.js near the end of the file in the “Summary Content Calculations” section. The second is a table that holds all the calculated values from the various sections the user has put information in. Both the chart and the table are updated every time the user clicks a calculate button in a section.

The final section is the “Methodology” section. This is just a collection of text and tables that reflect the data used in the methodology-notes.js.

***Detailed Breakdown of Individual Files - custom.js***

The beginning of the file is where all the buttons are given the their on click functionality. Each button has mostly the same behaviors of adding and removing an active class to itself, hiding all sections from the webpage, inserting the selected section into the startDiv and unhiding that selected section for the user to see. Some buttons have additional function calls that are required for functionality to their specific section.

An on change event handler is added to the input field NUMBER\_OF\_STUDENTS found on the welcome section. This will dynamically change all calculations in the summary when the user changes that input.

Next follows is each sections code to manipulate the inputs, calculate the carbon impact and display the results. Key values used in these calculations can be found in methodology-notes.js file. At the end of each section the results are input in the summary part of that section, the google charts table and the overall summary table. The function reCalculateSummary is called which will update the chart and table in the “Summary” section.

Finally, there is the “Summary Content Calculations” section which holds the definition for the reCalculateSummary function used by all the other sections and the details of the drawChart function used by Googles Chart API. Use of the API can be found at: <https://developers.google.com/chart/interactive/docs/quick_start>

***Detailed Breakdown of Individual Files – methodology-notes.js***

The values used in this file are externally sourced and commented for easy updating. Functions for each section are also found here. At the end of the file all the values are set in the “methodology” section of the index.html.