

Capstone Abstract
“Carbon Tracking Made Easy!”

Description of the Application:

The purpose of this application is to serve as a marketing tool for CSS Properties Management, a landscaping company that is currently working on developing and building biodigesters in Massachusetts and other areas. This application is meant to be something that can be presented to a municipality in order to highlight the benefits of using biodigesters, and the potential impact a biodigester can have on the community.

The application is divided into two sections. The first section is meant to be more of a consumer application, and is a tool where individuals can calculate and monitor their carbon footprint. This does not necessarily market biodigesters, but is meant to excite people about green initiatives. This entire interface is condensed into a single, interactive page. At the top, there is a welcome message, and a link where users can update their account information. Below this is the user's most recent carbon footprint, followed by a list of goals that would allow the user to reduce their footprint. Finally, at the bottom, is the main interface. On the left is a graph that displays the user's carbon footprint over time. On the right side, the user has the ability to take a survey in order to calculate a new footprint. The survey relies on sliders for user input. From the user's perspective, it is easier to enter input using sliders than providing raw numerical input through a form. When the user finishes completing the survey, a new point appears on the graph on the left, and a new set of goals are generated.

The second section is targeted more towards community initiatives. The user is first prompted to enter a U.S. state and city. When the form is submitted, the user is directed to a new page. At the top, there is information about number of restaurants in the community, because restaurants are the major sources of food waste in the community. There is also information about the implications of using the waste in a biodigester. Below that is a virtual biodigester application. Users can enter an amount of food waste, and the application will indicate the amount of energy that is produced. Below this is information about how biodigesters work, and the perks of using them. This page serves as the primary marketing tool of the application.

In order to use the application, users must create an account. A local account can be created by providing name information, an email address, and a password. Users can also sign up using Facebook.

Skills Used in the Project:

Although this capstone project was done through a class in the CS department, I did use skills from both my computer science and economics background. On the computer science side, I applied the various web development skills that I learned in the course, such as front-end design, back-end/server engineering, and database management. The project was written using the M.E.A.N. stack (i.e. MongoDB, Express, Angular.JS, Node.JS). On the economics side, this project required a good amount of data collection and analysis. For example, I needed to call numerous companies in order to collect data pertaining to biodigesters. When figuring out the consumer portion of the application, I had to analyze data such as lifecycle analysis (LCA), and call several companies in order to discuss potential sources of data. All of this raw data needed to be organized and placed into the Mongo database, so that it could be used by the application.