MICHIGAN STATE UNIVERSITY

Project Plan Presentation

Energy Market Evaluation Tool

The Capstone Experience

Team Anthropocene Institute

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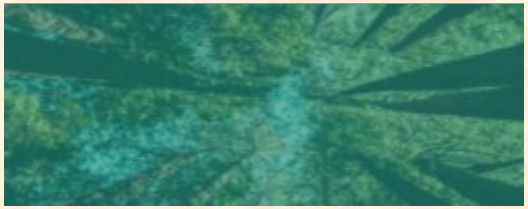
From Students…
…to Professionals

Project Sponsor Overview

- Anthropocene Institute is a non-profit organization located in Palo Alto, California
- They unite entrepreneurs, thought leaders, and investors to advance clean energy, technology, and climate policy
- Primary goal is to solve the climate disruption dilemma by 2030 by investing in and advancing the right science and technology

Anthropocene Institute



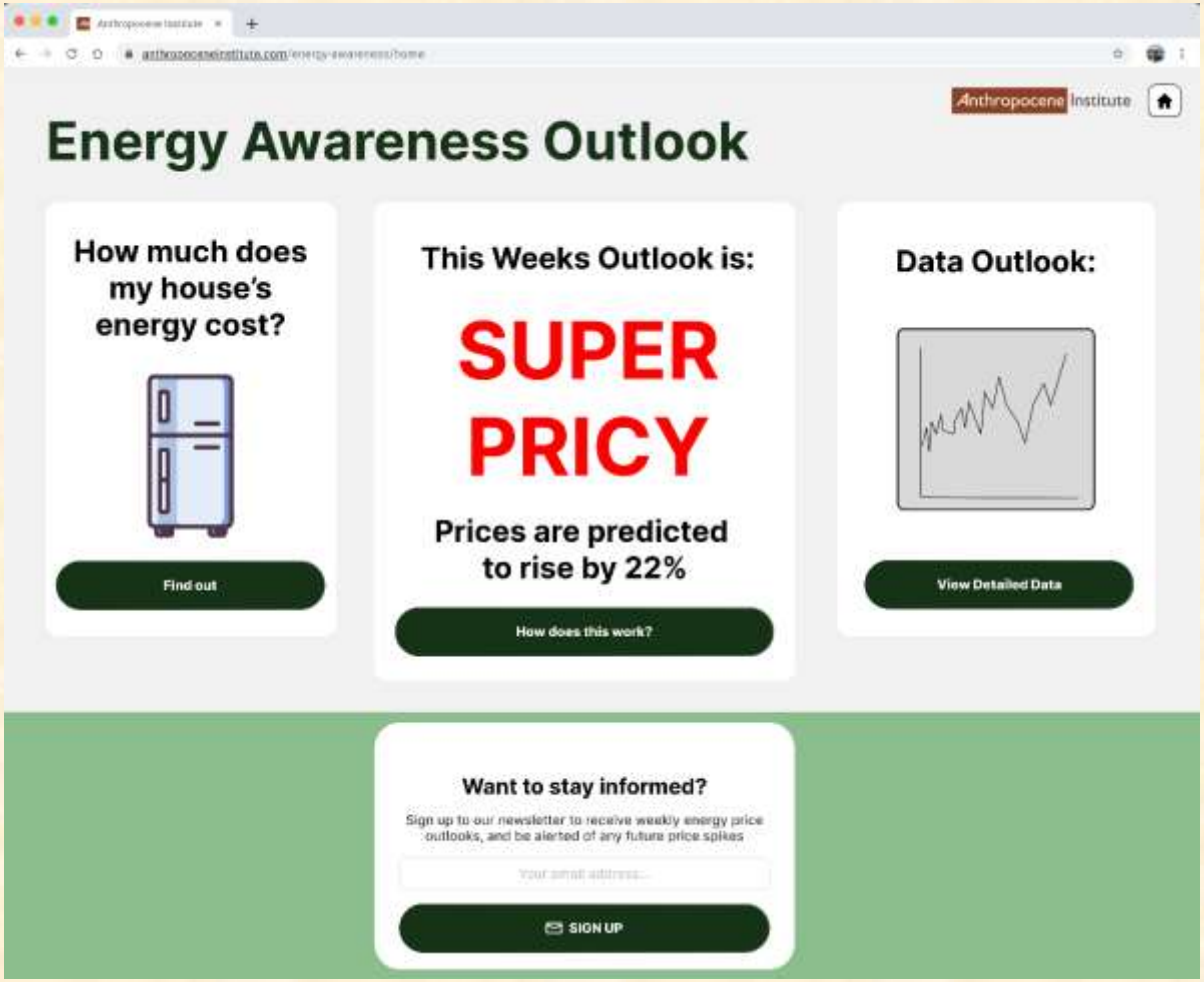
Project Functional Specifications

- Bring awareness and inform the public about the current energy market issues in California
- Select and view how much different household appliances cost in energy usage
- Visualizations of current energy prices and usages in the grid
- Alert people of rising energy prices through email or text

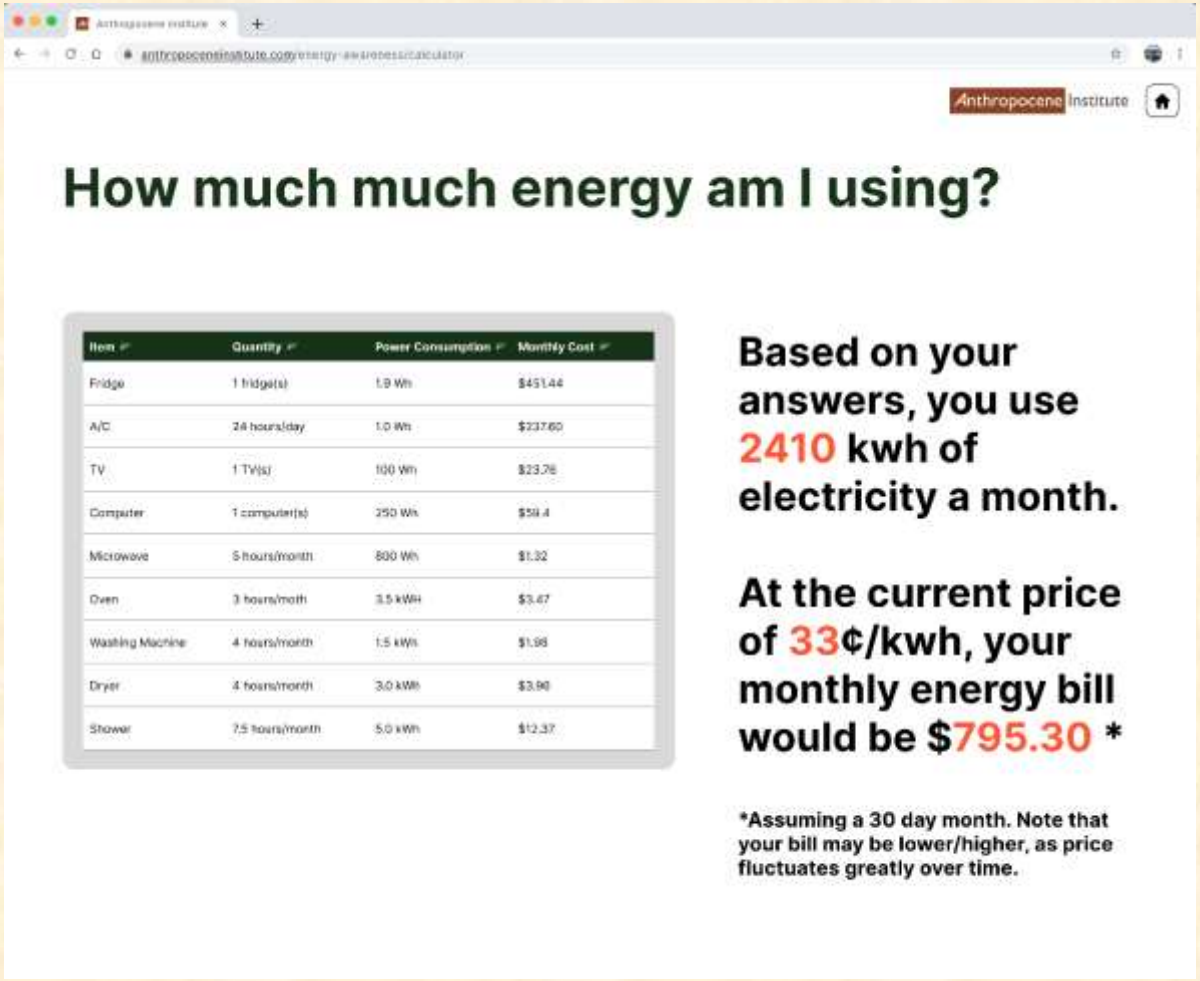
Project Design Specifications

- Web landing page has a consolidated view of the different user options
- Selecting an option will bring the user to an expanded view of that topic with information
- All pages have an option to subscribe to email or text notifications at the bottom
- Follows Anthropocene Institute branding standards

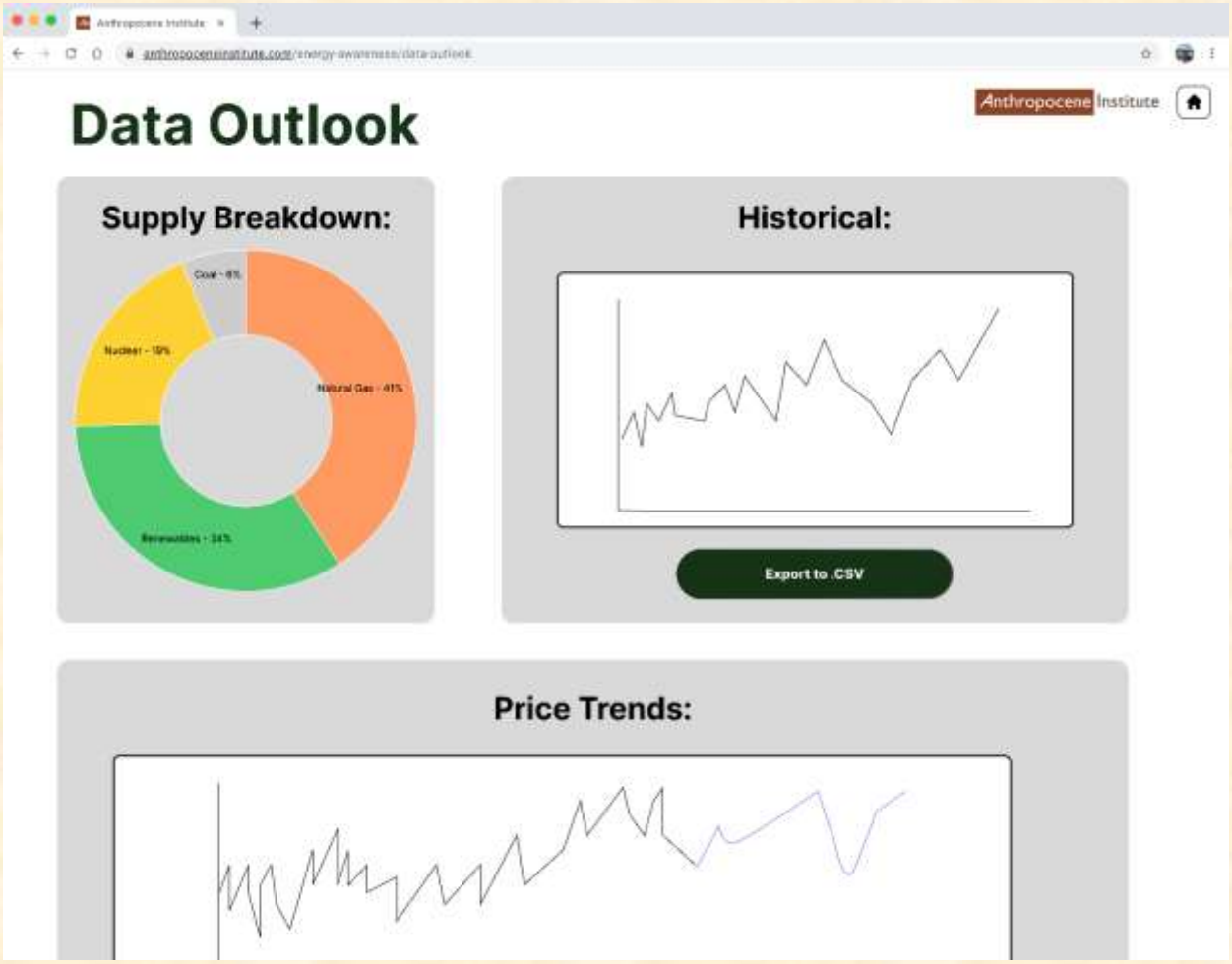
Screen Mockup: Landing Page



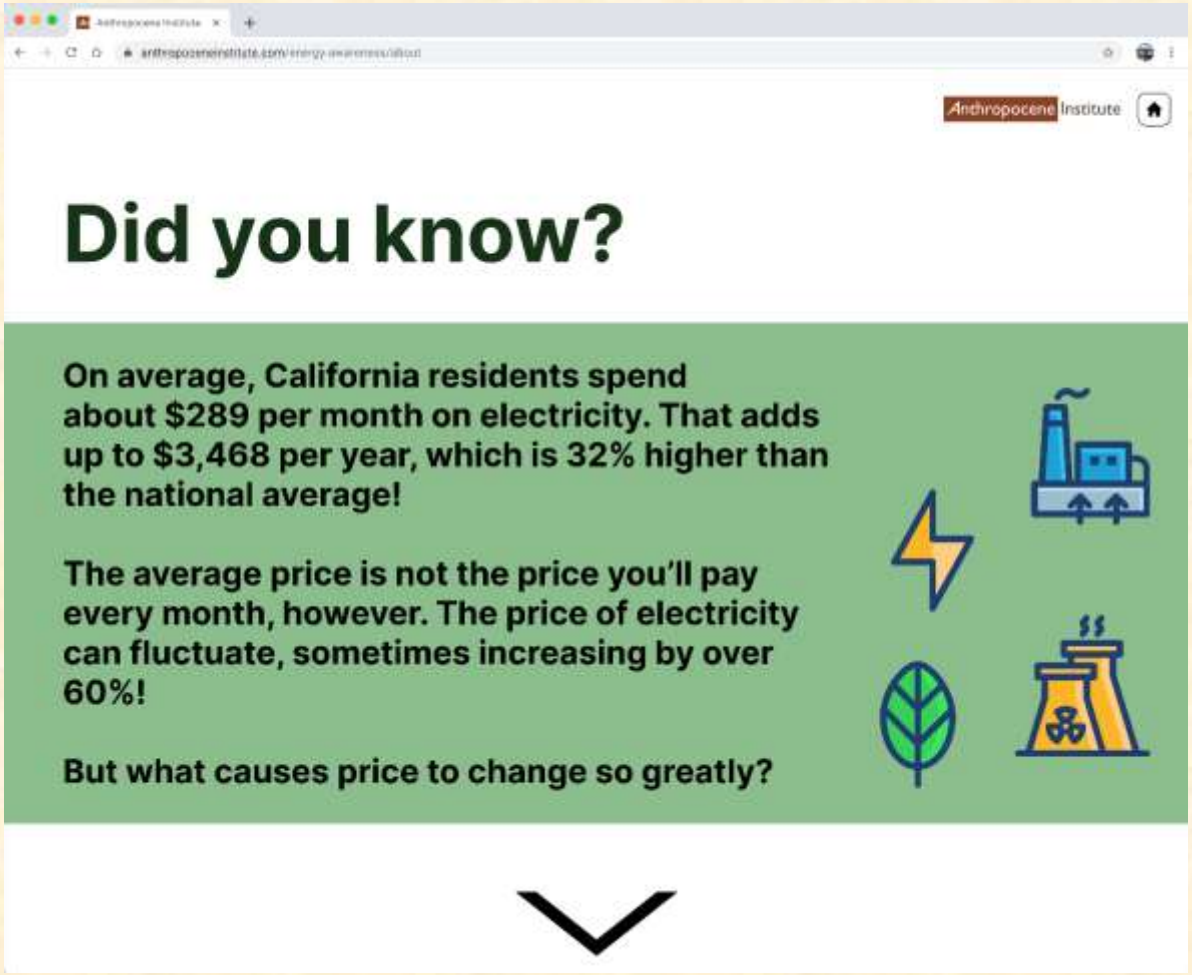
Screen Mockup: Energy Costs Calculator



Screen Mockup: Energy Outlook



Screen Mockup: About Page



Project Technical Specifications

- Flask Application
- MySQL backend
- CAISO OASIS API integration
- Smtplib for email and text alert system
- Chart.js for visualizations
- Stretch goal: Implement a machine learning model to predict future energy market price movement

Project System Architecture

Project System Components

- Hardware Platforms
  - N/A
- Software Platforms / Technologies
  - VS Code and Webstorm for local development
  - MSU GitLab repository
  - Standard Python libraries
  - CAISO OASIS API integration

Project Risks

- Data Security and Privacy
  - Handling user data, especially personal contact information for notifications, poses a risk of data breaches and privacy violations
  - Implement robust security measures including data encryption and secure data transmission protocols
- Inaccurate Data
  - Data pulled from CAISO has missing items or other inaccuracies
  - Regularly validate and verify the accuracy of external data sources or fill in with approximations
- API/Data Integration
  - This project requires a real-time data connection to load latest pricing data
  - Understanding live data through Flask with API connections which may include use of flask-socketio
- SMS Messaging
  - Smtplib may not work for sending SMS messages to all carriers otherwise other options may not be free to use
  - Research options and discuss integrations and expectations with our client

Questions?