MICHIGAN STATE UNIVERSITY

Beta Presentation

Balancing the Power Grid with Nuclear Power

The Capstone Experience

Team Anthropocene Institute

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From Students…
…to Professionals

Project Overview

- The Anthropocene Institute is an organization dedicated to advancing clean energy, technology, and climate policy
- Bring awareness and inform the public about the current energy market issues in California
- Web application that provides:
  - Energy market information and resources
  - Interactive tools
  - Customized alerts

Team Member's Technical Tasks

Technical Tasks Assigned

- Jaden Shah
  - Landing page and shared layout front end
  - Visuals page front end and energy consumption, 24hr prices charts
  - Energy type comparison and download graph data functionality
  - Additional resources section on landing page
- Aarav Desai
  - About nuclear page
  - Dynamic graphs comparing energy sources, 2024 Q4 prices, and real time appliance cost graphs
  - Machine leaning models for next-day prices forecast
  - FAQ page with search feature
- Hayden Cheney
  - Web scraper to collect, store, and analyze live CAISO pricing data
  - Collection of user information into database
  - Square footage cost calculator with zone specific live price usage
  - Appliance page front end tabular layout
- Xinyu Tian
  - Set up docker and initialize the database
  - Set up Twilio to allow sending SMS, and SMS related features
  - Sending notification function of the alert system
  - Sign-in popup window and display real-time feedback messages after user actions
- Owen Lenkiewicz
  - Emailer class system (sends emails via SMTP)
  - About page front end
  - Pricing alert system
  - Zone modal map to explain pricing zones
- Austin Blackwell
  - Appliance page front and back end
  - Custom data consumption API connection to database
  - User information encryption
  - Web scraper for load, zone, and interface data from EIA

Technical Tasks Completed

- Jaden Shah
  - Landing page and shared layout front end
  - Visuals page front end and energy consumption, 24hr prices charts
  - Energy type comparison and download graph data functionality
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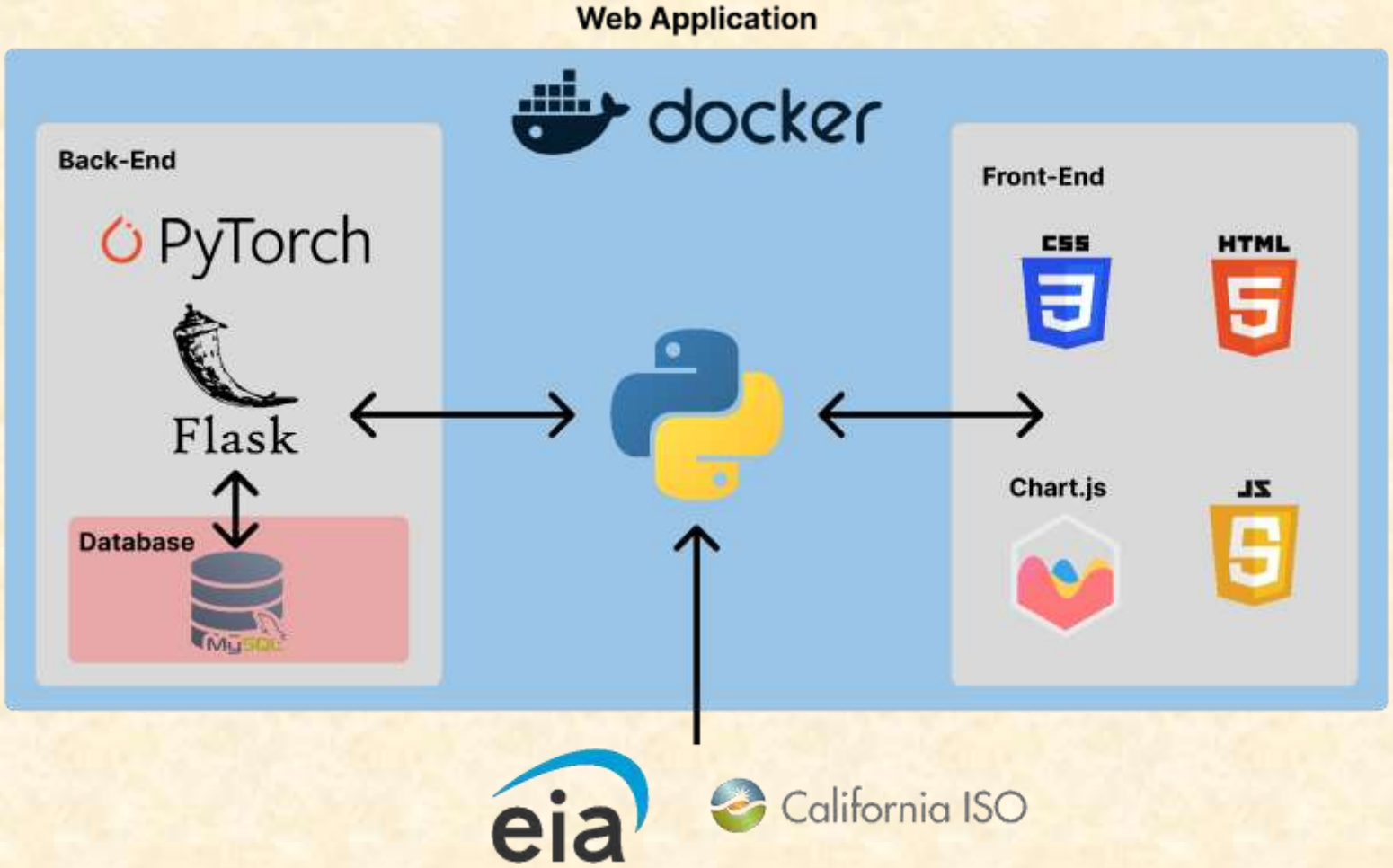
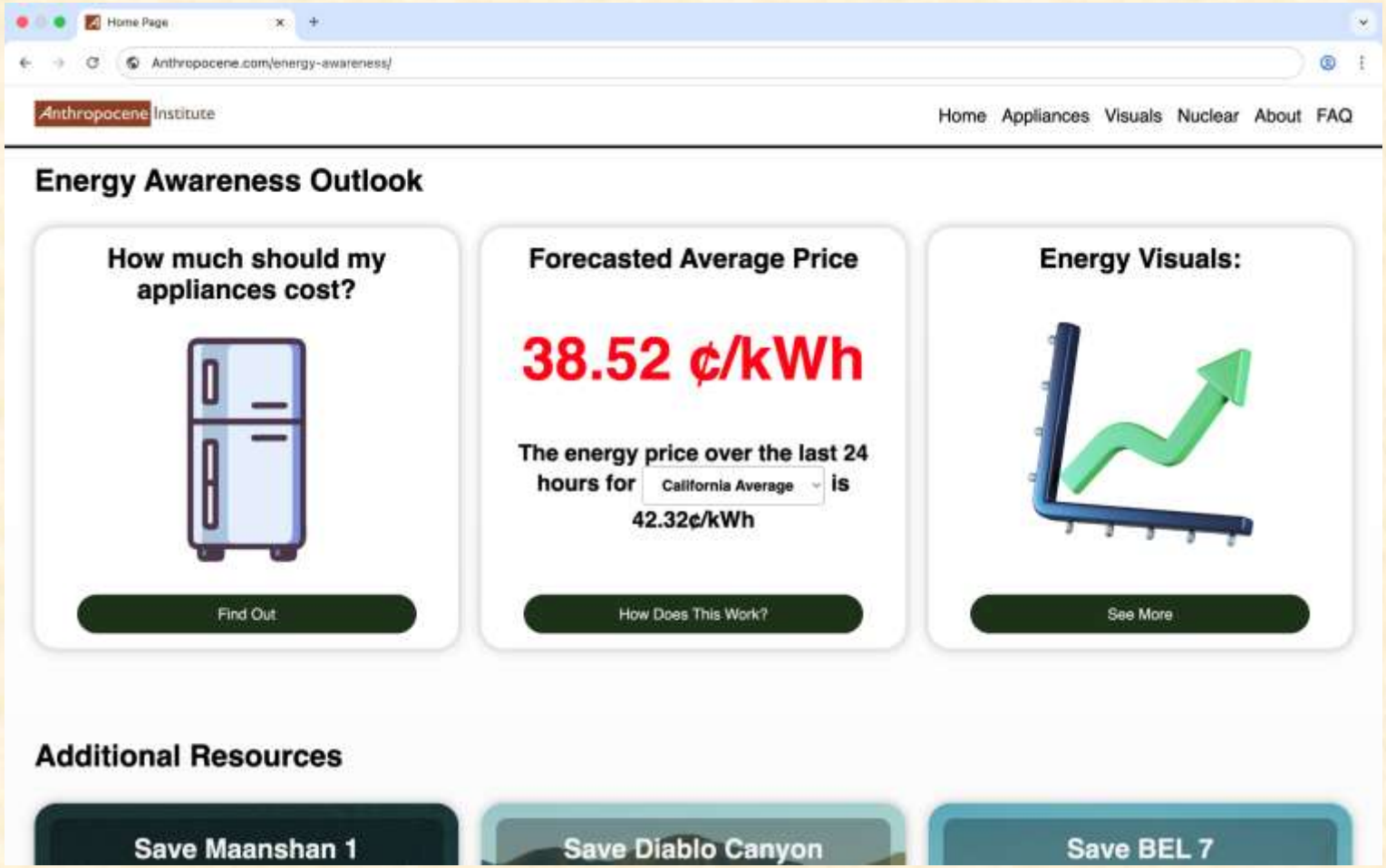
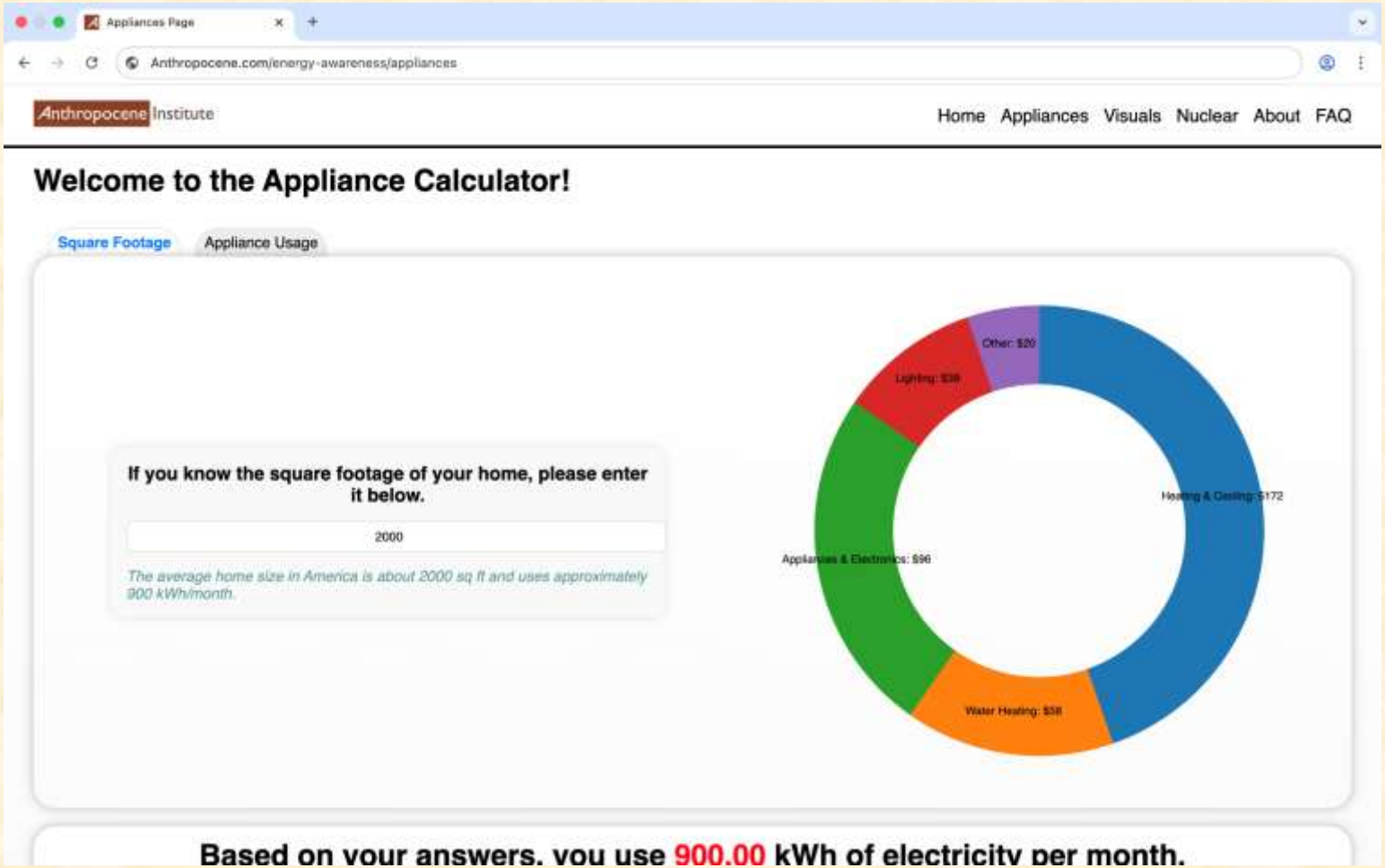
System Architecture



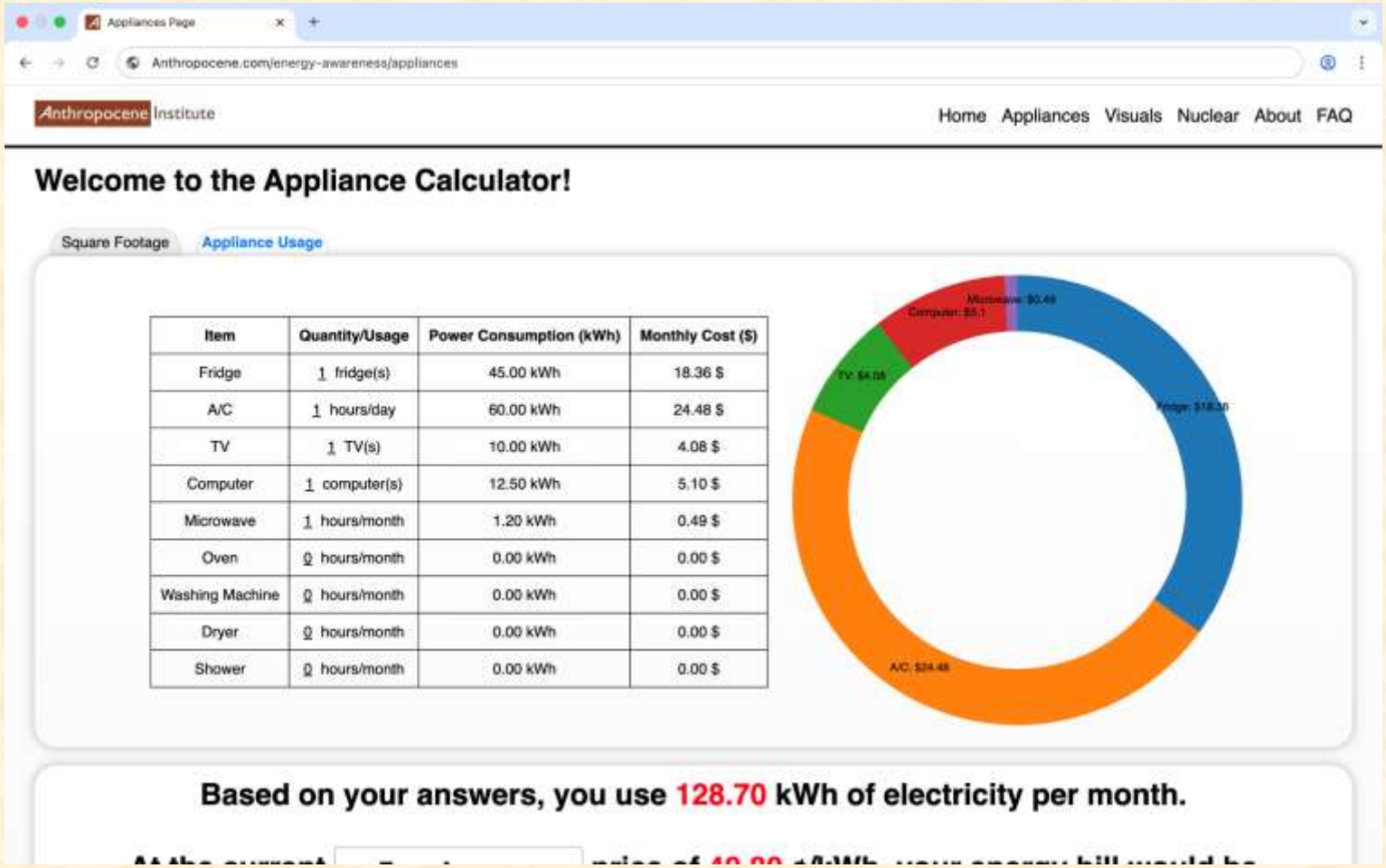
Landing Page



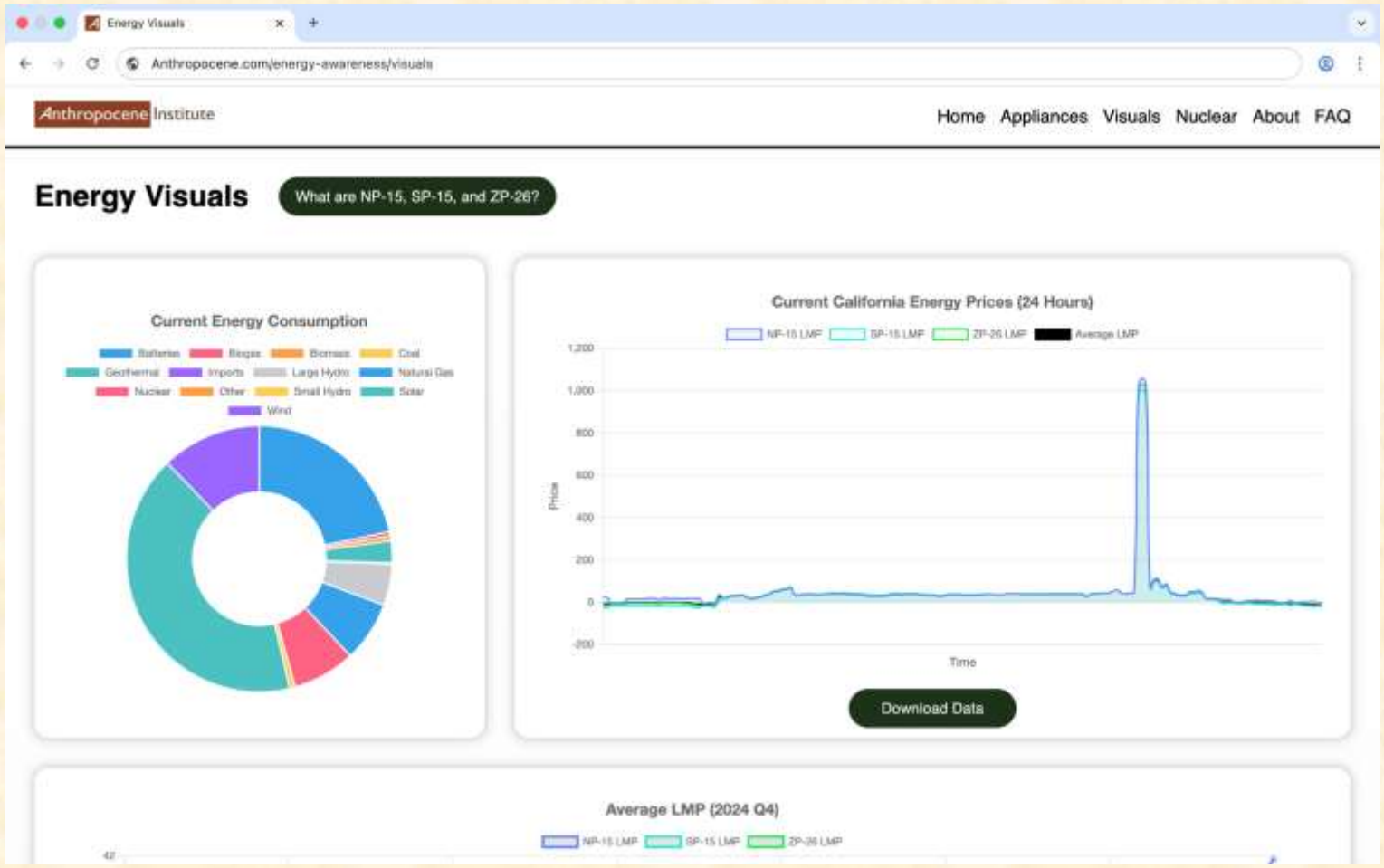
Appliance Calculator Square Footage



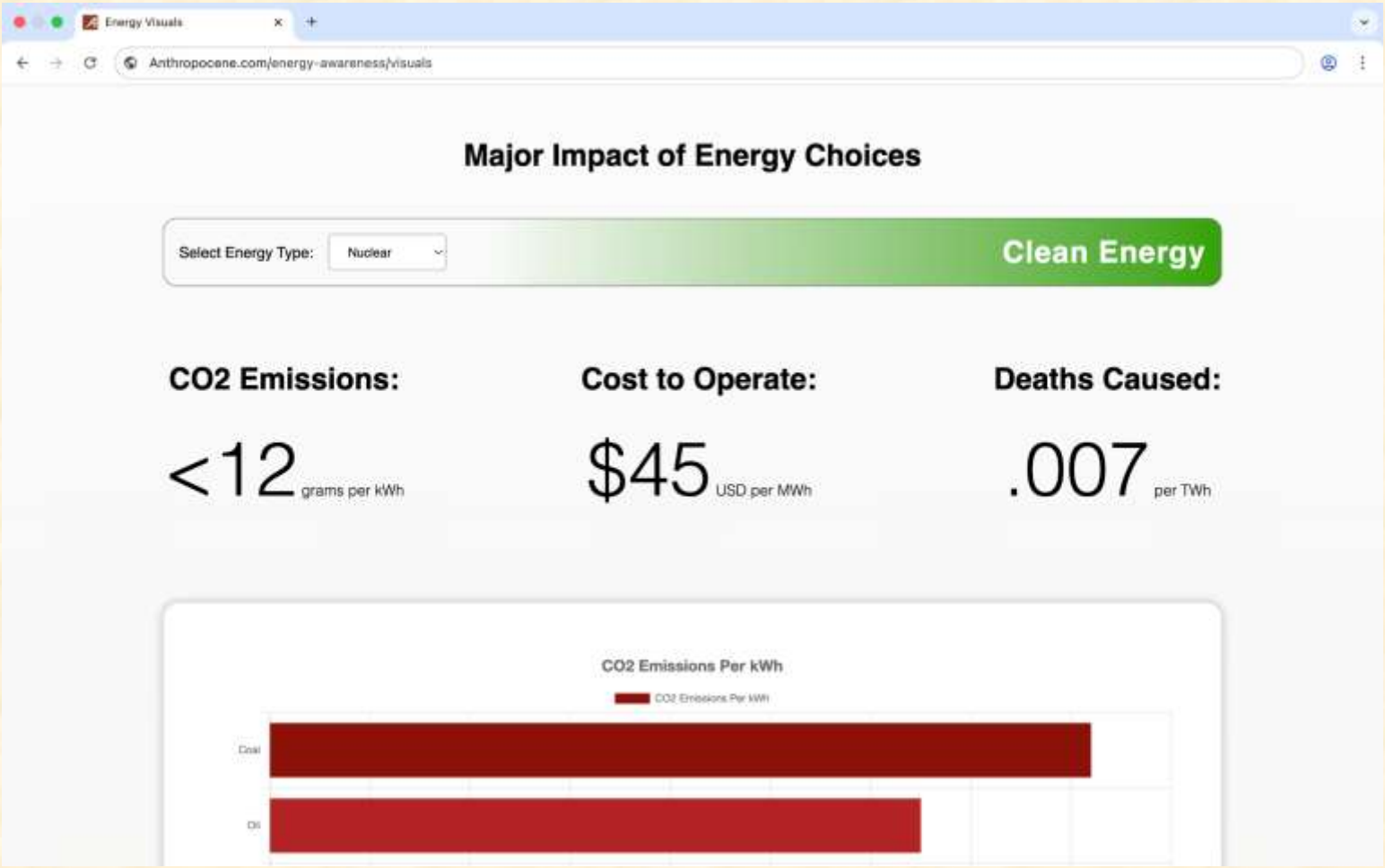
Appliance Calculator Usage



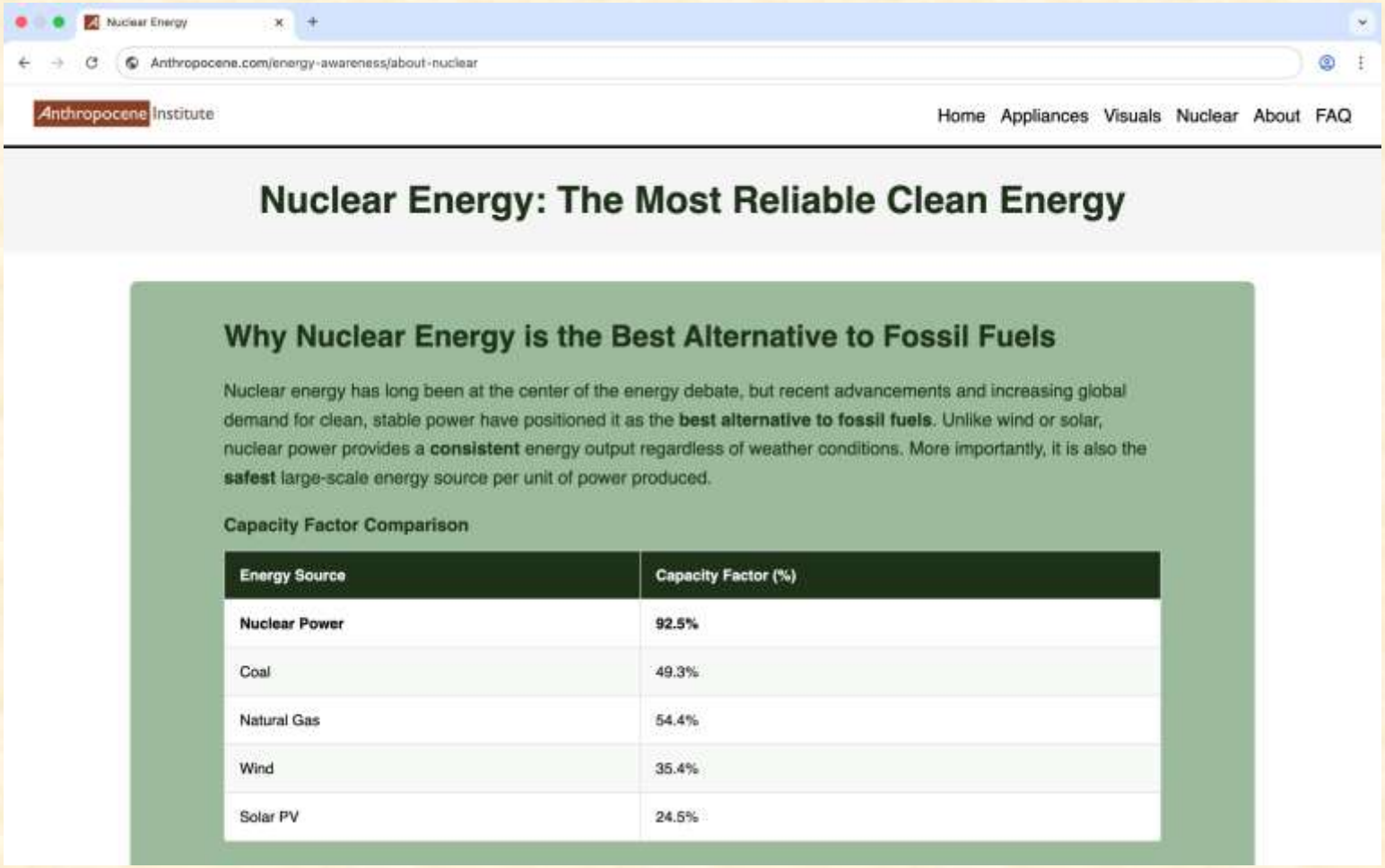
Energy Visualizations



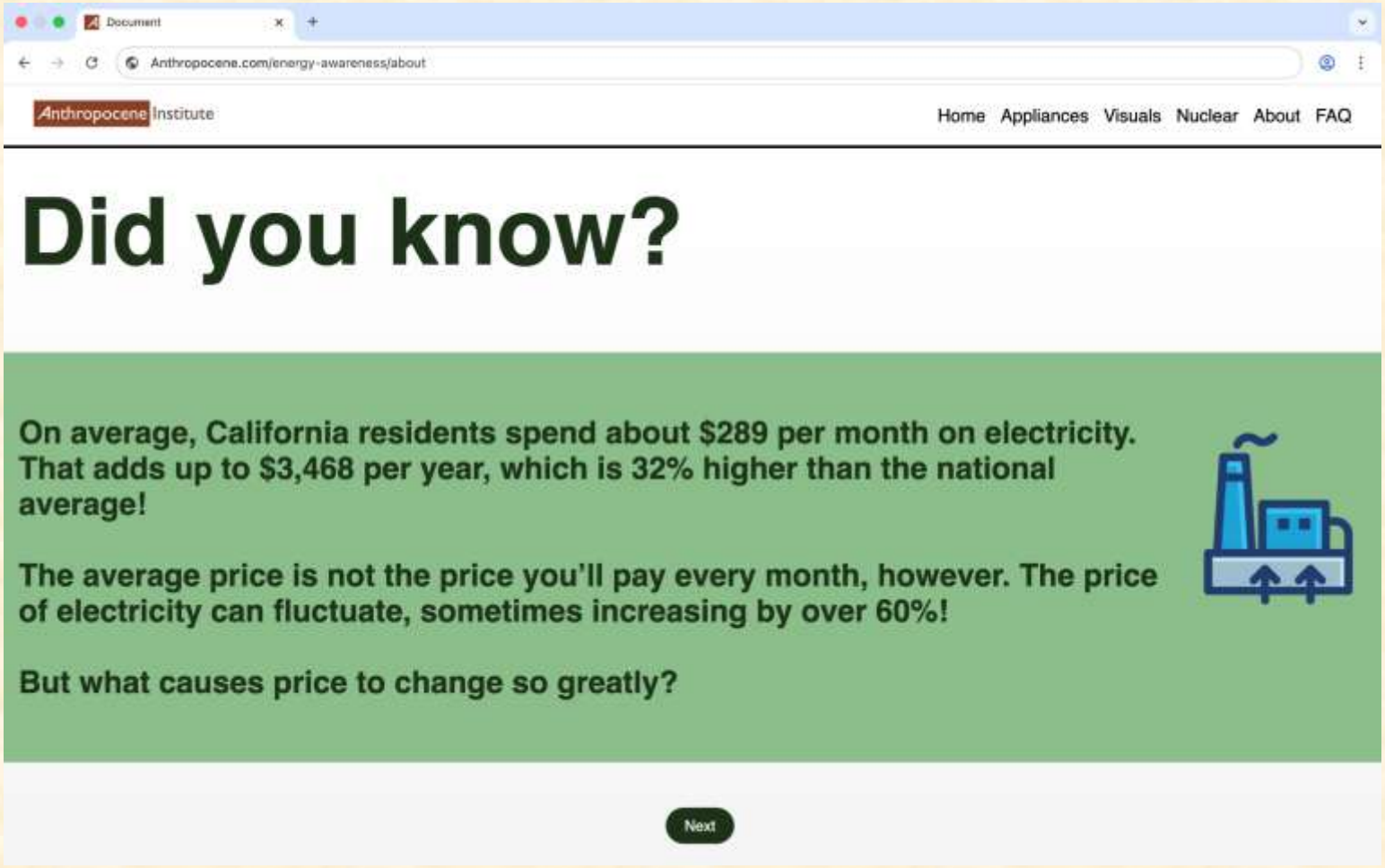
Energy Comparison Visualizations



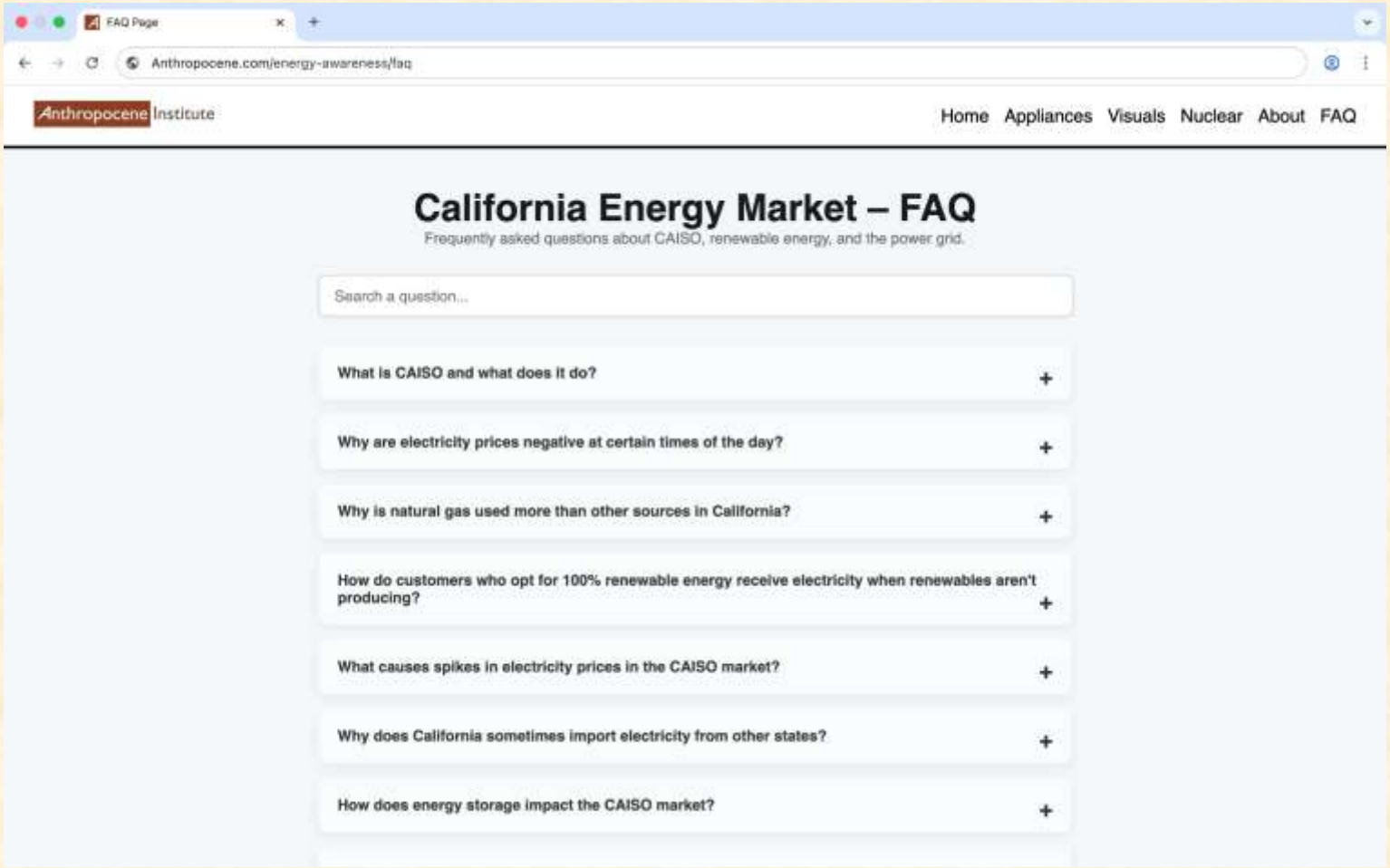
About Nuclear Energy



About


Document
Anthropocene.com/energy-awareness/about
Anthropocene Institute
Home Appliances Visuals Nuclear About FAQ
Did you know?
On average, California residents spend about $289 per month on electricity. That adds up to $3,468 per year, which is 32% higher than the national average!
The average price is not the price you'll pay every month, however. The price of electricity can fluctuate, sometimes increasing by over 60%!
But what causes price to change so greatly?
Next

FAQ


FAQ Page
Anthropocene.com/energy-awareness/faq
Anthropocene Institute
Home Appliances Visuals Nuclear About FAQ
California Energy Market – FAQ
Frequently asked questions about CAISO, renewable energy, and the power grid.
Search a question...
What is CAISO and what does it do?
Why are electricity prices negative at certain times of the day?
Why is natural gas used more than other sources in California?
How do customers who opt for 100% renewable energy receive electricity when renewables aren't producing?
What causes spikes in electricity prices in the CAISO market?
Why does California sometimes import electricity from other states?
How does energy storage impact the CAISO market?

What's left to do?

- Features
  - N/A
- Stretch Goals
  - N/A
- Other Tasks
  - Small UI adjustments and debugging
  - Documentation and clean up the codebase

Questions?