← Go to home

Calculating Carbon Footprint was never this easy

With EcoPrint
-Small steps, Big change-

Before looking at how, let's understand the problem EcoPrint is solving...

Have you ever heard of the terms...

- Energy Factor (EF)
- Kilowatt-hour (kWh)
- HVAC Efficiency Ratings
- British Thermal Unit (BTU)
- Carbon Intensity of Electricity
- and lot more...

You haven't right?
Me neither, until I was...

Trying to **calculate my carbon footprint**, I felt like I was preparing for a science quiz I didn't sign up for! I spent a lot of time googling terms to understand what they mean. I wasn't writing a PhD thesis report, I was just trying to calculate my carbon footprint. **Why should this be SOOOO HARD?**

With the mindset of a Designer...

With the tools equipped to Solve Problems...

With the aim to design for a Better Tomorrow...

I've decided to solve this Problem

In my Initial Research I found...

- Existing tools, **use very complex scientific nomenclature.**
- The existing way of **calculating carbon footprint is through questionnaire** which are generally very long, some forms contain 50-60 questions.
- The tools **does not suggest** any places where individuals footprint could be reduced.
- The experience of any tool is **not welcoming and appealing.**

Lot of problems for me to work on

Now, I need a Strategy to solve the above problems...

My Strategy

E mpathise **D** efine **I** deate **P** rototype **T** est

As I am equipped with a good strategy right now, I had to start with understanding the problem at Scientific level and consumer level, for that...

I asked couple of people some bunch of questions. I got an opportunity to talk to...

- 1 Environmental Scientist
- 2 Professors
- 4 Collage Students
- 2 House Owners

Demographics...

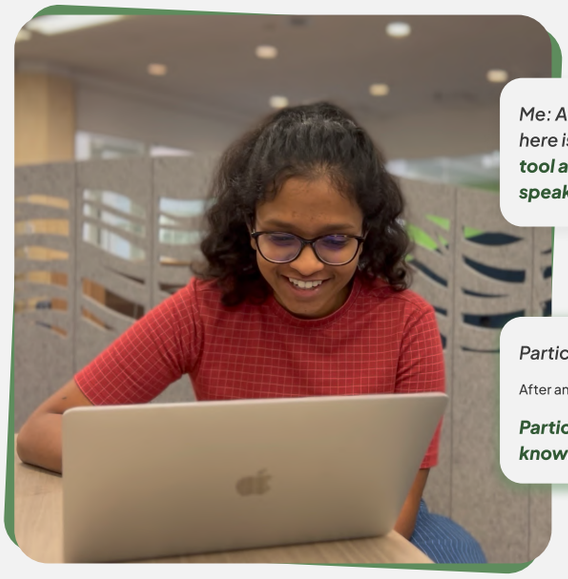
Age : 25-40 yrs

Location : United States

Nature : Environment Enthusiasts

Through talking to people I wanted to learn...

- This problem from **industry experts Point Of View.**
- With UX having very high emphasis these days, **why are tools designed with keeping UX least important?**
- What are some **other challenges which people face** with such tools?
- What motivates people to **continue a habit and challenges they face?**
- How people **felt about their data being tracked by social media** applications to suggest better content and to push focused ads.



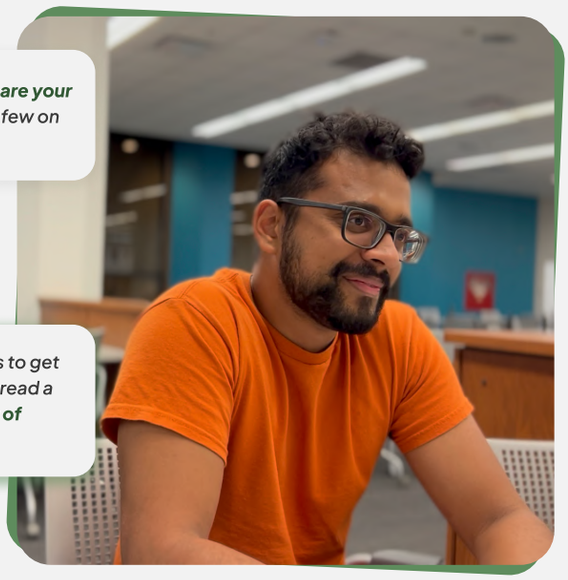
*Me: As you said, you wanna know your carbon footprint, here is a tool you can use, **can you navigate through the tool and let me know your thoughts, please speak up your thoughts.***

Participant: Sure, I would like to know my footprint, this should be easy.

After an eternity later...

Participant: Why is this asking soo many questions?? I am good with not knowing my carbon footprint.

*Me : As we are half a way through the year, **how are your new year resolutions going on**, can you share a few on resolutions you had taken.*



*Participant: Ya, I do have a few resolutions I had taken up, one is to get into shape, and it's going great in that end, while the other is to read a book, **I am a little but struggling on that part as it takes up a lot of motivation for me to sit and read.***

*Me: **Have you ever tried calculating your carbon footprint**? if yes how did the experience go, if not, why didn't you try it out?*

*Participant: no, because firstly I feel that it is a lot of work and along with it there is not a lot of people involved into calculating carbon footprint. If people are going around saying that my carbon footprint is this much, **it would have been a motivation for me, to know mine.***

Watch Full Interview >

*Me : Professor, as we know that climate change is real and we need to act upon it immediately and the primary reason for climate change would be carbon emissions. **What can residential places do to reduce their emissions?***

*Participant: Most of the carbon emissions we produce are very easy to control, people need to be properly educated on the importance of reducing their footprint, **but they should be told rather than being warned. I think emphatic education could help in reduction.***

With my talks with people from various fields of interest, I got a lot of insights which are invaluable. Some Important takeaways from the conversation were . . .

Almost 100% of people felt the **existing tools were very hard to use.**

People who want to know their carbon footprint find it really hard to know because **there is not an easy way out there.**

lack of motivation was one big reason for people as it lead people to **discontinue any habits** they were trying to form.

Learned a lot about **carbon footprint and how to capture carbon sustainably.**

Incentives are one thing people find it a lot engaging to continue a habit.

Some Idea's to solve the problem started popping...

What If we design an application that can...

Track individual's carbon footprint from day to day activities, from driving to eating habits.

Gamify the experience by bringing in **daily, weekly and monthly activity streaks**.

Recommend ways to reduce the carbon footprint, the **best part is they would be personalized**.

incentivize for maintaining their streaks through which they can **buy green products from the store**.

With all of that data, it's time for...User Persona's

Sam Ecoman

Age : 32 years **Location** : United States **Job** : Full time advocate

> *"As avid environmental advocates, we're committed to a greener future. We're eager to understand our carbon footprint and seek actionable ways to reduce it, leading the charge towards sustainable living.*

Goals

- Want to calculate carbon emissions with ease
- Along with knowing their footprint, we wanna know ways to reduce it
- Gaining knowledge about climate change, its impact, and ways to contribute positively through everyday actions.
- Gaining knowledge about climate change, its impact, and ways to contribute positively through everyday actions.
- Exploring options to offset unavoidable emissions, such as through tree planting or supporting renewable energy projects.

Frustrations

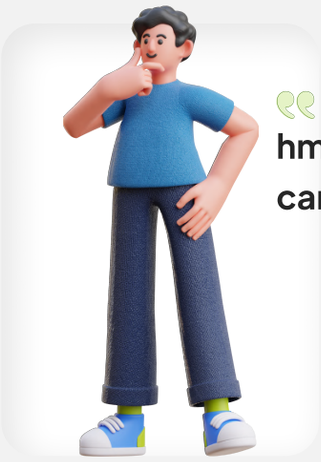
- Difficulty navigating the app due to a complex or non-intuitive interface, making it hard to find or use features.
- Lack of personalized recommendations or inability to customize the app according to individual lifestyles and preferences.
- Feeling overwhelmed by too much information or too many features, leading to confusion.
- Habit formation is very hard and some incentives should help in the process.

Proficient with apps : ✓ Knowledge about carbon Footprinting : ✓

Willing to explore new experiences : ✓

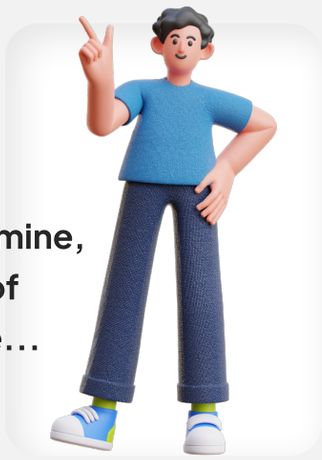
The above images are generated using DALL-E

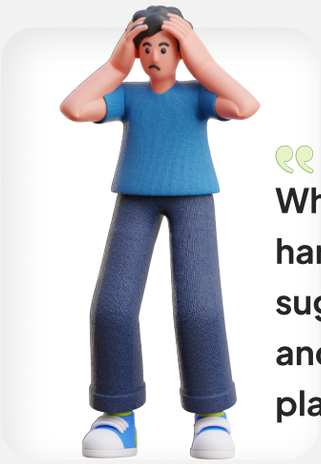
Problem? Check. Solution idea? Check. Time to Storyboard? Perfect timing!



hmm, I wonder how my carbon emissions are...

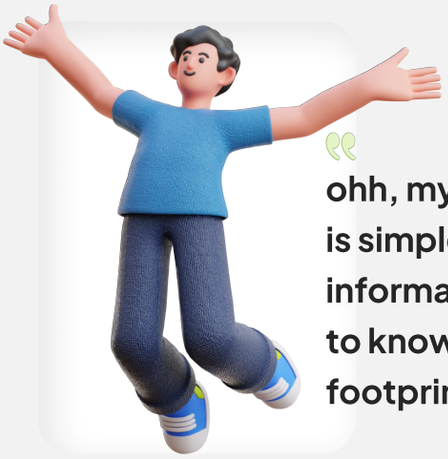
Why can't I calculate mine, there should be a lot of simple tools out there...





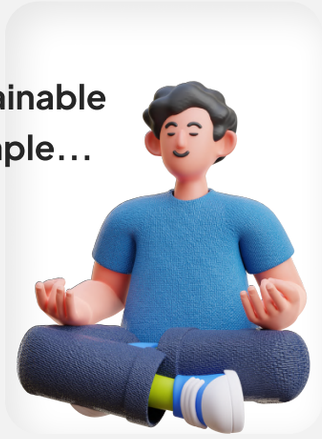
Why should this be soo hard, Seems the universe suggests I take a long trip and worry less about the planet for a bit!...

ohh wait, My friend mentioned a tool called Eco Print. Let's give it a whir...



ohh, my god this is tool is simple, easy and informative to use. I got to know my carbon footprint.

Eco-print made my choice of sustainable living easy and simple...



Got a problem and a solution, but clueless on the 'how-to'... Affinity Mapping to the rescue!"

I don't want to make your life hard by attaching screen shots of my Affinity map, instead...

Based upon the insights I got from interviews I ran a couple of rounds of information sorting and **in the 4th sorting attempt, I ended up with...**

Category 01

Challenges

In this group I most have information on the **current challenges out there to effectively calculate carbon footprint**. These challenges are focused at industry level and also consumer level.

Example : Lot of carbon is coming from fossil fuel burning. | The effect of Carbon offsetting is very minimal. | Procrastination is something that I am still trying to over come. | a lot more...

Category 02

Opportunities

As I had understood any challenges this project might contain from technical perspective and consumer perspective, **I got to understand some opportunities out there that can help me effectively tackle the challenges** and design experiences that are not only delightful, but also insightful and impactful.

Example : We can measure carbon emissions in 2 ways the way number 01). Release 02). Capture. | As a owner of my House I would like to know what can I do better for the betterment with my carbon emissions. | The fitness applications they donot incentivise enough. there should be some sort of incentives around. | Data is something which I feel comfortable sharing with. | a lot more...

Category 03

Behaviors

I wanted to understand any **current behaviors people have that they are using to tackle the challenges**. So I asked some questions on that front and got some really insightful thoughts.

Example : Every time I buy a plain ticket now it shows how much amount of carbon are you putting into the atmosphere. | Self motivation is something which will run out sooner or later. | Atleaste for short commutes I think we have to bike a lot. | Procrastination is something that I am still trying to over come. | a lot more...

Category 04

Features

Along with great insights, some users gave their ideology on a perfect carbon footprint tracking and habit formation application, with that information I sorted that information accordingly too.

Example : If AI can be usefull in like helping people in like buing these products, doing these for energy usage, it would be interesting. | It should not be setup like the way we scold people because for me that is one of the most ineffective ways to get something done. | I haven't tried any applications but watched a pitch deck. where they are offesetting the carbon in the firstplace. | I have been into multiple Environmental clubs and I have pledged to not use plastics for about an year. | a lot more...

Phew, Insights sorted. Next up : Giving our app a neat, tidy home with Information Architecture ...

I envisioned the application **would have 5 navigation pages** , the content include...

Home Page

Your Footprint Score (When open show full analytics of their footprint)

Show Active Streak's (Includes a time line and Personal Message's)

Some Eco New's (Show's that some trending news of ecology)

Few Eco/clubs you might like (Show's some clubs)

Curated EcoProducts/just for you Show some products which they can buy whith their eco coins.

Carbon Footprint Page

This is a detailed analytics page, where you can see all details about your carbon emissions.

A separate area through which you can look at the recommendations on your carbon footprint reductions.

A detailed Carbon off setting tab through which the users can help in offsetting the carbon emissions.

A tab(option) to show few clubs /environmental clubs which the users can take part in.

Your Achievements

A detailed streak on the number of challenges available and show any active streaks planning on any possibility for gamification for the active streaks.

Show badges the you have achieved so far like (Eco hero or something like that).

Show Achievement points (These are incentives through which you can buy eco products).

Eco-Store

This will be an all to itself page and the cart's or orders will not be showing on other pages. it will just be limited to show on these pages.

Multiple categories which kind of produce high carbon emissions like cattle meat/poultry e.t.c

In each product add ways on how we made this product carbon friendly/ carbon neutral.

Your Profile

An option to edit general preferences of the person like name, email and e.t.c.

Adding/editing any payment details on the profile page.

Logout/Login signup.

Any additional features are to be added later.

Isn't it getting too long, I feel the same...

so let's skip some generic stuff over here like...

Task Flow's

Because I know **you would not be interested** to zoom in and look through each flow

Low Fidelity Wireframes

I swear, I had done them, but on pen and paper, **it's too much work to beautify them**. lykyk

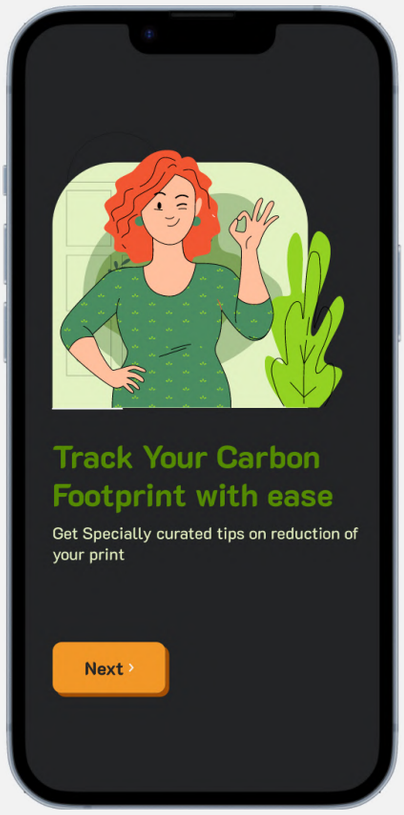
Mid Fidelity Wireframes

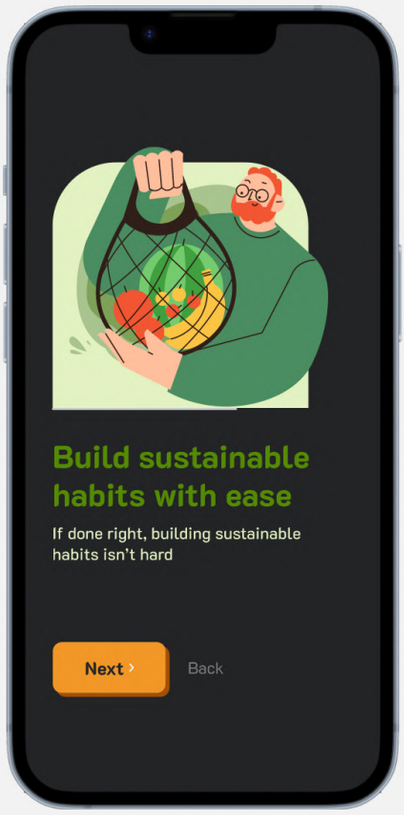
Because I believe there is no thing called mid fidelity wireframes. **Let's debate about this**

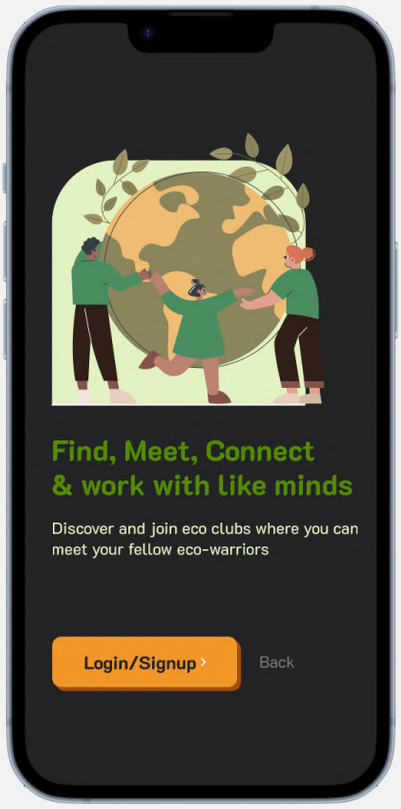
Time for...Design, the first Iteration :)

Intro Screens

Login Screen, Logo is cute isn't it? 🥵

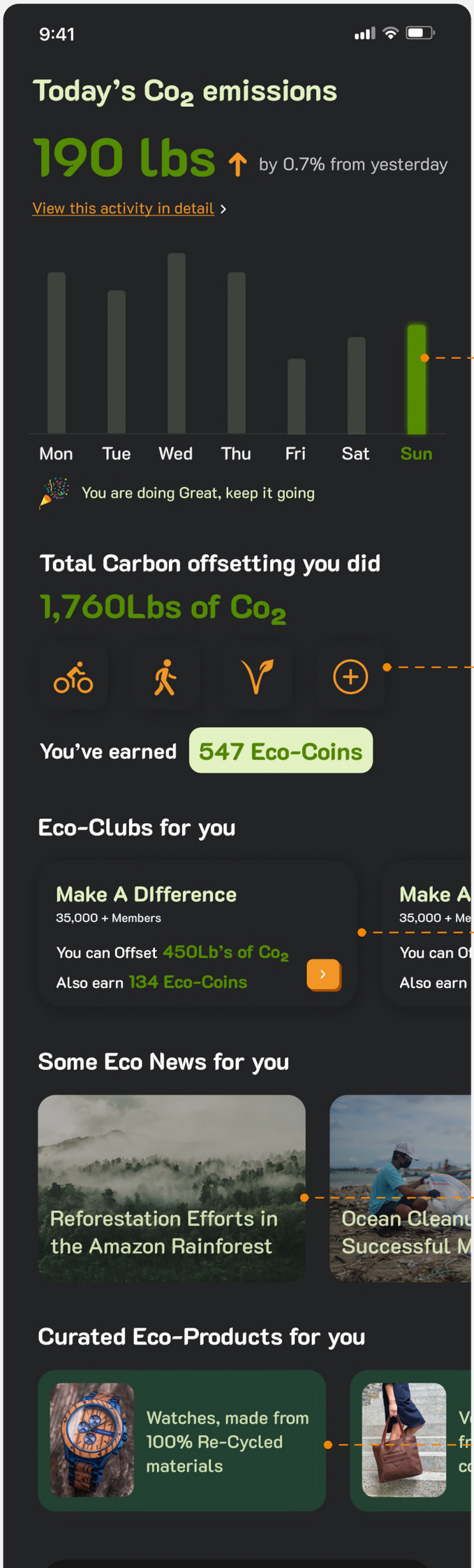






Splash Screen

What could be a better way to show what the application could do other than splash screens?



Home Page

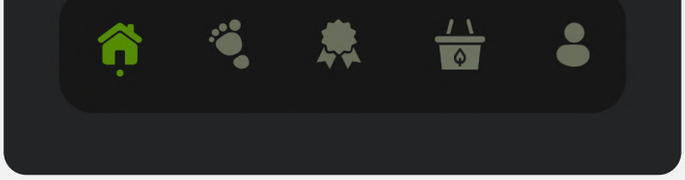
Daily carbon emissions per week, and option to look at detailed emissions

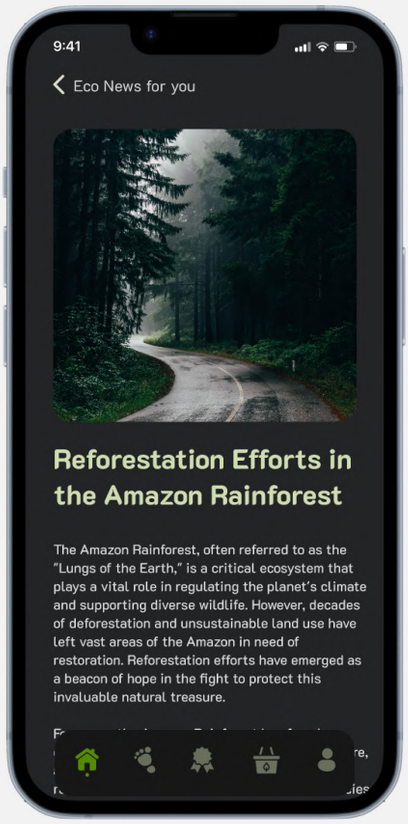
Several **ways to offset** Individual carbon emissions

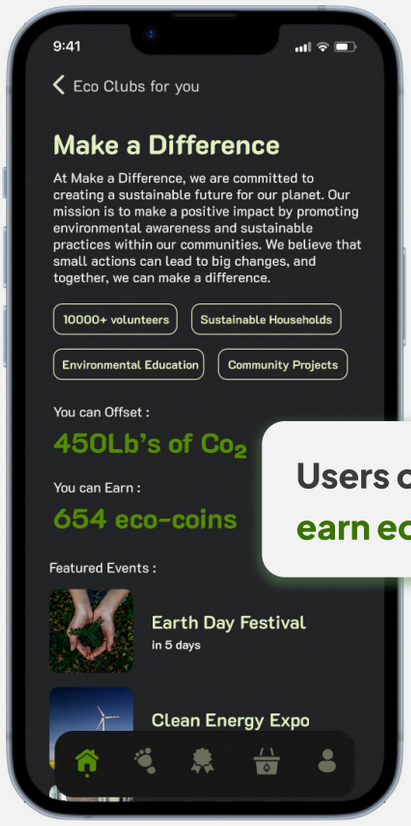
Some eco clubs in which **people can participate**

Eco news, just in case if you want to **learn about ongoing efforts**

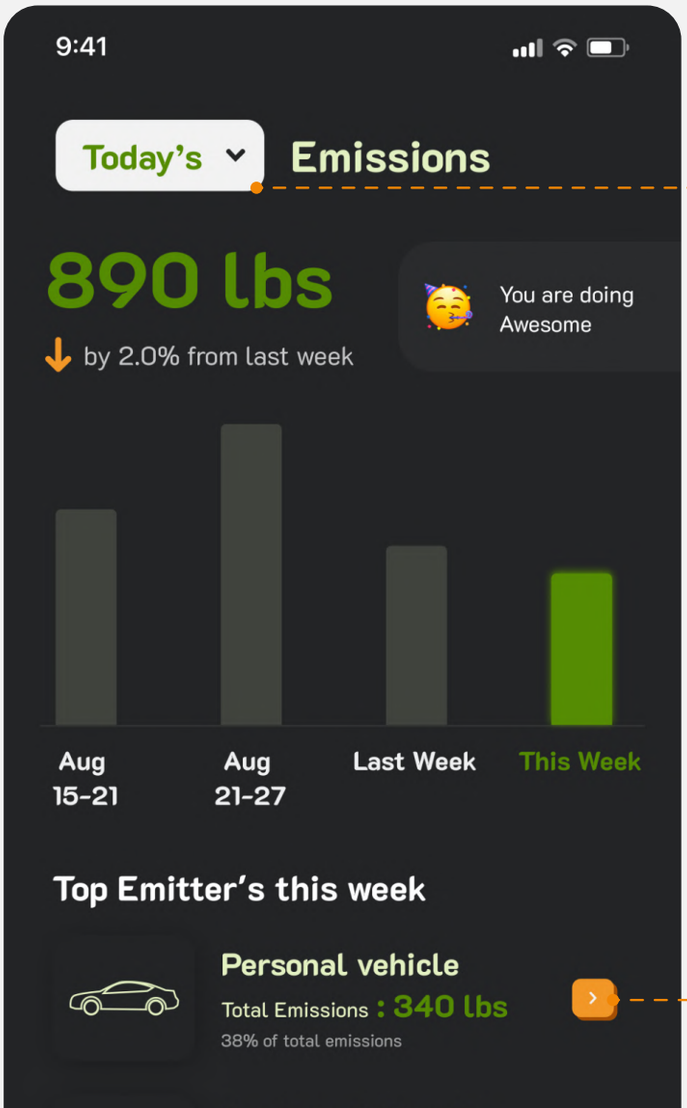
A **small list of eco products** for users to have a look at







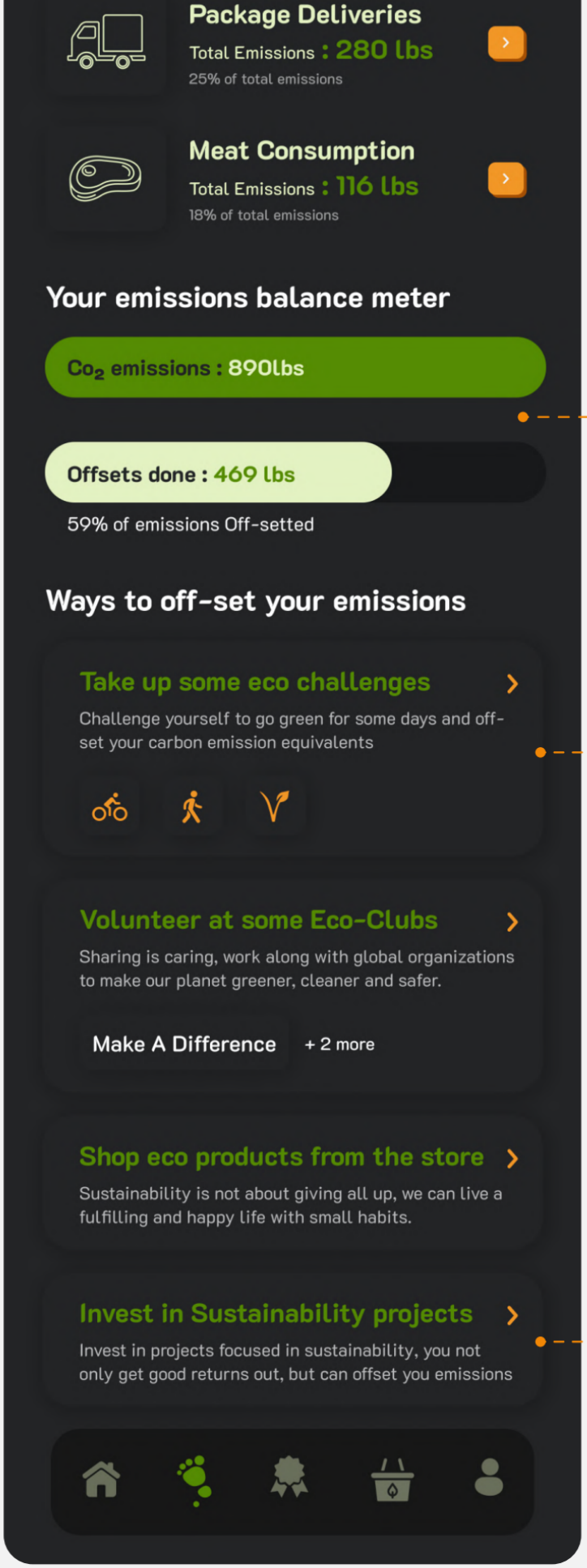
Users can offset emissions and also **earn eco-coins for joining clubs**



Carbon Emissions Page

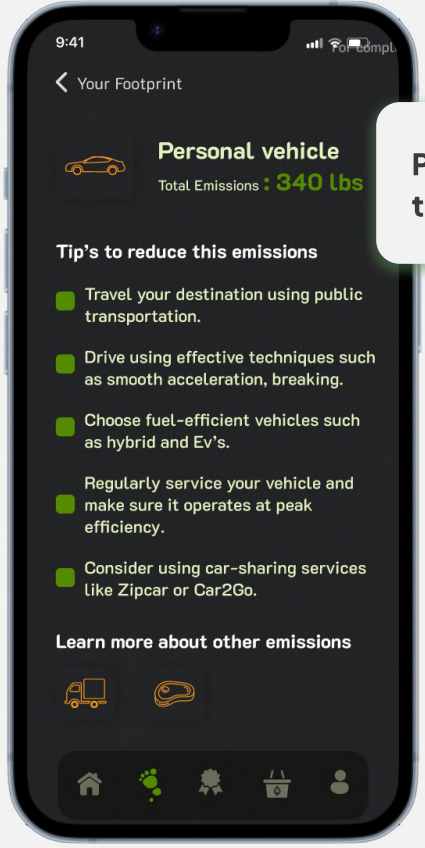
Dropdown filter through which users **can see their weekly, monthly and yearly emissions**

Total emissions for the week or day respectively. **Also, the users could see how to reduce them in detail**



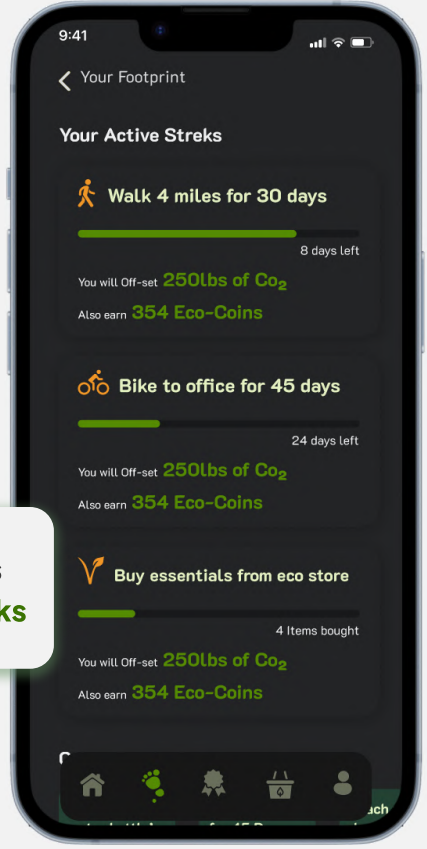
A gamified experience showing your **emissions and offsetting**

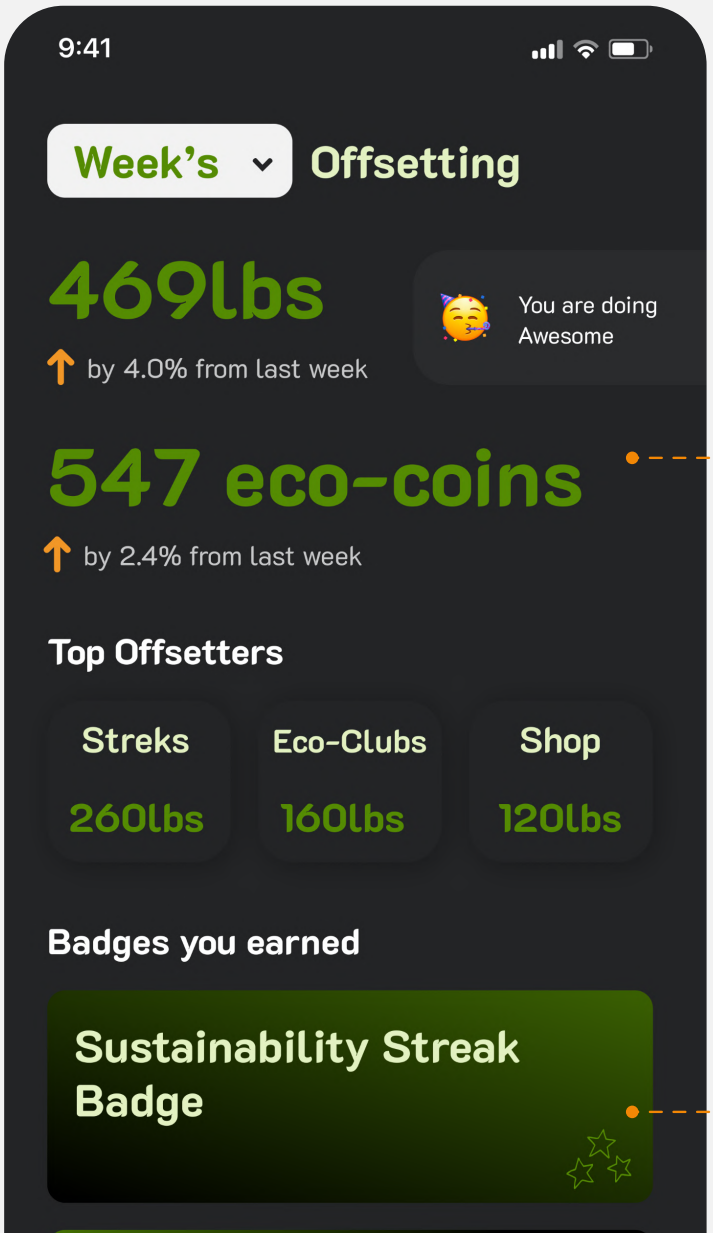
The app shows **different ways** to offset emissions



Personal recommendations to keep carbon emissions in check

One way to offset carbon emissions is through taking up some eco streaks

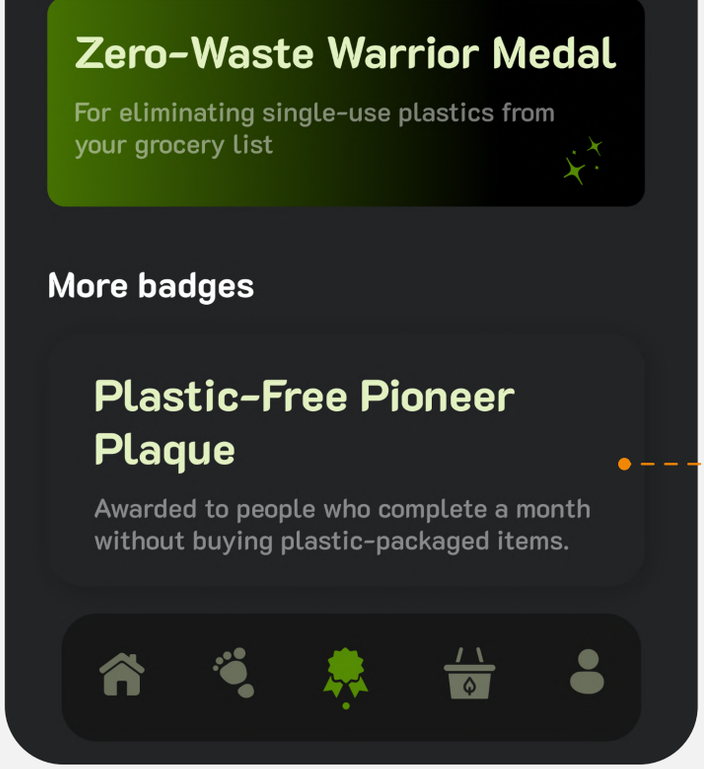




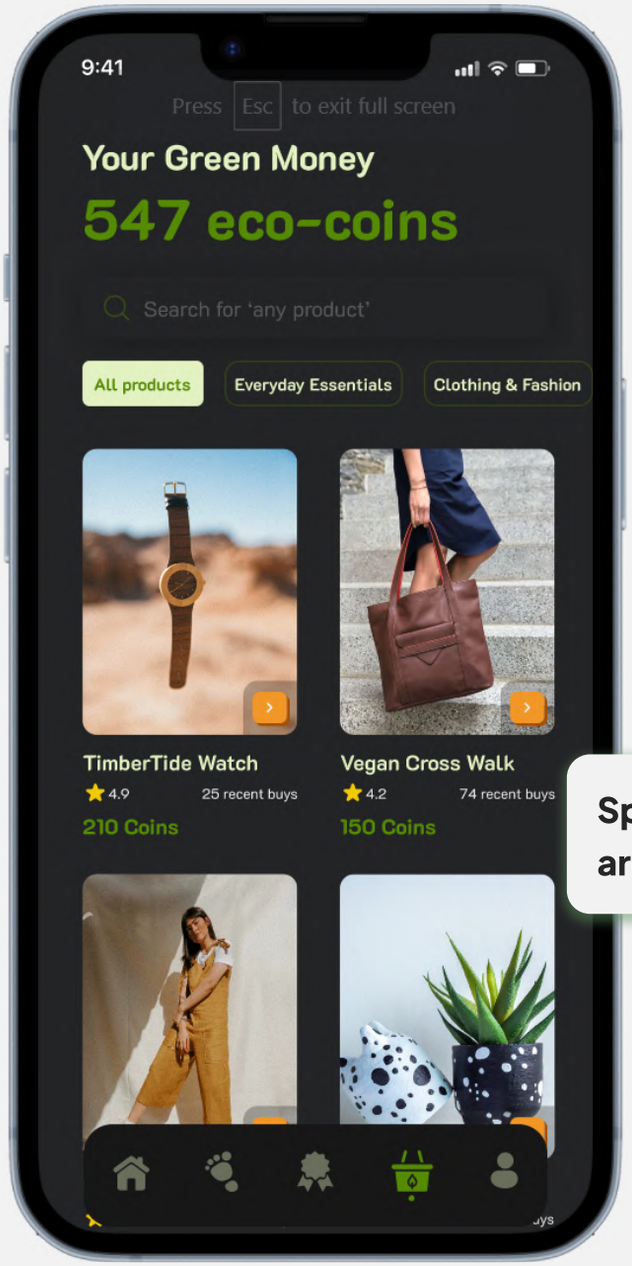
Rewards Page

Incentives, sweet right? Here, users can see their earned coins for offsets

Users receive badges for their effort, these are all earned badges



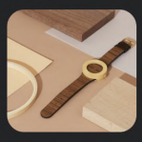
More badges they could uncover



EcoShop Page

Specially curated products that are **made with sustainable materials**

9:41



TimberTide Watch

"Every detail of the Watch is designed with the environment in mind"

100% Bamboo | 99.8 % Recyclable | 0 Emissions | Avg Life Span : 7 years

Price : **210 Coins**

Add to cart ›

The TimberTide Watch is more than just a watch, it's a statement of my commitment to the environment.

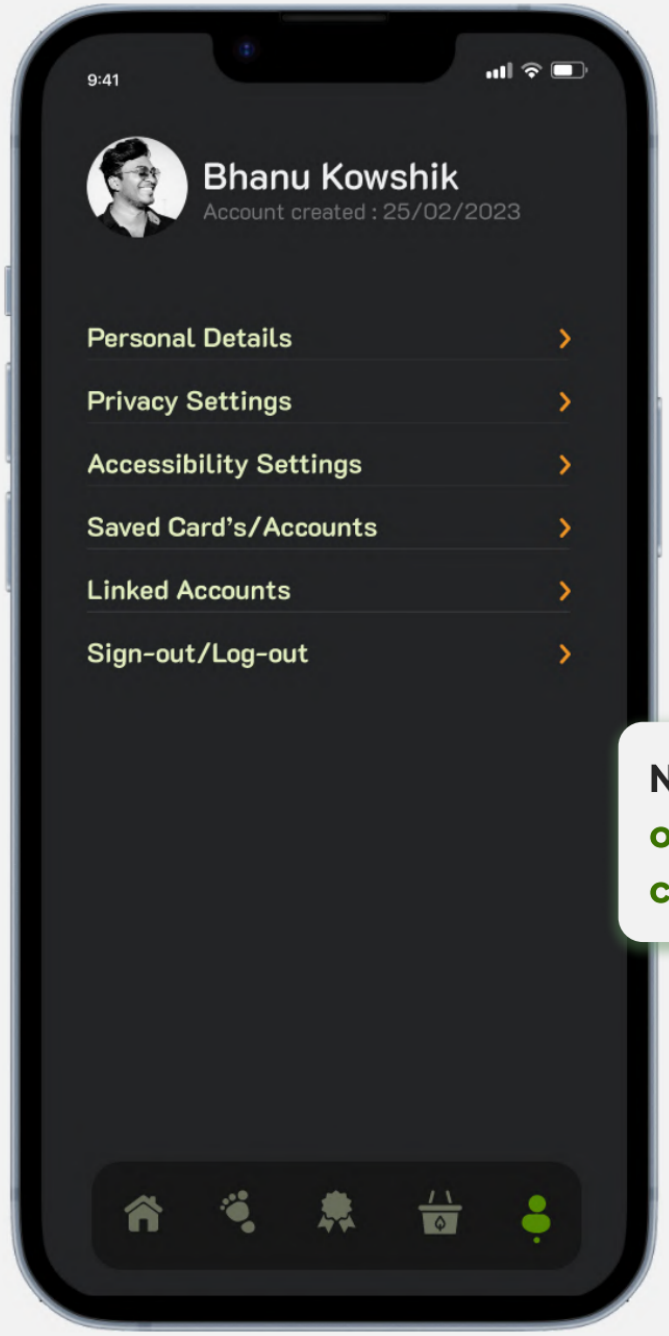
-Mark B-

I can't get enough of my SylvanStyle Timekeeper. It's a conversation starter wherever I go.

-Jake H-

Some metrics for users to **make the product appealing**

Reviews from users who have already used the product



Profile Page

Nothing specific over here, I actually used one of my older designs and changed the color pallet :)

What's good design without a little friendly critique?

Brace yourselves, it's Testing time!

- I Recruited 3 Participants
- I tested In-Person
- I ran the test for 30 -40 min
- I divided the test into scenarios
- I asked 17 questions focusing on ease of use, functionality and effectiveness
- I learned a lot in the process

Me : So, can you look at recommendations the application is recommending to reduce your carbon offsetting and ***let me know your thoughts on them?***

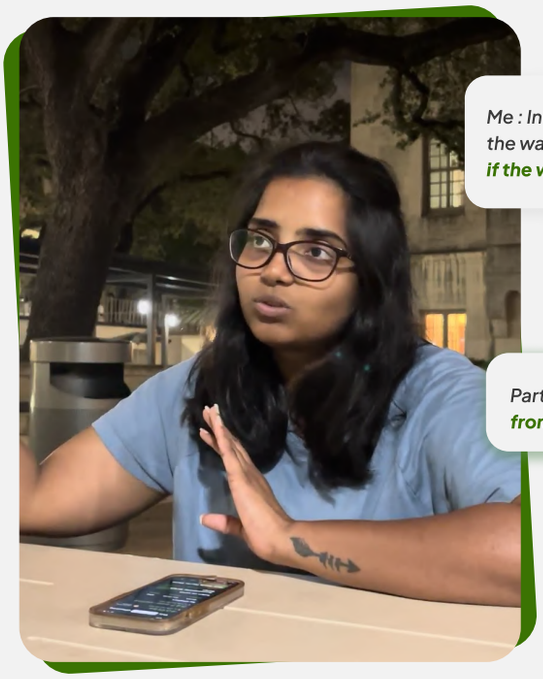
Participant: I feel the recommendations are very generic, the application is recommending me to switch to electric vehicle and it costs me 200k bucks I would not be willing to do so. ***Those recommendations are not personalized to me***

This participant also talked about the recommendations being generic

Me : (After the user had a glimpse through the splash screens)..Can you ***tell me top 3 features the application has.***

Participant : ahhhh, the application ***connects with like minded and also help me build habits.***

Me deep down thinking is it? I didn't design it for that



Me : In the eco product page, you really wanted to buy the watch from your carbon credits, ***how do you know if the watch is actually sustainable?***

Participant: I ***wanted to know where the materials have been sourced from*** *and what makes this product actually sustainable..*

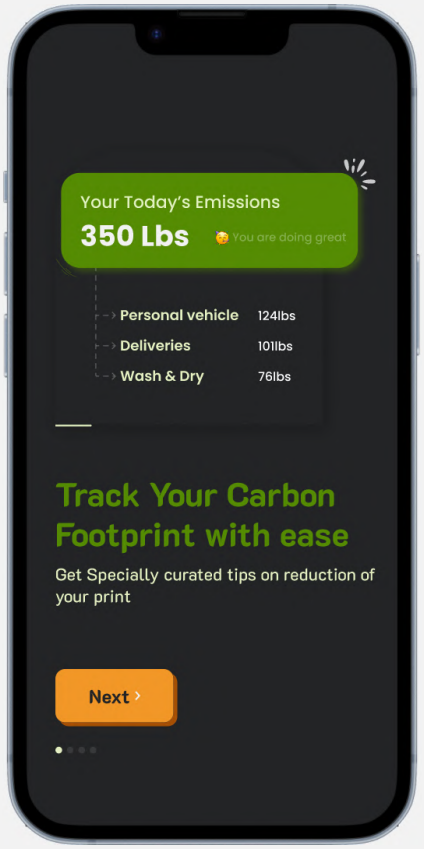
A wise man once said, it's never the users fault, SOOO it's now time for

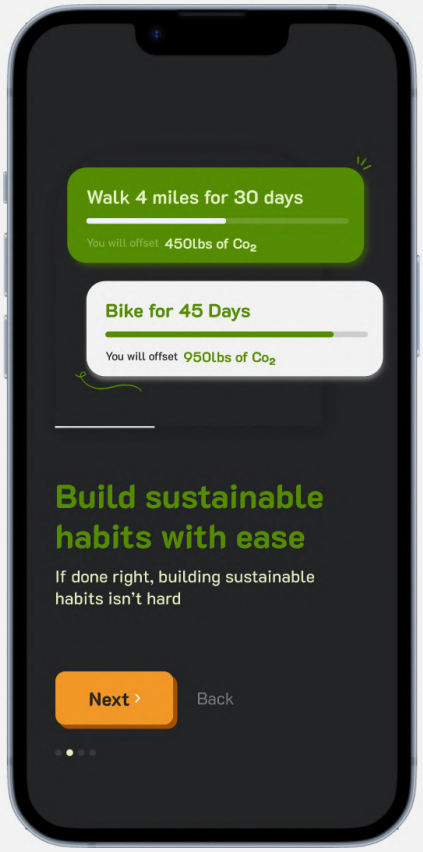
Design Iteration – 02 ...

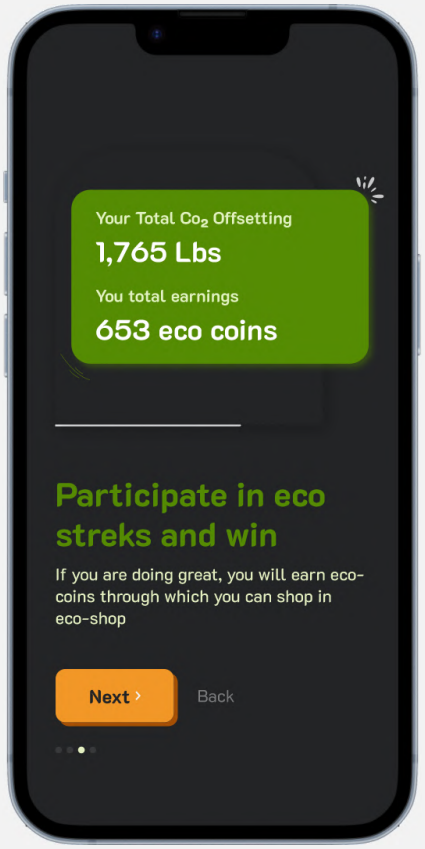
From the above testing, I found out several problems and ideated on an effective solution to solve them. Some problems I found out were...

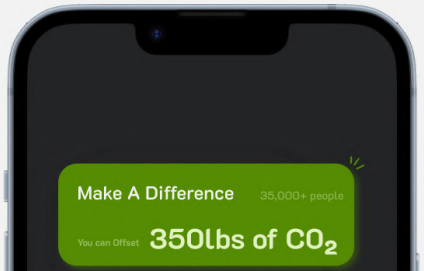
Problem 01 : The splash screens were not conveying proper message on what the application does

Solution : Instead of using graphics, we can use the actual app contents to exactly show what the application does .









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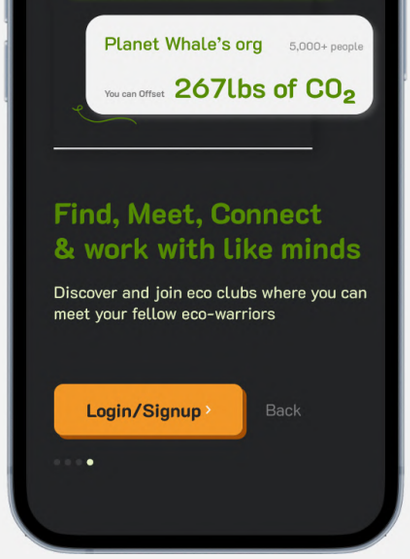
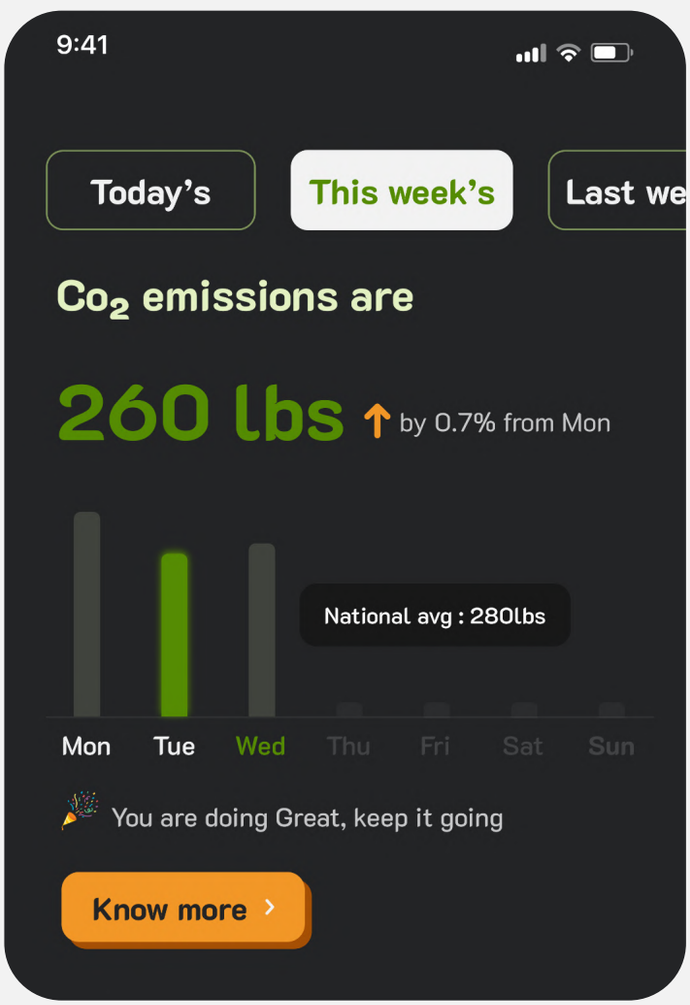


Splash Screen

As you could see, **the screens now show the actual content on the app** rather than graphics, I know the graphics look cuter...

Problem 02 : The Time navigation in the top is a little bit confusing, and the emissions do not show notional average.

Solution : Ok, I get that what if we use slider instead of drop down, along with that on the bar graph, I could also add national average on the graph.



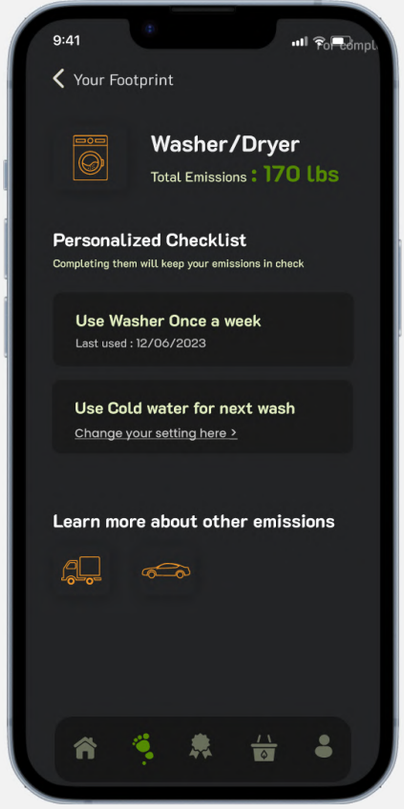
Updated

Home Page

Changed the **dropdown navigation to slider also added national average**

Problem 03 : The recommendations look too general, it would be of great help if they were personalized.

Solution : Say less, I solve problems for living, how hard could it be.... *Actually it was really hard :(*



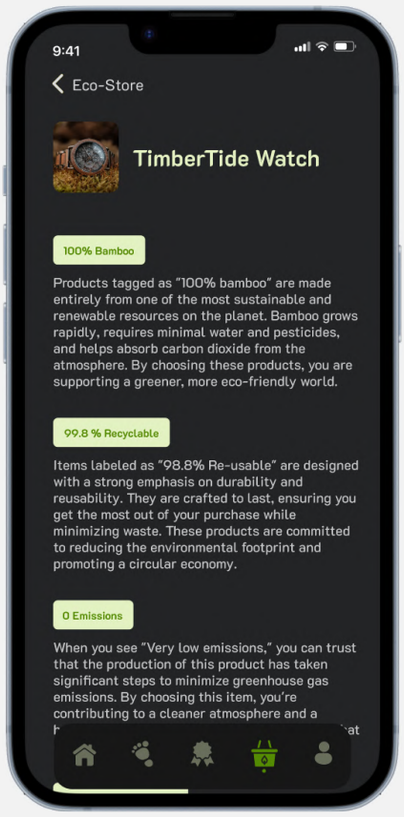
Updated

Recommendations Page

These **recommendations are personalized** based upon user's habits.

Problem 03 : The green products page shows the products are sustainable, but there is no way to validate it.

Solution : What if we add a small description on what makes this product sustainable?



Updated

Sustainable Page

This updated design gives users a little bit more insights on what is making it sustainable.

That's it..... I updated the design

Now what?

Ideally I have to do a 2nd round of testing, but I already...

Spent **8 months** on the project

Spent a **lot of resources** to recruit participants

Spent **700+ Design hours**

It not only hurts when a girl says no, it also hurts when people say no, as you are only trying to interview and test

Read 3 books on habit formation and design

Learned a lot about **carbon footprint and carbon capture**

Let's end the case study with credits

A big shout out too

Proff. Zoltan Nagy
Assistant Professor

Dr. Kara M. Kockelman
Professor, Civil Engineer

Dr. Kenneth R. Young
Professor, Emeritus

Dr. Susan D Hovorka
Research Professor

These are the people who guided me on better understanding the problem and were welcoming when I said that I wanted to solve the problem.

Thank **you**