

Spring – 2025

Group 5

My EcoFriend



Making Carbon Data Meaningful

How “MyEcoFriend” can help reduce transport carbon emissions.

Motivation: Making Carbon Emissions Tangible

Global carbon dioxide (CO₂) emissions have reached record levels, contributing directly to rising global temperatures and intensifying the pace of climate change. In 2023, the average atmospheric CO₂ concentration rose to 419.3 parts per million (ppm), a 2.8 ppm increase from the previous year (NOAA, 2024). At the same time, the Intergovernmental Panel on Climate Change (IPCC) reports that human activity has already caused approximately 1.1°C of warming since pre-industrial times (IPCC, 2023).

Crossing the 1.5°C threshold, now considered increasingly likely, could result in severe and potentially irreversible consequences (IPCC, 2023). These dangers are no longer distant projections. In recent years, the world has faced a wave of extreme climate events: Hurricane Helene brought widespread devastation to Florida in 2024, Hawaii suffered its deadliest wildfires in over a century, and Europe experienced unprecedented heatwaves and drought (NOAA, 2024). These events offer a stark reminder that climate change is no longer a future issue. It is already here.

What these crises reveal is a pressing challenge in the fight against climate change: the lack of individual awareness. Although climate change dominates headlines, most people struggle to understand how their own actions contribute. A major reason is the way emissions data is typically presented - Usually in tons of CO₂ per year. Without context or comparison, this data feels abstract and disconnected for daily life, making it difficult for people to assess their own impact.

To close this gap, we developed “MyEcoFriend”, an app designed to help users interpret their personal transport emissions. The app provides contextual comparisons by displaying a user’s emissions alongside national averages. This allows users to see whether their emissions are above or below the average, making the data more meaningful and motivating users to make changes in their behavior.

While many apps simply track emissions, our app goes a step further by providing concrete comparisons that make emissions more relatable and empowering. Unlike other platforms that focus on raw data, “MyEcoFriend” is designed to be user-friendly, with clear feedback on how personal behavior compares to national benchmarks.

“MyEcoFriend” operates on a business model that ensures both accessibility and growth. The app is free, providing users with essential features such as tracking emissions and comparing them to national averages. We will support the app’s growth through advertising revenue, ensuring its long-term sustainability while keeping it accessible to everyone. For users seeking deeper insights, we offer premium features through a subscription. This model allows us to continually improve the app’s functionality while maintaining free access to core features for all users.

Currently, “MyEcoFriend” tracks emissions and compares them to national averages in the Nordic countries as well as USA and China, with plans for future updates that will include national averages from additional countries. This will help users globally gain a better understanding of their emissions, raise awareness across regions and enable them to make more informed decisions to reduce their carbon footprint.

Our Methodology - Calculating CO₂ from transport emissions

Pollution per submission:

The main formula we will be using for calculating the user's emissions is that emissions in CO₂ is equal to Distance traveled times chosen vehicle's emission per kilometer divided by the number of passengers in the vehicle if applicable. Mathematically this formula can be written as such:

$$E = D * V / N$$

Where:

E = CO₂ Emission (in grams)

D = Distance traveled (in kilometers)

V = Vehicle's pollution per kilometer (in grams of CO₂ per kilometer)

N = Number of passengers in the vehicle (if applicable)

Example calculation:

Let's say a user drives 20 kilometers to work each day with a medium diesel car that emits 160 grams of CO₂ per kilometer, and the car has 2 passengers. The emissions per person for one trip would be calculated as:

$$E = 20 \text{ km} \times \frac{160g}{2} = 1600 \text{ g CO}_2$$

Vehicles pollution per kilometer (V)

To ensure transparency and accuracy, the table below presents the CO₂ emission factors applied in *MyEcoFriend* when calculating users' transport-related carbon footprints. The emission data provides the foundation for all calculations within the app and allows users to receive tailored and reliable feedback on the environmental impact of their travel habits.



Medium Diesel Car:

160g CO₂/km.

Medium Gasoline Car:

240g CO₂/km.

Electric SUV:

25g CO₂/km.

Small Electric Car:

14g CO₂/km

Traffic significantly increases these numbers. All sources from

[VY](#)

$$E = D \times \frac{(160g/240g/25g/14g)}{N}$$



Railway Long Range:

31g CO₂/km

- [Navit](#)

Railway Local:

58 g CO₂/km

- [Navit](#)

Electric train:

10g CO₂/km

- [VY](#)

$$E = D \times \frac{(31g/58g/10g)}{1}$$



Small Gasoline Motorbike: 82.77 g CO₂ per km

- [Thrustcarbon](#)

Medium Gasoline Motorbike:

100.86 g CO₂ per km

- [Thrustcarbon](#)

Large Gasoline Motorbike: 132.37 g CO₂ per km

- [Thrustcarbon](#)

$$E = D \times \frac{(82,77g/100,86g/132,37g)}{N}$$



Diesel Bus: 27g CO₂/km.

- [VY](#)

Electric Bus: 13g CO₂/km.

- [VY](#)

$$E = D \times \frac{(27g/13g)}{1}$$



Commercial Airplane

236 g CO₂ per km

- [Navit](#)

$$E = D \times \frac{(236g)}{1}$$



Diesel-Powered Ferries:

123 g CO₂ per km

- [Navit](#)

$$E = D \times \frac{(123g)}{1}$$

To ensure accuracy and transparency, MyEcoFriend uses emission data from reliable sources when calculating the pollution per kilometer of a vehicle:

- 1) [Navit](#) in which they use the calculations the German Umweltbundesamt or Federal Environment agency uses and is the numbers we use for trains, buses, airplanes and ferries.
- 2) [Thrustcarbon](#) uses the UK Government's Department for Environment, Food and Rural Affairs' numbers from 2020 and is the numbers we use for motorcycles.
- 3) [VY](#) is the Norwegian railway service and is the source we use for car and bus pollution as well as electric trains.
- 4) Walking and biking is assumed to have zero carbon emissions.

Number of passengers (N)

The number of passengers, N, will only be applicable for cars and motorcycles. For public transport such as buses and trains, we use the average emissions per passenger provided by the data sources. This implies that N will become 1 and can be disregarded.

Total carbon emissions

The user's total carbon emissions can be calculated as a sum of all E_i they input into our databases. This means that users can log their daily transport choices, and the app will calculate their total emissions. The total CO₂ burden is calculated by summing up the emissions for each trip:

$$TOTE = \sum_{i=1}^n E_i$$

$TOTE$ = Total CO₂ emissions for the user (in kg)

E_i = CO₂ emissions from each individual trip in the app

n = Number of trips logged by the user,

i = Amount larger than 1

This can be compared to the calculated average in each country mentioned above and can be an interesting benchmark for the user to see how they compare to others.

The formula for comparing your total emissions to the national average is:

$$\text{Comparative pollution} = \frac{TOTE}{A}$$

A = National average transportation emissions per person (in kg per year)

Comparative pollution = shows the ration of the user's emissions to the average. A result below 1 indicates lower emissions than the average, while a result above 1 indicates higher emissions.

Example calculation:

If the national average for yearly emissions is 1000 kilograms of CO₂, and the total emission is 1500 kilograms, the comparison would be:

$$\text{Comparative pollution} = \frac{1500kg}{1000kg} = \mathbf{150\%}$$

This means that the user's emissions are 50% higher than the national average.

Equivalent CO2 emissions

In order to better visualize the impact your pollution is making, we also help calculate the equivalent CO2 emissions your trip pollutes in terms of the amount of CO2 used in the production of beef (kg) or jeans (pairs). We assume that 1 pair of Levi's 501 jeans is roughly equivalent to 33,4 kg of CO2 and 1kg of beef is equivalent to 27 kg of CO2, where 27 kg is a very conservative number with higher estimates closer to 60 kgs of CO2.

Source for jeans: Levi Strauss & Co. 2015 sustainability report, page 17: [levistrauss](#)

Source for beef: [josephpoore](#)

Comparison Benchmarks "My Eco Friend" (A)

To help users better understand the significance of their carbon footprint, *MyEcoFriend* provides a comparison with average emissions at both the national and international level. This contextual reference allows users to see whether their emissions are above or below average, offering a more meaningful and motivating insight than raw numbers alone. The data presented below serves as the benchmark for the user comparison to average transport emissions in Norway. As our country of operations, Norway will serve as the main benchmark. As we will go further in depth later our main customer segment is EU citizens, especially those from the Nordic countries. To accommodate said demographic we have also added the ability for the user to compare their emissions to the average Swede, Dane and Fin. Said numbers we have calculated from a 2022 Statista survey showcasing each countries total transport emissions. A number which we subsequently divided by the country's population. To give our application a further international scope and to enable future expansion we also provide the user with the ability to compare their emissions to that of the average American and Chinese person. As the two largest industrial countries in the world, comparing oneself to these two countries might provide further context to the user. American transport emissions for 2022 have been taken from the EPA (Environmental protection agency), an American government entity. This number is again divided by their 2022 population. For the Chinese emissions we had to use a third-party observer as the Chinese government are quite secretive regarding their emissions. This number is therefore an estimate, and is not guaranteed to be exactly accurate. All the sources have been linked at the bottom of the paper.

In total we have found said numbers: All are measures in metric tons of Co2 equivalents in 2022 numbers, i.e 2.248 (t) equals 2 248kg Co2 equivalents.

Average annual CO2 emission per capita

Norway = 2,248 (t)

Sweden = 1,4 (t)

Denmark = 2.038 (t)

Finland = 1,76 (t)

USA = 5,328 (t)

China = 0,658 (t)

(Statista, Sweden, 2023) (Statista, Denmark, 2023) (Statista, Finland, 2023) (EPA, 2024)
(Climatechange.cn, 2023)

From Data to Impact: Our Business Plan

Our Purpose

"MyEcoFriend" is a mobile application designed to help individuals track their personal carbon emissions and understand their environmental impact. We want to help everyday people become more conscious of their carbon footprint and support international sustainability goals. Every step matters! The core feature of the app allows users to compare their emissions with national and regional averages. By providing this comparative data, the app makes carbon emissions tangible, motivating users to take actionable steps towards reducing their carbon footprint. The business model is centered around engaging users through simple, relatable data and a gamified experience, with clear pathways to growth and scalability.

Business Idea

The business idea behind "MyEcoFriend" is simple but impactful: empower individuals to understand and reduce their carbon emissions by showing how their personal footprint compares to national and regional averages. Many people struggle to understand the significance of their carbon footprint because emissions data is often presented in abstract terms (e.g., tons of CO₂ per year). "MyEcoFriend" addresses this challenge by providing contextual, visual comparisons that make the data more meaningful and accessible. By focusing on personal emissions against national and regional benchmarks, we help users understand how their everyday choices contribute to the environment. This clarity encourages behavioral change and empowers users to take steps towards reducing their carbon impact. Our mission is to help users reduce their carbon footprint by 10% within the first six months of regular use, based on tracking and comparison of their emissions over time.

Customer Segments

The primary target market for "MyEcoFriend" consists of tech-savvy, environmentally-conscious individuals aged 20–40 years who are already aware of climate change and are motivated to reduce their environmental footprint. These individuals typically live in urban areas and use public transport, a key measure that the app tracks. They are likely to be early adopters of apps that help with sustainability.

While the initial focus will be on the Nordic markets, we will look at including more European nations where there is growing awareness of sustainability issues. Even further down the road, the plan is to eventually scale the app to greater parts of North America and Asia, offering localized versions for each region. The goal is to expand the user base by targeting young professionals, students, and families who want to track and reduce their environmental impact in a simple and engaging way.

Value Proposition

"MyEcoFriend" delivers unique value by transforming carbon emissions data from an abstract concept into something concrete and actionable. The app offers:

Current Value Proposition
1. Personalized emissions tracking with comparisons to national averages.
2. Easy and user-friendly app through the implementation of quick-log of recurring trips, and a use friendly interface. (Clear instruction & intuitive layout)

In addition to the above approach which has already been done in our app, we also plan to add further functions:

Future Value Proposition
1. Actionable insights on how users can reduce their carbon footprint, including transport and lifestyle changes.
2. Gamification features, such as carbon scoreboards, monthly challenges and carbon-neutral rewards, to keep users engaged and motivated.

What sets "MyEcoFriend" apart from other apps is its focus on actionable, contextual feedback. While most carbon tracking apps simply track emissions, our app empowers users by providing them with personalized advice based on their actual emissions and how they compare to others in their region.

Business Model

"MyEcoFriend" will, when launched, operates under a **freemium model**:

- **Free Version:** Provides users with basic features such as carbon tracking and comparison to national averages.
- **Premium Subscription:** Offers advanced features, such as personalized carbon reduction plans, detailed emission breakdowns, and historical data comparisons.
- **Ad Revenue:** The free version of the app will generate revenue through ads, which will be displayed to users who choose not to pay for a subscription.
- **Data Licensing:** In addition to these revenue streams, as the user base grows, anonymized user data will be offered to sustainability-focused institutions for research purposes, providing an additional revenue stream in the future.

Growth Strategy

Phase 1 (Year 1):
Initial roll-out. The first year will see a full-scale push into more Northern European city centers. We will promote it through social media with other environmental groups and influencers. We hope to reach 10,000 members within a year as a foundation for future growth.
Phase 2 (Year 2):
Expansion with new features. Next year, the app will be rolled out in larger parts of North America and Asia, adding data on adapted national carbon emissions. In addition, we will be adding gamification features (e.g., carbon scoreboards, emission reduction challenges), to build habits and encourage users to participate in our app and then achieve 30,000 users.
Phase 3 (Year 3):
Global Expansion and institutional collaboration. We will focus on global expansion in Year 3, with the goal of having 50,000 active end users worldwide, and with a number of companies to establish strategic alliances. We hope to make this important step happen by helping companies with their projects or by studying data empowerment in the sustainability planning departments of colleges and universities, or we can help them solve their corporate problems with our carbon-tracking tools. And the business group also needs staff to be able to challenge employees to use the app to foster green living activities.

My Eco Friend's growth plan is divided into 3 phases to achieve steady growth, interaction enhancement, and enabling useful connections.

Marketing and User Acquisition

Considering our first target is young generations from 20-40, the marketing strategy will focus mainly on social media, which can effectively catch customers' attention and help us strengthen a sustainable impression. We plan to take the following measures in SNS:

- **Advertisements:** Instagram, Facebook and Messenger to increase tangibility.
- **Referral Programs:** Offer rewards or incentives for users who refer others to the app.
- **Influencer and Environmental NGOs Partnerships:** Collaborate with well-known sustainability influencers and NGOs to reach a larger audience.

In the first 6 months, we aim to acquire 2,000 users through these projects. Our estimated user acquisition cost is 25 NOK per user.

In addition to this program, for the long-term expansion of phase 3, in the future, we also plan to do

- **Corporate Collaborations:** Develop partnerships with companies to include "MyEcoFriend" in their employee wellness programs or corporate social responsibility (CSR) initiatives.

Financial Projections

The financial projections for the first three years are as follows:

Year 1: Ad Revenue: 50,000 NOK (10,000 active users * 5 NOK per user per month) Premium Revenue: 100,000 NOK (5% conversion rate of 10,000 users * 20 NOK/month * 12 months) Total Revenue Year 1: 150,000 NOK
Year 2: Ad Revenue: 90,000 NOK (30,000 active users * 5 NOK per user per month) Premium Revenue: 360,000 NOK (5% conversion rate of 30,000 users * 20 NOK/month * 12 months) Total Revenue Year 2: 450,000 NOK
Year 3: Ad Revenue: 150,000 NOK (50,000 active users * 5 NOK per user per month) Premium Revenue: 600,000 NOK (5% conversion rate of 50,000 users * 20 NOK/month * 12 months) Total Revenue Year 3: 750,000 NOK

Cost Structure

To ensure financial sustainability and scalability, we anticipate the following costs in the first three years:

Cost Type	Year 1	Year 2-3
App Development	40 000 – 60 000 NOK	10 000 – 30 000 NOK (project cost 40 00 nok)
Marketing	30 000 – 60 000 NOK	30 000 – 60 000 NOK (CPC 2 nok x 30 000)
Server Costs	5 000 – 11 000 NOK	10 000 – 20 000 NOK (\$65.98 per month x 12)
Operational Costs	10 000 – 24 000 NOK	15 000 – 30 000 NOK (app developer 200 per hour x 120 hours)
Total Costs	85 000 – 155 000 NOK	65 000 – 140 000 NOK

Expected Profit

From revenue streams and cost structures, we calculate expected profits for the first 3 years as follows:

	Year 1	Year 2	Year 3
Revenue	150 000 NOK	450 000 NOK	750 000 NOK
Costs	85 000 – 155 000 NOK	65 000 – 140 000 NOK	65 000 – 140 000 NOK
Expected Profit	30 000 NOK	347 500 NOK	647 5000 NOK

Conclusion

MyEcoFriend will be one of the sustainability apps that makes tracking and reducing carbon emissions intuitive and interactive. This application will make this invisible data useful and actionable. By focusing on engagement, scalability, and lasting impact, it can not only tell users what their emissions are doing, but also encourage them to apply new habits in their daily lives. As MyEcoFriend grows its applications and expands its database into new areas and improves its comparison tools, it has the potential to help create a more responsible society. Bridging the gap between individual responsibility for one's own life and individual responsibility for society has great potential in combating climate change. "MyEcoFriend" will help everyone make a contribution to protect the earth-simply, clearly and powerfully.

Connecting the dots: Business Model Canvas (overview)

Key Partners Year 1 (launch) - NGO - Influencers - Year 2,3 (expand and global scaling) - Corporates - Educational institutions	Key Activities - Help better understand and track their personal carbon emissions - Achieve the optimization of the entire industrial link - Bring awareness of emission reduction into daily life	Value Proposition Core - Promote environmental awareness - Calculate carbon emissions - Provide practical recommendations - Personalized emissions tracking - Actionable insights - Gamification features	Customer Relationship - User friendly analytics - Mutual communication through social media	Customer Segments Year 1 (launch) - Individuals <ul style="list-style-type: none">➤ 20-40➤ Environmental conscious➤ EU citizens (Nordic - base) Year 2,3 (expand and global scaling) - Individuals <ul style="list-style-type: none">➤ North America, Asia➤ Worldwide - Sustainable-focused institutions
	Key Resources - Methodology technology - Data of Carbon Emission		Channels Year 1 - Social Media Year 2,3 - Corporate Collaborations	
Cost Structure - App Development - Marketing - Server Costs - Operational Costs		Revenue Streams - AD fee - Premium subscription - Data licensing (in the future)		

Sources

- Appinventiv. (2025). Hentet fra <https://appinventiv.com/guide/mobile-app-development-cost/>
- AWS. (2025). Hentet fra <https://aws.amazon.com/amplify/pricing/>
- Climatechange.cn. (2023). *Analysis of carbon emission level and intensity of China's transportation industry and different transportation modes*. Hentet fra <https://www.climatechange.cn/EN/10.12006/j.issn.1673-1719.2022.183>
- CO., L. S. (2015). *The life cycle of a jean*. Levi Strauss & CO.
- EPA. (2024). Hentet fra Fast facts transportation greenhouse gas emissions: <https://www.epa.gov/greenvehicles/fast-facts-transportation-greenhouse-gas-emissions>
- IPCC. (2023). Hentet fra <https://www.ipcc.ch/report/ar6/syr/resources/spm-headline-statements>
- Navit. (2024). Hentet fra <https://www.navit.com/en/home>
- NOAA. (2024). *climate.gov*. Hentet fra <https://www.climate.gov/news-features/blogs/beyond-data/2024-active-year-us-billion-dollar-weather-and-climate-disasters>
- NOAA. (2024). *Climate.gov*. Hentet fra <https://www.climate.gov/news-features/understanding-climate/climate-change-atmospheric-carbon-dioxide>
- Poore, J. (2018). *Reducing food's environmental impacts through producers and consumers*.
- SSB. (2024). Hentet fra <https://www.ssb.no/befolkning/faktaside/befolkningen>
- Statista. (2023). Hentet fra Denmark: <https://www.statista.com/statistics/411855/annual-greenhouse-gas-emissions-of-the-transport-sector-in-denmark/>
- Statista. (2023). *Annual greenhouse gas emissions from fuel combustion in the transport sector in Sweden from 2013 to 2022*. Hentet fra <https://www.statista.com/statistics/411915/annual-greenhouse-gas-emissions-of-the-transport-sector-in-sweden/>
- Statista. (2023). *Finland*. Hentet fra <https://www.statista.com/statistics/411914/annual-greenhouse-gas-emissions-of-the-transport-sector-in-finland/>
- Statista. (2023). *Sweden*. Hentet fra <https://www.statista.com/statistics/411915/annual-greenhouse-gas-emissions-of-the-transport-sector-in-sweden/>
- Statista. (2024). Hentet fra <https://www.statista.com/statistics/1409918/meta-cpc-europe/>
- Thrustcarbon. (2021). Hentet fra https://thrustcarbon.com/insights/how-to-calculate-motorbike-co2-emissions?utm_source=chatgpt.com
- United Nations. (2023). Hentet fra <https://esa.un.org/unpd/wpp/>
- Vy. (2023). Vy. Hentet fra Års- og bærekraftsrapport 2023: <https://www.vy.no/files/eyx1eny7/vyno-production/0591b054bc7ae666950b9eb595e176bf56c826de.pdf>
- WebFX. (2025). Hentet fra https://www.webfx.com/social-media/pricing/how-much-does-facebook-advertising-cost/?utm_source=chatgpt.com
- Worldometer. (2022). Hentet fra https://www.worldometers.info/co2-emissions/norway-co2-emissions/?fbclid=IwZXh0bgNhZW0CMTEAAR7Hqqa80Nimnz7lFYEXdW1yld5bTjHEi0jD_22iARryedWaDdZnR4Qqhn5eEw_aem_59Q29etEBDlcOsBr_mZeeg
- Worldometer. (2023). *Norway Co2 emissions*. Hentet fra <https://www.worldometers.info/co2-emissions/norway-co2-emissions/>