EcoTrace

AI-Powered Carbon Optimization Platform

“Your personal path to carbon zero”

Introduction to EcoTrace

EcoTrace is an AI-powered tool designed to help people track and reduce their carbon footprint, giving users personalized, real-time tips they can actually act on.

Its purpose is to translate the often vague concept of a carbon footprint into clear, everyday choices that anyone can make, helping turn good intentions for the environment into real actions.

EcoTrace aims to make reducing your carbon footprint easier, more motivating, and meaningful by:

- Connecting real-time data from devices
- Using AI to encourage positive behaviors
- Mapping local resources for sustainable choices
- Adding elements like social challenges and gamification

Existing Solutions - Overview and Limitations

Current carbon footprint tracking apps include:

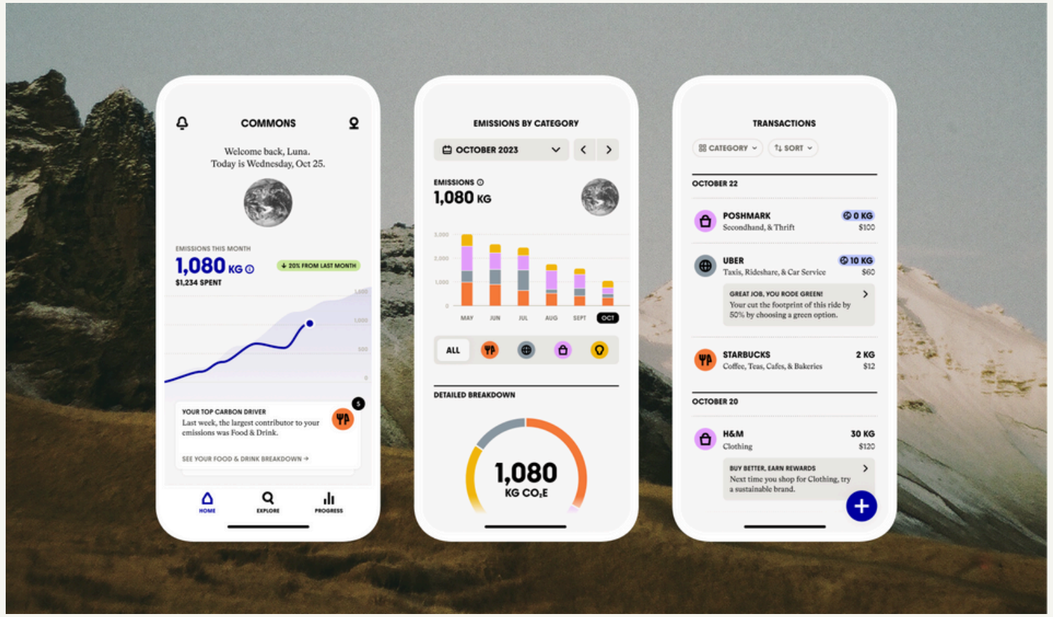
Commons (Joro) | **Klima** | **CoolClimate** | **Greenly**

Earth Hero

Key limitations of existing solutions:

- Input fatigue - requires constant manual data entry
- Lack of contextual intelligence - generic recommendations
- Limited integration with real-world systems and devices
- Fail to bridge the gap between intention and action

These limitations result in low user engagement and minimal real-world impact on carbon reduction.



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EcoTrace Key Features

EcoTrace offers an innovative approach to carbon footprint reduction through four key features:

— Real-time IoT Integration

Connect with smart home devices, vehicle telematics, and mobile sensors to gather environmental behavior data without manual input.

—— Behavioral AI Engine

Learn individual patterns, predict optimal intervention points, and provide personalized recommendations for carbon reduction.

--- Local Infrastructure Mapping

Integrate with local public transport APIs, renewable energy availability data, and sustainable vendor networks to offer hyper-localized advice.

—- Gamification with Social Impact

Convert carbon savings into tradeable credits for local environmental projects, fostering sustained engagement and tangible community impact.

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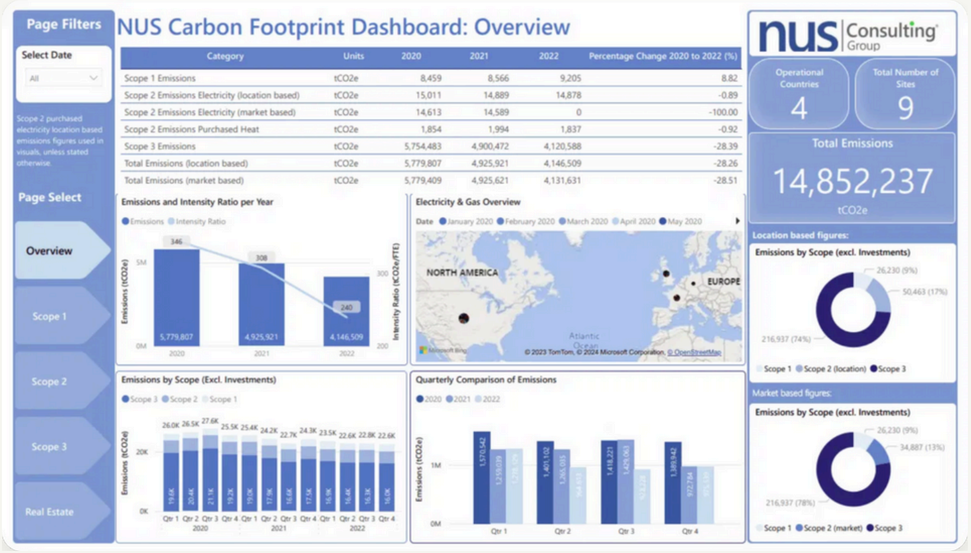
Comparison: Existing vs. Proposed Solution

Feature	Existing Solutions	EcoTrace
Real-time IoT Integration	Limited or manual data input	**Extensive real-time integration with devices**
Behavioral AI	Basic or rule-based recommendations	**Advanced AI for personalized recommendations**
Local Infrastructure	Minimal location-based advice	**Hyper-localized contextual advice**
Gamification	Simple points/badges system	**Carbon credits for environmental projects**
Personalization	Generic advice, high user input	**Context-aware, personalized guidance**
Input Fatigue	High, manual data entry	**Low, automated data collection**



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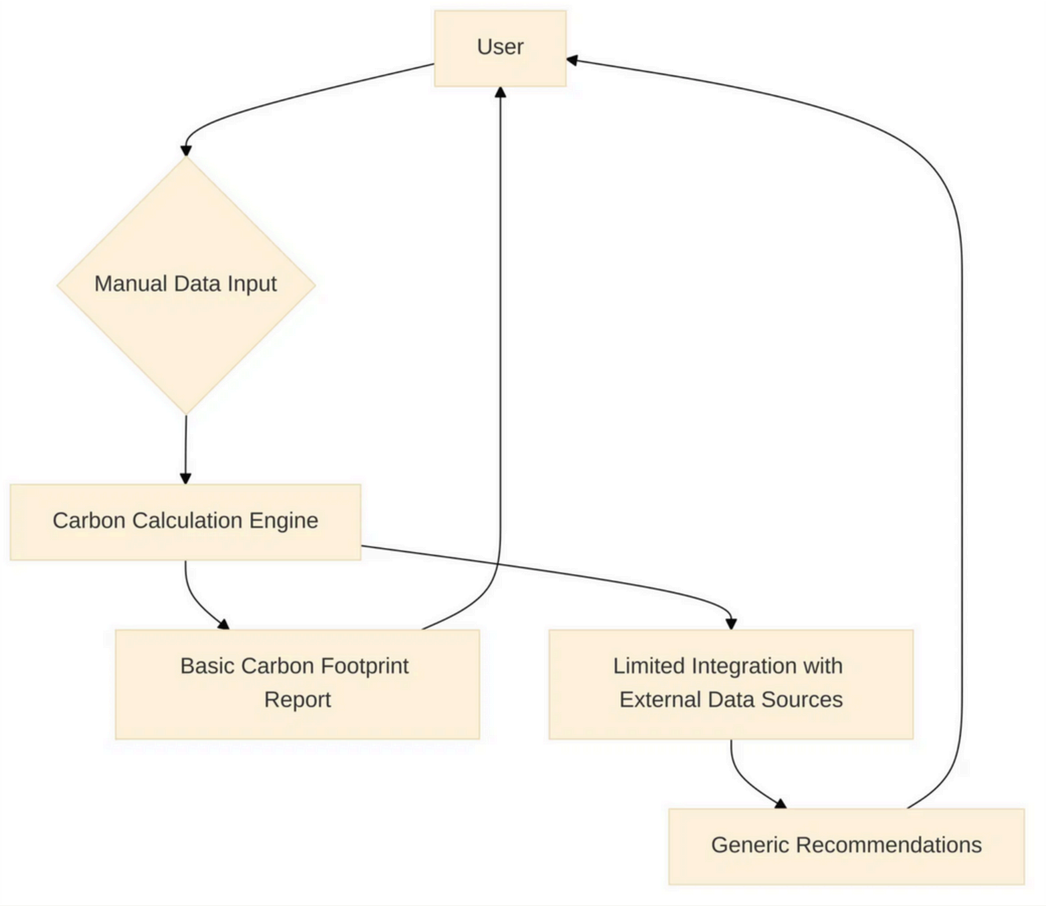
Existing Solution Architecture

Current carbon tracking applications typically rely on a simple architecture with limited integration capabilities and manual data input requirements:



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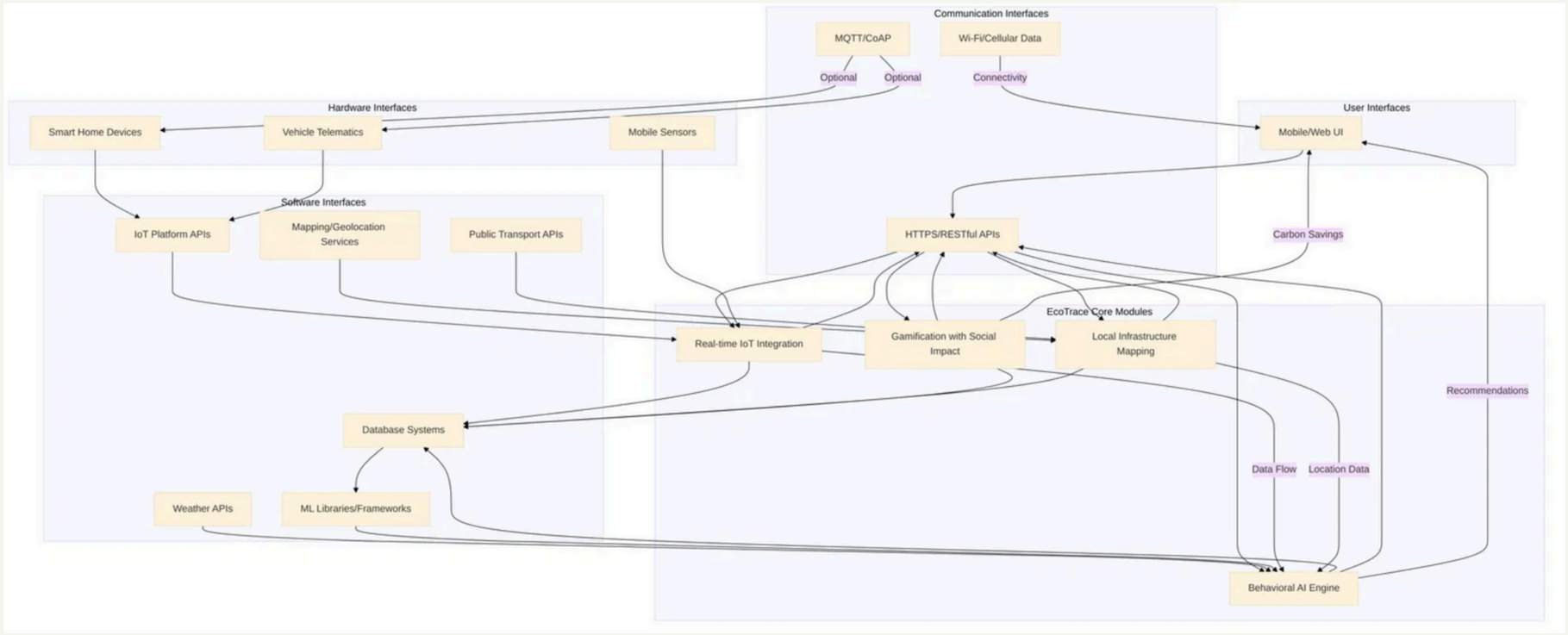
EcoTrace Solution Architecture

EcoTrace features a comprehensive, integrated architecture that connects multiple data sources and leverages AI to deliver personalized carbon optimization:



User Interfaces
Mobile/Web UI

Hardware Interfaces
Smart Home, Vehicle, Sensors

Software Interfaces
IoT, Mapping, Transport, Weather APIs

Communication
HTTPS, MQTT, Wi-Fi/Cellular

Core Modules
IoT Integration, AI Engine, Mapping, Gamification

Real-time IoT Integration

EcoTrace eliminates **input fatigue** by automatically collecting data from connected devices, providing real-time insights without manual entry.

Smart Home Devices

Smart meters, thermostats, and lighting systems provide energy consumption data for accurate home carbon footprint calculation.

Vehicle Telematics

OBD-II dongles and in-car systems track driving behavior and fuel consumption for transportation impact analysis.

Mobile Sensors

GPS and accelerometer data automatically detect transportation modes and activities for comprehensive lifestyle tracking.

Gamification with Social Impact

EcoTrace transforms carbon reduction into a **rewarding experience** with real-world impact, moving beyond simple badges and points to create meaningful engagement.

1

Carbon Savings Calculation

EcoTrace accurately calculates the carbon savings achieved through individual user actions based on real-time data.

2

Credit Conversion

Carbon savings are converted into a quantifiable credit system that users can track and accumulate over time.

3

Local Project Allocation

Users can allocate their earned credits to pre-defined local environmental projects of their choice.

4

Community Impact

The collective impact of user contributions to local environmental projects is tracked and displayed, creating a sense of shared achievement.

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Patent Analysis

Relevant Patent Landscape

- Carbon footprint calculations in multi-stage product lifecycles (US20250245674)
- Carbon-aware code optimization (US11803375B2)
- Carbon footprint tracker (US20210224819A1)
- Carbon neutrality management platform (WO2011106160A2)

Pros of EcoTrace's Approach

- Novel integration of IoT, AI, and local infrastructure mapping
- Unique gamification with tangible environmental impact
- Differentiated behavioral AI engine approach

Challenges to Consider

- Crowded patent space in carbon tracking
- Potential overlap with existing carbon calculation patents
- Need for freedom-to-operate analysis

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References

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