Project Name: Verdant

Tagline: Lower Carbon, Lower Rent

Category Tags: Real Estate, Sustainability, Technology

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Github link: https://github.com/DLee0207/Verdant

Detailed Description:
Buildings are responsible for nearly 40% of global carbon emissions, but tenants, the people responsible for the majority of a building's energy use, rarely see or think about how their behavior impacts sustainability. They have no feedback loop or incentive to reduce emissions. Meanwhile, landlords face rising pressures from ESG standards, energy regulations, and carbon-related fines, but lack tools that engage tenants and meaningfully reduce usage. There is currently no system that aligns incentives between tenants and landlords to lower carbon emissions in a positive, transparent, and measurable way. Verdant bridges this gap by aligning incentives and transforming energy reduction into a shared benefit.

Verdant measures real-time energy consumption at the unit level and converts it into a clear, understandable carbon footprint reflected in their Eco Score. Each tenant receives a personalized sustainability quota based on factors like historical usage, unit size, occupancy, climate zone, and building characteristics. When users stay under their monthly quota, they earn a rent discount for that month. The discounts are broken down into three tiers: Tier 1 - 5% discount on rent for tenants with an Eco Score between 90-100, Tier 2 - 2% discount on rent for tenants with an Eco Score between 70-90, Tier 3 - 0.5% discount for tenants with an Eco Score between 50-70. There is no discount for an Eco Score below 50. Through an interactive dashboard, users can track their daily progress, carbon savings, and historical patterns, while earning streaks, badges, AI-powered suggestions, and other gamified rewards that make sustainable habits feel engaging and achievable.

Verdant also delivers powerful incentives and compliance benefits for landlords, especially in cities with strict energy and carbon regulations like New York. Under Local Law 97, large buildings must stay below annual carbon emission caps or face substantial fines. By helping tenants reduce their energy use, Verdant lowers building-wide consumption, making LL97 compliance easier and reducing the risk of penalties. By helping tenants lower energy usage, Verdant reduces overall building emissions, making it easier and more cost-effective to stay

under LL97 thresholds. The platform’s verified data also strengthens eligibility for federal incentives like the 179D energy-efficient commercial building deduction and the 45L tax credit for multifamily performance upgrades. Additionally, Verdant helps buildings work toward ENERGY STAR certification, a recognized mark of high energy performance that boosts marketability and asset value.

We had a technical issue at the start of the Hackathon and did not get access to Claude Pro. We worked primarily using Cursor and ChatGPT. We integrated Google's Gemini API by creating a geminiService.js that sends tenant data (Eco Score, energy usage breakdown, unit characteristics) to Gemini 2.0 Flash and requests personalized energy-saving suggestions in JSON. The backend exposes a /api/tenant/:id/ai-suggestions endpoint that the frontend calls, and the returned suggestions are displayed in the "AI-Powered Suggestions" section of the tenant dashboard with impact estimates, difficulty levels, and XP rewards. The integration uses graceful degradation; if the API key is missing or invalid, the app continues to work without AI suggestions.