



Your Melbourne 2024

Recharge Melbourne

Brewing Energy, Powering Mobility, Connecting Communities

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Acknowledgement of Country

We would like to acknowledge and pay our respects to the traditional custodians of this land, the Wurundjuri people of the Kulin Nation.

We pay our respects to the elders, past and present, and recognise their enduring connection to this land.

Team



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Home to 1700 cafes



12 million
international visitors



208M tram
journeys yearly

Melbourne 2024

A Hub of Connectivity, Culture, and Tourism

Caffeine Capital


(Coffee Affection, 2022; Wikipedia, 2023).

Tourist Hotspot Allure

(Tourism Australia, 2023; Melbourne
Visitor Economy, 2023).

The Free Tram Zone

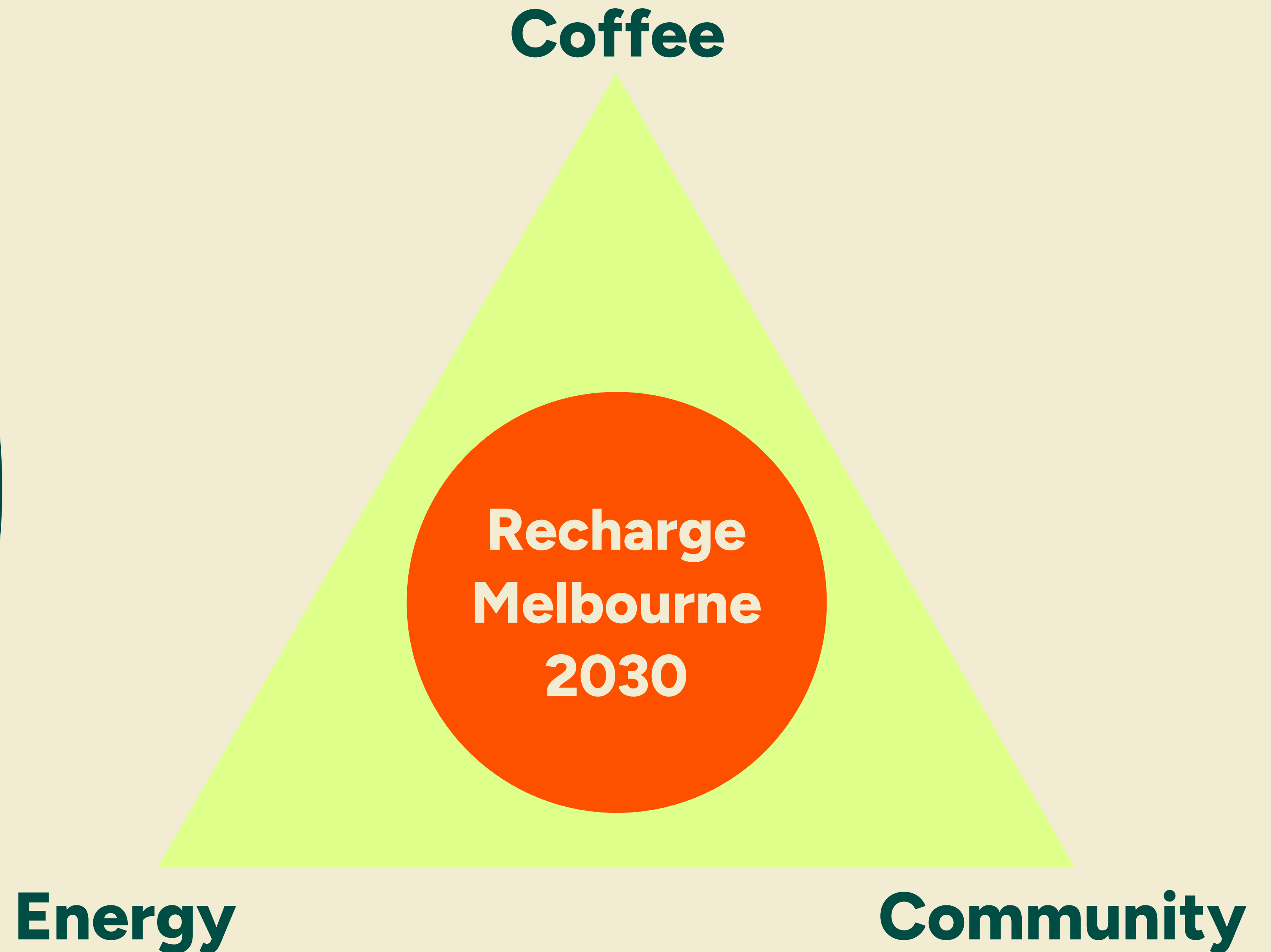
(Public Transport Victoria, 2023).



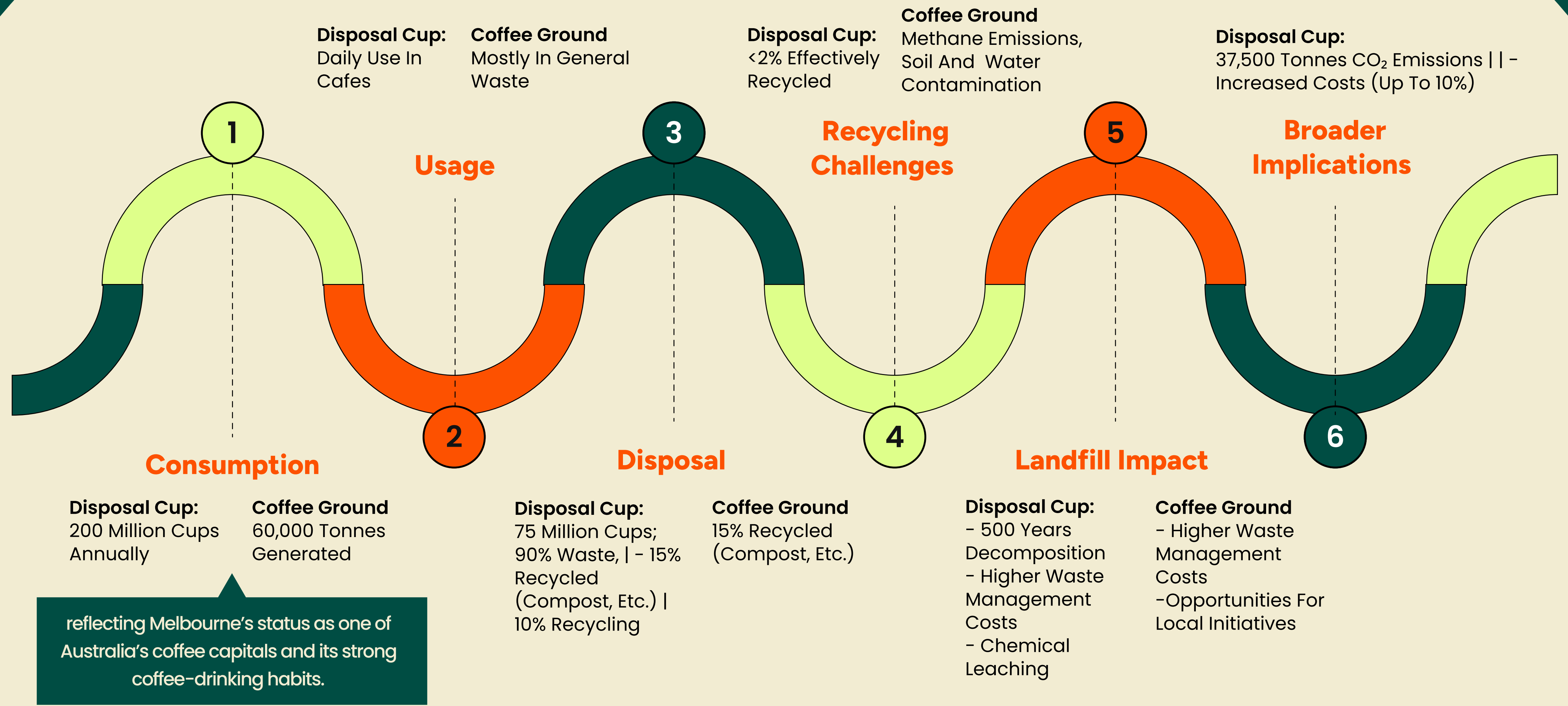
Do you think it will be the same in
Melbourne 2030?

Focus Points

Our focus for opportunities to enhance Melbourne in 2030 lies at the intersection of coffee, sustainable energy for mobility, and community engagement. We aim to create innovative solutions that integrate these elements, fostering a connected, greener urban environment.



Coffee ground & cup journey



Our Approach



Sustainability

Mega Trend
SDG 13: Climate Action
SDG 7: Affordable And Clean Energy
This Overarching Trend Focuses On Addressing Global Climate Change And Promoting Sustainable Practices Across All Sectors To Ensure Environmental Protection And Resource Conservation For Future Generations.

Energy

Macro Trend
SDG 7: Affordable And Clean Energy



Mobility

Macro Trend
SDG 11: Sustainable Cities And Communities
SDG 9: Industry, Innovation, And Infrastructure

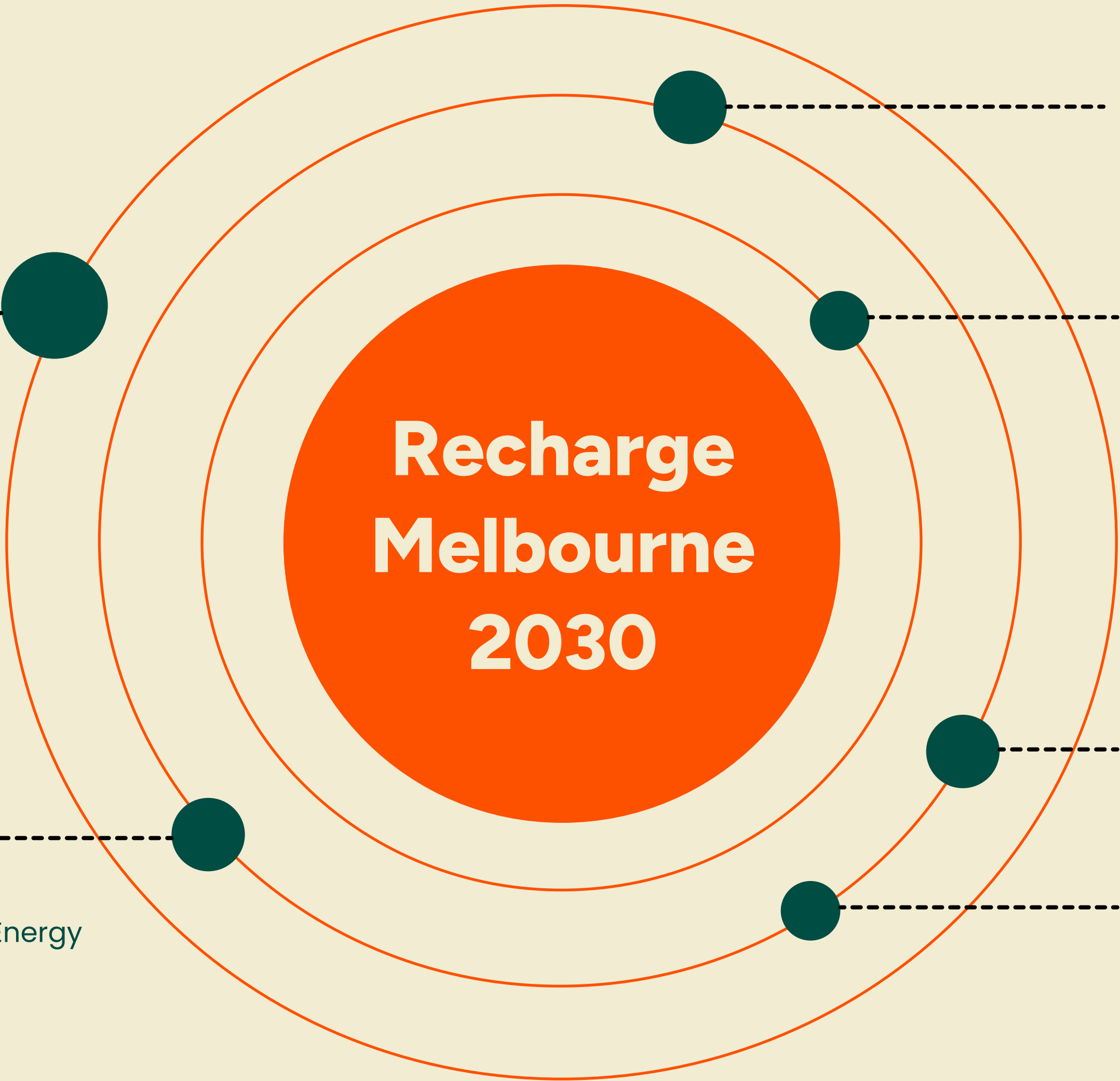
Micro Trend
SDG 12: Responsible Consumption And Production
SDG 7: Affordable And Clean Energy



Community

Macro Trend
SDG 11: Sustainable Cities And Communities

Micro Trend
SDG 16: Peace, Justice, And Strong Institutions





Design Opportunities



Rechargeable tram
 Coffee-based energy car
 EV car charging station
 Recharge hub
 Magic application

Mobility (Overview)



Public

Solar 3.0

Solar 3.0 technology aims to enhance Melbourne's sustainability by integrating advanced solar panels into infrastructure, reducing reliance on conventional energy sources

Rechargeable

Wireless charging for electric transportation provides a convenient and efficient way to recharge without plug-ins, boosting Melbourne's public transport sustainability

Wireless tram

Eliminate the need for overhead wires, offering a cleaner and more aesthetically pleasing transport solution while improving the efficiency and reliability of Melbourne's tram network.

Improve System

Improvements such as expanding the free tram zone, improving service scheduling, and revising fare structures for a more inclusive transit experience.

Private

Coffee-Based energy

Converting waste coffee grounds into biodiesel, providing a sustainable fuel alternative that reduces landfill waste and carbon emissions while contributing to a greener, circular economy.

Ai assistance in EV car

Featuring advanced self-driving capabilities, predictive cruise control, and automatic lane changes, enhancing urban travel with top-notch safety and convenience through 360-degree cameras and smart battery management.

Coffee car

Coffee-based biodiesel that transforms waste coffee grounds into renewable energy, promoting a circular economy while reducing emissions.

The Solar 3.0

Innovation integration

In our 2030 plan, we will use Solar 3.0 technology, featuring advanced perovskite and tandem cell panels, to generate energy for powering public transportation and recharging electric vehicles. This efficient and scalable solar solution will support both public transit and individual car batteries, advancing Melbourne's sustainability goals.

+30%
more energy per
square meter than
conventional
silicon panels



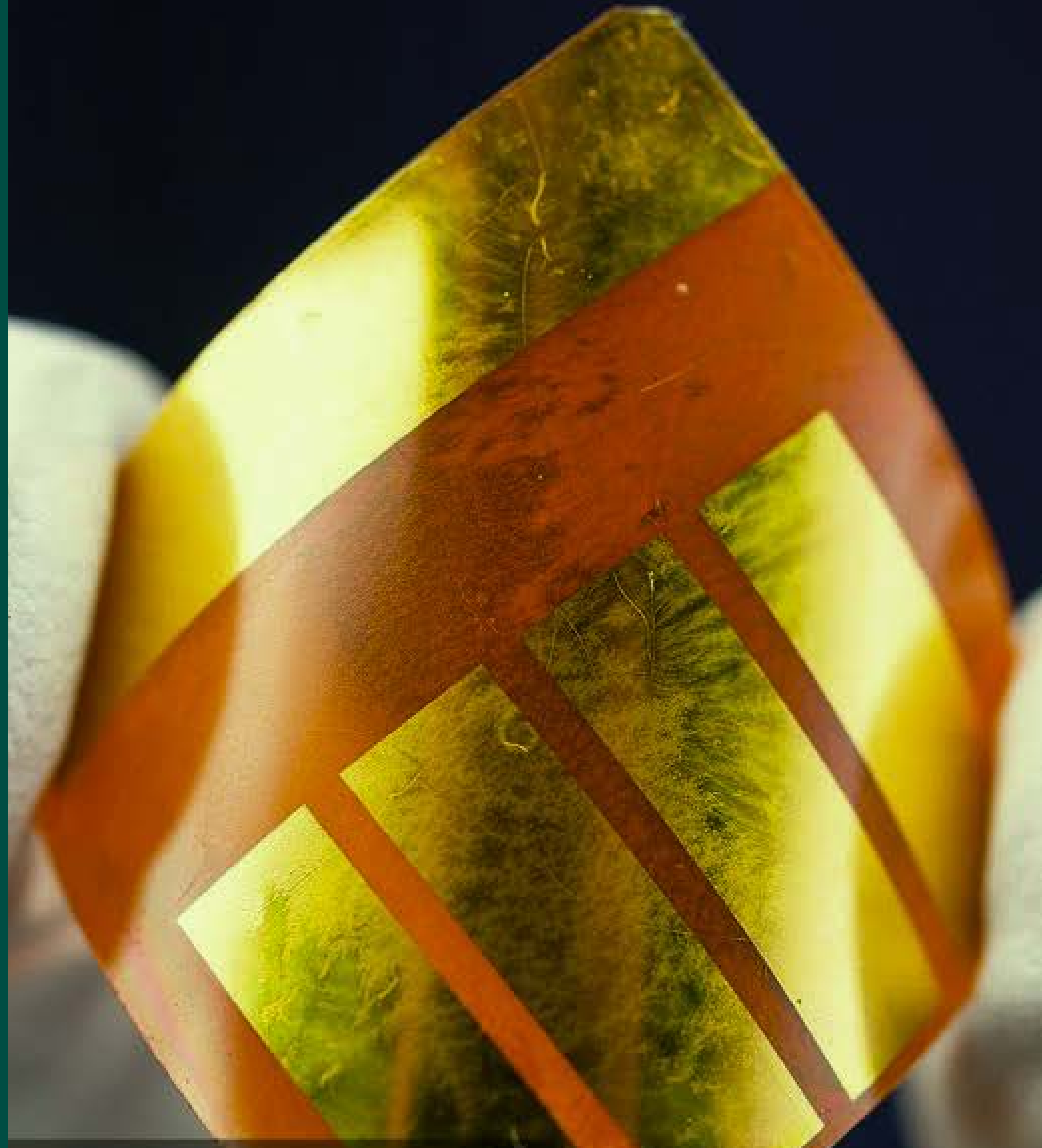
+50%
higher efficiency in
energy production



-50%
production cost
compared to
traditional silicon
panels



(Enkhardt, 2024)



Wireless Charging Trams

Wireless charging technology for trams eliminates the need for overhead power lines, allowing trams to charge while in motion through embedded infrastructure. This system enhances operational efficiency, reduces the reliance on large batteries, and minimizes maintenance costs (Ko et al., 2022; Sussman & Vasu, 2022).

Features

Inductive Charging: Uses electromagnetic fields to transfer energy without physical connectors.

Charging Pads: Embedded in tram tracks or designated stopping points.

Receivers: Installed on the underside of trams to capture and convert the energy.

Automatic Alignment: Trams automatically align with charging pads for efficient energy transfer.

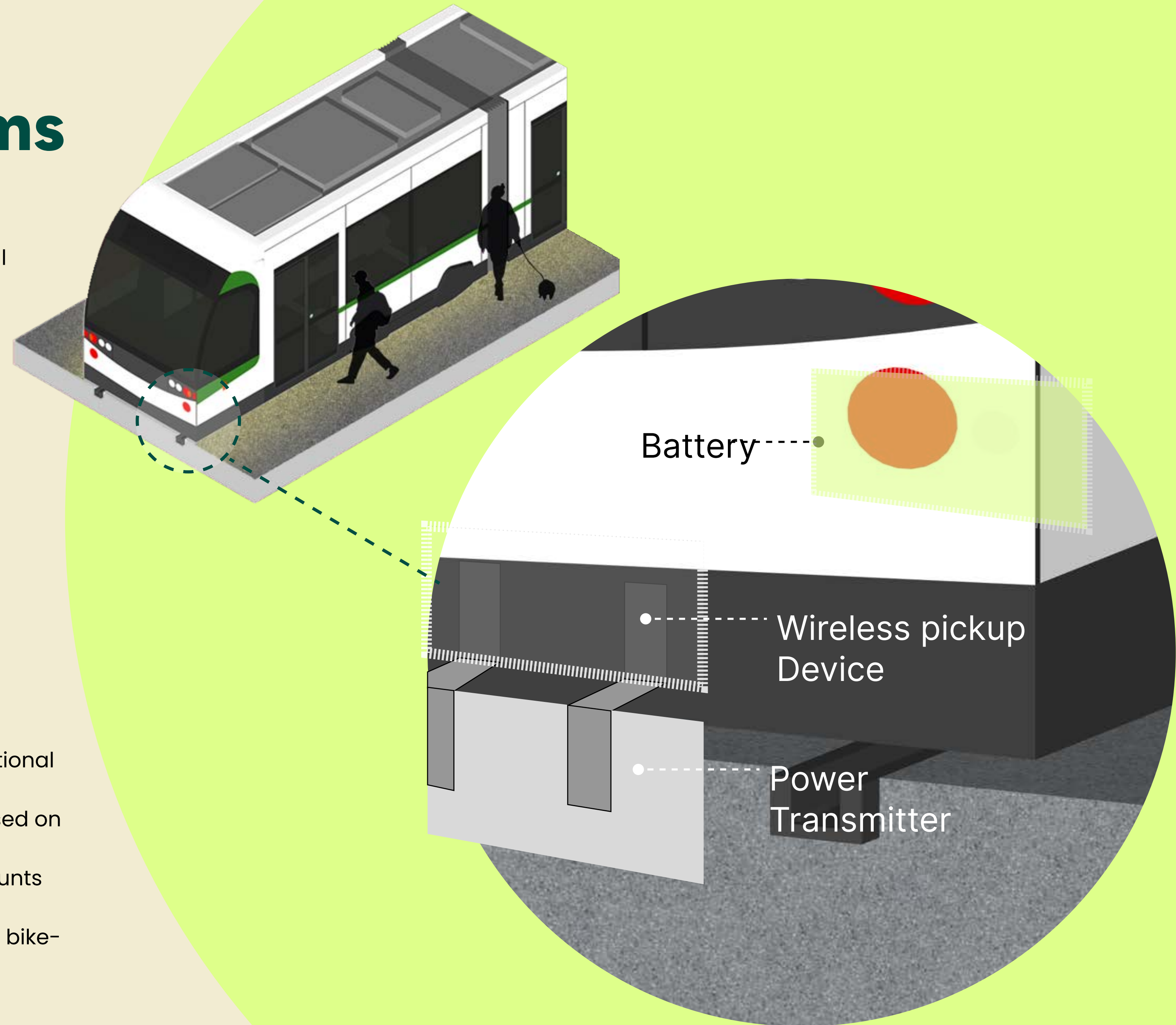
Improved System

Expand Free Tram Zone: Broaden the free tram zone to include additional inner suburbs for greater accessibility.

Dynamic Scheduling: Implement real-time service adjustments based on passenger demand to optimise tram frequency.

Inclusive Fare Structures: Create a tiered fare system offering discounts for families, students, and frequent users.

Integrated Transport Options: Enhance connections with buses and bike-sharing programs for seamless travel.



Private Mobility

Car-pucino

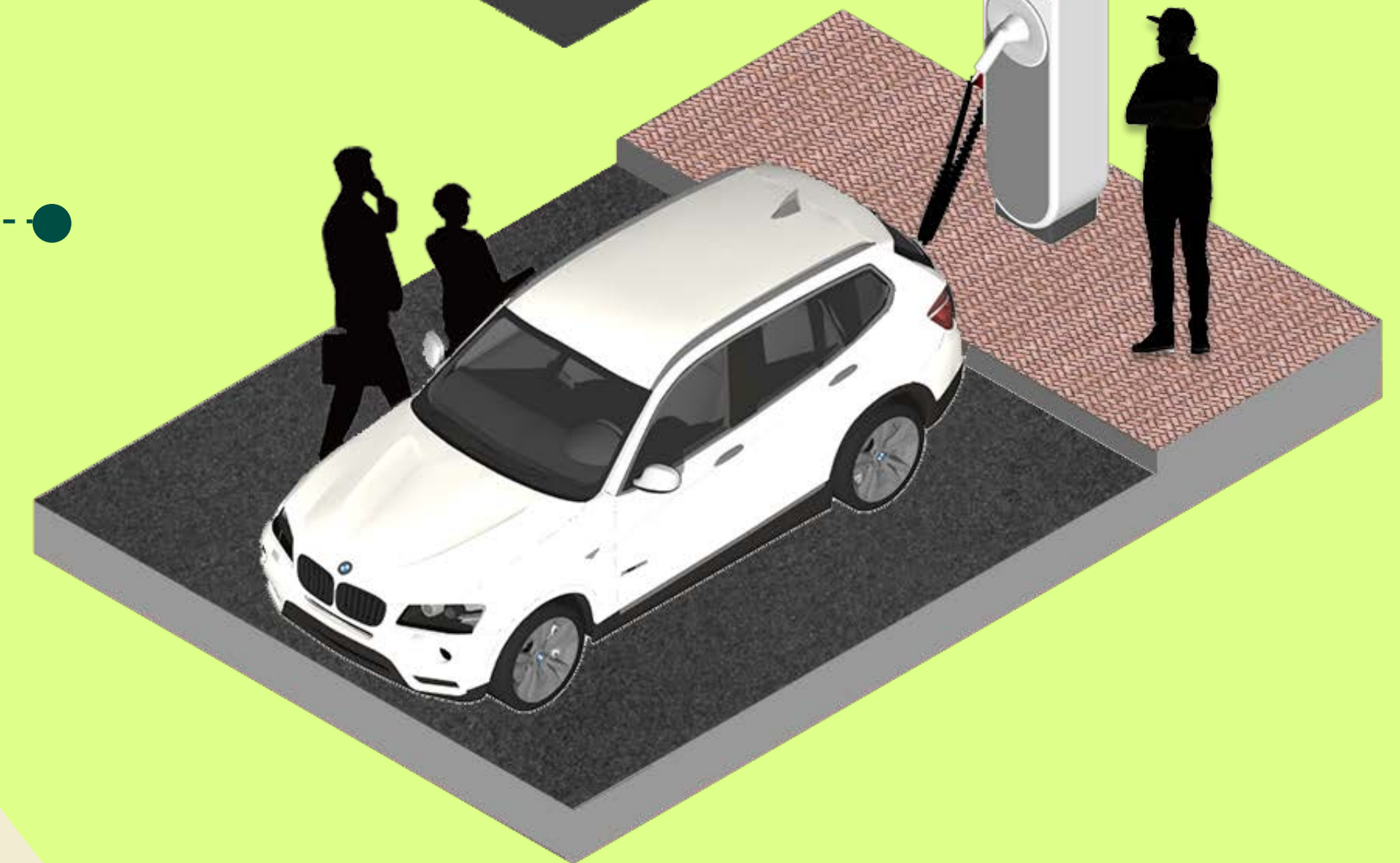
a prototype car inspired by the BMW Isetta that runs on coffee-based biodiesel to power its electric batteries. It is compact and environmentally friendly, transforming waste coffee grounds into renewable energy while lowering emissions and promoting a circular economy.



Electric car

In 2030, AI-assisted EVs in Melbourne will feature advanced self-driving, predictive cruise control, automatic lane changes, and remote parking. With 360-degree cameras, AR dashboards, and cross-traffic alerts, these cars offer top-notch safety and convenience.

AI will monitor battery levels, notify drivers, and book charging stations automatically, making urban travel effortless and efficient.



Private Mobility

Coffee-based energy

Coffee-based energy for electric vehicles (EVs) involves transforming used coffee grounds into a renewable fuel source. Waste coffee grounds are rich in oils that can be extracted and processed into biodiesel.

This biofuel can be used to power EVs or blended with other renewable energy sources. The process not only reduces the massive amount of coffee waste sent to landfills but also offers a sustainable energy alternative, lowering carbon emissions. By turning a common waste product into energy, coffee-based fuel contributes to a greener, circular economy.





Connectivity/ Urban planning

Recharge Hub

The Recharge Hub is a sustainable community space designed to inspire and rejuvenate. It includes smart vehicle charging, a community garden, workshops on coffee ground recycling, a versatile recharge area with e-bike and phone chargers, and a zero-waste café offering healthy, garden-sourced meals. The hub aims to promote eco-friendly living, education, and a zero-waste lifestyle, creating a greener future for all.

Connectivity/ Urban planning

Recharge Hub



Moc-car

Smart charging station

Recharge your vehicle



Brew garden

Community garden

Recharge with nature



Bean lab

Workshop, Exhibition space

Recharge your mind



E-space-so

Device charging space

Recharge devices



Cuppa cafe

Zero waste cafe

Recharge body with
coffee energy

Connectivity/ Urban planning

Recharge Hub Modular design



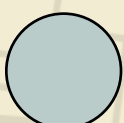


The Recharge Hub is designed as a modular system, where each component serves a unique function and can be independently adjusted.

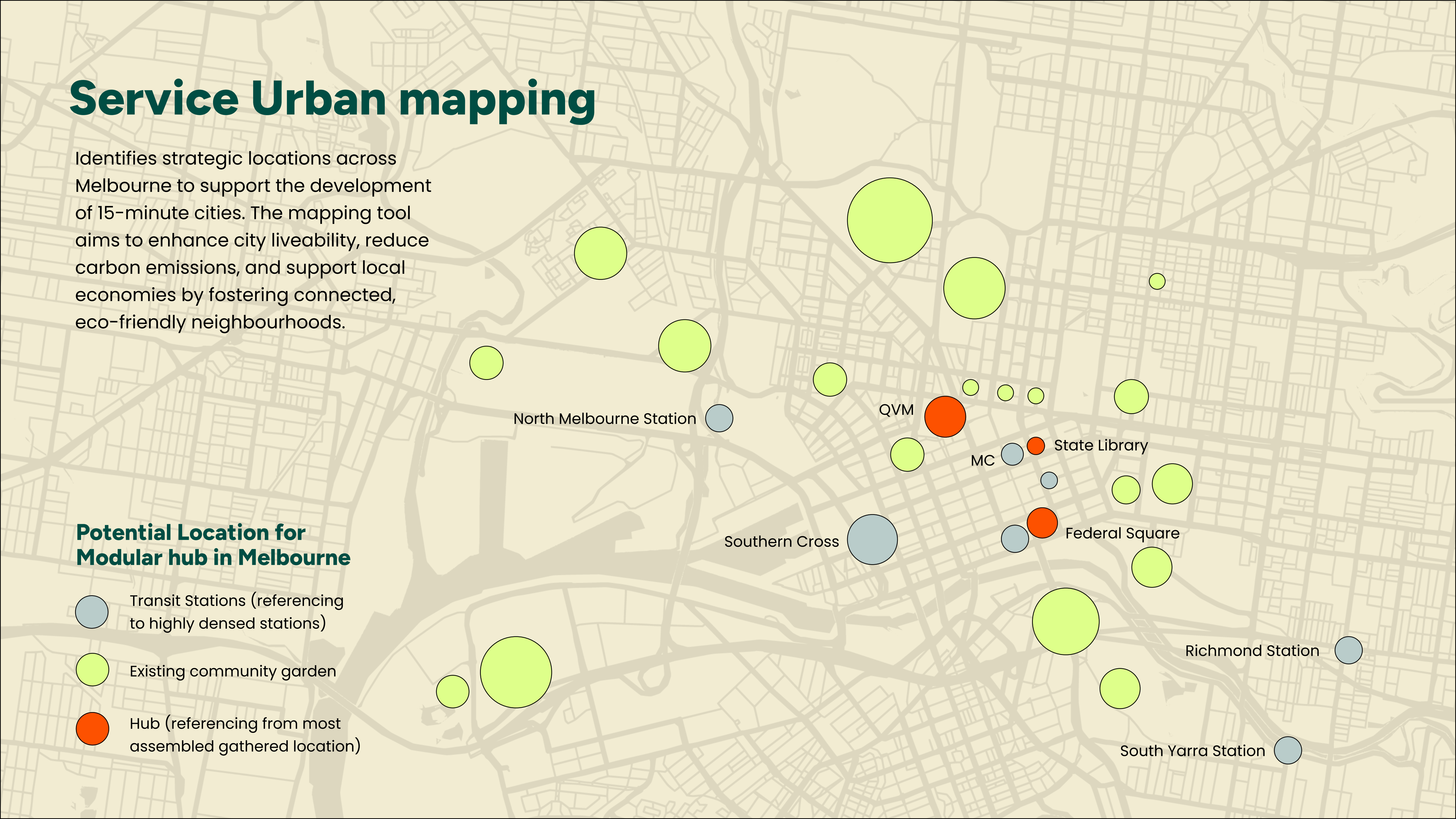
This flexible approach allows the hub to adapt to various locations and integrate with existing spaces.

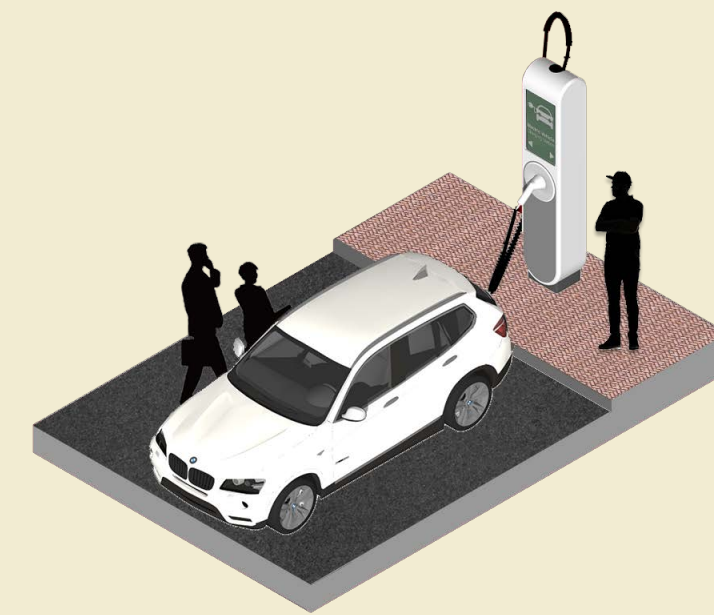
Service Urban mapping

Identifies strategic locations across Melbourne to support the development of 15-minute cities. The mapping tool aims to enhance city liveability, reduce carbon emissions, and support local economies by fostering connected, eco-friendly neighbourhoods.

Potential Location for Modular hub in Melbourne

-  Transit Stations (referencing to highly densed stations)
-  Existing community garden
-  Hub (referencing from most assembled gathered location)





Moc-car

Smart charging station

The Smart Charging Station offers three key features designed to enhance user convenience and promote sustainability

- **AI-Assisted Charging**

Integrated AI assistants in vehicles monitor battery levels, notify drivers when charging is needed, recommend the nearest stations, and automatically book spots.

- **Hybrid Charging Solutions**

The station provides dual charging options, supporting both traditional EV chargers and hybrid coffee-based biodiesel chargers, catering to various eco-friendly vehicles.

- **Rewards Program**

Frequent users earn rewards points that can be redeemed for discounts, café vouchers, or sustainable product offers.



Brew garden

Community garden

The Community Garden is developed by integrating existing community gardens and expanding with new additions, creating an educational and sustainable network for all ages.

- **Seasonal Melbourne Produce**

Featuring seasonal, locally grown plants, the garden offers an interactive space for kids, families, and Melburnians to explore edible produce and urban farming, enhancing their understanding of local food sources.

- **Coffee Grounds as Fertiliser**

The garden uses recycled coffee grounds to enrich the soil and demonstrate how everyday waste can be repurposed into valuable resources.

- **Harvest-to-Table Integration**

Produce from the garden supplies the Recharge Hub's zero-waste café, turning locally grown ingredients into delicious meals.



Bean Lab

Workshop and exhibition space



The Workshop and Exhibition Space is a vibrant hub that hosts events and activities, educating the public on sustainable uses of coffee grounds.

- **Information and Education Exhibition**

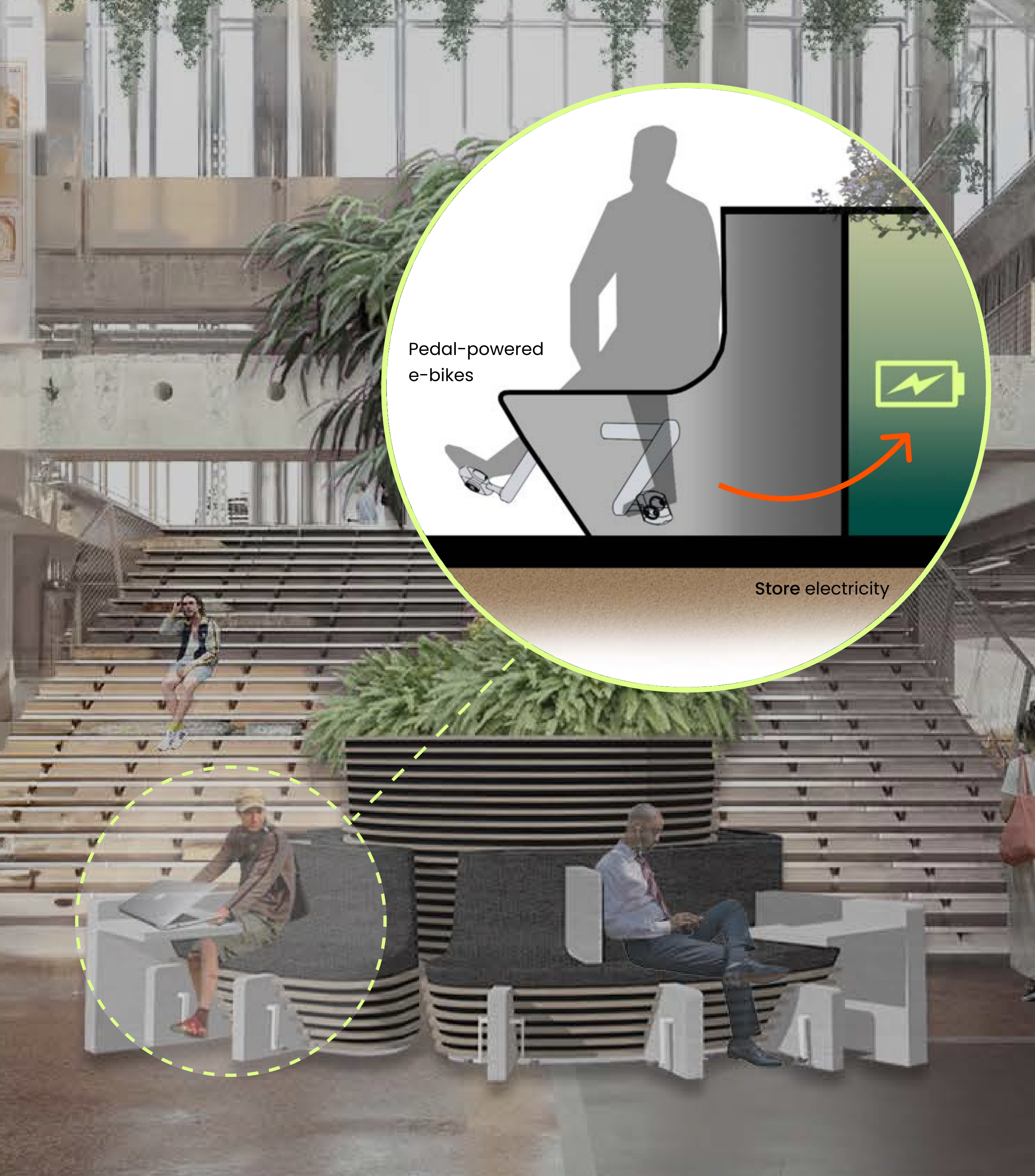
A multilingual center featuring exhibits that showcase the journey of coffee grounds from waste to valuable resources, providing insights into innovative recycling processes and their positive environmental impact for locals and tourists alike.

- **Hands-On Workshops**

Interactive workshops for all ages to create eco-bricks, plant pots, and reusable cups from recycled coffee grounds, teaching practical sustainability skills.

- **Factory Tours**

Guided tours for adults to explore the oil extraction process and the transformation of coffee waste into biodiesel and other products.



E-space-so

Device charging space

E-space-so is a charging area where visitors power their devices using energy from pedal-powered e-bikes, providing a space to study, work, or relax while promoting sustainability and fitness.

- **Community-Powered Space**

Pedaling e-bikes charge personal devices and also help power the Recharge Hub and nearby public areas, fostering a sense of community contribution.

- **Energy Tracking in Application**

Users can connect to an app to see their real-time energy production, enhancing engagement and awareness of their sustainable impact.

- **Well-Being Boost**

E-space-so promotes physical health and well-being, turning an exercise into a rewarding experience by combining physical activity with energy generation.



Cuppa cafe

Zero waste cafe

Cuppa Café is a zero-waste café committed to sustainability and community well-being

- **Coffee Ground Recycling**

Used coffee grounds from the café are repurposed into valuable resources, such as fertilisers or fuel, supporting a circular economy.

- **Healthy Garden-Sourced Menu**

The café serves fresh, nutritious meals from produce grown in the community garden, promoting local, healthy eating.

- **Coffee Cup Return Rewards**

Customers are encouraged to return coffee cups for rewards, incentivising reusable practices and minimising waste.

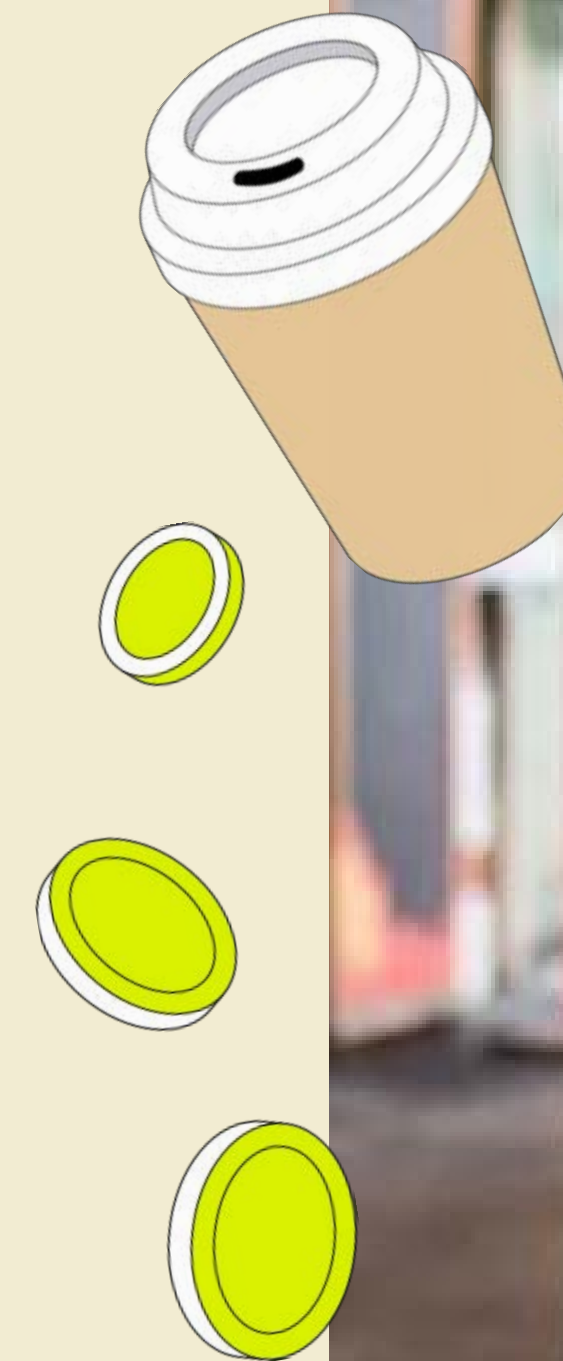


Sustainability & Community

Coffee Cup Reward

The reward point system encourages customers to return their takeaway coffee cups and lids to designated return stations. For every cup and lid returned, customers earn points, which can be earned and redeemed for a free coffee in the future.

The returned cups are collected by **Simply Cups**, a recycling initiative that ensures the materials are recycled and repurposed, reducing waste and promoting sustainability. This system not only rewards eco-friendly behaviour but also supports a circular economy by giving used coffee cups a second life.



Takeaway coffee → Return station → Enter Phone Number → Point Reward System

↓
Simply Cups → Recycle → Hub exterior/ interior/ products

- Paper cup asphalt
- Concrete utility slabs
- Mounting blocks
- Building materials

Simply
Cups
Products

Connectivity

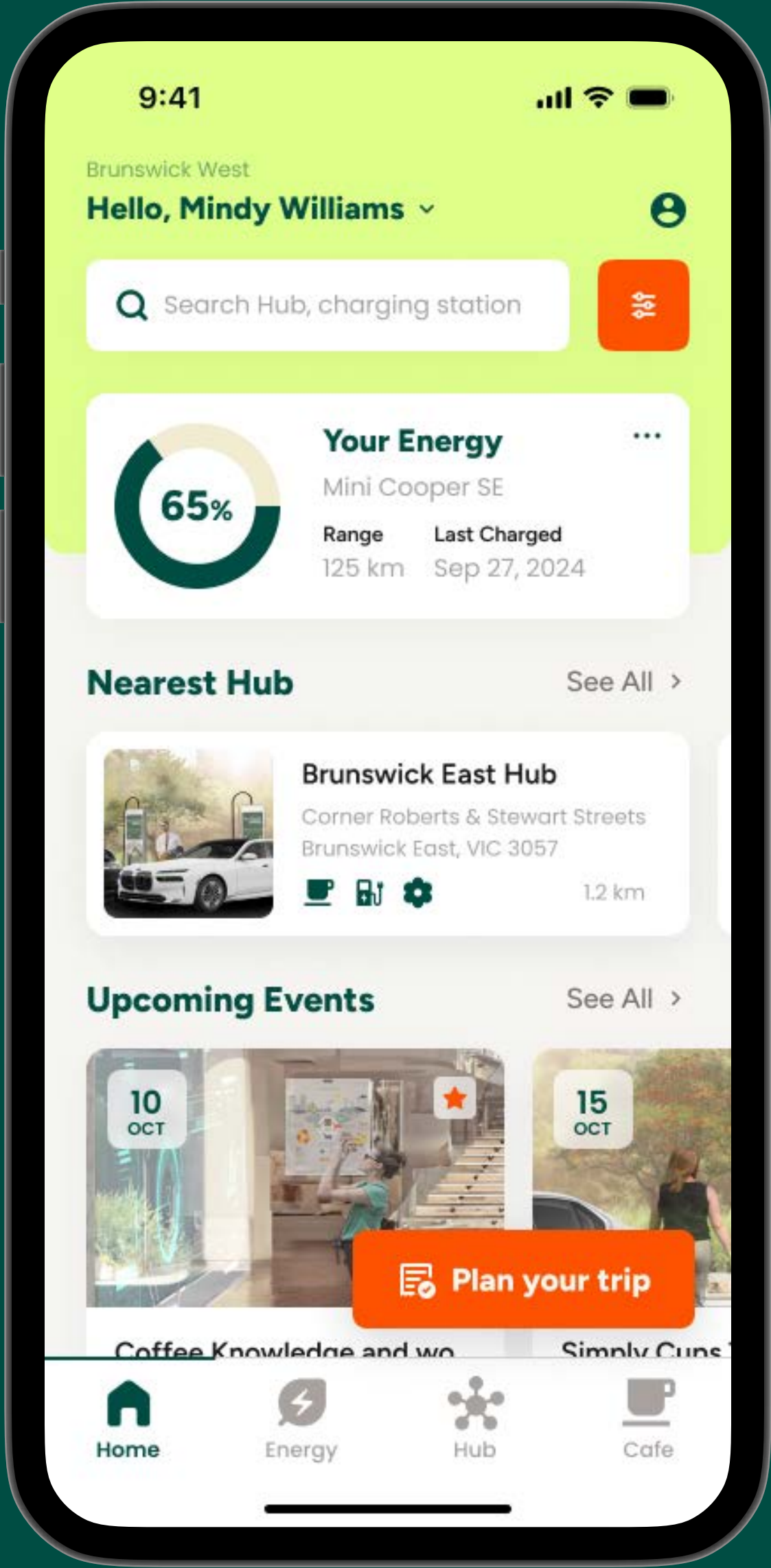
Magic Melbourne Mobile Application

The **Recharge Hub** mobile application provides an all-in-one platform for electric vehicle (EV) users to manage their charging and track energy usage. It allows users to locate and book charging spots at nearby hubs, ensuring a hassle-free charging experience.

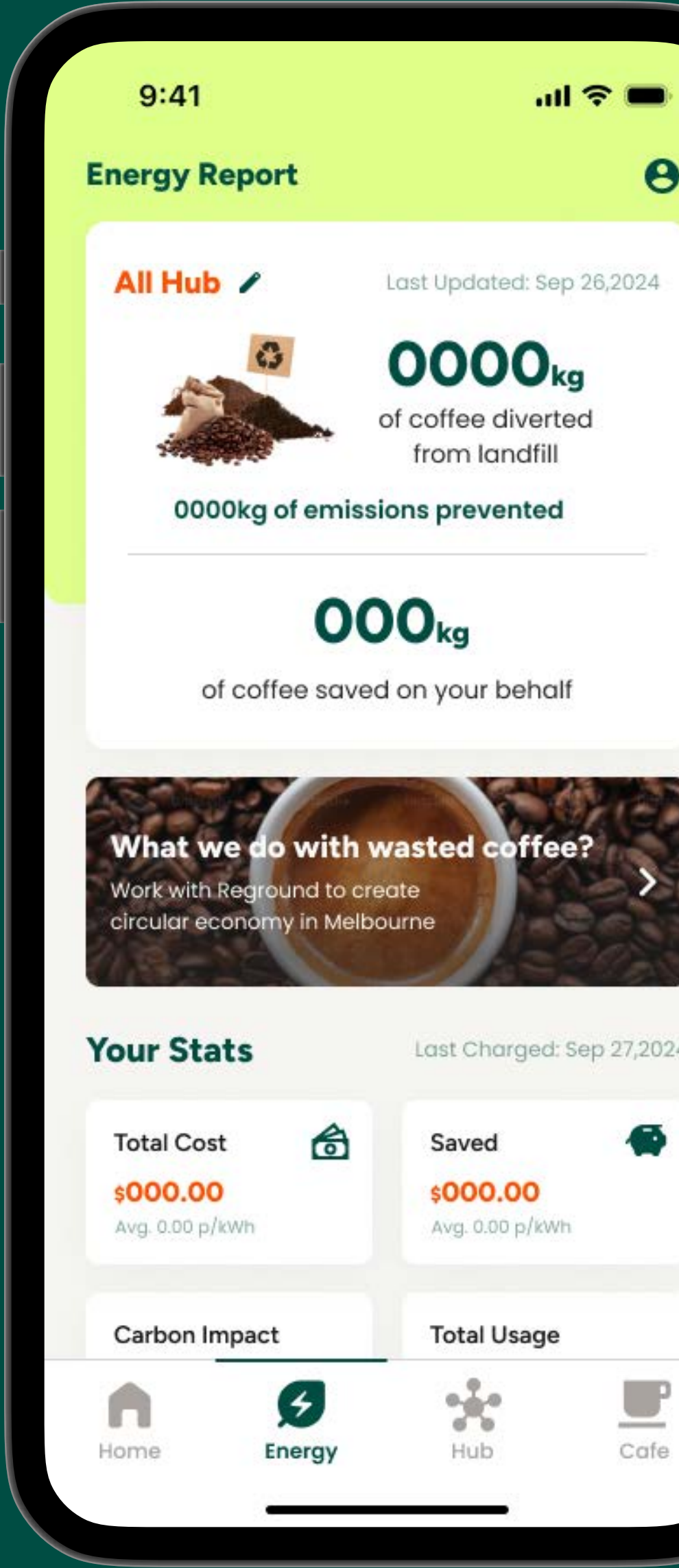
The app features an **Energy Report** section where users can monitor their environmental impact, such as the amount of coffee grounds recycled into energy and emissions prevented. Additionally, the app displays detailed stats on energy consumption, cost savings, and reward points earned through eco-friendly actions, creating a seamless and rewarding experience for sustainable living.



Let's play!



Dashboard

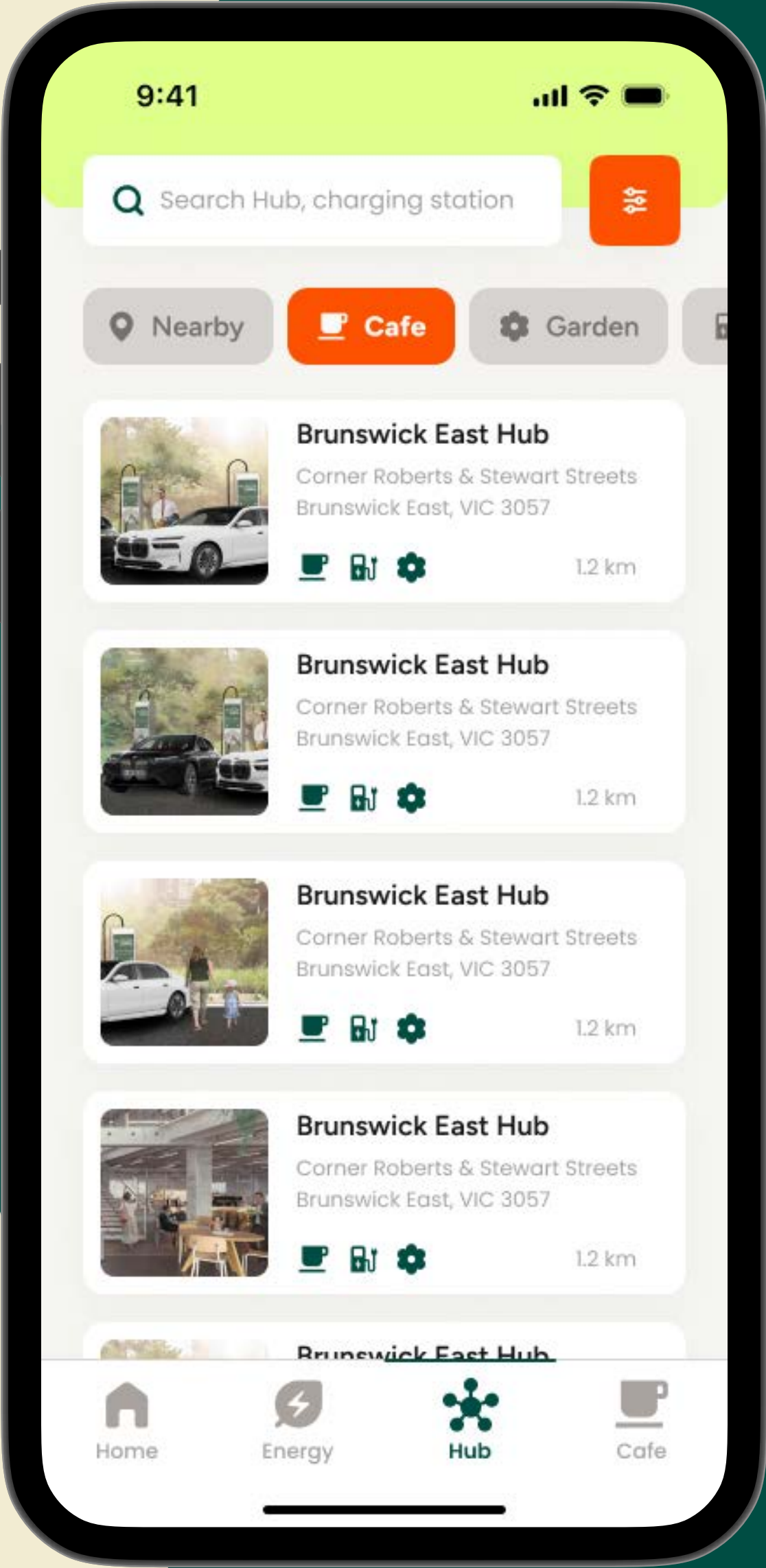


Energy

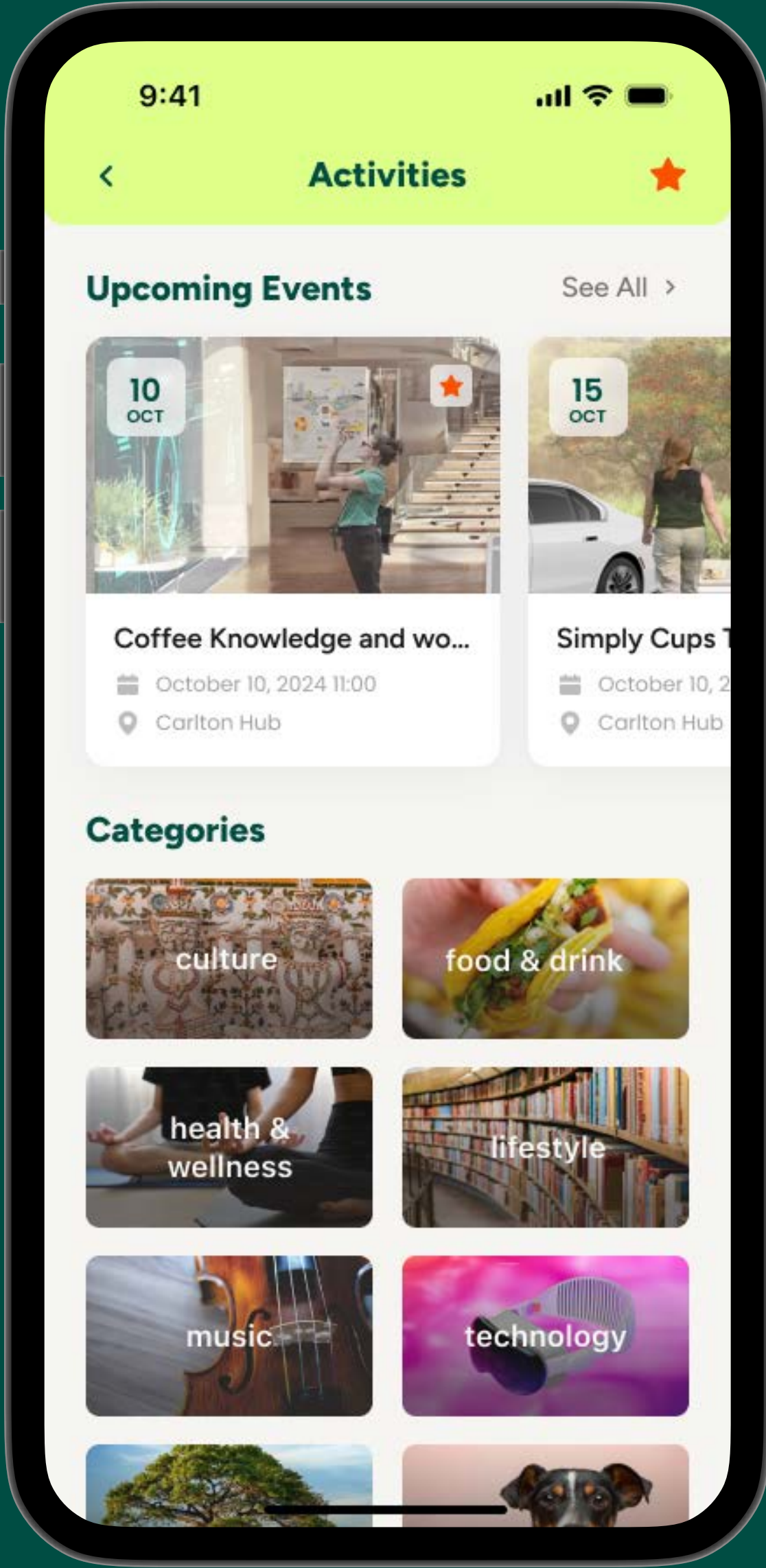
Café: Users can access the café's menu, place online orders for pickup, and participate in the Cup Return Reward System. By returning takeaway coffee cups to designated return stations, they earn points redeemable for future coffee purchases.

Activities: The app features a calendar of workshops and educational events focused on sustainability, knowledge, and community building.

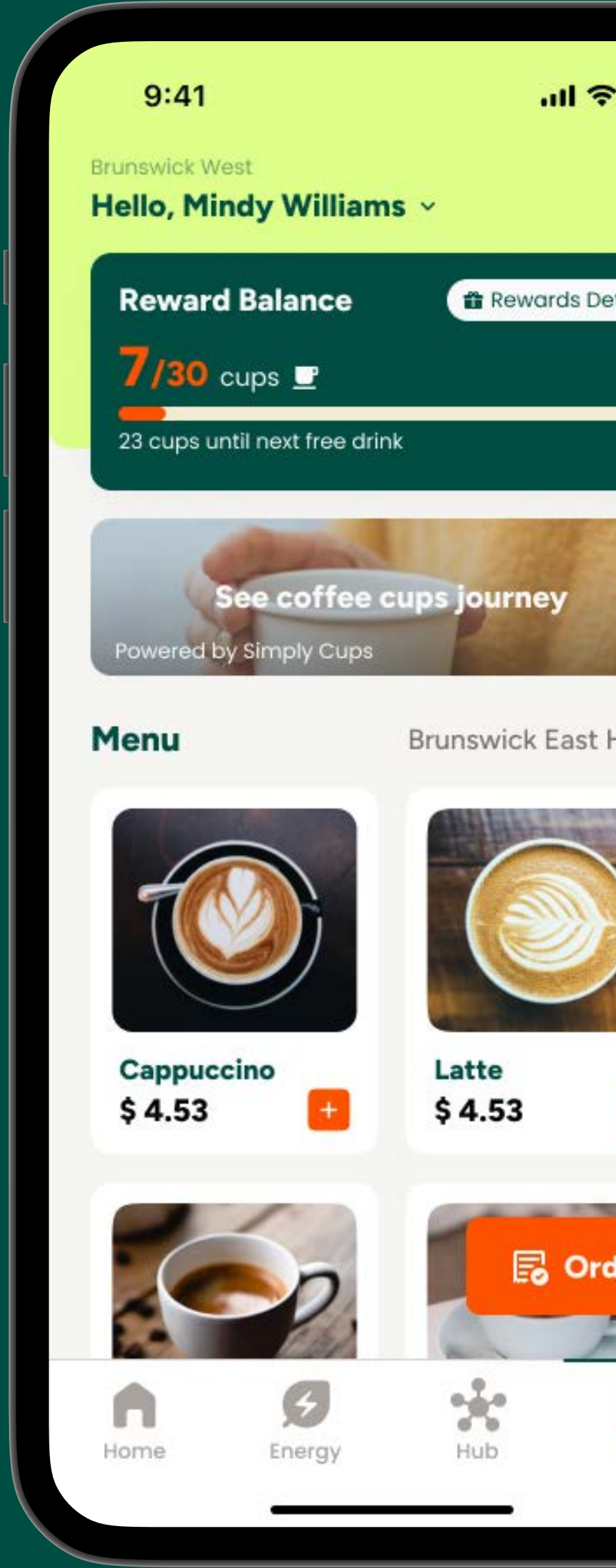
Hub: Users can easily search for nearby hubs, view detailed information about each location, including available charging stations, café services, and upcoming events, ensuring a smooth and connected community experience.



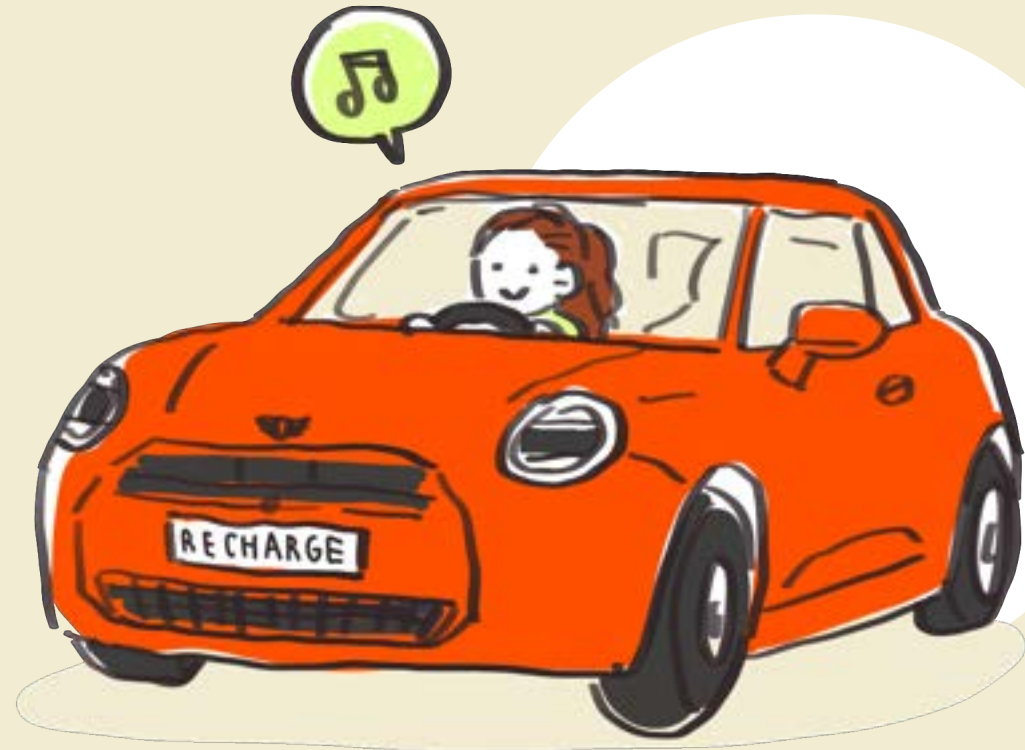
Hub



Activities



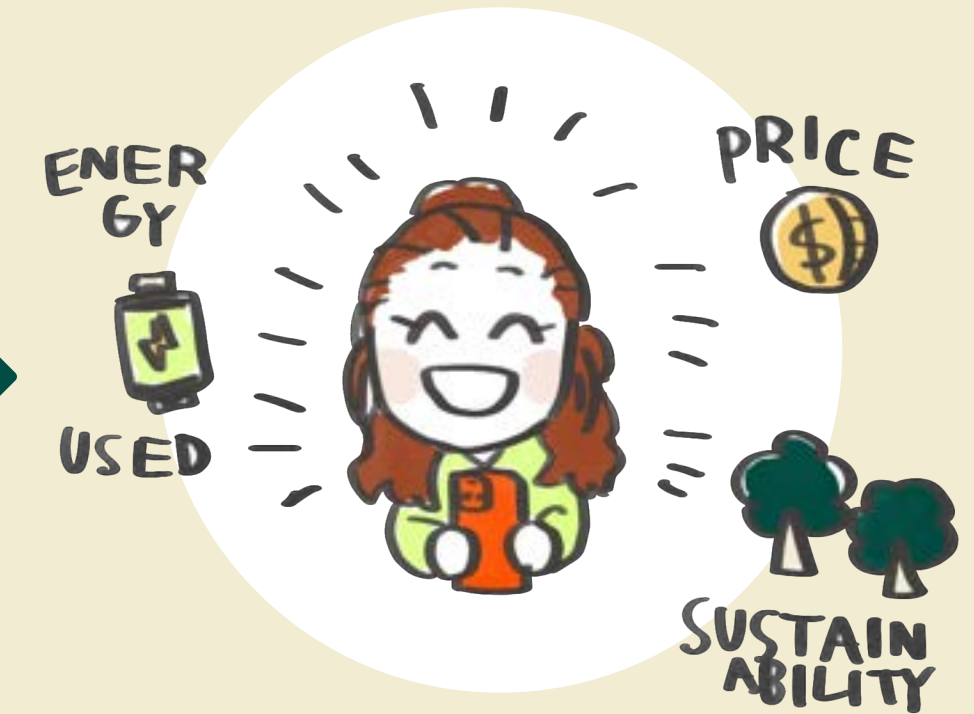
Cafe



Last year, Mindy switched to an electric vehicle. She's really happy with both the affordability and ease of use. She drives to work every day.



Mindy always books a charging spot through an app at a nearby charging station, which makes her daily routine hassle-free.



After charging, she enjoys checking the app to see how much energy she's used and how much money she saved.

Meet Mindy

Mindy, born and raised in Melbourne



Sometimes, she participates in workshops at the hub, where she enjoys meeting new people and engaging with the community.



Mindy loves the reward system the most. She's very motivated to dispose of her coffee cups properly and now even makes sure to do the same at other coffee shops.



On weekends, Mindy loves meeting her friends at the local community hub for a coffee and a chat.



Thomas is visiting Melbourne for the first time and is impressed by the vibrant city atmosphere and the convenience of the trams. He also notices how fresh and clean the air is.



Thomas takes trams to visit popular tourist attractions, all while enjoying the city's scenic views. The tram system has become one of his favourite parts of the city.



Every morning, Thomas grabs a cup of coffee before starting his day. He's impressed to learn that the coffee grounds from local cafés are used to generate energy for electric vehicles, showcasing the city's innovation.

Meet Thomas

Thomas, first time Melbourne tourist

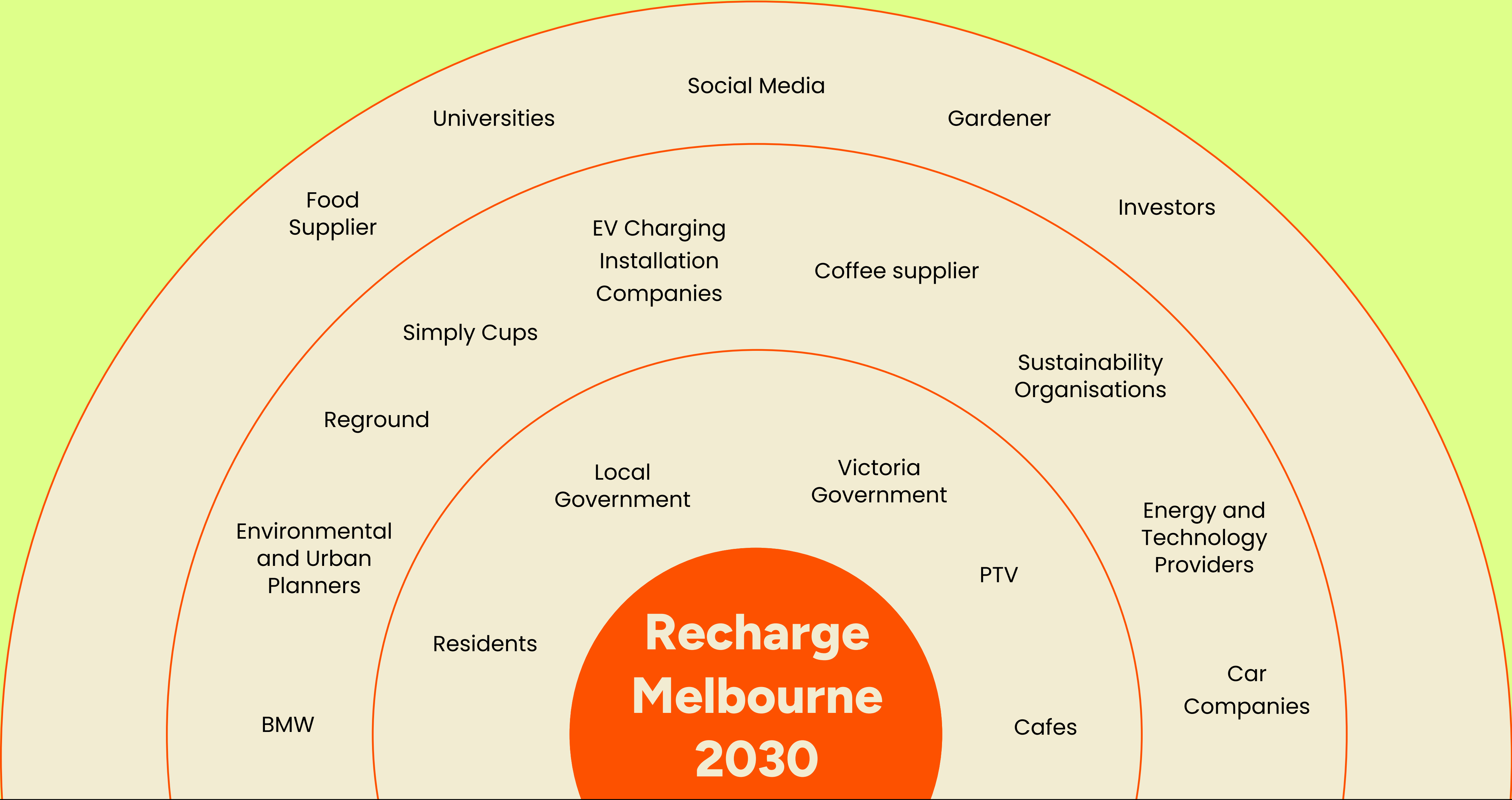


Thomas visits a recharge space, where he uses an e-bicycle to charge his phone. He finds the experience both fun and practical!



Thomas stops by the city's community hub, which also serves as an information centre. He picks up a list of activities, all tourist-friendly and offered in multiple languages.

Potential Contributor



Major Contributor

is

YOU

your Melbourne, our Melbourne.



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