



Circular Buildings & Digitalization



WHITE ROOM

Hello.



Gooi
Project Manager

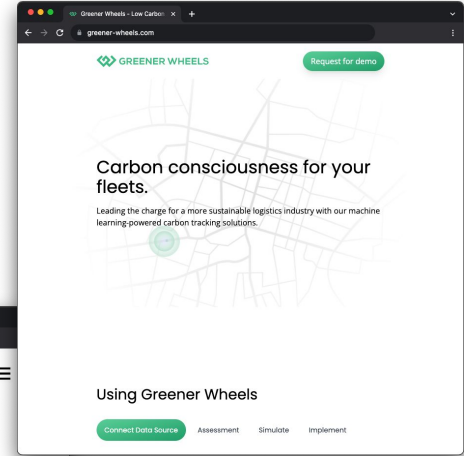
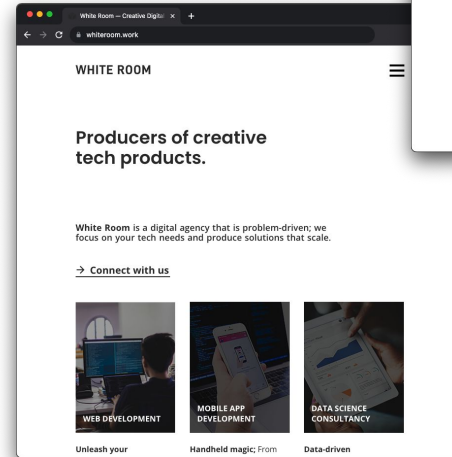


Jian
CTO

White Room is a software agency based in Penang, Malaysia; specializes in software development and integration, tech consultancy, etc.

As a *USASCP/Smart Cities Business Innovation Awardee*, **Greener Wheels** helps logistic companies to track their carbon footprint, and towards a greener and sustainable tomorrow.

greener-wheels
.com



whiteroom
.work

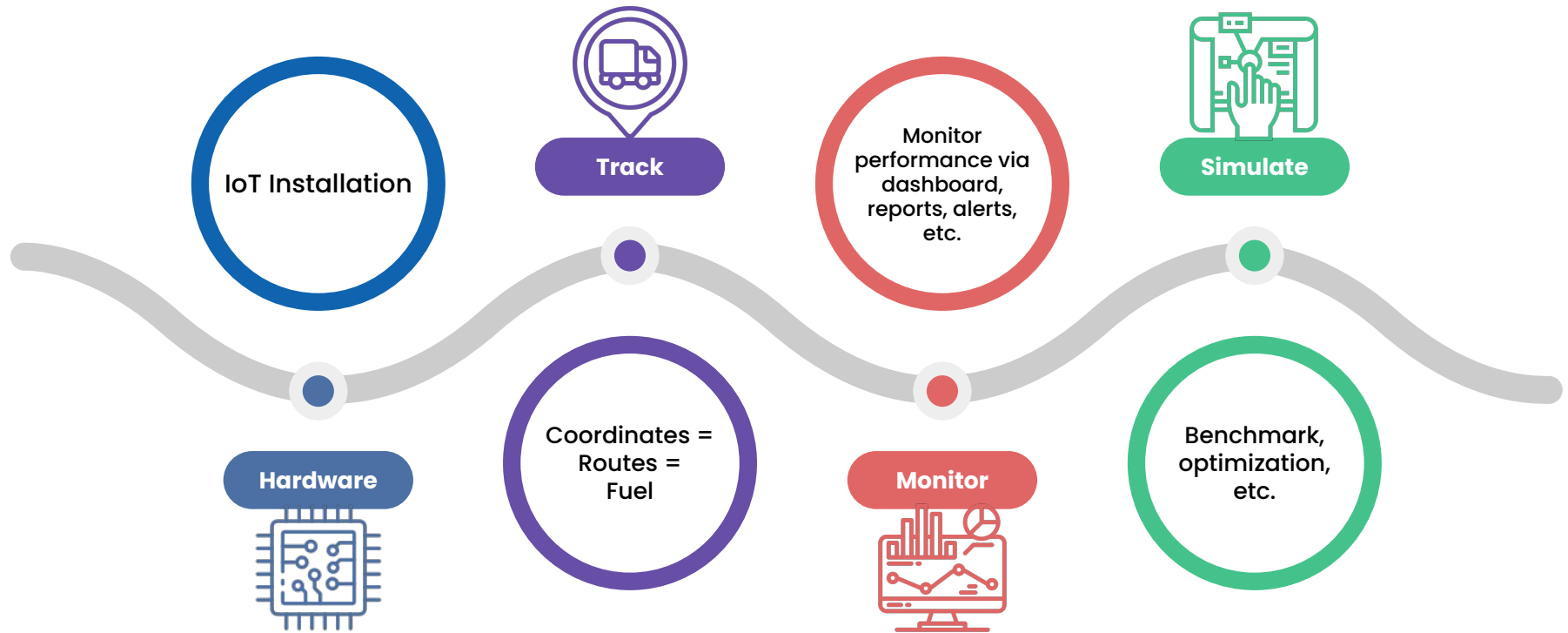




GREENER WHEELS

Allow logistics company to track **environment impact** and become **ESG ready**.

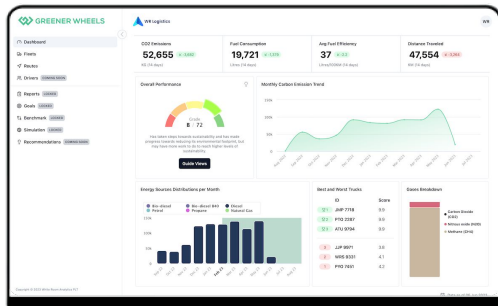
Provide insights for decision making towards **low and net zero carbon** operation.



Analytics Dashboard

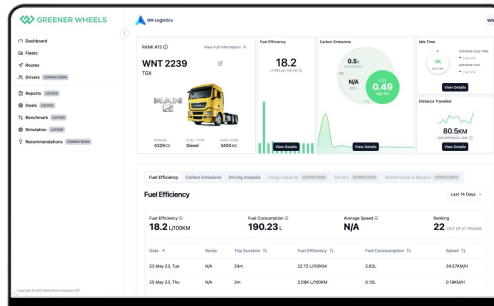
Dashboard

First glance view of company's environmental impact performance.



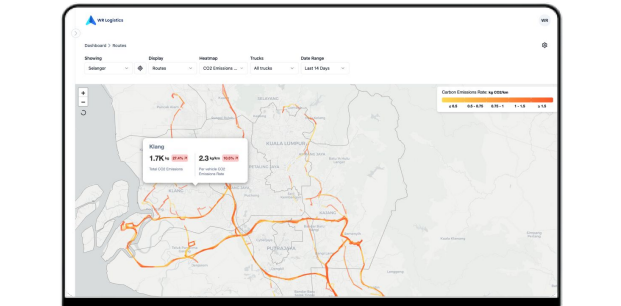
Vehicle Analytics

Complete analysis of carbon footprint tracking of every vehicle.



Route Analysis

View CO2 heatmap, routes and fuel performance, etc.



For GLCs, agencies, and policy makers.

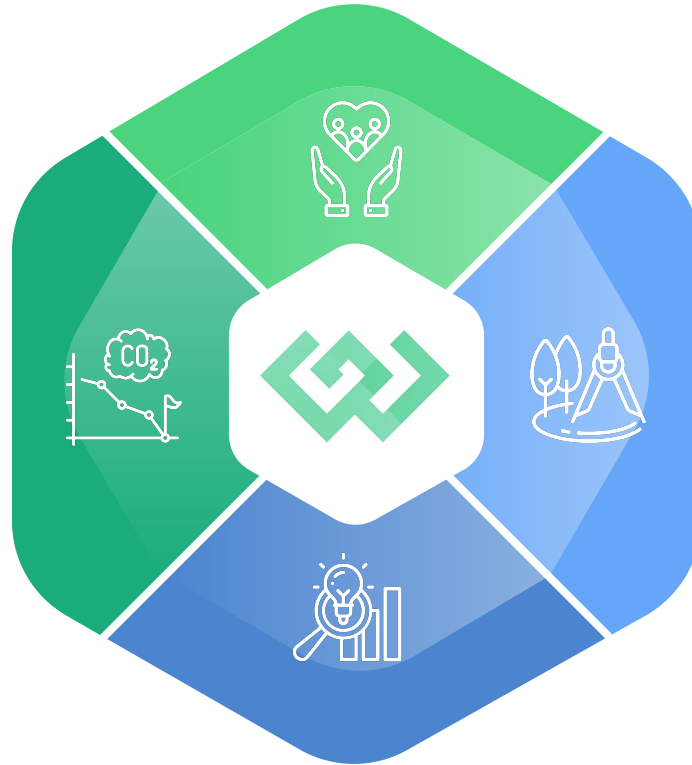
(Government-linked companies)

Public Awareness

Transparent data help public education and awareness.

Policy Development

Carbon reduction policies and initiatives, carbon tax, carbon credits, regulations and incentives.



City Planning

Traffic reports, route planning, supply chain optimization, etc.

GHG Emissions Insights

Accurate monitoring and reporting accurately, reduce carbon footprints.

CASE STUDY

Hin Bus Depot



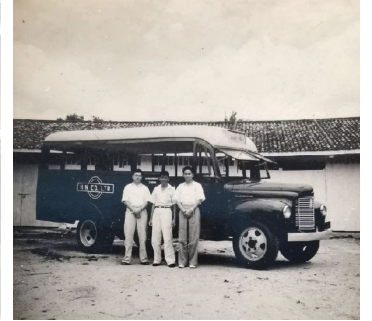
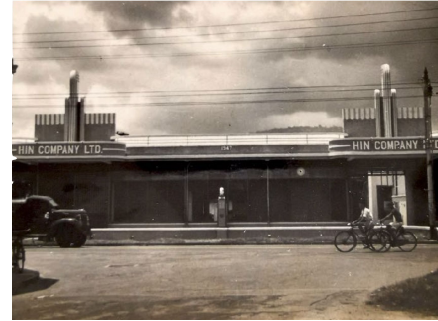
Greener logistics
with *Greener Wheels*.

Hin Bus Depot

History



Started in **1947**, was used as a bus depot for the *Hin Bus Company Limited*.



Hin Bus Depot

History



Later years, the bus business changed hands, and **relocated** its bus depot to another location.



Hin Bus Depot

Acquisition



Acquired in **2009** by property investors with a track record of investing in heritage properties throughout Penang.



Hin Bus Depot

Pivot Point



Until 2012, an artist friend, **Ernest Zacharevic** looking for a place to host his inaugural solo exhibition.



Hin Bus Depot

Pivot Point



A good reason to **refurbish** the place for his exhibition, with the hope that it will attract the ideal tenant to rent the entire space once his exhibition concluded.



Hin Bus Depot

Unexpected



His exhibition garnered **overwhelming** support and drew widespread attention from both visitors and the **local arts community**.

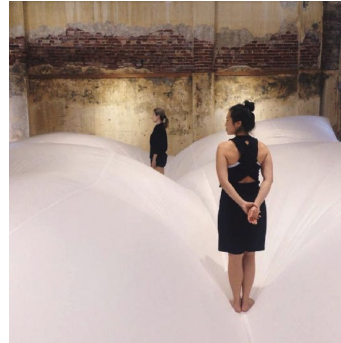


Hin Bus Depot

Unexpected



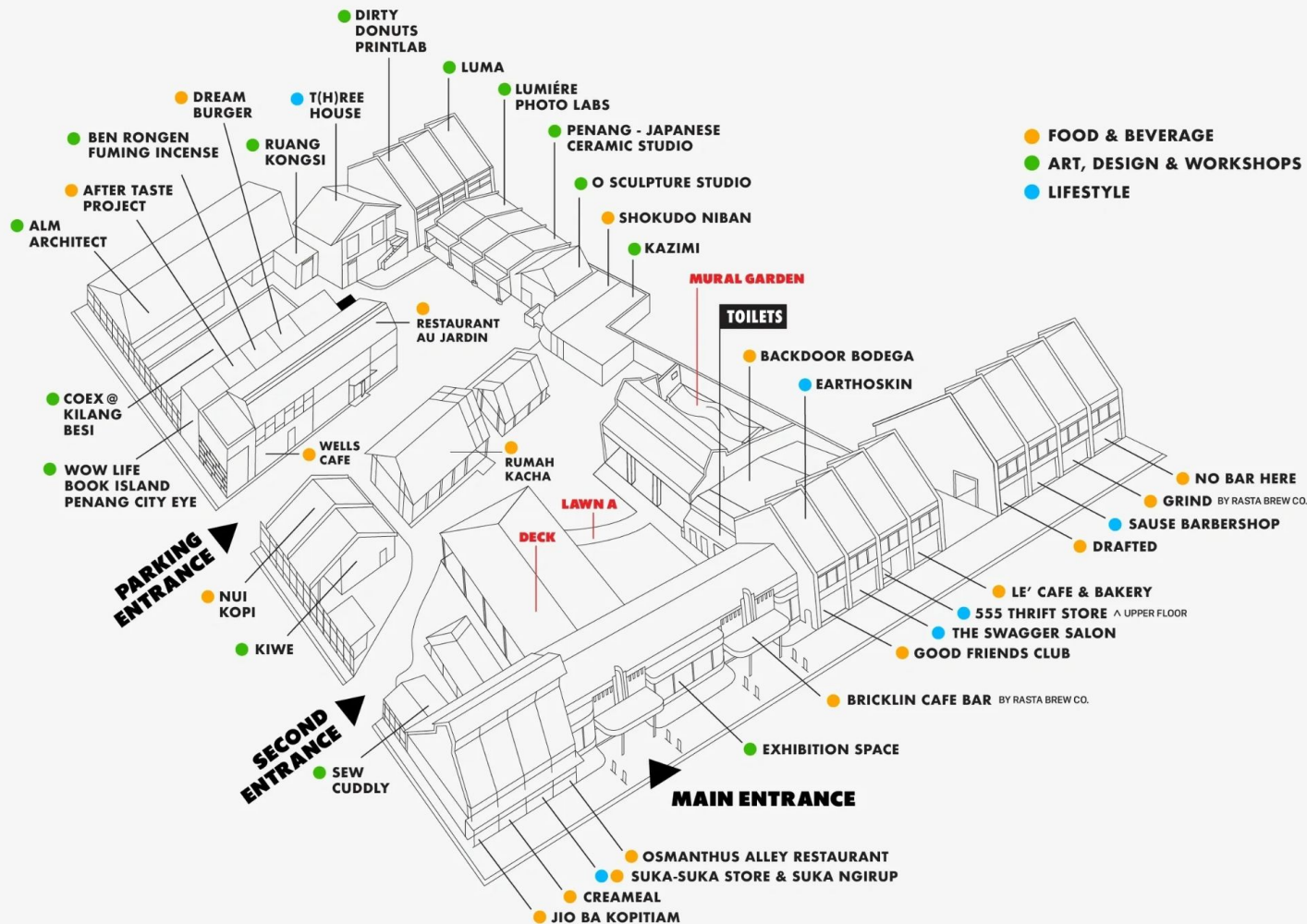
Unknowingly a void was filled by having a space where young and emerging artists can **exhibit their works** and It provided a safe space for them to **push the boundaries** of their creativity.



Greener logistics
with *Greener Wheels.*

Hin Bus Depot

Now



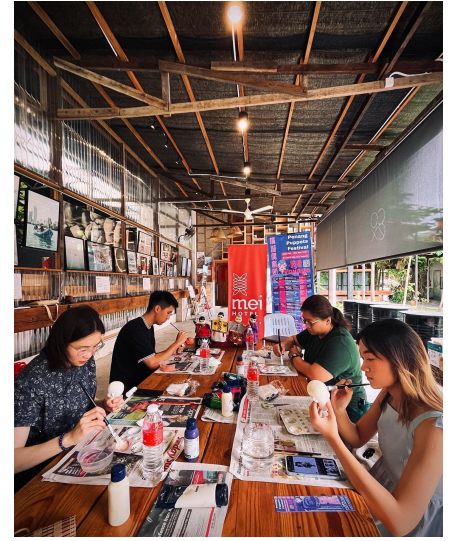


Hin Bus Depot
Now



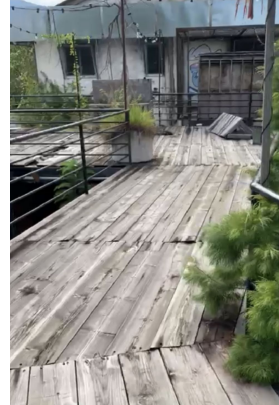
Hin Bus Depot

Community + Sustainability



Hin Bus Depot

Transformation: Reclaimed Materials



Construction waste from other projects.

Container wrapper from containers.



Greener logistics
with *Greener Wheels.*

Hin Bus Depot

Transformation: Reclaimed Materials

Work within the constraints of pandemic, skills & tools of the craftsmen as well as the **characteristic** of available reclaimed material.



Hin Bus Depot

Transformation: Reclaimed Materials

Work within the constraints of pandemic, skills & tools of the craftsmen as well as the **characteristic** of available reclaimed material.



Hin Bus Depot

Transformation: Reclaimed Materials

Work within the constraints of pandemic, skills & tools of the craftsmen as well as the **characteristic** of available reclaimed material.



Hin Bus Depot

Transformation: Reclaimed Materials

Work within the constraints of pandemic, skills & tools of the craftsmen as well as the **characteristic** of available reclaimed material.



Hin Bus Depot

Transformation: Reclaimed Materials

Work within the constraints of pandemic, skills & tools of the craftsmen as well as the **characteristic** of available reclaimed material.



Hin Bus Depot

Material Sourcing // The Philosophy



Adjust and **adapt** the design according to the material size, as customization costs on used materials are high.

Buy from nearby shops to support **local businesses**.

Be an expert or **highly knowledgeable** in sourced materials.

Hin Bus Depot

Regulation on Building



Hin Bus Depot is considered or viewed as a “**kampung house**” (traditional village house).

Hin Bus Depot plays a significant role in **contributing** to the community.

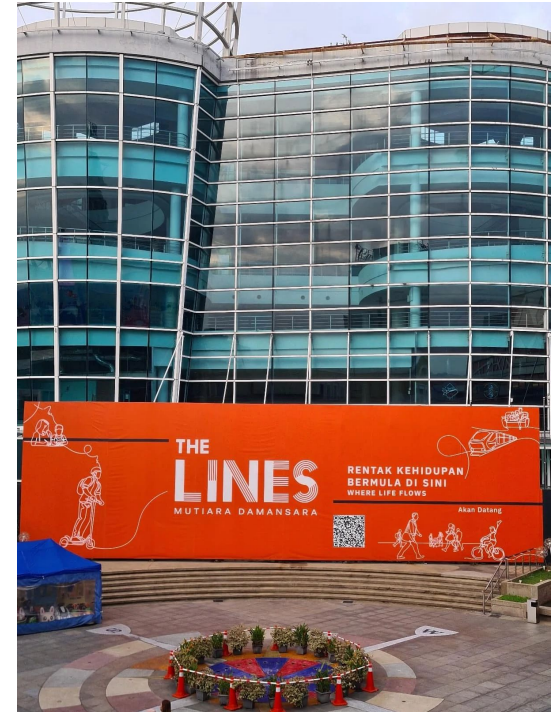
Supported by **local community** and local **government**.

Demolition of Damansara eCurve



Named after Boustead Properties Bhd's takeover in 2009, the business suffered greatly during the pandemic lockdown and decided to **permanently close** on March 31, 2021.

Part of a bigger plan to revitalise Mutiara Damansara in Petaling Jaya.



Demolition of Stadium Shah Alam



Stadium Shah Alam opened in 1994 and is scheduled for demolition on July 3, 2024, until it is fully demolished by mid-2025.

Other stadiums interested in reusing the old chairs can apply with the project team.



Rejuvenation of Sentul Depot



Railway engineering workshop in 1905.

Master plan started in 2002.

Now it serves as one of the key places in KL for corporate and **community events**.

Process of Building Construction in Malaysia



Greener logistics
with *Greener Wheels.*

Process of Building Construction in Malaysia

01

Schematic Design

Building plans
site visits
measurements

02

Planning Approval

Different (a lot) of government agencies and departments, ie. Department of Irrigation and Drainage, The Malaysian Public Works Department, IWK (National Sewerage Company) , PBA (State Water Dept.), TNB Electricity Utility), etc.

03

Building Plan

Fire department
Material
Structural

03

Implementation

Architect, contractors, and owners
To certify by lead architect and engineer.

04

CCC

Certificate of Completion and Compliance
Complies with all relevant building codes and regulations.

Pain point: Planning stage

02

Planning Approval

Government bodies take too long to approve.

- Too many design types and use-cases
- Guidelines that could not cope with different scenarios

With guidelines, but very subjective depending on site and building.

Some officers adhere strictly to the regulations.

Design and Build
Commercial Buildings:
**Sourcing
materials**

Design concepts based on **available materials** from the market, and/or on-site materials.

On-site materials often possess unique **characteristics** that contribute to more powerful and meaningful **storytelling**.

Sourcing old materials or furniture:

- second-hand shops
- personal / own connections
- online: Google, Marketplace, etc.

Design and Build
Commercial Buildings:
**Sourcing
materials**

Common problems with material reuse:

- Require expertise and specialized knowledge
- A lot more effort than just to purchase new materials
- Often more expensive due to need for processing
- Harder to control cost

Design and Build
Commercial Buildings:
**Sourcing
materials**

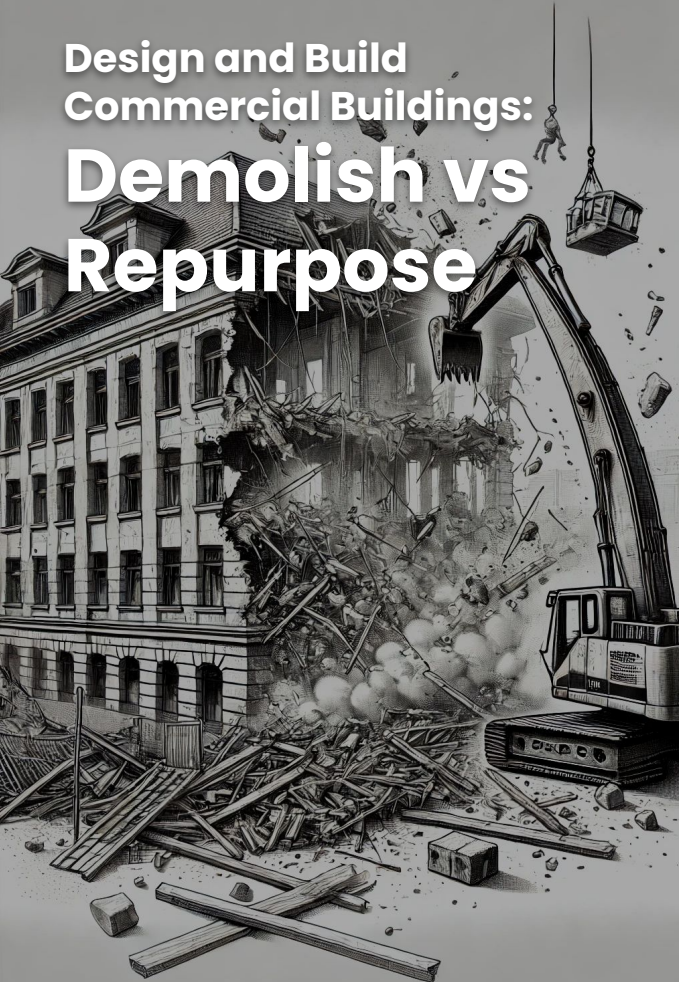
Sourcing locally results in **lower carbon emissions** compared to importing goods.

Suppliers and contractors are key stakeholders in **managing changes** or **usage of materials**.

Customers have the final say.

Design and Build
Commercial Buildings:

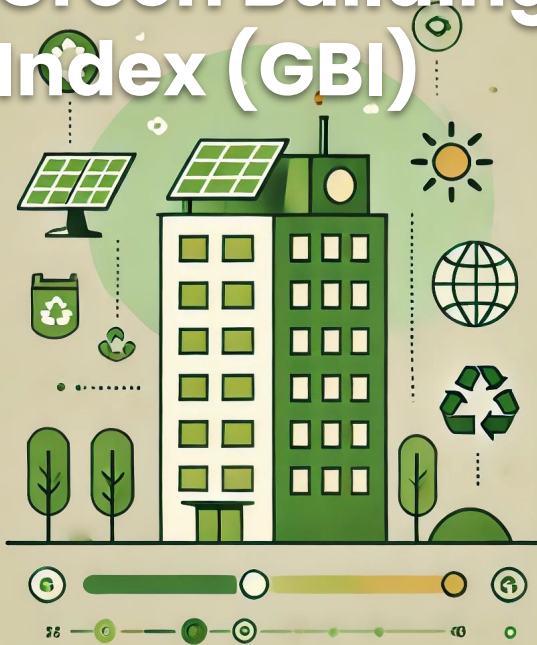
Demolish vs Repurpose



Generally, local firms prefer demolish than repurpose.

- Lower cost
- Missing / shortage of materials or replacements, eg. materials of old buildings no longer available
- Need experts to evaluate on building structure and materials

Design and Build Commercial Buildings: Green Building Index (GBI)



GREEN
BUILDING

Green Building Index (GBI)

Malaysia's industry-recognized **green building rating tool** promotes sustainability within the built environment.

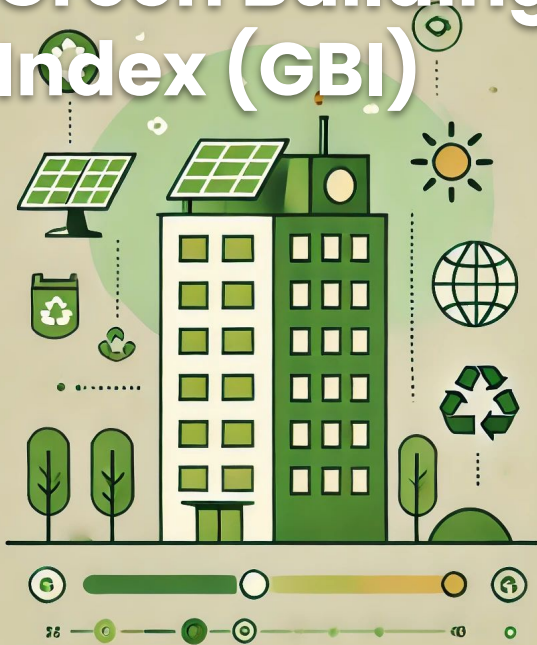
Raise awareness among developers, architects, engineers, planners, designers, contractors, and the public.

Malaysia Green Building Council (GBC)

Started in 2007, non-profit to promote sustainable buildings in Malaysia.

Supported by the professional, industrial and government sectors.

Design and Build Commercial Buildings: Green Building Index (GBI)



GREEN
BUILDING

A green building prioritizes **resource efficiency** and **minimizes environmental impact** through better siting, design, construction, operation, maintenance, and removal.

Eg. better ventilation, natural lighting, rainwater capture, using recycled and locally sourced materials, etc.

Voluntary but **highly encouraged** for those wishing to construct or renovate buildings with a focus on sustainability and environmental responsibility.

Oslo

MaterialMapper

Manage stakeholders (public & private)

Quality control & documentation

Buying and selling of materials

Transportation and storage

CO2 audit and certificate

Circularity of Construction

Buy & Sell Reusable Materials and Aggregates, Save CO₂ & Get Certified

JOIN NOW

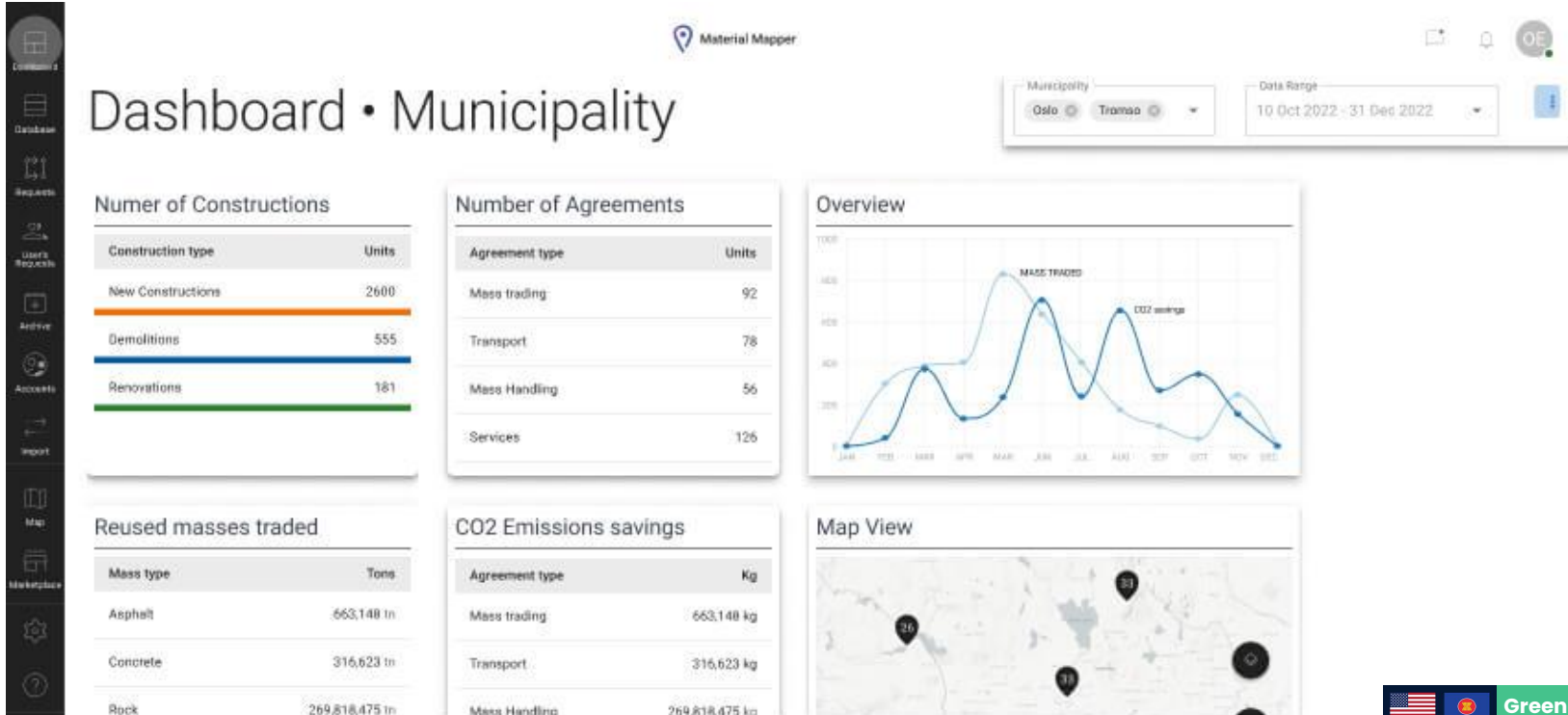
2023 Material Waste Forecast & CO₂ Potential Savings (Oslo City)

62,061,808 Tons Building waste will be generated	1,649,814,590 kg CO ₂ -eq. Potential CO ₂ saved if reused
---	--


- Municipalities
- Building Developers
- Contractors
- Architects & Consultants

Your partner for reusing building materials

MaterialMapper City Councils



MaterialMapper Developers / Builders

📄 🔔 👤

Your Construction

📍 {{construction_address}}


[VIEW DOCUMENTATION \(ID: OSL-NO-26\)](#) | [STATUS: UPDATED](#) | [EDIT CONSTRUCTION](#)

Details

[View documentation](#) • [Contact info](#)

About	Details
Type	Demolition
Size	8 000 sqm
Building type	Industry Building
Application date	2021-04-15 - 2021-06-24
Status	Tillatelse gitt
Reuse report	Available

Construction Media



Materials

Estimated waste

Map View

[3D Map view](#)

Comments

[View all Comments](#)

Adison Mango • 3 days ago
Est esse molestias laborum itaque alias quas ut natus. Dolore sint dolor et ab minus minima.

Ova • 2 hours ago
Consequantur perferendis et maiores sunt.

Joel Kirlin • 1 hour ago
Repellat est autem dicta et id dolore, qua aut teleniti. Porro ipsam repudiandae quam odit nobis eos odit blanditiis. Aut neque vel adipisci ipsum praesentium veritatis maiores. Minus optio quibusdam unde eius voluptattem. Modi cum vel voluptatem.



Greener logistics
with *Greener Wheels.*

MaterialMapper Contractors

The screenshot displays the MaterialMapper Marketplace interface. At the top, the 'Marketplace' header includes navigation options: 'BUY', 'SELL', 'FAVOURITES', and '+ NEW AD'. Below this, there are search filters for 'Location' (with an 'Address' input), 'Price' (with a 'Category' dropdown), and a 'Pure Only (Level 1-3)' checkbox. A 'Sort by: Date/Desc' dropdown is also present. The main content area features a grid of material categories: 'Concrete', 'Soil', and 'Rock'. A detailed view for 'Asphalt' is shown, including a 'Purity level: 3' indicator, location 'Oslo, Norway', and dates '11/Nov/2022 - 26/Dec/2022'. The price is listed as '7 700 NOK/ton, 126 tons' with the seller 'Angel Bricks'. Action buttons include 'CONTACT SELLER', 'CHAT REQUEST', 'CO2 REPORT', and 'GET TRANSPORT'. A map on the right shows the location in Oslo, Norway. A sidebar on the left contains navigation icons for Dashboard, Requests, My Profile, and other user-related functions.

MaterialMapper

Architects & Consultants

MATERIAL MAPPER

FILTERS

SEARCH

Demolition
TROSTERUDVEIEN 6 N, 7 - VESTRE AKER,
Stemdal Oslo, Norway

Size: 200 sq m

Status: Mottatt søknad...

Reuse report available

VIEW DETAILS →

Oslo

2022

EN NO

Malaysia Building materials online (BMO)

The screenshot displays the BMO website interface. At the top, there is a navigation bar with a language selector (English, Malay, Chinese), a search bar, and a shopping cart icon. Below the navigation bar, there are links for 'Create E-Tender', 'Join As Supplier Now!', 'Join Facebook Group', and 'Construction Calculators New!'. The main content area features a large banner for 'Switchable Smart Glass' with the tagline 'FLEXIBLE CONTROL OVER YOUR PRIVACY'. To the right of the banner, there is a 'JOIN OUR SUPPLIERS' button and a 'REQUEST FOR QUOTATION' button. Below the banner, there is a section titled 'The New Way To Source For Construction, Interior And Home Materials' with icons for 'Online Shopping', 'Request For Quotations', and 'Multi Channel Payment'. Further down, there is a section with six hexagonal icons representing 'Contract Management', 'Timeline Scheduling', 'Cost Planning', 'Project Tender', 'BID', and 'Resources Management'. To the right of this section is the 'build space' logo with the tagline 'Enabling Digital Transformation' and a 'find out more?' button. At the bottom of the page, there is a 'Featured Suppliers' section.

Autodesk Construction Cloud

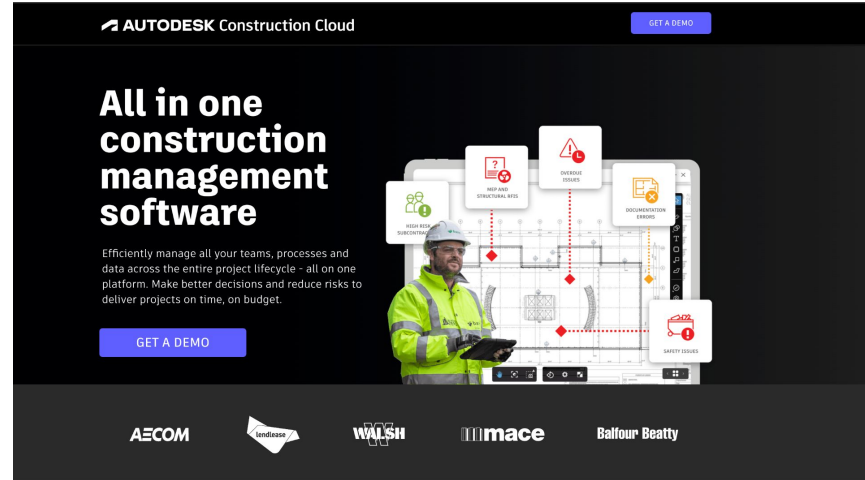
Common Data Environment (CDE)

Building Information Modeling (BIM)

Digital twin

Embodied Carbon in Construction
Calculator (EC3)

Compliance to local government



AUTODESK Construction Cloud [GET A DEMO](#)

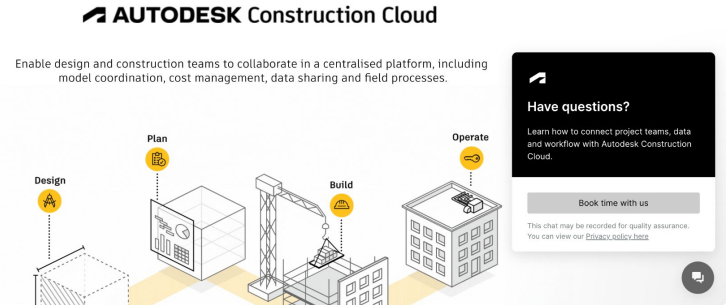
All in one construction management software

Efficiently manage all your teams, processes and data across the entire project lifecycle - all on one platform. Make better decisions and reduce risks to deliver projects on time, on budget.

[GET A DEMO](#)

Key features shown: NEED RESOURCES?, HIGH RISK STRUCTURAL ISSUES, DOCUMENTATION CHANGE, SAFETY ISSUES.

Partners: AECOM, endesse, WALSH, mace, Balfour Beatty



AUTODESK Construction Cloud

Enable design and construction teams to collaborate in a centralised platform, including model coordination, cost management, data sharing and field processes.

Design Plan Build Operate

Have questions?

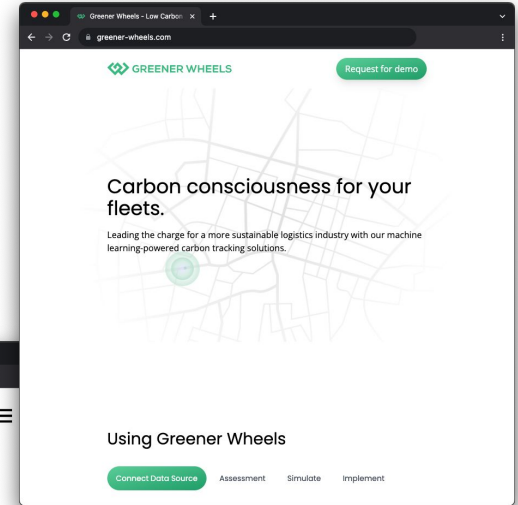
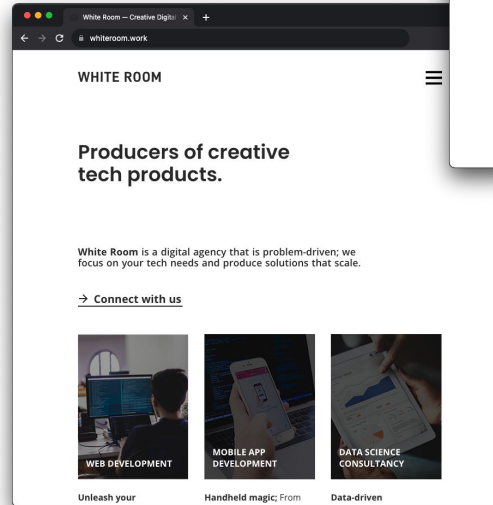
Learn how to connect project teams, data and workflow with Autodesk Construction Cloud.

[Book time with us](#)

This chat may be recorded for quality assurance. You can view our [Privacy Policy here](#).

Thank you.

greener-wheels
.com



whiteroom
.work