

1 Frugal Project Documentation

1.1 Green rooftop module

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Project Overview

This project aims to develop sustainable green rooftop models using wood as a primary material, incorporating environmentally friendly design principles to enhance urban biodiversity and mitigate the urban heat island effect.

Frugal Technology Approach

Introduction:

In pursuit of environmentally conscious urban development, this project strategically employs frugal technology to achieve its goals in implementing green rooftop models constructed primarily from wood. By leveraging cost-effective and resource-efficient technologies, the initiative aims to maximize sustainability while minimizing the ecological footprint, contributing to the advancement of greener urban landscapes.

Conclusion:

The utilization of frugal technology has been pivotal in realizing the objectives of this project, ensuring that the implementation of wood-based green rooftop models remains both economically viable and environmentally sustainable. The integration of innovative yet cost-effective solutions underscore the project's commitment to fostering resilient and eco-friendly urban ecosystems.

References:



Fig. 1.1 Green rooftop module idea

Project Image

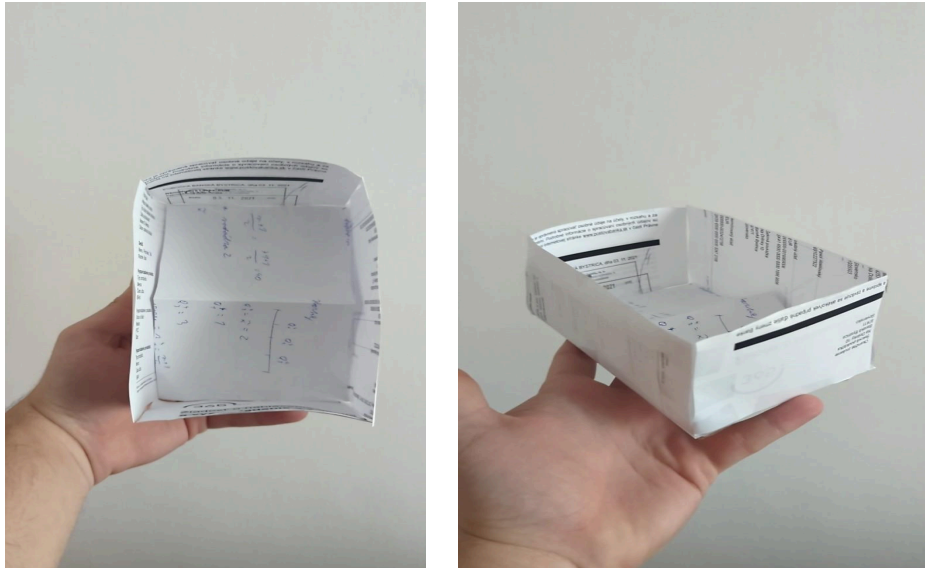


Fig. 1.2 Initially paper prototype

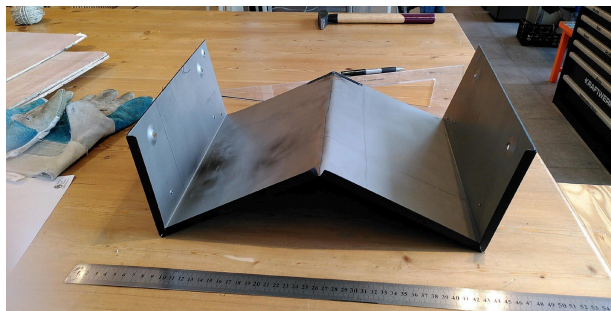


Fig. 1.3 Some materials for prototype

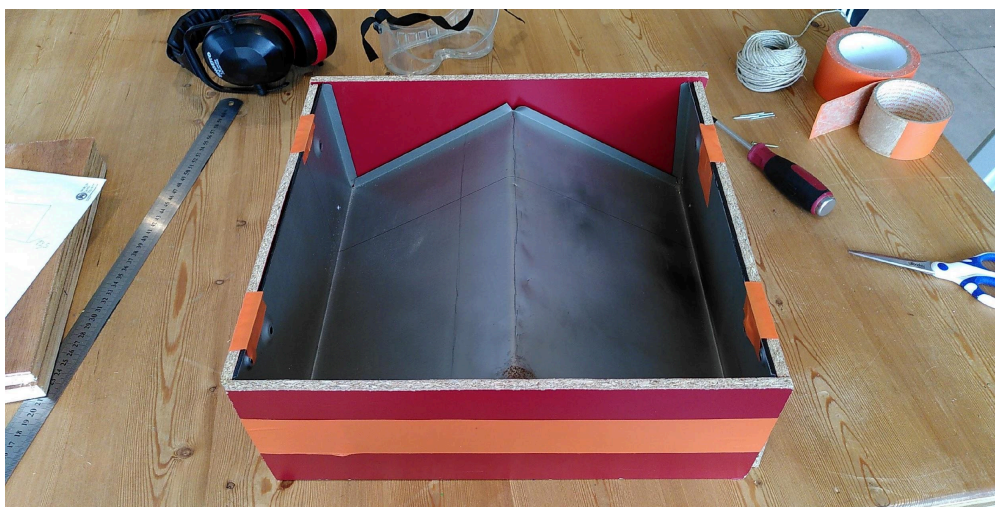
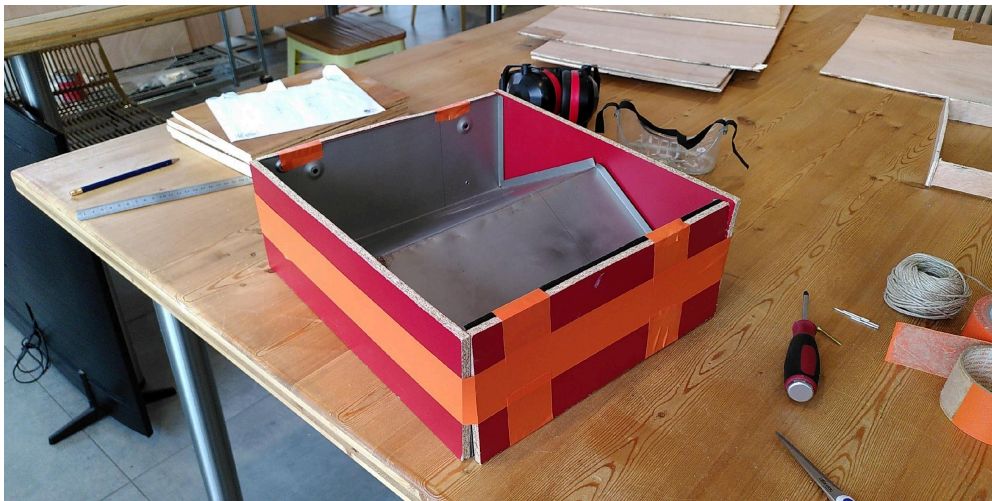
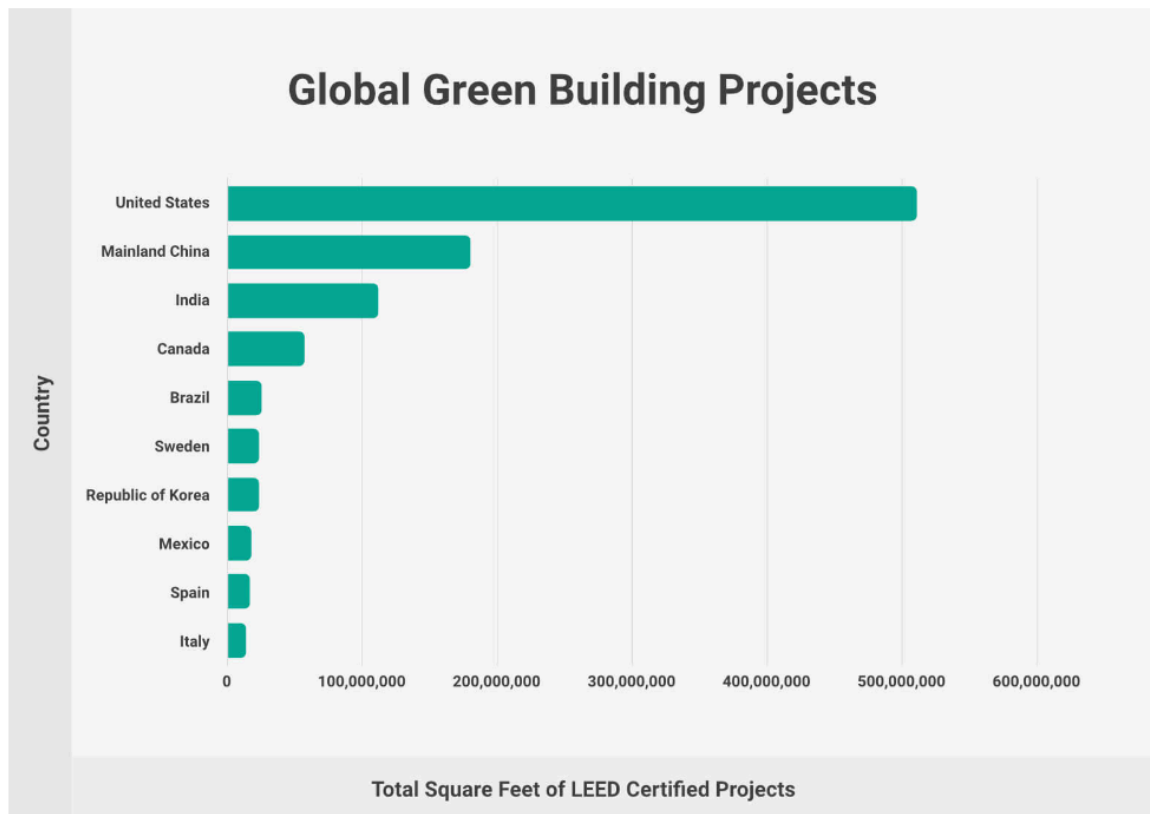


Fig. 1.4 The prototype green rooftop module

World need for green projects



Source: RubyHome 2023 ([Green Building Statistics \(2023\) \(rubyhome.com\)](https://www.rubyhome.com/green-building-statistics-2023))

Biotechnology Application

Biotechnology improves green rooftop sustainability by using biodegradable materials and advanced bioengineering for resilient, eco-friendly plant substrates enriched with beneficial microorganisms. It enhances plant tolerance to rooftop stressors, such as drought and temperature fluctuations, through genetic modification. Additionally, biotechnology optimizes water use, reducing irrigation needs and promoting sustainable water practices, ultimately enhancing the ecological performance, durability, and adaptability of green rooftop modules for sustainable urban development.

Ecological Impact

Green rooftop modules are a key asset in urban ecology, providing solutions to challenges posed by urbanization. This overview delves into their ecological impacts, emphasizing their role in fostering biodiversity, alleviating the urban heat island effect, enhancing air quality, and managing stormwater runoff.

Green rooftops excel in promoting urban biodiversity, creating habitats for various species. They also combat the urban heat island effect by reducing surface temperatures, improving overall urban climate resilience. Additionally, these modules act as natural air

purifiers, capturing pollutants and dust particles, and contribute to sustainable water practices by managing stormwater runoff.

In summary, green rooftop modules emerge as a comprehensive solution for promoting ecological balance in urban areas. Their contributions to biodiversity, climate regulation, air quality, and water management make them integral for sustainable urban development.

Open-Source Contribution

Our open-source green rooftop module is a do-it-yourself (DIY) solution designed to empower individuals and communities to create sustainable urban green spaces. The module is compact, lightweight, and easy to assemble, making it accessible for both gardening enthusiasts and those new to green roofing.

Future Company Potential

In the evolving landscape of urban sustainability, a pioneering company specializing in DIY green rooftop modules stands at the forefront of transformative possibilities. This venture envisions a future where individuals, from homeowners to community organizations, can seamlessly contribute to environmental conservation and elevate the aesthetic and functional value of their properties.

The market potential for DIY green rooftop modules is robust, driven by a burgeoning demand for accessible and affordable solutions. The modular design not only ensures affordability but also allows users to customize their green rooftops, catering to diverse urban environments and individual preferences.

Key features, including educational initiatives and tech integration for smart monitoring, position the company as an influential player in the urban sustainability sector. By fostering a culture of learning and collaboration, the company not only contributes to green infrastructure but also promotes environmental education.

The environmental impact of DIY green rooftop modules is substantial, addressing the urban heat island effect, enhancing air quality, and fostering biodiversity. As individuals adopt these modules, the cumulative effect on the urban ecosystem is poised to be transformative.

Recommended sources

- [Green Roof Systems - Green Roof Outfitters](#)
- [M-Tray® Modular Green Roofs - Wallbarn](#)
- <https://www.calgary.ca/content/dam/www/uep/water/documents/water-documents/development-approvals-documents/2019/module-three-green-roofs.pdf>