New European Bauhaus

beautiful | sustainable | together





Green Renovation Wave for Ukraine





FINAL REPORT

Green Renovation Wave for Ukraine

Project Team



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GOSS

CONTENT



- Project Summary
- Researches and Mentors Support
- Updated Project Vision
- Survey
- Business Opportunities
- Inspirational Cases
- Design Vision
- Resume
- Contacts





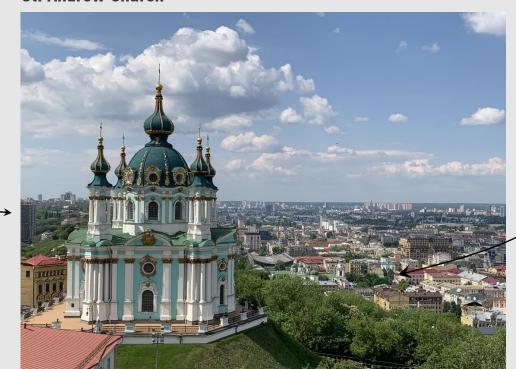


VALUE OF THE PODIL IN KYIV:

- Window views and connection with the environment
- Spirit of Place
- All infrastructure and existing buildings' roofs

St. Sophia Cathedral

St. Andrew Church



Podil



Project Idea



The idea of the project is the creation of a strategic vision and concept design project of Sustainable District Renovation using existing attic floors and flat roofs on Podil district in Kyiv, Ukraine.

This project will help to:

- 1. Save the existing buildings by the most sustainable way according to Sustainable Development Goals
- 2. Create a holistic vision for a positive district in Kyiv which could be apply in other cities in Ukraine
- 3. Improve energy efficiency parameters of buildings and include more renewable energy in the local energy grid
- 4. Save the heights of buildings, views to historical part of Kyiv and sky
- 5. Improve the quality of life for the local society of different ages
- 6. Find new square meters for the new inhabitants (extremely needed taking into account the russian invasion of Ukraine) without building skyscrapers from concrete in the most beautiful part of Kyiv)

Project Challenges



3-steps project phases will help to create a vision for Podil "green" renovation:

- Communication with local community and create a task for architects
- Concept architectural vision for the Podil sustainable Renovation
- Public presentation to community and Podil administration to receive a feedback for future project development

Re-connecting with nature

Re-gaining sense of community and belonging

Prioritising the places and people that need it the most

The need for long-term, life cycle and integrated thinking in industrial ecosystem



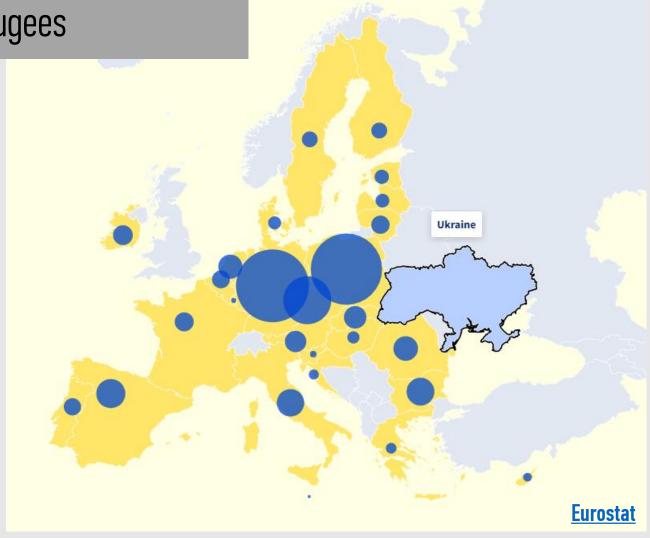




RESEARCHES. Ukrainian refugees

"In total, around six million Ukrainian refugees were registered across Europe and **6.2 million** worldwide as of September 2023".

Statista



RESEARCHES. Economy

"Without people coming back, we will not have a strong economy," Ukrainian President Volodymyr Zelensky said in June 2022.

The Ministry of Economy said Ukraine's projected gross domestic product drops by 0.5% for every 100,000 Ukrainians living abroad. Ukraine's GDP shrank by a third in 2022".

WSJ



RESEARCHES. People's health and well-being

Healthy life

DALY Disability Adjusted Life Year is a measure of overall disease burden, expressed as the cumulative number of years lost due to ill-health, disability or early death YLD Years Lived with Disability Years of Life Lost

Disease or Disability

The impact of the war on the **physical and mental health** of Ukrainians cannot be overestimated. Therefore, buildings that provide optimal conditions for health, learning and work productivity should be the standard for green, **healthy and sustainable recovery of Ukraine.**



Expected

life years

Early death

RESEARCHES. Healthy buildings

Participation in the Healthy Buildings 2023 Europe Conference in Aachen (Germany) gave us new evidence-based arguments, that Active House approach is the simplest, fastest and most affordable way for Ukraine to build real energy-efficient, sustainable, HEALTHY buildings for people and the planet.





RESEARCHES. Podil Neighborhood Problems

- Ditrict and buildings overheating
- High energy demand and dependence on Fossil Fuel Energy
- Lack of green spaces and public access
- Floods during each rain
- No goals and solid data for business investment with a focus on **people's health** (including mental health), well-being and low impact on the environment

1931. The corner of Shchekavytska and Mezhyhirska streets





RESEARCHES. Building and Environment



Building and Environment

Volume 244, 1 October 2023, 110704



Increasing solar panel output with bluegreen roofs in water-circular and nature inclusive urban development

Els van der Roest a b 💍 🖾 , Joris G.W.F. Voeten c, Dirk Gijsbert Cirkel a

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https://doi.org/10.1016/j.buildenv.2023.110704 7

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open access

Highlights

- · Comparative research on full-scale PV systems on a bitumen and a bluegreen roof.
- · Grey water reuse generated an essential extra water source for roof vegetation.
- Plant-cooling effect visible if roof surface temperature difference is above 4.6°C.
- 4.4% more PV output on a blue-green versus bitumen roof with similar irradiation.

Building and Environment 223 (2022) 109317



Contents lists available at ScienceDirect

Building and Environment

journal homepage: www.elsevier.com/locate/buildenv



Enlightening wellbeing in the home: The impact of natural light design on perceived happiness and sadness in residential spaces

Javiera Morales-Bravo^a, Pablo Navarrete-Hernandez^{b,*}

- ^a Department of Architecture, University of Chile, Santiago, Chile
- ^b Department of Landscape Architecture, University of Sheffield, Sheffield, UK

ABSTRACT

As more people move towards work-from-home options during the COVID-19 pandemic, residential indoor environments are increasingly becoming places where we spend a large share of our time living, working and studying. While the relevance of indoor environments for our emotional wellbeing is well established, little is known about the specific aspects of residential indoor spaces that affect negative and positive emotions. This article studies the relationship between natural lighting in the home and the emotional subjective wellbeing (E-SWB) of its inhabitants. In a randomised control trial, we test the hypothesis that natural lighting improvements in housing contribute to residents' E-SWB, determining which aspects of housing daylight design are more relevant for this. A total of 750 participants took part in the experiment and rated, according to their perceived happiness or sadness, a series of 3D computer simulations representing seven types of natural lighting improvements in the home. The results show that the natural lighting conditions of housing significantly impact people's perceptions of happiness and sadness, with settings that have an increased amount of daylight entering the home leading to the greatest impacts.



MENTORS support & contribution

Our Mentors helped us:

- **prioritized** the project goals (to "prioritising the places and people that need it the most")
- focus efforts on essential activities (create not only sustaibale living conditions, but business opportunities for the district development also)
- update a long-term vison of the project (mechanisms of implementation and trasferable knowledges to scale the solutions on the national level in Ukraine and abroad)



Loredana STASISIN - Design



Breandán GOSS - Business



Project Idea



The idea of the project is a creation of strategic vision and concept design project of Sustainable District Renovation using existing attic floors and flat roofs on Podil district in Kyiv, Ukraine.

Creating social, residential, urban conditions and business opportunities for Ukrainians back to Ukraine. People is a driving engine of the economy.

Not only Green and energy efficiency, but also HEALTHY buildings for people and the planet

Project Challenges



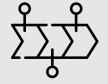
Re-connecting with nature

Re-gaining sense of community and belonging

Prioritising the places and people that need it the most

The need for long-term, life cycle and integrated thinking in industrial ecosystem

hases



5-steps project phases will help to create a vision for Podil "green" and healthy renovation:

- Communication with local community and create a task for architects
- 2. Business Model Canvases of the prioritized solutions for the Green & Healthy Renovation of the Podil district
- 3. Best-world cases and practices.
- 4. The concept Design Vision for the Podil sustainable Renovation.
- Public access to the results of the Project feasibility stage for Podil Inhabitants, Podil OSBB* and administration, professional and civil society

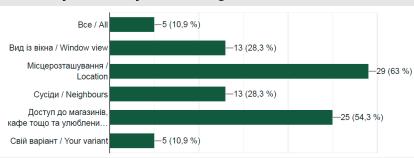
UPDATED VISION OF THE PROJECT

* OSBB (OSMD - the associations of co-owners of apartment buildings)



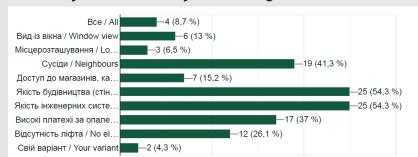
Online survey was created and suggested to fill for the inhabitants and business owners of the Podil district. Full description and questions (Ukrainian/English): <u>link</u>. Summary with main results see below. Full analysis according to NEB values & principles by Loredana Stasisin also attached to the Report by separate file: <u>link</u>

What do you like in your building?



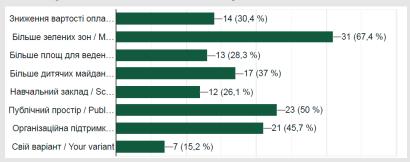
Comment: The results showed that the Podil district is a very valuable and favorite location in Kyiv

What do you don't like in your building?



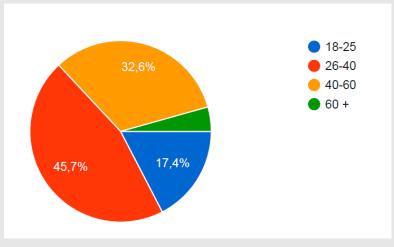
Comment: The quality of the buildings envelope, engineering system, energy bills and communication with neighbors look like a problems for inhabitants

What changes of your building and district could make your life better?



Comment: Green spaces access, public spaces and local administration support are the main priorities

Your age?









Perspective business opportunities implementation will allow to OSMD (The associations of co-owners of apartment buildings) and Podil administration create a conditions for investing, green & healthy recovery of the district

- 1. **Organic roof farms** (food, water, plants)
- 2. Blue-green roofs (photovoltaics, plants, water)
- **3. Vertical extension** (buildings):
 - Residential: living, co-living, module apartments for rent/live for refugees or/and veterans
 - Business: coworking spaces, module offices, organic restaurants/cafes
 - Public spaces: mixed-use spaces

The Lean Business Model Canvas:

1. Organic Roof Farm

PROBLEM

- Existing flat roofs need maintenance
- 2. Local food shops and restaurants need fresh salads and vegetables
- Local citizens (mainly older generation and veterans) want to do something for their physical and mental health

List your top 1-3 problems.

EXISTING ALTERNATIVES

- 1. Existing flat roofs are waiting for insulation and new covering every 5 years
- 2. Local food shops and restaurants buy vegetables and salads from the farms in Ukraine
- 3. Local citizens walk the streets and are looking for more green public space

List how these problems are solved today.

SOLUTION

Organic Roof Farm

KEY METRICS

Roof area in m2 for

Income per year from

shops and restaurants

temperature decreasing

in the neighborhood

Inside temperature

Indoor air quality improvements (pm 2.5,

decreasing at the last

gardening

to OSBB

floors

pm 10)

Outside air

Outline a possible solution for each problem.

UV PROPOSITION

Use your roof for Organic Business

Single, clear, compelling message that turns an unaware visitor into an interested prospect.

HIGH-LEVEL CONCEPT

Reference Case 1



Reference Case 2



List your X and Y analogy (e.g. YouTube = Flickr for videos)

UNFAIR ADVANTAGE

- Views of the sky, surroundings and Kyiv's historical part
- Reduce overheating (urban heat islands) of the neighborhood and city
- Reduce air pollution
- Increase biodiversity
- Improve roof insulation
- New jobs for people with disabilities in their place of residence

Something that can't be easily copied or bought.

CHANNELS

- The vegetables and salads are grown by locals on the flat roofs of the multifamily residential buildings (OSBB)
- Local shops and restaurants in a 500 m distance radius buy it
- Online: social media channels
- Offline: local events

List your path to customers.

CUSTOMER SEGMENTS

- Food shops and markets
- Restaurants and cafes
- residential customers
- Podil administration,
- Potential investors.

List your target customers and users.

EARLY ADOPTERS

- Restaurant with a focus on sustainable cuisine
- Responsible businesses which are going to create a sustainable food chain
- Local inhabitants

List the characteristics of your ideal customers.

COST STRUCTURE

- Roof construction analysing
- Architectural, landscape and building project
- 75 euro/m2 to prepare the roof
- Water and electricity per month
- Rent

List your fixed and variable costs.

REVENUE STREAMS

- Rent fee from the business to OSBB
- Money from the local food shops and restaurants on the ground floor to Organic Roof Farm on the last (or in a 500 m distance radius)
- Direct-to-consumer sales, workshops, and events
- Clear pricing strategies for different customer segments

List your sources of revenue.



The Lean Business Model Canvas:

2. Blue Green Roofs + Photovoltaics

PROBLEM

- Permanent need in sustainable renewable energy
- Buildings overheating and Urban Heat Islands
- Podil district floods each rain

List your top 1-3 problems.

EXISTING ALTERNATIVES

- Existing flat roofs are waiting for insulation and new covering by bitumen (an immensely viscous constituent of petroleum) every 5 years
- Podil area depends from non-renewable energy sources including coal.

3.

List how these problems are solved today.

SOLUTION

KEY METRICS

panels

green roof

Roof area in m2 for blue-

Area in m2 for photovoltaic

production in kWh per year

Total electricity energy

Summer period outside

the neighbourhood in

Celsius degrees

temperature reduction of

Roof area in m2 to collect (or absorb) rainwater

Community engagement

levels in: visitors per year, workshops and events per

Blue Green Roofs + Photovoltaic Panels

Outline a possible solution for each problem.

HIGH-LEVEL CONCEPT

UV PROPOSITION

and prevents flooding

prospect.

Transform your roof into a green energy

powerhouse that cools your neighborhood

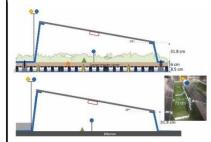
Single, clear, compelling message that turns

an unaware visitor into an interested

Reference Case 1



Reference Case 2 (Research)



UNFAIR ADVANTAGE

- Views of the sky, surroundings and Kyiv's historical part
- Independence in energy for the neighborhood
- Reducing the load on the stormwater runoff system of neighbourhood streets
- Air quality improving

Something that can't be easily copied or bought.

CHANNELS

- Local messengers chat group channels
- Social media strategies and promotion
- Collaboration with Sustainablefocused organizations
- Podil administration resources
- Local website

List your path to customers.

CUSTOMER SEGMENTS

- Local business
- Local inhabitants
- Podil administration
- Energy companies

List your target customers and users.

EARLY ADOPTERS

- OSBB for their own needs
- OSBB organize and manage the green-blue roofs with energy sales to local businesses
- Win-win collaboration between OSBB and Podil administration in reducing flood risks in the area: financial or administrative support of OSBB, because roofs reduce stormwater runoff system of the streets

List the characteristics of your ideal customers.

COST STRUCTURE

- Roof construction analyzing
- Architectural, landscape and building project
- System maintenance per month (panels cleaning, plant cutting, etc.)

vear

List your fixed and variable costs.

REVENUE STREAMS

- Rent fee from the business to OSBB
- Post-war recovery financial support to OSBB
- Money from the local business for renewable energy produced on the roofs
- Income from the City administration in case of the sale of renewable energy to the
- Workshops and education for Ukrainian OSB, Energy companies, City administration and Developers, and Sustainable-focused organisations.

List your sources of revenue.



The Lean Business Model Canvas:

3. Vertical Extension

PROBLEM

- New m2 for residential, business, public and mixeduse spaces in the existing city with all infrastructure
- High level of CO2 emissions from demolition and totally new buildings
- Economically reasonable sustainable renovation of existing buildings with a focus on people's health (not only developers' profit)

List your top 1-3 problems.

EXISTING ALTERNATIVES

- Demolition in the center of Kyiv to create new buildings for living and business
- New locations for development are far from the Kyiv center and need a lot of investments in infrastructure
- Nearly 200 000 m2 of empty attic roofs and flat roofs in the Podil district in Kyiv need maintenance and renovation

List how these problems are solved today.

SOLUTION

Vertical Extension for living, business and public spaces in existing buildings

Outline a possible solution for each problem.

KEY METRICS

Roof area in m2 for

adaptation to residential,

commercial, public, and

families and veterans who

focus on sustainability, well-

CO2 emission savings in kg

in comparison with totally new construction

need new homes with a

being and health (for

4. New jobs in sustainable

vertical extension and

mixed-use function

2. Amount of Ukrainian

recovering)

renovation

3.

UV PROPOSITION

Transform your roof into co-living, coworking and public spaces in the heart of Kyiv and increase your property value

Single, clear, compelling message that turns an unaware visitor into an interested prospect.

HIGH-LEVEL CONCEPT

Reference Case 1 (New)



Reference Case 2 (Renovation)



UNFAIR ADVANTAGE

- Saving the Podil district with new functions and business opportunities
- Saving views of the sky, surroundings and Kyiv's historical part from the Podil area buildings
- Community engagement, and support in post-war recovery for Ukrainian families and veterans
- Health and wellbeing for Ukrainians

Something that can't be easily copied or bought.

CHANNELS

- Local website
- Mobile app for community engagement
- Social media strategies and promotion
- Collaboration with Sustainablefocused organizations
- Podil administration resources
- Real Estate Developer media resources

List your path to customers.

CUSTOMER SEGMENTS

- Developers
- Investors
- Ukrainian war-affected families
- Veterans

List your target customers and users.

EARLY ADOPTERS

- OSBB
- Podil administration
- People focused real estate developer
- Ukrainian war-affected families

List the characteristics of your ideal customers.

COST STRUCTURE

- Roof construction analyzing
- Architectural and building project
- Permits and compliance with local building codes
- Building renovation cost
- Operational costs, such as property management and community engagement activities

List your fixed and variable costs.

REVENUE STREAMS

- Rent
- Sale
- Roofs leasing from the side of OSBB
- Workshops and education for Ukrainian OSBB, City administration, Developers and Sustainable-focused organizations
- Consultancy services for similar projects in other districts or cities

List your sources of revenue.





INSPIRATIONAL CASES:

• Organic Roof Farm (see cases links in Business Canvases description)



Blue Green Roof + Photovoltaics

(see cases links in Business Canvases description)



Vertical extension

(see cases below in the Vertical Extension Reference Cases chapter)











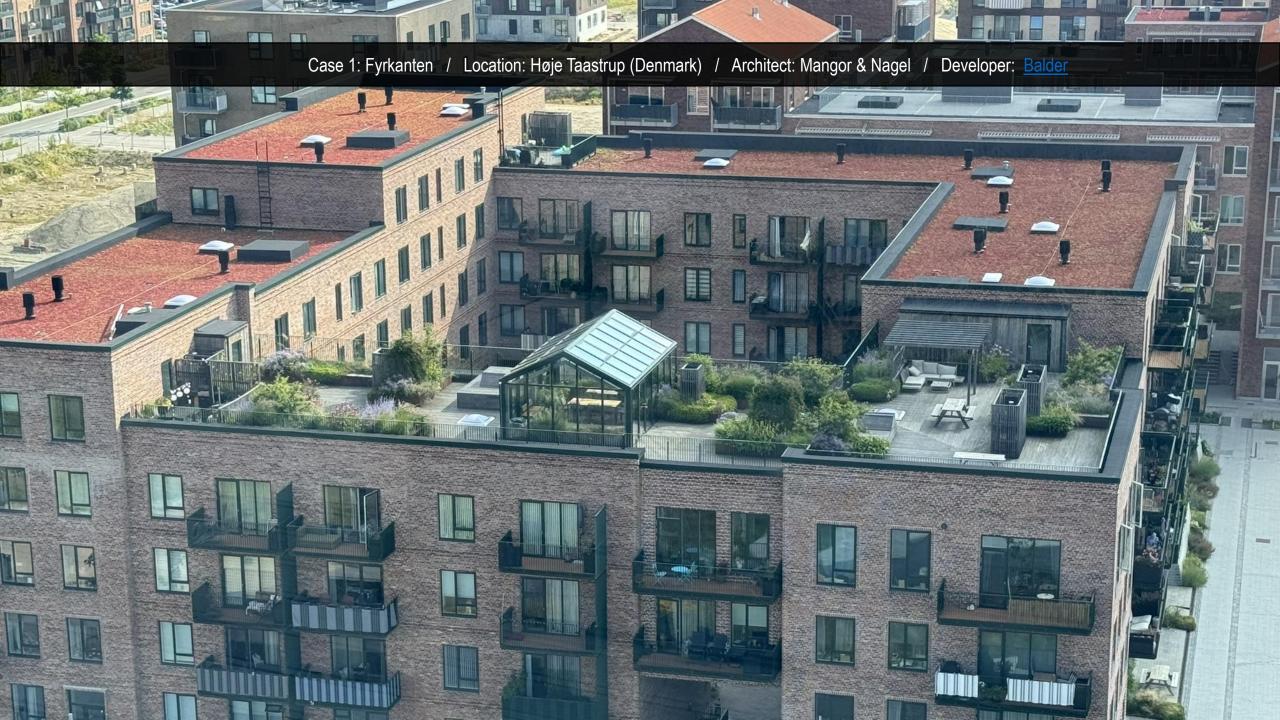


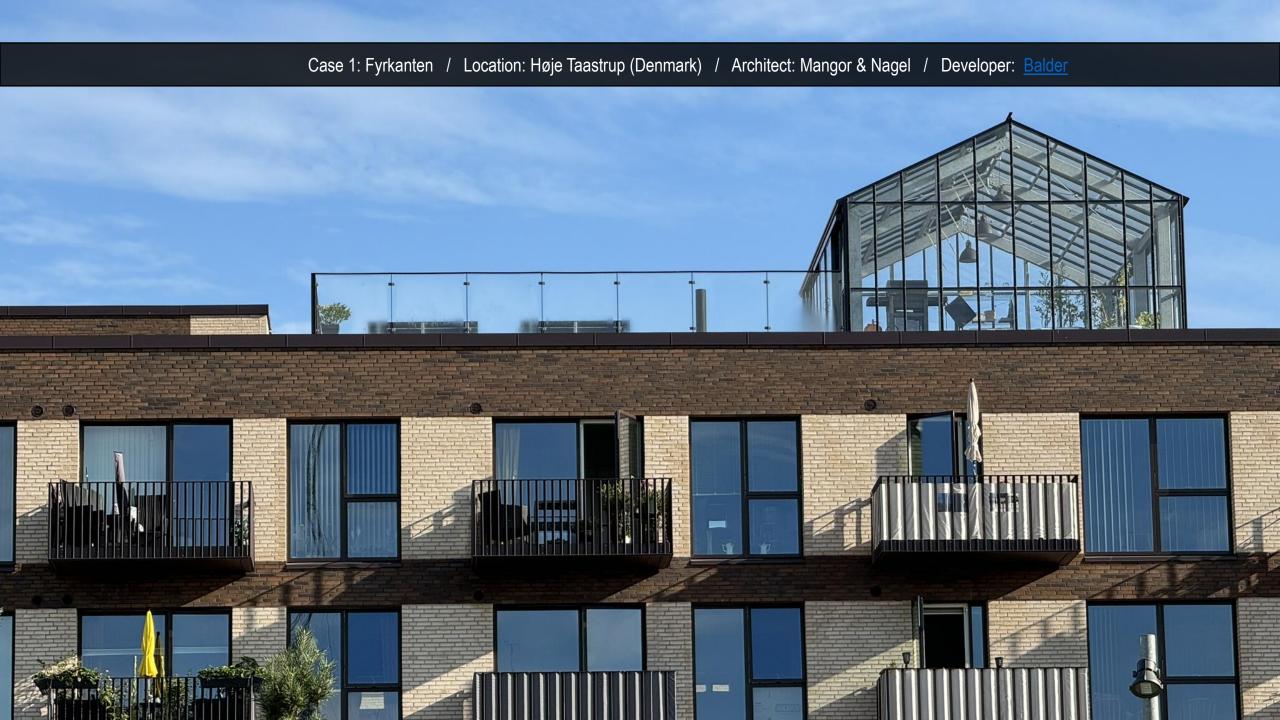
Proposed solutions based on a deeply research, including visiting the realized buildings in person and real measurements in situ.

These solutions have an evidence-based potential to:

- solve the problems of the Green Recovery of Ukraine from the consequences of War
- solve the problems of the Podil district (and other analogue districts) development in Ukrainian cities and abroad
- follow New European Bauhaus values & principles
- Support Sustainable Development Goals achievement
- Lead to climate neutrality according to European Green Deal legislation
- Satisfy the requirements of <u>New European Bauhaus Investment</u> <u>Guidelines</u>







Case 2: Living Places / Location: Copenhagen / Architect: EFFEKT / Partners: VELUX, Artelia Denmark Possible integration in context of the Podil (3D visualization by <a>EFFECT)



• **CAPSULE**: offsite sustainable technologies for architecture

Case 3: Capsule / Location: Modena (Italy) / Architect: il Prisma / Interior: Lago / Manufacturer: MANNI GREEN TECH





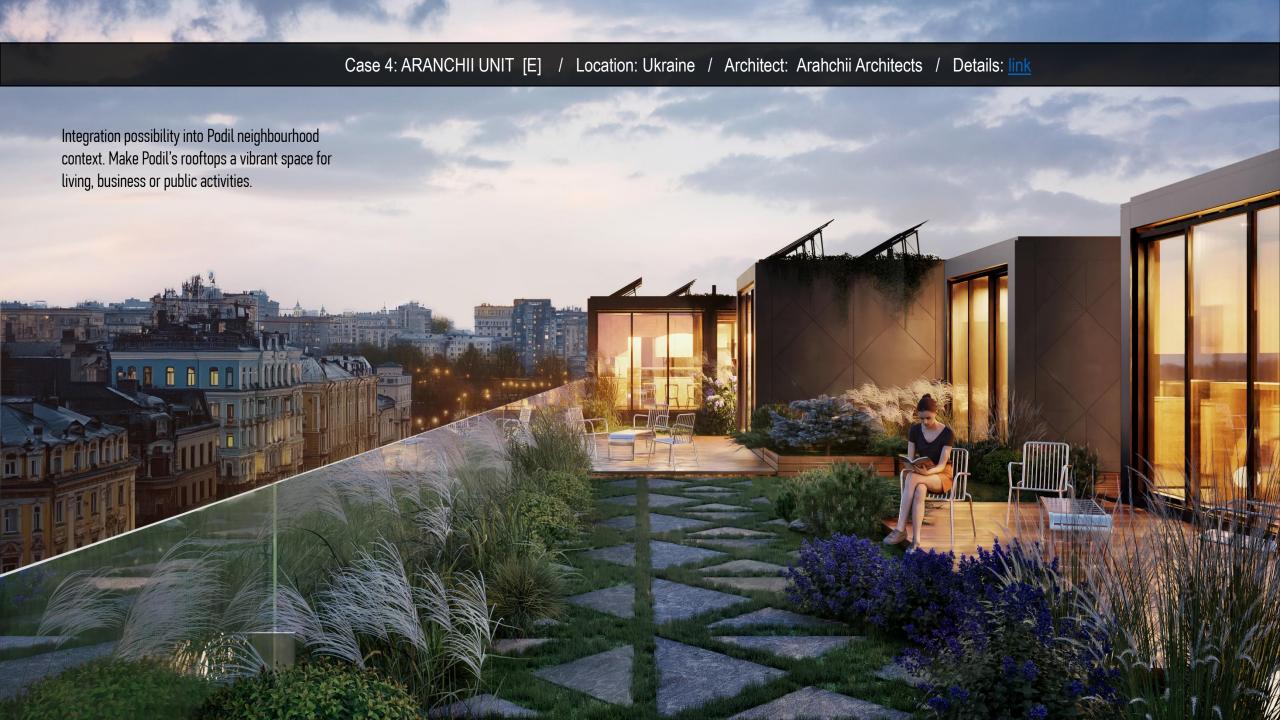








- ARANCHII UNIT [E] : Multipurpose Adaptive Sustainable Architectural System
- Active House Apartments: Green & Healthy Renovation in Kyiv

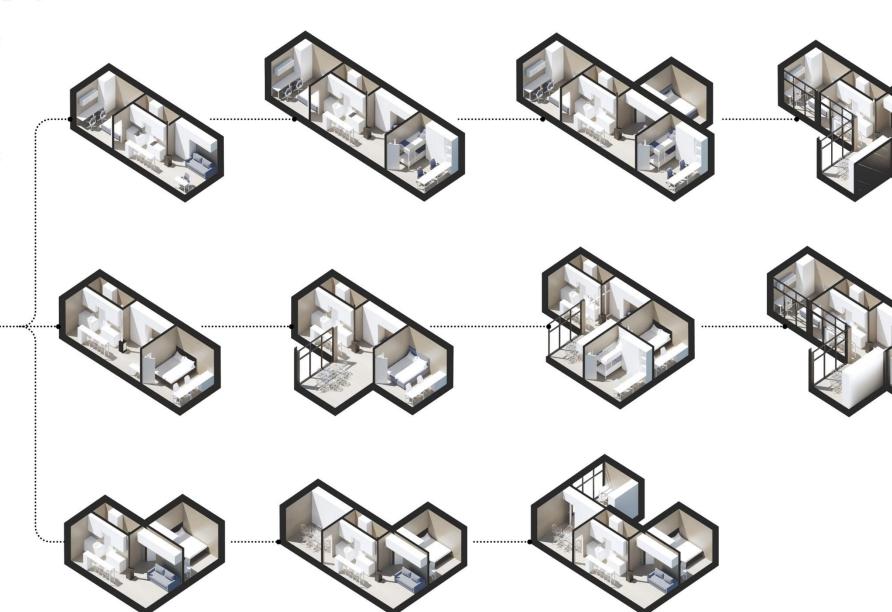


ARANCHII UNIT[E] | Residential

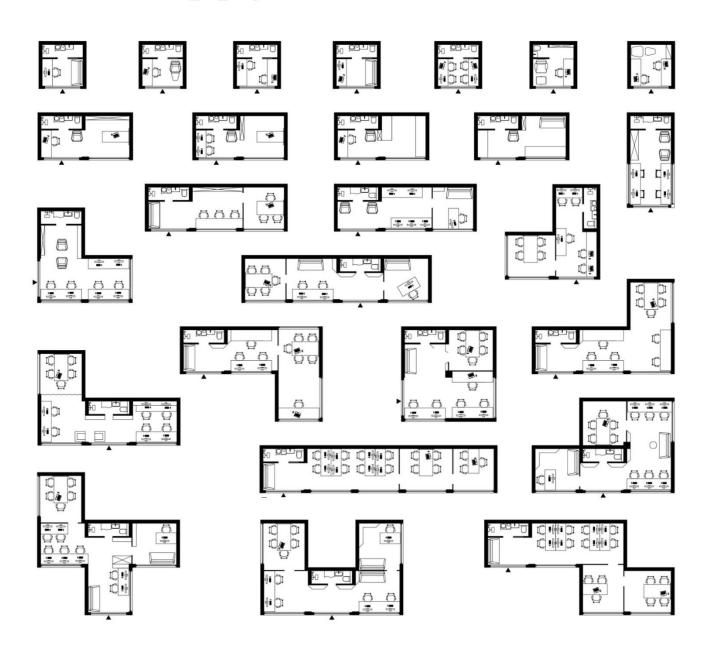
The system is sustainable, long-lasting, and manufactured with high precision through automation.

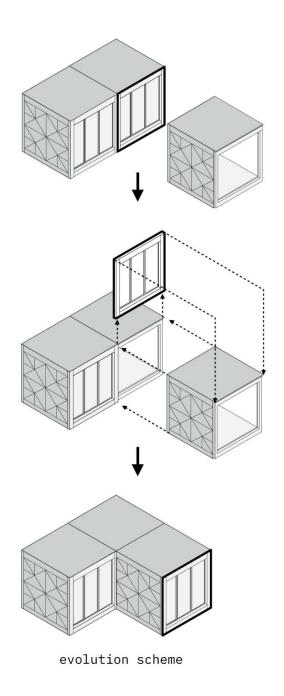
High adaptability allows for the provision of quality technological housing to meet the needs of a single individual, a large family, or even a co-living arrangement.

evolution scheme



ARANCHII UNIT[E] | Business





ARANCHII UNIT[E] | Multipurpose rooftop spaces







International Recognition

















Thermal Environment (1) 2.02 **@** Primary Energy Performance Before renovation After renovation

Active House Radar

SHOW THE AMBITION WITH THE BUILDING

THIS FIGURE SHOWS HOW ALL CRITERIA

- Dayligt
- Thermal Environment
 - Indoor Air Quality
- Acoustic Quality
- Energy Demand
- Energy Supply
- Primary Energy
- Sustainable Construction
- Freshwater Consumprion

WITHIN EACH PRINCIPLE

- Comfort & Health
- Energy
- Environment

ARE BALANCED
AGAINST EACH OTHER
AND DEPENDS ON ACTIVE HOUSE CHOICE
AND PRIORITISATION





A building may be labeled as Active House if the overall score of all nine criteria is below 2.0 for new buildings and below 2.5 for renovated buildings.

Overall
Active House Score

Sum of total scores of all 9 Active House Parameters

≤ 2.0 (2,5)

The overall score in each Principle separately (Comfort & Health, Energy, Environment) should be below 2.5 for new buildings and below 3.0 for renovated buildings.

1.5 + 1.5 + 1.0 + 2.0 + 3.4 + 2.03 + 2.25 + 2.54 + 2.0

 $= 2.02 \le 2.0 (2,5)$

(renovation)



Overall

Score

Active House



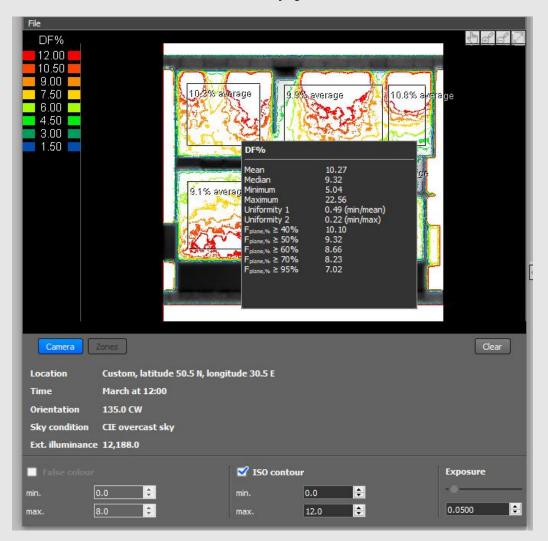
Active House Radar

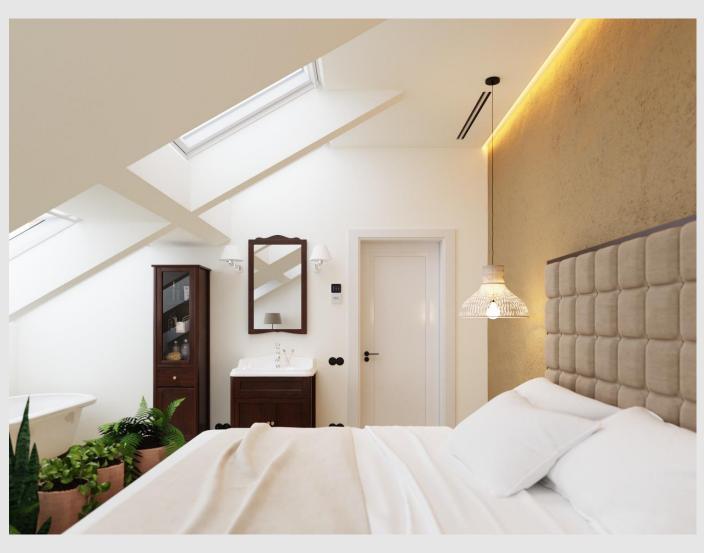
Active House Apartments (Kyiv)



EVIDENCE-BASED ARCHITECTURE AND DESIGN

Confirmation <u>link</u> about the measured in-situ level of daylight





EVIDENCE-BASED ARCHITECTURE AND DESIGN

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Enlightening wellbeing in the home: The impact of natural light design on perceived happiness and sadness in residential spaces

Javiera Morales-Bravo^a, Pablo Navarrete-Hernandez^{b,*}

ABSTRACT

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<u>link</u>

<u>Research</u>

^a Department of Architecture, University of Chile, Santiago, Chile

b Department of Landscape Architecture, University of Sheffield, Sheffield, UK

ACTIVE HOUSE APARTMENTS: Save The Views to the Podil, Kyiv and Sky









PROJECT AREA

(FEASIBILITY STAGE):

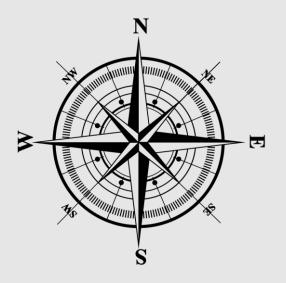
Naberezhno-Kreshatyts'ka from the North-East,

Nyzhnyi Val from the South-East,

Kyrylivska from the South-West,

Olenivska from the North-West,

Naberezhno-Lugova from the North



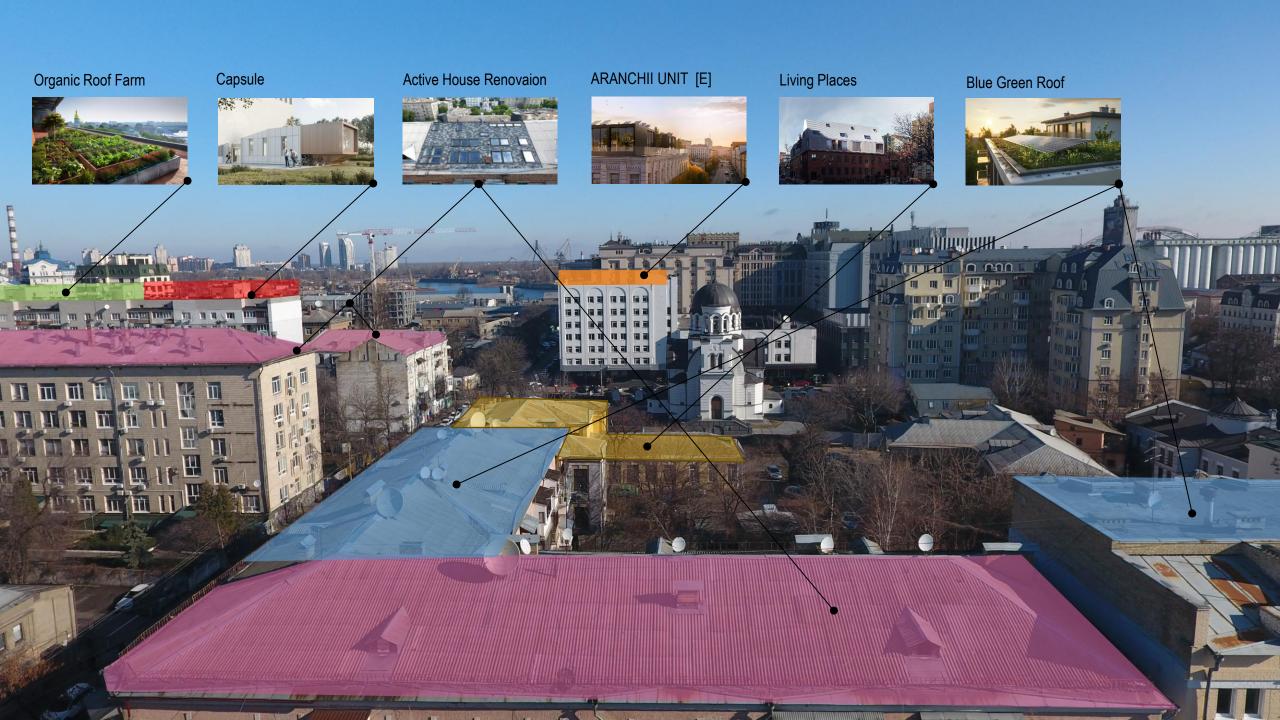


POSSIBLE ZONING

(FEASIBILITY STAGE):

Colour	Туре	Area, m2	Area, %
	Organic Roof Farm	29 807 m2	15 %
	Blue Green Roof	57 164 m2	30 %
	Active House Renovaion (UA)	76 761 m2	39 %
	ARANCHII UNIT E (UA)	7 837 m2	4 %
	Living Places (DK)	14 455 m2	8 %
	Capsule (IT)	7 567 m2	4%
	TOTAL	193 591 m2	100 %

^{*} These calculations are preliminary and are advisory in nature. Final decisions will be made by the condominium and the Podil district administration.



GRAPHICAL SCHEMES OF IDEAS APPLICATION

Organic Roof Farm



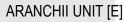
Public Space



Capsule











Blue Green Roof













SUMMARY ANALYSIS OF HOW THE "GREEN RENOVATION WAVE FOR UKRAINE" (GRWU)

PROJECT ALIGNS WITH THE NEB INVESTMENT GUIDELINES

1. ALIGNMENT WITH NEB PRINCIPLES AND VALUES:

Beauty, Sustainability, and Inclusiveness: The GRWU project fully aligns with the NEB principles by aiming to create an energy-efficient, green, and healthy residential area in Podil. The project emphasizes sustainable resource use, improving the quality of life for local residents, and creating an inclusive public space.

Integrated Thinking and Long-Term Planning: The project focuses on long-term development of the area, emphasizing increased green spaces, improved energy efficiency, and the integration of renewable energy sources. These aspects highlight the need for long-term planning and sustainable development, reflecting the key values of NEB.

2. PRIORITIZATION OF LOCAL NEEDS AND COMMUNITIES:

Consideration of Local Needs and Priorities: The project actively involves the local community, as seen in the stages of communication with residents and gathering feedback for further development. This approach aligns with the NEB criterion of "prioritizing places and people who need it most.«

Creating Favorable Conditions for the Return of Ukrainian Refugees: In the current crisis, the project aims to create conditions that encourage the return of Ukrainians to Ukraine. This aspect underscores the social significance of the project and its commitment to the country's recovery.

3. BUSINESS OPPORTUNITIES AND SUSTAINABILITY:

Development of New Business Models: The project proposes specific business ideas, such as organic rooftop farms and vertical building extensions, which align with the NEB criterion of creating economic opportunities that contribute to sustainable development.

Incorporation of Innovative Solutions: The project integrates innovative architectural solutions, such as Active House and Blue-Green Roofs, which contribute to achieving sustainability and climate neutrality goals.

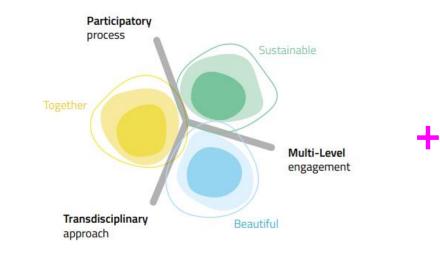


CONCLUSION

The GRWU project demonstrates a **high degree of alignment with the NEB criteria** and principles. It is focused on creating a sustainable, inclusive, and **innovative urban space** that addresses contemporary challenges. The project considers both **social and economic aspects**, making it a strong candidate for investment under the NEB framework.

THE FORMULA OF SUCCESS FOR GREEN & HEALTHY NEIGHBORHOOD













PROJECT PROMOTION ACTIVITIES



Green Renovation Wave for Ukraine project announcement

at The World Congress of Architects 2023 in Copenhagen



Vitaliy Goy

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