Vienna House Innovative Affordable Housing Demonstration Project

Integrated Design Process Workshop No. 3

VIENNA HOUSE

BC HOUSING RESEARCH CENTRE

BC HOUSING
RESEARCH CENTRE

BC Housing's Research Centre works in collaboration with housing sector partners to foster excellence in residential construction and find innovative solutions for affordable housing in British Columbia. Sharing leading-edge research, advances in building science, and new technologies encourage best practice. The Research Centre identifies and bridges research gaps to address homelessness, housing affordability, social housing challenges and the needs of distinct populations. Mobilizing knowledge and research expertise helps improve the quality of housing and leads to innovation and adoption of new construction techniques, Building Code changes, and enhanced education and training programs. Learn more about the Research Centre at www.bchousing.org. Sign up to receive the latest news and updates at www.bchousing.org/subscribe.

BC Housing
1701- 4555 Kingsway
Burnaby, British Columbia
V5H 4V8 Canada

Acknowledgments

Commissioned by BC's Forestry Innovation Investment Ltd., the findings and recommendations in this report are based on the information and feedback provided by participants in the workshops. These workshops are Integrated Design Process (IDP) charrettes being conducted to identify opportunities and establish the direction for achieving project goals for the Vienna House project with the guidance of the City of Vancouver, in partnership with BC Housing and the Vancouver Affordable Housing Agency.

Authors

This report was prepared by SCIUS Advisory.

Disclaimer

Contents

Summary

The cities of Vancouver and Vienna, Austria signed a Memorandum of Cooperation in early 2018 to rapidly advance green-building innovation in their respective cities. As a cornerstone of this collaboration, each city is developing a low-carbon, affordable housing project. Through these two projects, city staff, the project teams and industry experts in the two cities will exchange knowledge and experiences.

The City of Vancouver, in partnership with BC Housing and the Vancouver Affordable Housing Agency, is developing a high performance, mid-rise, social housing project in Vancouver that is at the early design stage.

Forestry Innovation Investment, in partnership with BC Housing, is funding four Integrated Design Process (IDP) charrettes with building experts and policymakers from the City of Vienna and the City of Vancouver. This process identifies opportunities and establishes the direction for achieving project goals for the Vienna House project in Vancouver, B.C. IDP is a method for realizing high performance buildings that contribute to sustainable communities. It is a collaborative process that:

- Focuses on the design, construction, operation and occupancy of a building over its complete life cycle.
- Is designed to allow the client and other stakeholders to develop and realize clearly defined and challenging functional, environmental and economic goals and objectives.
- Consists of a multi-disciplinary design team that includes or acquires the skills required to address all design issues flowing from the objectives.
- Proceeds from "whole building system" strategies working through increasing levels of specificity to realize more optimally integrated solutions.

The workshop was held on March 18, 2021. It consisted of 46 participants working together over Adobe Connect, an online conference platform, and was facilitated by SCIUS Advisory Inc. and Light House Sustainable Building Centre. The workshop brought together the owner group comprising BC Housing, Vancouver Affordable Housing Agency (VAHA) and More Than a Roof Housing Society with industry experts, policy makers and researchers from Vancouver and Vienna to:

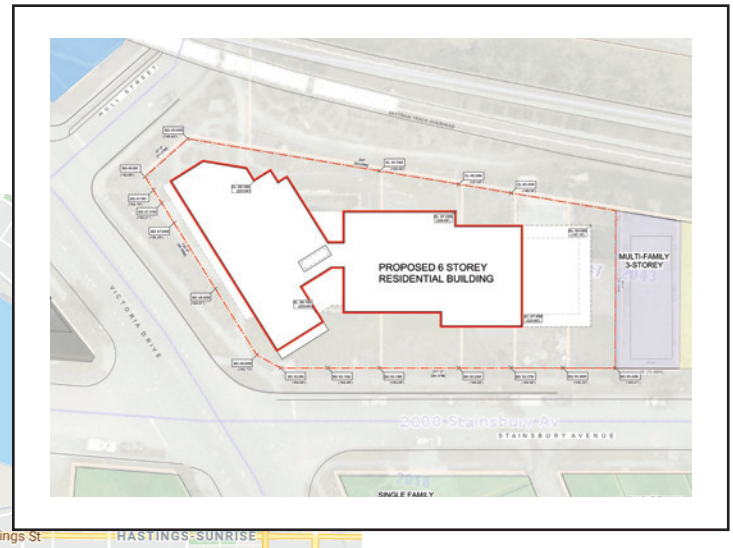
- Provide an opportunity for enhanced collaboration between the projects in Vienna and Vancouver.
- Highlight social housing objectives, initiatives, and projects.

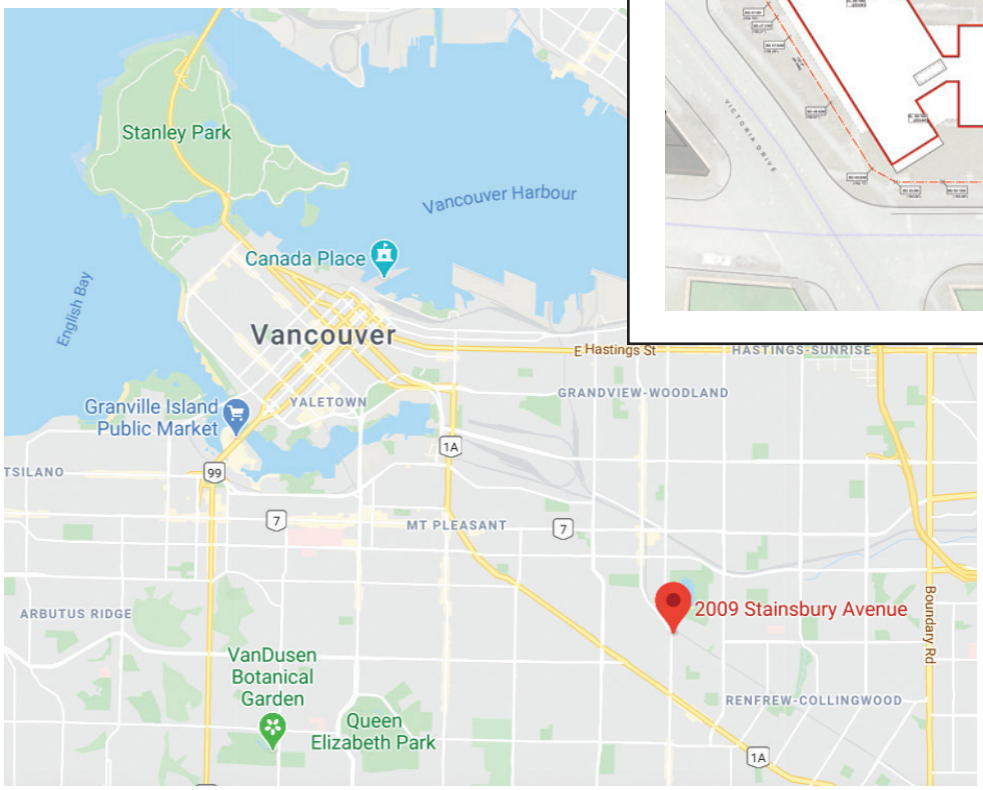
Project Context

The project is located at 2009 - 2037 Stainsbury Avenue (at the intersection with Victoria Drive) in Vancouver. Vienna House will be a six-storey social residential building with 106 rental units. Our vision is to demonstrate affordable, climate resilient, near-zero-emission (operational and embodied) housing through the exploration of different procurement models, prefabrication processes and community integration approaches. The rezoning process is underway and the operator, More Than A Roof Housing Society, is onboard. The design team at PUBLIC Architecture has been chosen and the construction manager will be selected in the coming months. There is a particular focus on state-of-the-art wood structural and envelope systems and prefabrication.

The Vancouver House project is located at Waldrebengasse 3, Vienna, Austria. The result of a developers' competition in 2018-2020, Vancouver House will provide innovative and affordable housing for single parents, and will include an in-home daycare provider on the ground floor, a nursery school, a central communal space, and a spacious area for bicycles and prams. It will be constructed with a hybrid solution of mass timber and concrete to optimize fire, noise and weather protection, utilizing prefabrication to provide economic and technical advantages. Heating will be provided with 100 per cent renewable energy sources through the use of ambient heat supplemented with a photovoltaic system.

Location and site plan





Site map showing the location of the Vancouver House project at Waldrebengasse 3, Vienna, Austria.

Project Objectives

The project objectives are to provide an affordable social housing project that contributes to market transformation, improving availability, affordability of energy efficient and/or low-carbon building solutions.

The key focus areas, defined by BC Housing, VAHA and City of Vancouver, include:

1. **Low-Carbon, Affordable Housing**: The Vienna House project aims to achieve the lowest possible carbon emissions, while keeping the building affordable. The strategies adopted in this project are intended to be replicable in future affordable housing projects in Vancouver and the B.C. Lower Mainland. During the design process, the team will analyze the affordability of various energy reduction goals and choose the ones that best fit the project's need and budget.

2. **Resilient Design**: The impact of rapidly changing climate is already being experienced in all countries around the world. Authorities and industry leaders are exploring the ways in which buildings can be designed to adapt to these changes. Vienna House will explore solutions for a resilient design by considering future climate and post-disaster requirements in its design process. This project will demonstrate innovative mechanical system solutions to maintain thermal comfort in this social housing project in the face of climate change.

3. **Procurement Innovation**: To succeed in achieving the project's complex goals, City of Vancouver and BC Housing are committed to incorporating innovative procurement methods. To do so, all the partners' procurement staff will participate in the development process. Additionally, North American and Viennese experts will be consulted to identify the best alternative contracting methods for setting targets and creating commitments.

4. **Knowledge Transformation**: While the local experts will design and build the project, experts from Vienna will offer their experience in delivering affordable low-carbon housing in a large scale. Potential areas of contribution could include advice on: request for proposals, advanced building components, alternative approaches to mechanical heating, ventilation and air condition systems (HVAC), and envelope design.

Preparing for the Workshop

Normally, IDP charrettes are conducted in a highly collaborative fashion with the entire project team face to face in a large meeting space over the best part of a day. Due to travel restrictions arising from the COVID-19 pandemic, the Adobe Connect platform was used. Time zone differences between Vancouver and Vienna meant that only three hours were possible in one session.

Adobe Connect is not a commonly used platform, however many of the participants had experience using it in previous workshops. Additional technical support provided by Light House was available during the event in case of any issues with the platform.

Workshop 3

The third Vienna House Workshop brought together 46 participants from Vienna and Vancouver, including representatives from the owner group and industry experts primarily to discuss issues and ideas regarding Vancouver House in Vienna, with some additional updates regarding Vienna House in Vancouver and discussion of social housing issues. There were seven presentations followed by a facilitated discussion during the course of the three-hour workshop. Slides that are available for the presentations can be found by following the links in the following table.

Presentation	Presenter	Link for Download
Technical Research and Communications Committees	**Kelly Walsh** SCIUS Advisory	Link
Vienna House Update	**Melvin Lee** BC Housing	
Vienna Social Housing	**Daniel Glaser and Kurt Hofstetter** City of Vienna	Link
Vancouver House in Vienna	**Oliver Sterl** Rüdiger Lainer + Partner Architekten ZT GmbH	Link
Energy Systems	**Stefan Sattler** City of Vienna	Link
Circular Construction	**Klaus Kodydek** City of Vienna	Link
Housing for All	**Wilco van Bemmel** Dunefield Consulting	Link

Information Sharing

Details of the seven presentations listed above are provided on the following pages.

KELLY WALSH
Associate, SCIUS Advisory

Vienna House is intended to serve as a case study for industry and policy makers. Facilitating those efforts, a research project has been initiated by BC Housing to engage in knowledge capture, research and knowledge transformation as well as dissemination activities. The research includes the formation of two committees, the Technical Research and Communications Committees, to conduct those activities. They will:

- Capture the relevant discussions, concerns, issues, and decisions during the design and construction phases of the project.
- Assist with the development of a Building Information Modeling/ Virtual Design and Construction (BIM/VDC) strategy, providing coaching and project support.
- Perform testing, instrumentation and performance monitoring during and post-construction.
- Produce and implement a Communications and Outreach Strategy that will outline how a wide range of industry, government, and utility audiences receive compelling, timely, and accurate information about the project from its groundbreaking through to completion and commissioning.

Dissemination will be provided through case studies and reports as well as a web page, blog, and social media posts.

The project offers opportunities for research, innovation, industry capacity building, performance testing and ROI in the areas of:

- Energy performance and efficiency and low operational carbon emissions.
- Virtual design and construction systems, off-site prefabrication and/or modular construction and the capabilities of BIM to streamline project handover, transfer to facility management and optimize building performance over time.
- Lean project delivery and opportunities for effective project team collaboration.
- Innovative mass timber applications and monetizing the carbon benefits of choosing wood.
- Integrated project delivery or integrated design process.
- Codes and standards (including fire testing, acoustical provisions for mid-rise, regulatory processes for prefabricated residential structures) and opportunities for streamlining and speeding up processes.

The committees are comprised of representatives from BC Housing Research, Wood WORKS! BC, UBC Sustainability Initiative, FP Innovations, BIM One, Summit BIM, Glave Strategies, and SCIUS Advisory.

MELVIN LEE
Development Manager, BC Housing

Melvin will be supporting the project through the BC Housing approval process. BC Housing is acting as the primary funder and financier for the Vienna House Development Project. With assistance from the City of Vancouver, VAHA, and More Than a Roof, they have issued an RFP and selected an architect, PUBLIC Architecture + Communication. Criteria used to select the architects included:

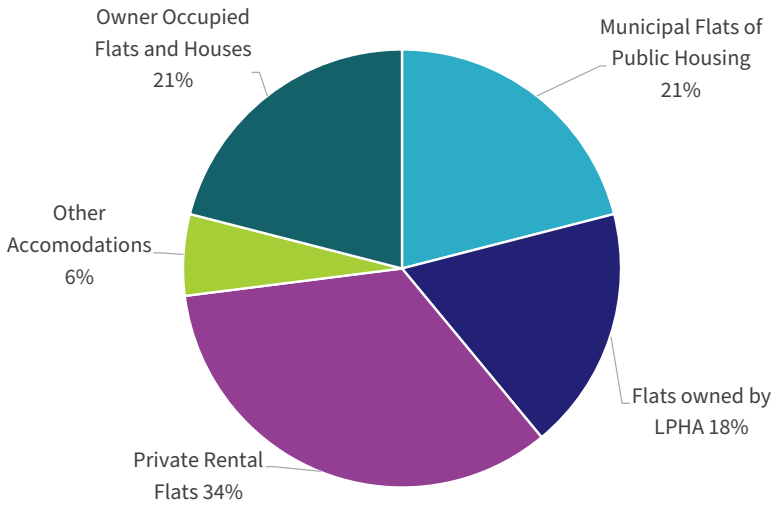
- Successfully developing multi-storey, residential-zone projects for public entities
- Working with cross-departmental, external reporting structures
- Managing design and consulting services for multi-story development
- Demonstrating and achieving schedule and cost savings using offsite prefabrication
- Working knowledge utilizing BIM
- Meeting requirements such as Passive House targets

DANIEL GLASER
Housing Expert, Department for Housing Promotion, City of Vienna

The Department for Housing Promotion at the City of Vienna is responsible for the funding of social housing, subsidies for new buildings and renovations, and financial supports to access affordable housing.

Total Housing Stock in Vienna, 2021

Source: Statistik Austria/MA 50



Social housing stock in Vienna includes two different concepts. First, about 220,000 municipal flats of "Public Housing" are owned and managed by the City of Vienna. This is about 21 per cent of total housing stock. The second important part of the housing structure is affordable housing flats owned by the Limited Profit Housing Association (LPHA), which is a regulated private association. They provide 18 per cent of the total housing stock, about 185,000 flats. In total this is about 40 per cent of housing, which is not common for other cities. Public housing flats are allocated per demand by standards of income, residency and need as well as by social criteria such as hardship. About a third of LPHA flats are subsidized by the City of Vienna and have age, residency and citizenship requirements. All of the LPHA flats have an income limit.

To manage and influence the supply, the plots owned by the City of Vienna have a developers competition based on quality. Architects and housebuilders submit a fully developed project which is judged based on a 4-pillar evaluation matrix:

Social Sustainability	Architecture	Economy	Ecology
sustainability for daily use	quality of urban structure	costs for the land plot	climate-friendly and resource-saving construction
affordability by efficient planning	quality of building structure	costs for building	healthy and environmental-friendly construction
living in the community	quality of flats and floorplans	costs for tenants and contract conditions	quality of green and public spaces
living for changing needs	quality of design	price-quality ratio, maintenance costs	diverse quality of green and public space
Total Evaluation			

KURT HOFSTETTER
Senior Coordinator, International Building Exhibition, City of Vienna

Kurt Hofstetter is the head of the International Building Exhibition Vienna (IBA-Wein) which will be including exhibits on Vancouver house next year. He gave three examples of projects for special groups completed through the developers competition.

Podhagskygasse is 100 subsidized units of temporary housing that was developed for refugees. It is a modular timber building that can be re-erected three times over a 40 year lifecycle. It is high level housing with simple means. Currently, a third of the 600 apartments are used by refugees.

An der Schanze is under construction and includes shade and low tech cooling. It has a new vision for parks and public greenery.

Que[e]rbau Seestadt is a co-housing project for LGBTQ residents under an inclusion concept which is now also running a community center for the surrounding neighborhood. It has been very successful and they are now building another one.

IBA-Wein is working with other cities to show what is being developed elsewhere and they would like to include examples of social housing from Vancouver in the future.

He explained that the developer and operator put forward the proposals for the developers competition together. Within that proposal is a plan for diversity and inclusion, including subsidies, that is evaluated through the pillars.

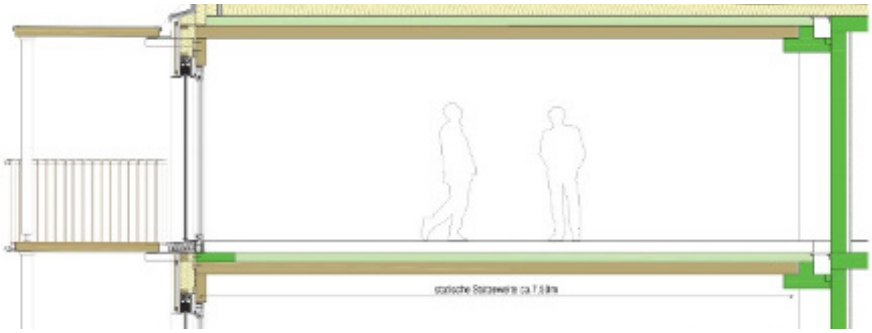
OLIVER STERL
Managing Director, Rüdiger Lainer + Partner Architekten ZT GmbH

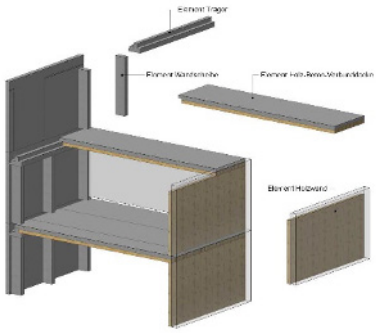
Oliver Sterl discussed the status of Vancouver House in Vienna. The competition for Vancouver House had a goal of 100-110 rental units and a kindergarden, including 12 units for assisted living and 11 units for single parents, and to be built with a wooden construction system. It also needed to match the proportions of the facades of the surrounding buildings.

They designed three buildings which are connected underneath with garage and technical areas, giving them a chance to have a few free space areas and natural light and ventilation into the garage areas.

Different materials (solid wood, CLT, GLT, etc.), structures and fabrication were evaluated, as well as the type of core for various components of the building.

The selected building is a hybrid approach with a core of reinforced concrete and an attached wooden structure. The walls are 14 cm CLT and 20 cm of insulation with a curtain wall of wooden planks. The ceiling is a composite of 18 cm CLT and about 12 cm concrete slab on top. The facade is a curtain wall of vertical wooden planks with different widths and proportions to give a warm appearance.



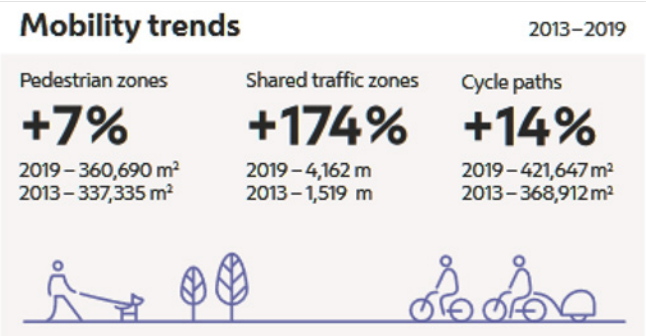


It was important to have flexibility and variability, so the core and outer walls are load bearing to allow for different sizes and typologies of units. It is changeable to different layouts.

There are a variety of units to address different social needs. In addition to the kindergarden and commercial spaces, units of different sizes and layouts are available among the four floors.

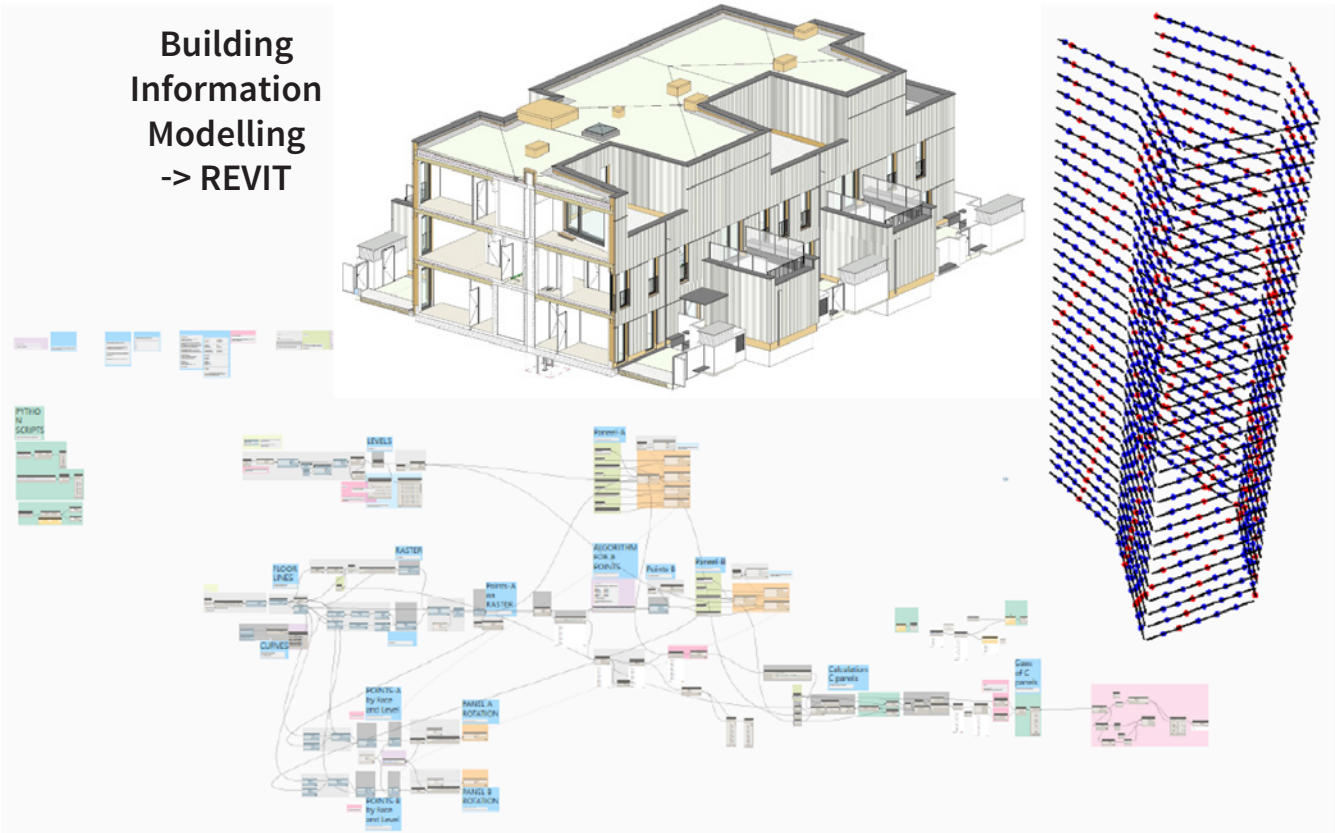
The garage space has an added value zone that has natural light and ventilation and can be converted to a recreational area as parking space demand reduces. Vienna has a low car ownership rate and cycling is a popular mode of transportaion.

ADDED VALUE ZONE



The developer has to guarantee a financial contribution of 60 €/m2 and a rental fees of 7.5 €/m2 including operating costs and tax, so Vancouver House is designed to costs to hit those targets.

They are using BIM on this and other projects. The digital information is used by the construction companies to create the prefabricated elements. Design for Vancouver House is using a cost comparison matrix to evaluate costs and performance to finalize decisions. Mr. Sterl gave an example of different options for the ceiling that covered different spans and used different support structures and the costs involved. Plans are anticipated to be submitted for a building permit in September 2021 and construction is anticipated to begin in June 2022.

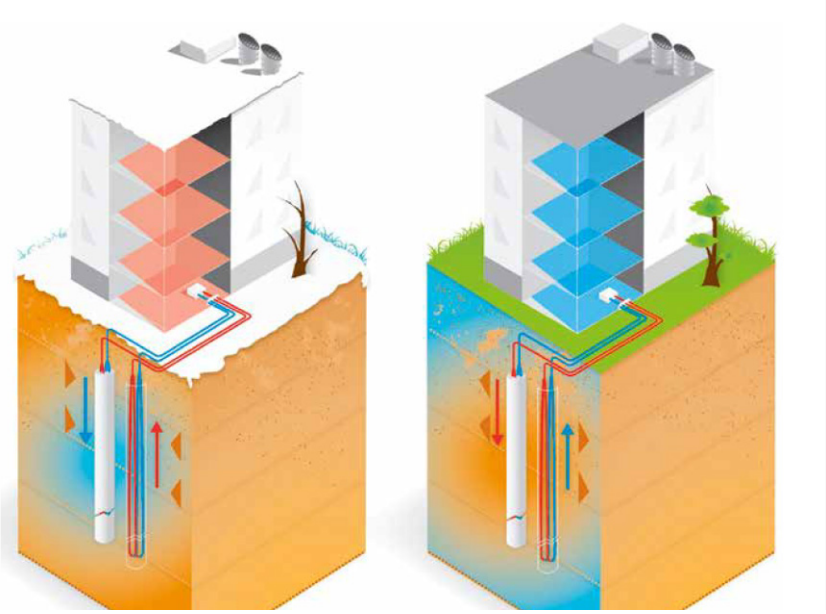


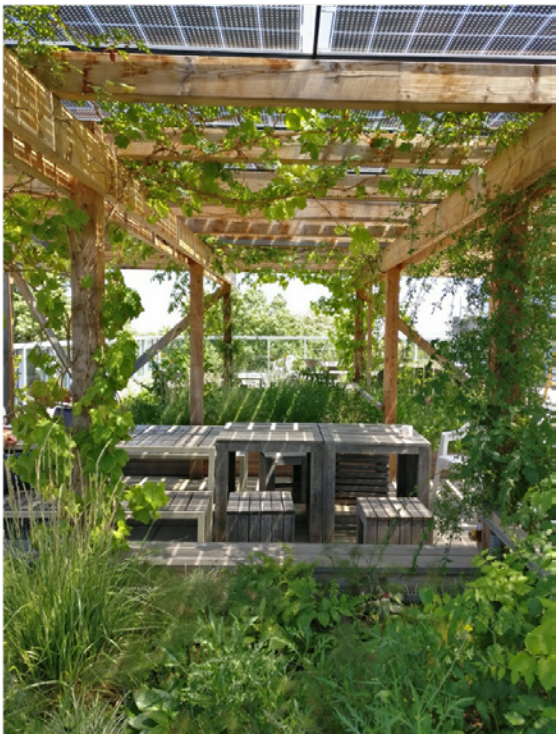
Rüdiger Lainer + Partner Architekten have been working on other hybrid building projects since 2014, ranging from three to 24 floors. The requirement for this project was not to build a wooden building just to have a wooden building, but to use the materials to best fit the requirements. The cost requirements of this subsidized housing project required everyone to be flexible. Flexible floor layouts were part of the requirements.

The decision to use CLT was greatly influenced by the need for prefabricated elements due to the narrow construction site. Prefabricated elements also decreased the amount of moisture brought into contact with the wood-concrete composite elements.

STEFAN SATTLER
Renewable Energy and Green Building Expert, City of Vienna

The mean temperature in Vienna is rising, with the number of summer heating days increasing and the number of freezing days declining. The need for cooling is therefore increasing, but Mr. Sattler's team is looking for ways to do that without air conditioning. Geothermal and solar energy have been chosen for Vancouver House. Component activation that provides heating and cooling through the floor, combined with storing energy in the soil (perhaps describing it as a battery system for heat) or building (by means of efficient envelopes) allows for temperature regulation.





The roof is also being used as a recreation space and has solar panels for energy generation. Integrating photovoltaics into the built environment allows more green spaces in the city to be used for recreation.

Ten designs were submitted for the developers competition, all using wood and 100 per cent renewable energy, although the approaches were different. Seven used many load bearing walls and three used wide spans to provide flexible floor plans. The City of Vienna was pleased to see so many innovative designs incorporating the use of wood and renewable energy and looks forward to working with these ambitious architecture teams on future projects.

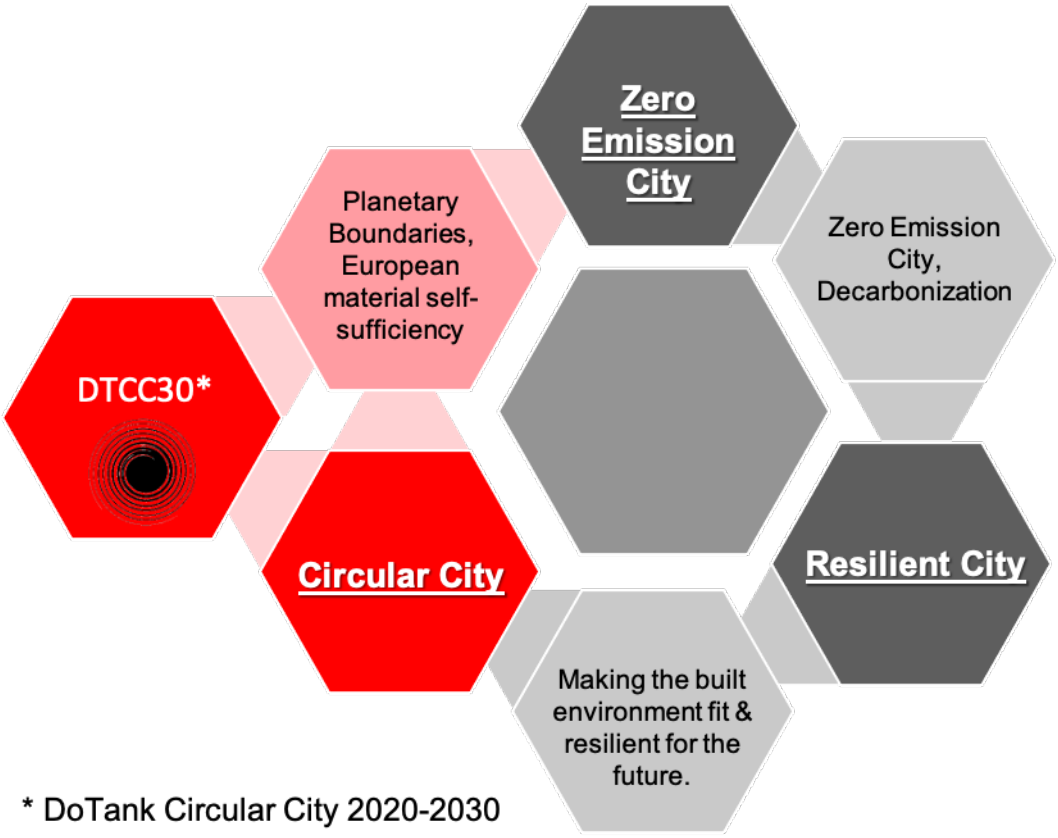
The winning design used 7.5m spans, is very flexible, and uses geothermal energy with air-water heat pumps that are mainly used to heat water in the summer. The heat pumps also store warmth in the soil. There are 90 kW peak PV units on the roof and future options may include PV on the facade as a shading device or integrated into the balconies.

In the future, goals of decarbonization will use waste heat, wind energy and solar. Energy can be imported from green sources such as nearby wind farms instead of using fossil fuels.

KLAUS KODYDEK

Circular Construction Projects, City of Vienna

Mr. Kodydek discussed the goals, structure and timeline of DoTank Circular City project and how it is linked to the Vancouver House project. To make Vienna a resilient city fit for the future, it needs the interplay of climate protection, adaptation to climate change and resource conservation. These goals are now anchored in the new City Government Agreement 2020 which includes the implementation of greenhouse gas reduction, adapting our living space, and reducing raw material consumption. Circular City means they are addressing planetary boundaries and trying to be material self-sufficient.



Three guiding goals for the DoTank Circular City are:

- Reducing consumption-based material footprint by 30 per cent by 2030 and 50 per cent by 2050.
- 2030 onwards: site- and use-appropriate planning and construction for maximum resource conservation will be standard.
- Components and materials from demolished buildings and major conversions will be 80 per cent reused or recycled by 2050.

The idea is to focus on three pillars to foster:

Resilience:

- Reduced reliance on raw materials
- Balancing local production with global supply chains

Prosperity:

- Reduced congestion through better logistics and mobility
- Eliminating waste by using it as a resource
- Reducing lifecycle costs by following an integral programming and planning approach
- Decoupling value creation from the use of finite resources – new skills, new jobs, new growth (e.g. Social Urban Mining)

Liveability:

- Enhanced social interactions
- Improved air quality
- Reduced pollution

The pandemic has illustrated how harmful it can be for cities to rely on global supply chains. It is important to balance with local production.

To do this they are working on

1. A long-term vision position paper for Circular City Vienna that will be politically agreed upon.
2. Revising the building culture to have Circular City be considered from the start of planning.
3. Regulatory changes in legislation, funding guidelines and tenders.

By focusing on these activities:

1. Establishing the city as a pioneer in the Circular City effort.
2. Recognizing the built environment as a material bank with construction projects that are long-lasting, deconstructable, and separable.
3. Establish material transparency to understand which materials are being used where.
4. Identify and demonstrate economic and environmental benefits.

The Vancouver House has implemented some strategies for Circular City and will be participating in this effort.

The transition will take place in three phases between now and 2030, starting with identifying methods, regulations, funding schemes and startprojects. Phase two (2024-2026) will adapt framework, implement startprojects (not pilot projects, these would be easily scalable) and develop the roadmap. By phase 3 (2027-2029) they will have the impact evaluation and will be able to implement the roadmap for 2050 goals.

To transfer to the circular environment, questions still need to be answered when it comes to the built environment and socio-economics. Culture and lifestyle changes will need time to be established.

WILCO VAN BEMMEL
Dunefield Consulting

Mr. van Bemmel is conducting a research project with Kacey Ng, who is completing her Masters degree in Community Planning at UBC, and the support of BC Housing and SCIUS Advisory entitled **Housing for All - Lessons from Social Housing Models in Vienna**. The research project is looking at the socio-economic impacts and benefits of social housing for different demographics.

Research questions include:

1. How can we identify the social and economic outcomes that social housing projects have in Vienna? Are they measured? Are there quantitative metrics?
2. How do social housing projects impact and benefit equity-seeking groups? Do they help people find work, make friends, and generally settle into their communities? How can social housing lead us to a more diverse and inclusive society?
3. How are the learnings applicable to future housing projects in Vancouver?

Methodology stages include:

1. Data Collection – These efforts include reaching out to stakeholders in Vienna social housing and collection of available research. They are seeking three case studies of social housing projects in Vienna that are representative and demonstrate the diversity of groups, the benefits received and the challenges encountered.
2. Impact Analysis – Analyzing the socio-economic impact of social housing programs through stakeholder interviews.
3. Local application – Interpret data to understand how the learnings can be applied in Vancouver.

During these stages, information will be collected via interviews and case study analysis involving city staff and professionals in Vienna engaged in policy, planning and projects. Attempts will also be made to speak with equity-seeking groups such as the elderly, immigrants, young families, racialized communities, and those living with disabilities.

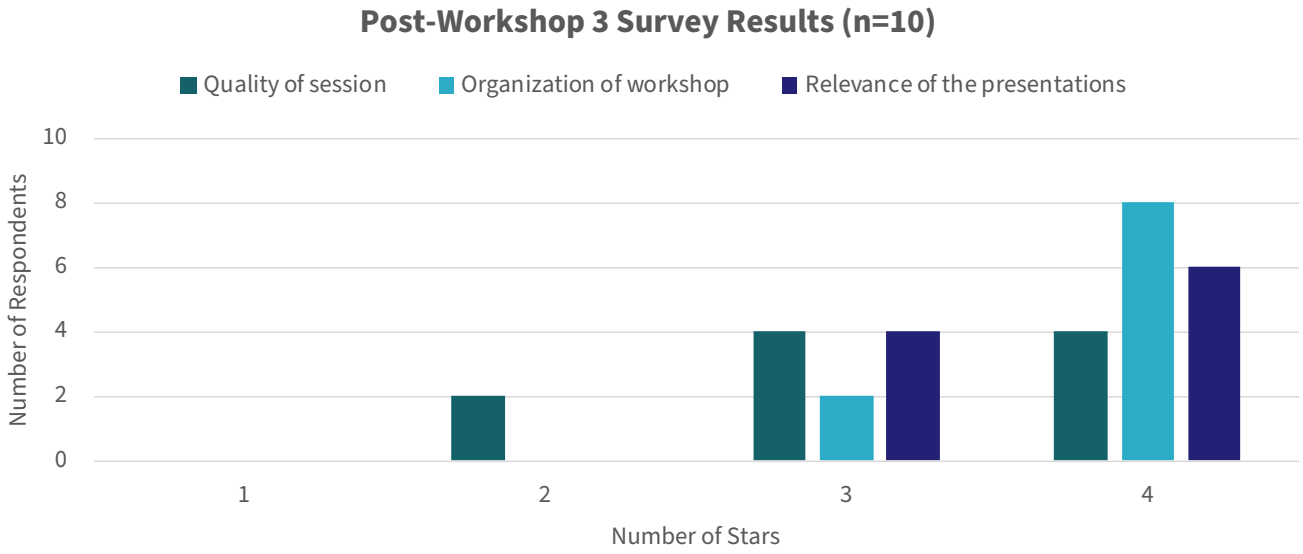
Facilitated Discussion

Following the information sharing session, participants were able to ask further questions of the presenters and engage in more in-depth discussions. Topics are summarized below.

- In Vienna subsidized housing, developers have sub-departments who deal with operating the housing. Different branches of the city work together for development, regulatory, permitting, for example. There is a history of long-term loans (20-30 years) that provides funding for new projects, as well as some federal tax revenues.
- The BIM model used on Vancouver House is for building and construction site processes and is not being extended into the handover process and operations of the project. There is no data input for operations. The data twin is a long-term goal. Operators have limited technical abilities so would have difficulty using the data, but in the future it is planned that they will be.
- Vienna has very high standards of acoustics in every project, including wooden structures. Composite elements are used to buffer the sound with a layered structure.
- Shading systems help protect from overheating and should be standard. The geothermal floor heating system can be used as a cooling system in summer. Older buildings must use sun screens or plants (trees) to provide shade in summer while letting sunlight through in winter. Concrete slabs for flooring help provide a consistent temperature. Intelligent systems need to be developed in addition to shade and ventilation to combat the additional heat contributed by climate change. Care needs to be taken to not put it back into the environment, creating a heat island effect.
- Social housing metrics are being assessed in Wilco's research with inspiration from European reports that include them. They are looking at economic impacts on families and households, employment and participation in the workforce. For social impacts, understanding the relationship between housing and health, education, crime, and if people feel represented by local government.
- All of the four pillars for the developers competitions are required. The economic one is the only quantitative one, so qualitative criteria are more open to discussion, but all criteria must be met within cost restrictions. With respect to the choice of CLT as an economic impact, wood use was required and CLT was chosen for the long spans, but it is still being discussed.
- To measure success in social sustainability and building performance for a particular project, trust in the developers is required during the competition. Feasibility of long term goals is evaluated by the jury, using examples from the past. Research on completed projects is done to see if goals have been met in order to improve future tenders.
- There is no gas connection to the site. Everything onsite is powered by renewable energy.
- Vancouver has a rezoning goal of a 30 per cent embodied carbon reduction, phasing out gas until 2040. Vienna House will achieve this compared to a baseline.

Participant Feedback

At the end of the workshop, participants were asked to complete an online survey. There were ten responses (22 per cent response rate).



"Personally challenging to pull ideas from Vienna to apply to Vancouver's project. The projects are designed using a very different method, approach, expectation. But nonetheless, inspirational."

Overall, participants thought the organization and relevance of the presentations was good, but many had difficulties with the Adobe Connect platform audio quality. They enjoyed the information presented and the quality of the slides and discussion. One commenter noted that the discussion jumped back and forth between topics.

Key takeaways mentioned by respondents include:

- Details of Vancouver House program and structure.
- Understanding the design ideas of Vancouver House.
- Financing model for social housing.
- Circular economy in construction.
- Developers competition method, procurement process for social housing in Vienna.
- Vienna and Vancouver share many challenges and goals with respect to social, environmental and economic concerns.
- Understanding the BIM use of Vancouver House.
- Variety/diverse types of social housing available and that structures are built for three life cycles.
- Committees for Vienna House in Vancouver.

- Construction methodology of wood mix with concrete for longer span and how it can be removed and reused.
- Vienna seems self sufficient in self-funding for its projects, capital and operationally.
- Flexible unit layouts.
- The developer competition approach appears to work quite well.
- Circular economy – DoTank presentation.
- Understanding the Sustainability aspects of Vancouver House.
- Social housing is used as a hand-up approach to assist different social/economic/age demographics and not as emergency or last resort housing.
- More exchange about funding systems.
- The three life cycles. I would want to learn more about that.
- Design considerations appear much different than Vancouver particularly around ability to use underground parking as additional value-add space (conversion) and flex spaces.
- Mixed need buildings - family, senior, accessible, starter, etc.
- Hybrid building strategies appear to perform well in Vienna.

Appendix 1: Workshop Agenda

IDP Workshop No. 3 Agenda

Thursday, March 18, 2021 Vancouver: 8:30 - 11:30 am PDT, Vienna 4:30 - 7:30pm GMT +1

Time	Item	Facilitator
8:30 – 8:40	**Welcome** › Workshop overview › Rules of the road	Helen Goodland **SCIUS** Sarah Radi **Light House**
8:40 –8:50	**Technical Research and Communications Committees Objectives**	Kelly Walsh **SCIUS Advisory**
8:50 - 9:10	**Vienna House Update** › Summary of RFP Process › Introduction of Vienna House Architect	Melvin Lee **BC Housing**
9:10 - 9:30	**Vienna Social Housing** › Social Housing in Vienna › Discussion	Daniel Glaser and Kurt Hofstetter **City of Vienna**
9:30 - 9:55	**Vancouver House in Vienna** › Progress at Vancouver House › Discussion	Oliver Sterl **Rüdiger Lainer + Partner Architekten ZT GmbH**
9:55 - 10:00	**Break**	
10:00 - 10:20	**Energy Systems** › Energy Systems at Vancouver House › Discussion	Stefan Sattler **City of Vienna**
10:20 - 10:40	**Circular Construction** › Goals and Strategies for Circular Construction in Vienna	Klaus Kodydek **City of Vienna**
10:40 - 10:50	**Social Equity and Diversity in Vancouver** › Housing for All › Discussion	Wilco van Bemmel **Dunefield Consulting**
10:50 - 11:20	**Facilitated Discussion**	Brenda Martens **Light House**
11:20 - 11:30	**Commitments and Next Steps**	Helen Goodland **SCIUS**

Appendix 2: Participant List

Name	Position / expertise	Organization
Adam Terris	Research Centre	BC Housing
Allahyar Raza	Development Manager	VAHA
Andrew Matterson	Procurement Manager	City of Vancouver
Angelique Pilon	Urban Innovation Research	UBC Sustainability
Brenda Martens	Workshop Facilitator	Light House
Brian Wakelin	Architect	PUBLIC
Casey Wickham	Operator/Owner	More Than A Roof
Chris Higgins	Planning, Urban Design and Sustainability	City of Vancouver
Cindy Moran	Research Centre	BC Housing
Daniel Glaser	Department for Housing Promotion	City of Vienna
Denisa Ionescu	Research Centre	BC Housing
Devarsh Bhonde	Researcher	UBC
Diana Lopez	Researcher	UBC Sustainability
Geraldine Rayner	BIM FM and Digital Hand-over	Summit BIM
Graham Plant	Development Consultant	CPA Development
Gustavo Tsay	Researcher	UBC Sustainability
Helen Goodland	Workshop Co-facilitator	SCIUS
James Glave	Communications Specialist	Glave Strategies
Jamie Hart	Architect	PUBLIC
Jieying Wang	Researcher	FPInnovations
Jim Lowood	Contracting Specialist	City of Vancouver
John Wall	Architect	PUBLIC

Name	Position / expertise	Organization
Kacey Ng	Researcher	UBC
Kelly Walsh	Documentation and Reporting	SCIUS
Kira Pederson	Energy and Sustainability	BC Housing
Kurt Hofstetter	Social Housing	City of Vienna
Lee-Anne Michayluk	Operator/Owner	More Than A Roof
Melvin Lee	Development Manager	BC Housing
Oliver Sterl	Architect of the Vancouver House in Vienna	Rüdiger Lainer + Partner Architekten ZT GmbH
Paul Shorthouse	Circular Construction	Delphi Group
Pedram Faghani	Technical Manager	WoodWORKS! BC
Puyan Zadeh	Researcher	UBC
Rachel Morse	Documentation	SCIUS Advisory
Remi Charron	Consultant, Technical Research	BC Housing
Ren Bai	Project Technician | Construction Services	BC Housing
Robert Drew	Architect	PUBLIC
Robyn Gerry	Development Coordinator	CPA Development
Sarah Radi	Adobe Connect Hosting	Light House
Scott Chatterton	BIM, Digital Strategy	AEOS Consulting
Shagufta Pasta	Organizational Initiatives | Executive Office	BC Housing
Shane O'Neill	Architect	PUBLIC
Stefan Sattler	Energy Efficiency/ Passive House	City of Vienna
Stuart Hood	Engineer	Integral Group
Wilco van Bemmel	Consultant	Dunefield

Appendix 3: Speaker Background

Daniel Glaser

Daniel Glaser studied architecture and regional planning at Technical University of Vienna and at the Technical Faculty of the University of Zagreb. This was followed by work for several architectural studios and freelance research in the fields of urban renewal, urban design and housing construction.

From 2012 to 2013, he worked for the "Urban Renewal Office'' in Vienna's 16th municipal district and organized a conference on "Re-densification Potentials of Urban Quarter of the Gründerzeit Period." Since 2013, he has been working for the Municipal Department for Housing Promotion of the City of Vienna, first in the Housing Research and International Relations Unit and later for the "International Building Exhibition Vienna" (IBA_Vienna)." Since 2019, he has been serving as chairman of the "Housing Initiative Advisory Board" moreover, he directly reports to the department head as housing expert and interface coordinator for budget and controlling.

Oliver Sterl

Oliver Sterl was born 1969 in Villach, Carinthia. He studied architecture at the Technical Universities of Graz and Vienna and got the diploma in 1999. While studying he did intensive hands-on activities among others at Auböck + Kárász, Vienna (1996-99), where he was conducting building projects and landscape designs. Since 2000 involved in project management at RLP Rüdiger Lainer + Partner, in 2004 empowered as an architect, since 2005 Partner and Managing Director of RLP Rüdiger Lainer + Partner. Major buildings as project manager and together with Rüdiger Lainer: Cineplexx Center in Salzburg (2001), extension Favoritenstraße, Vienna (2005), Chamber of Commerce, St. Pölten (2005). Housing complex and kindergarten Haus mit Veranden, Vienna (2008), Apartment and old-people-residence Döbling, Vienna (2012). Div. apartment buildings in Vienna (2014). Extension Schottenring 19, Vienna (2015), residential project Sonnwend-Quartier (2017), apartment building and serviced apartments in Quartier Belvedere Central (2018), timber high-rise HoHo Wien (2019), housing complex and hotel/office building Biotope City (2020). Under construction: MGC high rise. In addition to his work in the office, there is an intensive lecture and participation in numerous juries in Austria and abroad.

Stefan Sattler

Stefan Sattler studied Civil Engineering at the University of University of Natural Resources and Life Sciences Vienna. He then worked as a researcher and lecturer at the University of Natural Resources and Life Sciences Vienna in the field of Resource-efficient buildings for nearly 5 years. In 2020 he finished his PhD with the topic of "Climate-sensitive construction and climate change." Since 2018 he has been working for the Energy Planning Department of the City of Vienna, where he is leading the renewable energy team. His main focus is on using renewable energy for heating and cooling and how natural gas can be faced out for existing buildings. Wood construction and circular economy are two other topics in which he is increasingly active. He coordinates the "Vancouver House" in Vienna and he is together with Klaus Kodydek the head of the flagship projects phase of the "DoTank Circular City 2030 Vienna."

Klaus Kodydek

Klaus Kodydek has a background in Architecture (VUT) and Social Design (University of Applied Arts Vienna). The Competence Centre Building Research, Building Regulations, Engineering, Standards in the Executive Group for Construction and Technology launched the 10 year program DoTank Circular City Wien 2020-2030 (DTCC30), led by Dr. Anna-Vera Deinhammer. Within the DTCC30 together with Dr. Stefan Sattler he is responsible for the phase 'Case Studies & Start Projects' aiming to identify and support Circular projects.

Wilco van Bemmel

Wilco van Bemmel is the CEO of Dunefield, a consulting practice specialized in development through the lens of community, culture and local economy. His experience spans projects across Canada and the Netherlands.

BC HOUSING
RESEARCH CENTRE

1701 – 4555 Kingsway

Burnaby, B.C. V5H 4V8

Phone: 604.439.4135

Toll-free: 1.866.465.6873

Email: technicalresearch@bchousing.org

www.bchousing.org