

Oulu – Hiukkavaara ***Sustainable Arctic Winter City***

Integrative Urban Development Concept - INURDECO

Integrative Urban Development Concept – INURDECO - is a joint project where the City of Oulu, Hartela-Forum Oy, Skanska Oy, Sonell and the University of Oulu have developed scalable, interactive, sustainable and energizing winter-city planning practices and tools. The overall frame of reference has been an example city designed and constructed for challenging northern living conditions. It is a test environment - a Living Lab- for urban planning and construction where enterprises can test their products.

Integrating urban development work refers to an approach that enables mutual learning and finding new solutions. The aim of the companies has been to develop and increase their business. The aim has been to create a Living Lab of urban planning and construction that improves the quality of cities and living environments.

With the help of a concrete city plan project, the city of Oulu has developed its integrating urban planning and urban development and partnership zoning practices. In connection to this, the city will prepare the first winter city strategy in Finland and a compilation of winter city planning instructions, a communication plan and a solar energy survey. Furthermore, it will identify criteria for energizing city plans and user-oriented operating models.

Land policy approaches, conveyancing procedures, Living Lab model agreements for the construction industry as well as a virtual interactive town plan have been developed within the framework of the project. The overall frame of reference has been an example city designed and constructed for challenging northern living conditions. The city is a test environment - a Living Lab- for urban planning and construction.

Skanska Oy has examined energy efficiency calculation models and a new generation of high-rise residential blocks in Hiukkavaara. Hartela-Forum Oy has studied a hybrid block utilizing waste energy as well as its role as a developer in the implementation of the area. Sonell Oy has developed customer-oriented interactive virtual tools as well as a new generation of low-rise blocks. The faculty of architecture at the University of Oulu has studied collaborative urban development and a variety of energy-efficient block designs. The environmental and chemical engineering research group has developed energy calculation models, energy production sustainability analysis, wind modeling and assessment tools for sustainable development. The faculty of economics has studied the development of a business ecosystem in the Living Lab environment.

The project has been developed side by side with an actual town plan project in the Hiukkavaara centre. In contrast to previous work on the subject, corporate partners have been involved in the process already before the start of the town planning process, and cooperation is hoped to continue until the end of the life cycle.

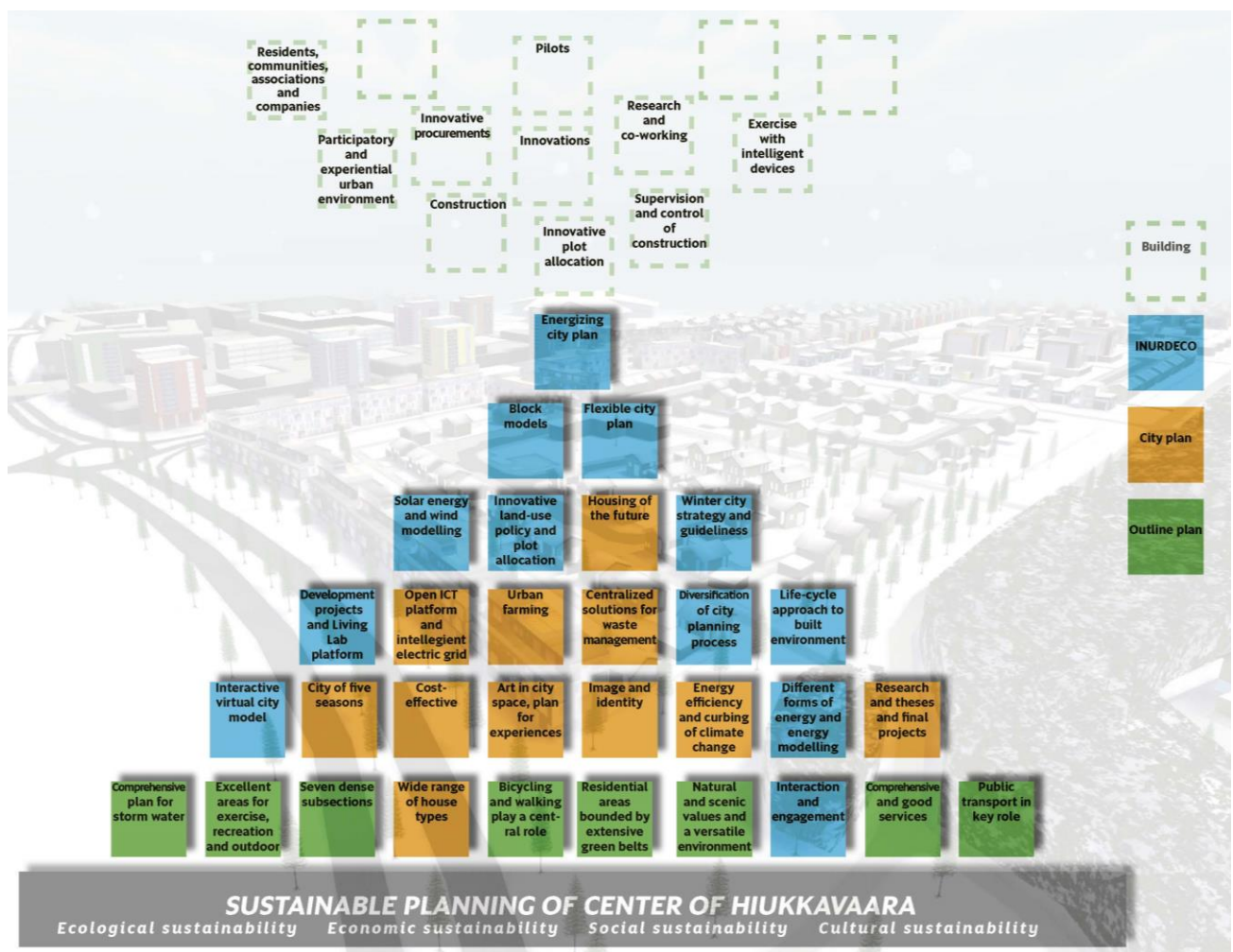
In parallel with INURDECO development project, its objectives and results have resulted in a number of different studies, plans and theses such as winter research, experience formula associated with the City of

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Oulu's urban culture activity program, snow-sizing guidelines for the winter city's public spaces, a parking study and a parking cost estimate.

The result of all this is an energizing Hiukkavaara centre town plan that refers to the sustainable development values that are a result of the Hiukkavaara plan frame and Hiukkavaara centre's town plan process and that will have ecological, social, cultural and economic effects. Altogether 29 different sustainable values have been identified. These objectives are the result of the city of Oulu's strategic objectives. They have been deepened in the town plans for the area, and taken into account in the design of the Hiukkavaara centre's town plan. A particular theme has been to involve and engage in the town planning process from the get-go.

A new neighborhood for about 20 000 inhabitants will be built in Hiukkavaara. The area will consist of several residential areas and a compact urban residential and service center called the Hiukkavaara centre. The pilot area for the project, the Hiukkavaara centre, will be a new district center serving approximately 40 000 inhabitants in the nearby region. Hiukkavaara centre will offer diversified housing, extensive municipal and private services, as well as jobs. Hiukkavaara is the most important area for future expansion in Oulu and attracts investments. The area will set an international example for northern city planning and construction – and be an interesting showcase for private and public operators.



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Interaction

A successful interaction contributes to a good living environment and a sustainable development of urban structures. It is also an essential part of good governance. INURDECO development project set in Hiukkavaara has enabled a higher level of interactivity and experimenting with new methods in the planning. As a part of the project, a plan of interaction was drawn up. It can be utilized as a manual in the planning and further construction of new neighborhoods.

The interaction plan was limited to the town planning stage. The aim was to improve the planning, make it more user-oriented and establish a genuine dialogue between various stakeholders. The interaction plan identifies the parties involved in the project, necessary interaction and its timing with respect to critical points in terms of planning as well as suitable interaction methods for each situation.

Methods used in INURDECO include e.g.

- polls and competitions (online and letter surveys, social media)
- a user community suitable for the testing of innovations developed by the University of Oulu: PATIO web forum
- UBI displays, large public interactive display devices
- a virtual town model, which is demonstrated to test groups in a three-dimensional CAVE virtual space through 3D glasses
- workshops, idea days, events
- social media, blogs, web applications,
- a reference group consisting of inhabitants and others who are interested

In the survey connected to the interaction plan, an open 3D model proved to be one of the most desired forms of interaction in addition to web sites, planning workshops and social media.

Developers involved in the INURDECO project developed virtual interaction and used social media to their own customer approach. Virtual models show what the future could look like. They also allow plans to be better illustrated, and nothing is hidden from the viewer. In this way, residents, businesses and other users have a better chance to understand the implications of the plans, participate and influence. Designers, in turn, receive valuable information from the parties affected, and the quality of the plan is improved. At best, cost savings may be generated if and when space is used more efficiently, land space is saved, and the number of complaints on the town plan is reduced. All this contributes to a more streamlined process.

Virtual models can be viewed on a home computer or in virtual laboratory facilities through 3D glasses. The city of Oulu has a CAVE 3D Virtual Laboratory (CAVE Automatic Virtual Environment), in which models can be viewed through 3D glasses. CAVE space and 3D modeling can be used to explore the planned areas and buildings and to explore their impression of space. The space can be used for design and planning, for presenting plans and gathering feedback from future users or for demonstrating plan projects for residents, as well as for a variety of other applications. The CAVE area is mobile so it can be used in various events.

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INURDECO has studied virtual models as a tool for design and interaction as well as envisioned the future. In addition, there are other development ideas including virtual conveyancing, games, innovation platforms, open data, user-friendly online applications and electronic online services. The virtual city model enables commercial applications and business.



Hiukkavaara virtual model <http://hiukkavaara3d.ouka.fi/>

