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Development of a Communication Tool to Frame a Vision for Changing Neighbourhoods

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1 ABSTRACT

Post war neighborhoods all over Europe are facing different kind of challenges in order to adapt them for the use in the future. The predominant factor in many concepts of neighborhood refurbishments is the energy demand of the buildings. In connection, many research projects focus on the reduction of CO_2 emissions omitting the fact that this specific value does not have any immediate benefit on the residents themselves, neither on a psychological nor on an economical level. Benefits are solely on a macro-economic level, which rarely is calculated and most likely cannot be communicated as a benefit to the residents in a comprehensible fashion.

The methodological approach presented in this paper reflects an iterative process of establishing a vision for a neighborhood development strategy. Its core is an iterative process, using the tools of questionnaires, workshops and focus group discussions, which includes the owners of the buildings, the local energy provider, policy makers, representation of the residents and research experts. Singular priorities were harmonized in the form of a questionnaire and multiple workshops. Based on this process, five key areas of action (energy, living space, open space, social and mobility) have been identified. It is valid for an urban area with mostly social housing, erected between 1966 and 1976. The reference neighborhood houses approximately 2,500 inhabitants and is situated in the town of Salzburg/Austria. The developed iterative process is multipliable and transferrable to comparable urban areas, which share a set of similarities. It is the basis for future decisions and gives orientation to the building owners, the energy provider and policy makers.

Besides the methodology the outcome of this process are a poster, a folder and a detailed catalog of measures. The poster and the folder visualise the neighborhood development strategy. A set of characters, icons and photos including easily comprehensible comics were developed. Those design features are important in order to create a recognition value and to stimulate acceptance among the inhabitants of the neighborhood. Moreover, the low-threshold approach of the design facilitates future communication with the concerned public.

The methodology of the neighborhood development strategy guarantees the inclusion of all stakeholders and supports a prioritization in order to decide on future measures that can lead to a more energy-efficient and liveable development of neighborhoods in need of adaptation.

Keywords: neighbourhood, communication tool, adaptation building stock, stakeholder inclusion, energy efficiency

2 INTRODUCTION

The need to mitigate the threats of climate change is undisputable. (Kennedy & Sgouridis 2011: 5,259) There is strong scientific consensus that anthropogenic influences are the dominant cause for a range of developments, e. g. warming of the atmosphere and the oceans, changes in the global water cycle as well as a rise in global mean sea level. (IPCC 2013: 17) Carbon dioxide concentration in the atmosphere has reached unprecedented levels in at least the last 800,000 years and has increased by approximately 40 % since pre-industrial times. The primary cause is the combustion of fossil fuels. (IPCC 2013: 11)

As a result, it can be observed that a large number of communities follow a trend to announce targets for carbon emissions and develop plans for reduction of energy and resources consumption. The aim is to lower their carbon footprint in order to become “zero carbon”, “carbon neutral” or “CO_2 neutral” communities (Kennedy & Sgouridis 2011: 5,259), eventually even “climate neutral”.

Especially post-war neighborhoods all over Europe are posing different kinds of challenges in regard to their adaptation for the use in the future. The predominant factor in many concepts of neighborhood refurbishment is the energy demand of the buildings, which sums up to 40 % of the global energy demand. (Bindra & Scanlon 2010) As mentioned above, many research projects focus on the reduction of CO2 emissions,

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omitting the fact that this specific value does not have any immediate benefit for the residents themselves, neither on a psychological nor on an economic level. Benefits are solely on a macro-economic level, which rarely is calculated and most likely cannot be communicated as a benefit to the residents in a comprehensible fashion.

2.1 Definitions

The research project "SmartItzGoes – Smarte Stadtteilsanierung Itzling -Goethesiedlung", on which this paper is based, also aimed to examine the possibilities of redeveloping the reference neighborhood into a carbon neutral urban district. In order to avoid misinterpretations, a definition of these two key terms, often referred to in this paper, is necessary.

A wide variety of definitions of the term "neighborhood" exists and an elaborate discussion is ongoing among planners and sociologists. Albert Hunter states: "undoubtedly, there is consensus that the neighborhood is a 'social/spatial' unit of social organization […] larger than a household and smaller than a city" (Hunter 1978: 270). Mostly, this is where the consensus ends. In this paper a neighborhood is "a social space, smaller than an administrative district, but more multifaceted than a residential area, which is strictly defined for residential purposes by law." (Alisch 2002: 60) Current literature offers a multitude of different categorizations of concepts (Erman 2014: 831) which aim at reducing CO_2 emissions. They include but are not limited to "zero carbon", "carbon neutral", "CO_2 neutral" or "climate neutral" concepts. Carbon neutral or CO_2 neutral are synonyms, describing a condition, in which the activities of an individual, an organization, a city or a country do not contribute to the gross input of global CO_2 emissions. Either the activities themselves do not cause CO_2 emissions or compensation alternatives, respectively "offsets" within or beyond the system counterbalance the emissions. The term "CO_2 neutrality" only refers to carbon dioxide and does not take the other greenhouse gases[1], in total responsible for the greenhouse effect, into consideration. (Bundesinstitut für Bau-, Stadt- und Raumforschung (BBSR) im Bundesamt für Bauwesen und Raumordnung 2017: 29)

Within the concept of "climate neutrality" or "net-zero GHG emissions" the effect of all GHG emissions on the atmosphere (according to the Kyoto protocol), expressed in the unit of CO_2 equivalent (CO_2e), is being accounted for. This does not imply that these concepts are "emission free". There is a slight difference between the two concepts. "Climate neutrality" can be reached if all GHG emissions can be compensated through analog reduction. The goal of "net-zero GHG emissions" can only be accomplished if the emissions are counterbalanced with real negative emissions, e. g. through CCS (carbon capture and storage). (Bundesinstitut für Bau-, Stadt- und Raumforschung (BBSR) im Bundesamt für Bauwesen und Raumordnung 2017: 31-32)

Recent research, e. g. the CLUE project (Climate Neutral Urban Districts in Europe[2]), are guided by the idea that climate neutral urban districts should function as test beds for new planning approaches in order to accomplish a transformation towards low carbon societies. Primarily new developments are in focus, although the biggest challenge is the conversion of the existing urban fabrique. It has to be stated that there is no climate neutral urban district today, which can serve as an example. Only a patchwork of experiences and good practices exists, which in their totality would eventually lead to a climate neutral urban district. (Erman 2014: 831)

2.2 Description of the reference neighbourhood

This paper deals with the methodology and the visualization of a participatory neighborhood development strategy for an urban area in Salzburg. This neighborhood incorporates mostly social housing, which was erected between 1966 and 1976, in a period of reconstruction and housing shortage in Salzburg. At that time, the welfare state established numerous collective housing structures, still known as social housing. The reference neighborhood is situated in the district of Itzling in the North of the town of Salzburg/Austria. The district is shaped by heterogeneous forms of housing developments with varying densities and manifold uses (residential area, trade, industry, education). The reference neighborhood itself consists of 26 buildings,

[1] There are natural and anthropogenic greenhouse gases. The primary greenhouse gases in the earth's atmosphere are water vapor (H_2O), carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4) and ozone (O_3). Besides those gases exists a number of entirely human-made greenhouse gases. (IPCC 2013: 1,455)

[2] More information can be obtained here: http://www.clue-project.eu/

housing approximately 2,500 inhabitants in 1,257 apartments on a gross floor area of almost 100,000 m². Figure 1 offers an aerial view of the neighborhood.

Figure 1: aerial view of the reference neighborhood (Source: Google Earth, 2016)

It can be observed that the neighborhood was built at the verge of a transition from the urban concept of the "structured and loosened town" to the model of "urbanity through density". Those settlements are products of a time when modernism as a method of urbanism was at its heyday. A strict separation of functions into places for housing, work, education, recovery and provision was predominant. Mobility by car was the central feature of a city. Hence, many of those settlements are situated in former suburban locations, now encircled by the encroaching urban development from the past forty years.

In the North of the area, a big sealed space is used predominantly for parking. The zone between the buildings is characterized by green space with a smooth transition between public and private free spaces. The building stock, characterized by uniform height and following the row typology, is undergoing thermal renovation in a gradual manner. The institutional framework of social housing provides favourable conditions for change due to less complex ownership structures and the established system of residential building subsidies. Nevertheless, many of the buildings still have sub-standard insulation and inadequate HVAC systems, which no longer meet today's energy-efficiency standards. Migrant communities, low-income households and an aged population (more than 40 % of the inhabitants are over 60 years old) have replaced the original target group. The settlement will be exposed to strong pressure for change over the next few years, mainly caused by a foreseeable generational change in the tenant base, the demand for higher quality accommodation and the increasing requirements for energy efficiency and climate protection.

3 METHODOLOGY

In order to be able to formulate a neighborhood development strategy, a detailed inventory of the building stock and an urbanistic analysis followed by a SWOT-analysis is performed. The main goal of the neighborhood development strategy is to frame and visualise a desired target condition, which is shared by all relevant stakeholders (i. e. building owner, policy makers, energy provider and the institution representing the residents). It must create inward orientation and project a positive image to the public. Chapter 3.1 explains the iterative development of the content. Chapter 3.2 elaborates on the components as well as the graphical structure of the poster and folder representing the neighborhood development strategy visually. It should serve as a powerful communication tool for future projects concerning similar neighborhoods in need of adaptation.

3.1 Content

The methodology proposed in this paper includes three different instruments (questionnaires, workshops, focus group discussion), which are explained in chapter 3.1.1. At the core of the neighborhood development strategy is an iterative development process, which is shown schematically in Figure 2 and presented in detail in chapter 3.1.2. Participants in this process include the owners of the buildings, the local energy provider, policy makers, an institution representing the residents and research experts.

3.1.1 Instruments

Detailed and tested questionnaires are the instrument of choice in providing a strong foundation for the neighborhood development strategy. They are necessary in order to harmonize singular priorities of the building owners and in a following step prioritize the possible measures.

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The method of workshops was chosen because it provides the opportunity to work on many different topics and problems in a short period of time. The involvement of experts and relevant stakeholders as a valuable resource of knowledge and experience as well as a high degree of interaction secure an arranged approach in the development process. Utilizable results and valuable input can be deducted and allow a refinement of the neighborhood development strategy. Moreover, workshops enable a clarification of opinions and the identification and discussion of different perceptions. In an iterative process, all information was collected, structured, combined and evaluated. The result of this collective effort is a common understanding among the stakeholders.

Figure 2: schematic representation of the iterative process of neighborhood development strategy (Salzburg University of Applied Sciences)

Another important instrument in the development process is the moderated focus group discussion. It is organized and carried out by a trained sociologist. Participants are an institution serving as the representation of the residents, the housing office of the city of Salzburg, representatives of the urban planning and traffic department of the city of Salzburg as well as the building owners and the building management. Within this workshop, the opinions, interests and sentiments of the stakeholders are collected. The results are included in the process of the neighborhood development strategy leading finally – together with the other two instruments – to a common vision of the neighborhood.

3.1.2 Iterative Process

The results from the urbanistic analysis as well as the conclusion drawn from the SWOT-analysis serve as the basis for the formulation of possible measures for the future neighborhood development. Regarding the political frame conditions, a first catalog of measures is developed by the research experts, building owners as well as the energy provider.

The presentation of this first draft in a workshop in front of the policy makers in the city of Salzburg and the discussion of the measures is leading to a concretization of the objectives from the city government's point of view. Including policy makers in the process is a vital step in order to create acceptance and support for the project. Research experts document and reflect on the results of this workshop with the aim to provide suggestions for a necessary adaptation of the neighborhood development strategy.

A questionnaire targeted towards the building owners is developed. Within this questionnaire, the building owners are asked to prioritize the envisioned measures. The responses from the returning questionnaires are collected, structured, evaluated and graphically treated. This serves as a preparation for the following workshop with the building owners. The neighborhood development strategy is adapted accordingly. In the workshop with the building owners, the evaluation results of the questionnaire are presented and discussed. Additional input, as well as clarification and concretion of the suggested measures are the output of the workshop. The iterative process continues with the graphic treatment of the results from the workshop, deducting a voting questionnaire from the findings, which is sent to the building owners and the energy provider in order to deliver a second round of prioritization.

The results are structured and harmonized leading to an adaption of the neighborhood development strategy and the catalog of measures. The moderated focus group discussion follows and the recommendations are included. In a final workshop with policy makers, the objectives are further concretized and a final version of suggested measures under a mutual understanding is established. According to the results the neighborhood development strategy is finalized.

Figure 3 shows the workflow of the iterative development process chronologically.

Figure 3: workflow of the iterative process of the neighborhood development strategy (Salzburg University of Applied Sciences)

Based on this iterative harmonization and prioritization process, five key areas of action (energy, living space, open space, social and mobility) have been identified. They are visualized in Figure 4. For each key area of action, an illustrative icon with a high recall value is designed.

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Figure 4: five key area of action (Salzburg University of Applied Sciences)

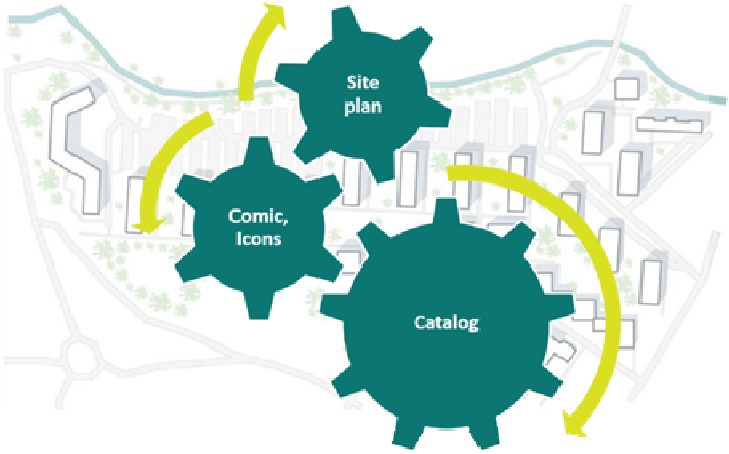

Figure 5: components of the neighborhood development strategy (Salzburg University of Applied Sciences)

3.2 Components and Design

The visual representation of the neighborhood development strategy follows a low-threshold approach. It is necessary to establish an original and aesthetically appealing concept in order to use it for future communication with relevant stakeholders and the concerned public. For this reason, a set of characters representing the residents is developed . The neighborhood development strategy consists of three components, which differ in scale and content according to the addressed target group. Starting with sketches of the agreed measures the following three components are developed:

- The site plan is graphically enhanced according to aerial pictures. It serves the purpose of localisation and gives an overview of the neighborhood.
- During site visits the situation in the neighborhood was captured. These photographs are enhanced with an individual set of characters, a visionary statement concerning the key area of action as well as generally understandable messages. The concept follows a comic style, which helps to simplify complex content.

- A detailed catalog of measures for each key area of action, including keywords, a visionary statement and background information relevant to the examined neighborhood forms the backbone of the neighborhood development strategy. This catalog is the basis for future decisions and gives orientation to the building owners, the energy provider and policy makers.

Figure 5 visualises the three components of the neighborhood development strategy graphically.

4 RESULTS

As an outcome of the iterative development process, a poster (see Figure 6, Appendix 1) with a unique concept serves as the visual representation of the neighborhood development. The set of characters, icons, photos and visionary statements are easily comprehensible. It represents a collective identification and action basis for all stakeholders and should stimulate acceptance among the residents.

A folder (see Figure 7, Appendix 2) was designed as an additional communication tool and a basis for future action. It is especially targeted towards the residents of the neighborhood to support a direct communication. They should be well informed and welcome in the process of change. Moreover, it is of great importance for the residents to realize that the planned changes will improve their quality of life.

Finally, the catalog of proposed measures (see an overview in Table 1) provides a detailed insight into the desired target condition from the viewpoint of the involved stakeholders.

Key area of action	Exemplary measure
ENERGY	Thermal improvement of building stock; use of renewable energy; increase in efficiency
PUBLIC SPACE	increased attractiveness; improved usability
MOBILITY	Sufficient space for bikes; e-mobility; car-sharing
LIVING SPACE	Careful densification; new forms of dwelling; room for interaction and health care
SOCIAL	Energy efficient lighting; reduction of fear causing open spaces; social and technical interconnection

Table 1: overview of the catalog of measures (Salzburg University of Applied Sciences)

In the course of the research project, all partners agreed that this iterative neighborhood development process should be integrated in the planning process of future projects. The focus on establishing a CO2 neutral neighborhood should not be the sole driver of change, although it is an important step for the transformation of a neighborhood in need of transition in order to reach climate and comfort goals. Only an integrated planning and developing process, incorporating energy, living space, public space, social and mobility guarantees direct benefits for the residents and visitors alike.

5 CONCLUSION

The methodology of the neighborhood development strategy guarantees the inclusion of all stakeholders and supports a prioritization in order to decide on future measures that can lead to a more energy-efficient and liveable development of neighborhoods in need of adaptation. It can provide assistance to meet the present and future comfort demands of its inhabitants, reach climate goals and react to demographic and social phenomena.

The developed concept is multipliable and transferrable to comparable urban areas, which share a set of similarities. In Austria 11 % (Statistic Austria 2011) and in Europe 18 % (Birchall et al. 2016) of the building stock are multi-family homes erected in the same time period as the reference neighborhood.

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The proposed visual representation of the neighborhood development strategy is a powerful communication tool, which can be a vital element in the process of implementing ambitious redevelopment plans applicable to social housing in Europe.

Support, acceptance and identification with the redevelopment plans of urban neighborhoods needs to be gained by residents and other relevant actors alike. In Austria, there is no legal basis for resident participation. Building owners and political decision makers are aware of the power of the residents and hence often fear their participation at early stages of a project. Understandably, if information is transported in a non-coordinated manner, it can get a self-propelling power. Mixed with personal sentiments and perceptions of people with no deep understanding of the situation, it can cause a downward spiral up to the point where there is strong resistance against any measures. Comprehensible information for the residents, even at an early stage of a project, with the possibility to participate, should be seen as a potential for redevelopment of the existing social housing stock and its immediate environment.

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7 REFERENCES

ALISCH: Soziale Stadtentwicklung. Politik mit neuer Qualität. In Uwe Jens Walther (Ed.): Soziale Stadt - Zwischenbilanzen. Ein Programm auf dem Weg zur Sozialen Stadt? Opladen: Leske + Budrich, 2002.

BINDRA, Scanlon: UNEP annual report 2009. Seizing the green opportunity. Nairobi: United Nations Environment Programme (UNEP). United Nations / Environment Programme: Annual report 2009. 2010

BIRCHALL, Gustafsson, Wallis, Dipasquale, Bellini, Fedrizzi et al: Survey and simulation of energy use in the European building stock. Accessed at: http://www.diva-portal.org [01/03/2017), 2016

BUNDESINSTITUT FÜR BAU-, STADT- UND RAUMFORSCHUNG (BBSR) im Bundesamt für Bauwesen und Raumordnung (Ed.): CO2-neutral in Stadt und Quartier. Die europäische und internationale Perspektive. BBSR-Online-Publikation 03/2017. Accessed at: http://www.bbsr.bund.de/BBSR/DE/Veroeffentlichungen/BBSROnline/2017/bbsr-online-03-2017.html?nn=1187544 [01/03/2017], 2017

ERMAN: Climate Neutral City Districts - the Smartest Form of a City's District? In: Schrenk M., Popovic V., Vasily V., Zeile P. (Ed.), Plan it smart. Clever solutions for smart cities. proceedings of 19th International Conference on Urban Planning, Regional Development and Information Society. 831–838. Accessed at: http://www.corp.at/archive/CORP2014_171.pdf [01/03/2017], 2014

HUNTER: The Urban Neighborhood. Its Analytical and Social Contexts. In: Urban Affairs Quarterly, 14, 267–288, 1978

IPCC: Climate change. The physical science basis. Contribution of Working Group I to the fifth assessment report of the Intergovernmental Panel on Climate Change. 1. publ. Stocker T., Qin D., Plattner G.-K., Tignor M., Allen S. K., Boschung A. et al (Ed.). Cambridge, United Kingdom and New York, NY, USA, 2013

KENNEDY, Sgouridis: Rigorous classification and carbon accounting principles for low and Zero Carbon Cities. In Energy Policy, 39 (9). 5259–5268, 2011

STATISTIC AUSTRIA: Gebäude 2011 nach überwiegender Gebäudeeigenschaft, Errichtungsjahr und Bundesland. Accessed at: https://www.statistik.at/web_de/statistiken [03/03/2017], 2016