ABSTRACT: The smart city initiative of the European frame program aims to achieve energy independency of smart cities in European model areas within the next 30 years. In terms of durability the use of wood as a renewable and carbon storing material will be of highest interest. The challenge will be to prepare the timber economy & industry to gain access to a fast growing market of big volume constructions as numerous multi-storey buildings. The force of the European wood economy has been not his size, but the competence of small and by innovation driven companies. The experience showed that the timber economy & industry has still difficulties to get access to the big volume multi-storey market. Reasons are mainly the mentality of real estate companies, which only quest for profit, but also the lack of experience and education to design multi-storey timber constructions especially in combination with other disciplines. Lacking experience and logistics lead to high costs and let appear timber construction more expensive than the mass production of concrete. As most of the knowledge came up in the last few years, innovation and the increase of know how could be achieved only by intensive education, further training and research activities. Only with a strong and complete network of confederation, code committees, education and research institutions in combination with a strong lobby and marketing activity, it will be possible to develop modern technologies for economic big seize multi-storey buildings. Superior objective targets are very important to assess clear targets and strategies where humans and the creation of added value are the centres of interest. Efficient climate protection measures decide about our future. Mission statement as the society of “2000 Watt” in Switzerland and energy self-supply are some of these superior objectives. The biggest challenge however will be shortage of resources. Resources mean as well human resources as the material resource wood. The future flux of wood will depend on the resource distribution between biomass, substitution of petrol products and will influence the part of wood used for timber construction. As far as only the primary construction costs will be taken into account without consideration of the life cycle costs, the value of wood as building material will be under estimated. The forest based industry needs a deep restructuring and new organisation to face the challenge to be the leading construction material in smart cities. Measures concern the association of timber with other key technologies, integrated design in combination with prefabrication, emerging of general contractors specialised on timber construction. Furthermore it will be important to reorient the system of codes, confederations, education and RDT on superior values as common welfare, climate protection and the creation of local value.

KEYWORDS: smart city, multi-storey timber buildings, forest based industry

1 INTRODUCTION

The Smart Cities Initiative aims to improve energy efficiency and to step up the development of renewable energy in cities going even further than levels foreseen in the EU energy and climate change policy. This Initiative will support cities and regions that take pioneering measures to progress towards a radical reduction of greenhouse gas emissions through the sustainable use and production of energy low-carbon economy.

In the initiation program “Wörgl fit for set” ¹ general measures were proposed to halve the energy consumption by the construction of new multi-storey buildings with low carbon emission materials in best practise energy standard. Furthermore 50% of all old buildings has to be retrofit until 2025 in low energy Standard. These measures induce necessarily to use wood for new buildings as well as for retrofitting measures. In order to achieve the goal of low energy consumption the annual rate of retrofitting must be raised to a required level and need to condense existing building to higher multistory constructions. Thus new markets and new technologies will emerge for timber construction and require new competences, different design and construction process as well as the restructuring of the timber industry to face large scale multistory constructions.

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2 PROJECT DESCRIPTION

The smart cities initiative tackles the climate change and offers to the timber industry the opportunity to gain access to a new huge market of large scale multi-storey buildings responding to the low carbon emission challenge. In preparation of the future smart cities projects and the fast growing marked of large scale multi-storey a group of experts and representatives of the forest and timber industry from Austria, Germany and Switzerland has discussed relevant recommendations and strategies to face the upcoming demand for timber buildings in cities. Only a complete bunch of measures will allow the timber industry to get prepared to challenge of the future market for big seize projects in urban areas. The overall strategy will include the following arguments:

✓ Wood alone is not enough to build large scale construction, wood must be associated to energy efficiency, HVACR-technology and necessarily be used for hybrid constructions (wood-concrete composites for example).

✓ Small companies specialized on timber building or not enough, the marked of large scale buildings will require general contractors specialized on prefabrication and systems building. In addition to the competence in timber technology these companies must have the capacity to design and fabricate integrated systems including the whole range of disciplines from HVACR technologies until ready to use constructions.

✓ A customer and volume based production is not enough; superior values as common welfare, climate protection, team competence and the creation of local value have to be considered and integrated into the process.

✓ Building companies are not enough, a good working overall system is necessary with a complete network including codes, confederations, education, research and development integrating superior values.

✓ Followers and sectarians doing their own things are not enough, we need boosters, masterminds, visionary ideas and people practising global societal concepts to be implemented by an interdisciplinary team of scientists in cooperation with municipalities and representatives of cities or regions.

✓ Achieved knowledge and experience is not enough, we need constantly regeneration by continuing education, R&D activities, innovation and visions in combination with adequate communication and marketing.

The SINFONIA project, part of the FP 7 Program for smart cities 2013, proposes to elaborate a “refurbished city district model” for the cities of Innsbruck (A) and Bolzano (I). Major housing associations intend to retrofit 120,000 m² of residential and public buildings in the next 4 years. Intended refurbishment measures include the improvement of thermal insulation by new wood based technologies and a high degree of prefabrication will be used.

According to the aims of SET-Plan the project intend to accelerate knowledge development, technology transfer and up-take in order to contribute to the worldwide transition to a low carbon economy by 2050 (limiting climate change to a global temperature rise of no more than 2°C, in particular by matching the vision to reduce EU greenhouse gas emissions by 80 - 95%). The forest and timber industry could be one of the major players, provided that the branch will be ready for a substantial transformation by his means and logistics as well as the consciousness about a fundamental change of values in the future economy and society.

3 CONCLUSION

The smart cities initiative will generate a very important activity in the field of eco-construction where wood and the timber industry will have the opportunity to access to a huge new market, especially in refurbishment and the construction of numerous multi-storey buildings in smart cities. This opportunity could be used to make of wood the major construction material provided that the forest and timber industry will manage the renewal of his structures and logistics. As recommendations of experts show, integrated design and prefabrication must be developed inside a good working network with all concerned partners. Especially Universities and researches will play a key part by global visions and innovative technologies in close cooperation with industrial and politic partners.

REFERENCES