

ADVANTAGES OF BUILDING WITH WOOD



CONTENTS

INTRODUCTION	3
ADVANTAGES OF BUILDING WITH WOOD	4
How to achieve building with wood?	6
Advantages of wooden houses	7
FORESDA PROJECT	8
ABOUT ZEDA AGENCY	10
WE REPRESENT TO YOU:	12
Examples of building with wood from Bosnia and Herzegovina	12

INTRODUCTION

In order to inform the target groups (investors and architects) in Bosnia and Herzegovina about the advantages of building with wood, a brochure "Advantages of building with wood" was produced as a result of research and analysis of the wood sector as well as an analysis conducted by professors from the Faculty of Forestry of the University of Belgrade (Dr. Nebojša Todorović, Dr. Zdravko Popović and Dr. Goran Milic, "Building with wood", Belgrade 2018) within the framework of the implementation of the FORESDA project.

The FORESDA project, Zenica Development Agency ZEDA (as a partner in project implementation) and several export-oriented BiH companies were presented in the brochure as well as the advantages of using timber as building material.

In the past few years, we have been facing various weather disasters such as floods, droughts, ice rains, strong winds, which are the result of climate changes. All this is caused by a man who, with the desire for material gain, destroys the environment in which he lives ... By intensive exploitation of fossil fuels and the production of energy-intensive materials (cement, steel, aluminum, plastics), the gases of glass garden (methane, nitrogen oxide, fluorocarbon compounds, water vapor, carbon dioxide...) are discharged into the atmosphere and disturb the Earth's natural balance. In order to avoid disasters, we must act decisively and reduce greenhouse gas emissions. Reducing could be achieved if natural building materials, such as stone and wood are in main use. If we compare all the building materials, we can see that only wood bonds with carbon dioxide (CO₂ reduction) and helps maintain standards and technological development with minimal environmental and human impact. Because of this, the significance of building wooden structures today is much greater than ever before. The use of wood in building has undergone great revival in recent years. Why? Wood is a gift of nature and is in accordance with the principles of sustainable development. In the forests it produces solar energy from the CO₂ (photosynthesis), and objects built from it can store CO₂ for decades. Contribution to further reduction of CO₂ emissions is also the fact that building wooden structures needs several times less energy than building in materials such as cement, steel, brick, stone and glass wool. In the final calculation, one cubic meter of built-in wood contributes to two-tone reduction of CO₂ in atmosphere, while the cubic meter of reinforced concrete increases concentration of CO₂ for several times! Therefore, the use of wood as building and insulation material significantly reduces the emission of greenhouse gases. A wooden house of average size, equipped with wooden furniture in a 60-year lifespan, stores approximately 50 to 70 tons of CO₂ (depending on the size). If proportion of newly constructed wooden houses increases for 10% in a year, that would decrease 25% of CO₂ yearly emissions, according to the Kyoto agreement.

Building a wooden house is not only good for reducing greenhouse gas emissions but also for thermal insulation of buildings. Solid wood walls represent excellent heat insulation and provide a pleasant and healthy living environment. Wooden houses require much less energy for heating and cooling because the feeling of cold or heat in the space compensates for about 2° C, which in addition saves energy. However, in the last twenty years, the energy passivity of armored concrete and brick houses with wearing stone or glass wool, was supported in Bosnia and Herzegovina. For the production of such materials, big amount of energy and free CO₂ is needed, whose emissions will be compensated only after several

decades of living in the home. That is why the house's excessive passivity is completely meaningless because it contributes to the deterioration of climatic conditions, rather than mitigating them. For this reason each facility should be labeled to know how much CO₂ is released from the production of materials, construction and equipment. The wall thickness of a house should depend on the climate and the country where it is made.

ADVANTAGES OF BUILDING WITH WOOD

Wood is one of the oldest building materials that plays a significant role in traditional building, not only in BiH but also around the world. Through the 19th and 20th centuries, wood is neglected in building, but over the last decades, thanks to the new technologies and growing concern for the environment, it is again important.

The trees need sun, water, air and soil to grow, and after they are planted they do not require almost any investment. During growth, wood absorbs carbon dioxide from the atmosphere and binds it to its structure, making it the only constructive building material with negative CO₂ printing.

Throughout the whole process of obtaining construction products, processing of semi-finished raw materials usually requires the most energy and is the only process that has negative impact on the environment. The costs and energy needed for the exploitation and processing of wood as raw materials are extremely low compared to oil, iron and even crushed stone. Energy costs and demands on wood processing are much smaller because wood does not require complex processing, such as steel melting or cement baking. During the production of wooden building elements, about 35% of the logs are used in hardwood species, such as oak or 45% in softwood species, such as larch and spruce. It is important to emphasize that the rest of the timber does not throw away, but is exploited to the smallest pieces of sawdust for the production of various other products, from sound insulation in the form of wood wool, all the way to heating pellets. Utilizing the timber completely eliminates the costs of waste disposal and added value is added to the new products.





This building material is very durable (... and it grows in front of your eyes, as Austrians would say ...) and there is almost no way of building that is better (when it comes to energy), faster and more reliable than wood. Thanks to the properties of wood in modern building, the modern conditions of thermal protection are met with ease.

At the same time, as a building material, wood creates a comfortable living environment and therefore this type of building is so popular in Scandinavia, Central Europe and more and more in Eastern European countries such as the Czech Republic and Slovakia. The reason for this is not only time and cost savings, (due to the possibility of production of prefabricated elements and dry construction), but wood also has remarkable isolation characteristics. Thus, for example, 6,5 cm thick coniferous wood has the same thermal insulation as 40 cm of full bricks (source: Egger company, Tyrol-Austria). In addition, wooden building elements have a large bearing capacity with relatively low weight. Because of this, the walls of wooden structures are thinner, which significantly increases the useful space in the interior.

Bearing in mind the function of forests and the fact that forests, in all countries involved in the FORESDA project, (with the exception of Hungary), cover over 30% of the land area (in Bosnia and Herzegovina, forest and forest land accounts for about 58% of the territory, of the wondrous countries of Europe) there is no doubt that rational use of wood as a forest product represents a vital state interest.

Wood elements, after processing and drying, have a density of 400 to 800 kilograms per cubic meter. Transportation of such elements requires less energy and has a lower degradation effect on the road than the steel mass of 7.5 tons per cubic meter, or a concrete mass of 2.5 tons per cubic meter. Local availability of wood, besides further reduction of transport costs, develops the industry in rural areas and contributes to the development of small and medium-sized enterprises traditionally prevailing in the wood processing industry.

Modern wood-based technology, such as prefabricated construction with semi-finished elements and machining of elements, enables fast and efficient building, and because of its low weight the elements of such a building require less dimensional foundation. The advantage of constructing in semi-finished elements is that the production and preparation of elements can take place in parallel with the process of obtaining building permits. After obtaining all the required approvals, the finished elements are delivered to the construction site, where they are incorporated into the building in a very short time, thus reducing the cost of the construction site. By using lamellar wood, the architectural constraints associated to the building of wooden structures are now exceeded.

In the fight against climate changes, absolute advantage should be given to wooden houses, which throughout the life cycle have a positive impact on the environment. The share of building of wooden houses is growing everywhere in the world, especially in developed countries: Canada, USA, Scandinavian countries... In Sweden they have already built four wooden seven-floor buildings, and are planning to build thirty four-floor buildings out of wood. A good example is Austria, which has fewer wood amount per person, but its application in building predominates several times in comparison to neighboring countries.

Apart from a positive influence on the climate, the wooden house also has other advantages. Building is fast and can be run all year long, even at low temperatures. The high degree of prefabrication allows the facility to be set within a few days, and the time from start to finish is shorter than the conventional construction. Due to the excellent structural and insulation properties, the wooden massive walls can be thinner and at the same external dimensions, up to 10% more residential surfaces can be obtained. Exceptional structural properties of wood have also shown in testing on earthquakes and fires. Small weight, pressure and tensile strength of the wood makes earthquake-resistant wooden buildings and adding carbonated layer on the surface makes them also much safer than reinforced-concrete.

How to achieve building with wood?

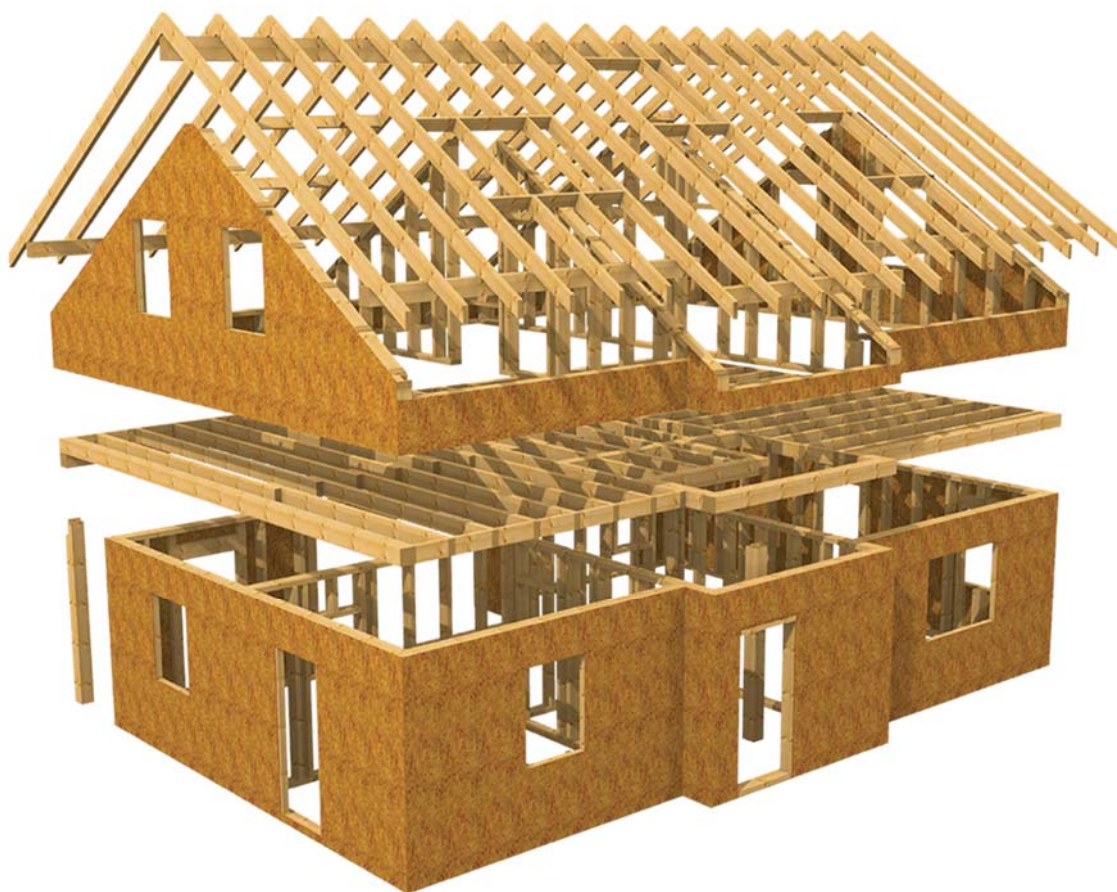
Damage that fossil materials cause is burden of the society as a whole, however, when constructing wooden houses, ecological advantage is not taken into consideration. In realistic design, the prices of wooden objects would be cheaper than fossil material objects. For example, if you would include the costs of greenhouse gas emissions in the price of concrete-reinforced building, the passive house with stone wool would be considerably more expensive than wood. But, as we know, the interest of the state lies in money, and not in a healthy environment.

Wood is the only available raw material from which, with little energy, we can build industrial and private facilities in Bosnia and Herzegovina. Only then we could be economically and politically less dependent on others. Wood processing and woodworking should be a huge opportunity for BiH to join „low-energy family“ and an ecologically "green" economy.

In accordance with the above, each country must pay more attention to financing projects that point to the use of wood and give priority to projects based on knowledge, innovation and commercialization. Wooden building projects for public buildings, such as kindergartens, schools or some multipurpose buildings, are required to be implemented as examples of good practice and thus to raise awareness among people that wood is a quality, cheap and energy-efficient building material. This would significantly improve the use of wood as a material of equal value to other building materials.

Advantages of wooden houses

Wooden houses are the healthiest way to build, have a lot of ecological properties and thus ensure a healthy lifestyle. Wood as a material for building houses and furniture has always been interesting because it is warm and natural material.



Some of the most important advantages of wooden low-energy houses are:

Insulation: Excellent insulation properties of wood allow natural thermoregulation, which makes them warm in the winter and fresh in the summer. Wood is 6 times better insulator than brick and 15 times better than concrete.

Weight: Due to less weight, building is possible even on softer terrain, such as areas around the water or mountain areas. Wood is up to 5 times lighter than concrete, but it has a high bearing capacity and can withstand high pressure and tensile forces. Because of this, wood is considered a flexible material.

Antiallergic properties: Spruce timber has very good antiallergic properties. Wood generally exhibits excellent electrostatic properties, and will not electrify and attract microparticles of dust and pollen, which is especially important for people with various forms of allergy since this creates an ideal antiallergic environment.

Fire resistance: There is a high fire resistance of wooden houses due to the three-component impregnation, which is excellent fire protection.

Durability: With new ways of treatment, wood is given better characteristics - great resistance to moisture, fire resistance, cracking, fungi, insects. Proper maintenance and use of quality wooden house materials can reach a really deep age, from 90 to several hundred years.

Savings: The low energy house uses ordinary, classic heating and saves up to 30% of energy.

Humidity: The houses are made of quality spruce containing 13% moisture, which results in wood stability, better mechanical properties and prolong the durability of the house. Wooden walls keep the air humidity in all rooms, so no additional air conditioners or room humidifiers are needed because wooden houses absorb moisture when moisture is too high and release it when the air is dry. That's why air in wooden houses is ideal throughout the year.

Immediately ready for moving in: Quick building and moving in is possible in a month or two from drafting, while only the drying phase of a masonry house lasts that long.

Earthquake-resistant house: It can withstand the earthquake stronger than 11 degrees Mercallian rankings.

Pure, clean building: This is because the complete building takes place in production halls for ready-made elements, which, after finishing the construction, are mounted on your plot with minimal noise and dust.

FORESDA PROJECT

Zenica Development Agency-ZEDA, as a member of the Consortium of EU and IPA Organizations, started with the implementation of the FORESDA project - Support for Innovation and Competitiveness of Cross-sectoral Value-Based Forestry / Woodcutting Profiles in January 2017.

The project is implemented by 13 partners and 7 affiliated strategic partners in the nine Danube countries: Austria, BiH (ZEDA, PREDA), Bulgaria, Hungary, Germany, Romania, Slovenia, Serbia and Croatia. The leading project partner is CyberForum e.V. from Germany.

The aim of the FORESDA project is to support the transformation of traditional forestry and woodworking industries into innovative sectors, the development of a favorable environment for innovation development, the development of new value chains, the

development of innovation culture in small and medium enterprises and the strengthening of institution cooperation on the quadruple-helix principle. In this way, the project will significantly support the transfer of knowledge, cooperation and innovation development in the direction of a more sustainable Danube region in the aspect of available resources, energy efficiency and environmental protection.

Through the realization of the FORESDA project activities, it was noted that the share of building with wood in project participant countries is very small, but that a positive trend has been noted and that the exploitation of wood in construction is worth more attention and promotion. It has also been noted that the main cause of the small involvement of this type of building is the lack of knowledge of the characteristics of wood as a material and a characteristic of building with wood. It was established that a large number of people opt for classical construction because it is a tradition, and that a small number of them are familiar with the essential advantages of wood although there is an increased interest in using natural materials and energy efficient building.

More about FORESDA: <http://www.interreg-danube.eu/approved-projects>



ABOUT ZEDA AGENCY



Developing agencies as operational bodies identify sectoral or overall development issues, choose methodologies for solving them and promote projects that can maximize the resolution of these problems, and are extremely important instruments of support for local and regional authorities.

ZEDA was founded by the City of Zenica in 2004 with the aim of economic development, assisting the development of SMEs and creating a favorable environment, which overall leads to the development of the community or region.

New projects are the basis for the development of each city, and the ZEDA Agency plays a significant role in the implementation of the development projects of the City of Zenica.

Thanks to the cooperation and assistance of various institutions, donors and partners (EU, USAID, UNDP, SIDA, GIZ, Czech Development Agency, Environment Park, Sicily Region, SPARK Netherlands, OSCE etc.) we have achieved remarkable results.



For fourteen years of operation, ZEDA has implemented, partnered and co-sponsored dozens of projects in the field of: developing and promoting entrepreneurship, creating favorable conditions for domestic and foreign investment in the economy, strengthening competitiveness and export potential of SMEs, building entrepreneurial infrastructure and environment; product safety control, ecology - sustainable development and energy efficiency, human resources, tourism etc.

ZEDA takes an active part in the projects implemented by the City of Zenica and represents a significant instrument of support for the City of Zenica in the elaboration of all important strategic documents.



The ZEDA Agency and the City of Zenica continuously develop various mechanisms to support the improvement of the economy and create a favorable business environment. Within the ZEDA Agency, the Laboratory for Safety of Products Testing - LIND, is the only B&H laboratory of this kind that, through product safety testing, provides direct support to our producers, primarily exporters, in a way that their products have an added value and are in compliance with European standards.

Also, ZEDA manages the Business Incubator Zenica, which is a generator of the development of new businesses and jobs. In 2016, the Impulse Creative Center was established - a development center whose primary purpose is to be the driving force of entrepreneurship development, and thus the startup of the community in Zenica and the IT sector.

In the ZEDA Agency, a BusinessPoint Zenica Support Center was established, which includes a place to promote the capacities of the Zenica economy, employment promotion programs and the contact point of domestic businessmen and investors.

Since 2018, ZEDA manages the Zenica Business Area 1, where more than 70 companies operate, while the City of Zenica and ZEDA are actively working to create conditions for the introduction of new and developing existing businesses in Zenica Business Zone 1.

WE REPRESENT TO YOU:

Examples of building with wood from Bosnia and Herzegovina

	<p>Krivaja-TMK doo Radnička 2, 72220 Zavidovići Bosnia and Herzegovina Tel.: +387 (0)32 878 064 Tel.: +387 (0)32 878 068 Fax: +387 (0)32 878 065 info@krivajahomes.com www.krivajahomes.com</p>
	

The greatest pleasure of work is the relationship we create with you while we are building your dream home together. We have successfully built houses since 1950. It is over sixty years of experience, development and continuous progress. In these past sixty years we have built more than 1.5 million square feet of living space around the world.

	<p>PROMO d.o.o. Ul. 770. Sbbr bb, 70220 Donji Vakuf Bosnia and Herzegovina Tel.: +387 30 205 360 Tel.: +387 30 205 488 info@promo.ba www.promo.ba</p>
	

PROMO d.o.o. is a company from Donji Vakuf, primarily engaged in the production of prefabricated houses and other facilities. In addition to the production of the house, PROMO also produces peeled veneer, chairs and other finishing products. Over 80% of PROMO's production is exported, primarily to EU countries.

ARTISAN®

Artisan d.o.o.

Medakovo bb, 74260 Tešanj
 Bosnia and Herzegovina
 Tel.: +387 32 667 910 / +387 32 667 911
 Fax: +387 32 658 820
info@artisan.ba
www.artisan.ba



The artisan specializes in the manual production of high quality furniture made of solid wood and is precisely insisting on manual, artisan work that distinguishes us from others. With every collection, every piece of wood, every vision of a designer, and with every touch of the masters hand, we strive to justify the philosophy that we follow.

IMPROVE YOUR HOME & IMPROVE OUR WORLD




ZANAT

Zanat

Varda 2, 88400 Konjic
 Bosnia and Herzegovina
 Tel.: +387 36 727 299
 Fax: +387 36 725 753
yourhelp@zanat.org
www.zanat.org



The craft was formally launched as a designer brand in 2015 and has gone a long way ever since. The roots of Crafts go deeper into history. Our vision includes a development model that seeks to establish the region of Bosnia and the Balkans as a renowned region on the global designer furniture market, and according to the writing of prominent international journals and newspapers we have already succeeded.

	<p>Standard Furniture Factory Bosanski put 103, Ilijaš Bosnia and Herzegovina Tel.: +387 33 842 000 info@standard-furniture.ba www.standard-furniture.ba</p>
	

Our story begins 50 years ago. We were born out of the idea of joining beauty and utility, to do what we love doing and what makes us fulfilled. Standard, as a furniture manufacturer, is recognized as a quality brand on ours as well as on the European market. We are present in over 1000 salons throughout Europe, and our team of experts, always ready for new challenges, stands proudly behind every product.

	<p>MS&Wood Podcitonja bb, Fojnica 71270 Bosnia and Herzegovina Tel.: +387 30 831 838 info@mswood.ba www.mswood.ba</p>
	

We are a designer-oriented full-wood furniture manufacturer who aims to meet the needs of the highest segment of the furniture market.

	PROGRAD d.o.o. Donja Golubinja bb Begov Han, Žepče 72233 Bosnia and Herzegovina Tel.: +387 32 684 060 prograd@prograd.ba www.prograd.ba
	

The company Prograd Holz d.o.o. Žepče has many years of tradition and experience in the production of high quality wood and wood-aluminum joinery. According to the tests carried out in the certification houses related to water permeability, wind speed, quality, type and humidity of the wood, quality of production and processing, heat energy savings and sound insulation, wood and wood-aluminum joinery manufactured at the premises of Prograd Holz doo Žepče, is placed at the very top of European and world wood and wood-aluminum joinery, which meets all European standards and norms.

	Nansi d.o.o. Prva ulica 64, Žepče Bosnia and Herzegovina Tel./Fax: +387 32 684 358 info@nansi.ba www.nansi.ba
	

NANSI deals with primary and secondary wood processing, production of semi-finished and final products and placement of its goods. Our mission is to offer a customer a product that we can guarantee to meet all the requirements set by time and modern society (product quality and modern design). We try to produce our products with minimal environmental effects.

yield.
 GROUP



YIELD d.o.o. / GAZZDA

Hamdije Kreševljakovića 64

71000 Sarajevo

Bosnia and Herzegovina

Tel.: +387 33 257 310

info@gazzda.com

www.gazzda.com



The home is an association for warm feelings. That's why Gazzda wants to design exquisite home furnishings. We are at service for our customers to build a home that they can be proud of, which makes them smile even when they think about it, which causes positive feelings when they talk about it, which calms them when they rest in it. Our vision is: Three traits, one feeling; Bright, smooth, natural - phenomenal.



Poslovna zona Zenica 1
 Zmaja od Bosne bb
 Zgrada TechnoPark-a
 72000 Zenica
 Bosnia and Herzegovina

Tel.: +387 32 449 410

Tel.: +387 32 445 631

www.zeda.ba

info@zeda.ba