

Economic evaluation of product innovation in the wood industry - a case study

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Abstract: The aim of this article is to present the economic analysis focused on the economic evaluation of the product innovation preceding production extension by the new products. The assessment of profitability was conducted on the basis of a specific example.

Keywords: product innovation, economic evaluation, economic effectiveness.

INTRODUCTION

According to the EU regulations concerning construction industry, the standards connected with the materials for the production of doors and windows were restricted. Especially it is connected with wood density, which should be not less than 600kg/m^3 .² According to the EU standards, windows and doors are the integral constructional parts of the building. Wood density is connected with its mechanical strength, limiting the possibility of installing thick and heavy window glass with proper thermal conductivity, as well as fittings and anti-burglary window glass. Appropriate quality of glass and fittings is a guarantee of stability and stiffness of a profile and better and more steady installation within the construction of a given building. Expansion of the production profile with the new kinds of wood is therefore the innovative change with a product character. One of the tasks of effective management of innovations is economical evaluation of the profitability of taken actions.

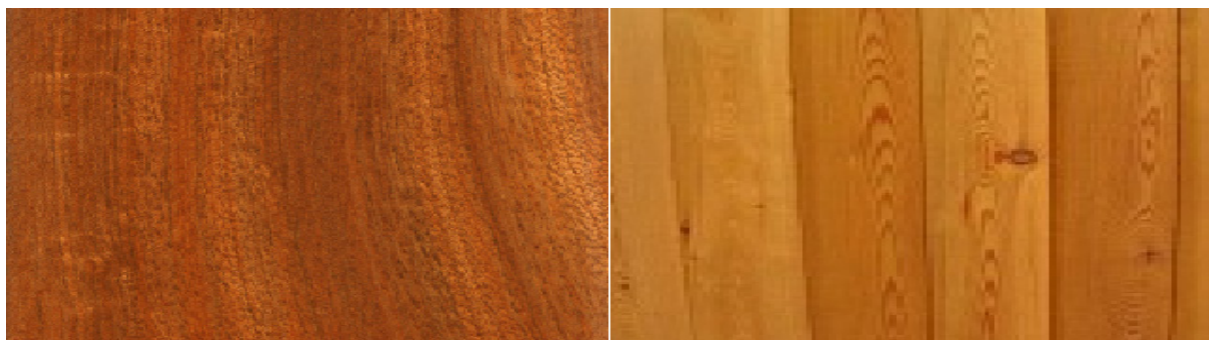
THE SCOPE OF THE PRODUCT INNOVATION

The basic materials for production of a scantling meeting the requirements of the European building and construction law, will be lumber with thickness 32-50mm and humidity 25-30%, made of exotic wood- African mahogany and Siberian larch. Durability of these types of wood exceeds 600kg/m^3 . It is also characterized by small number of material defects, and:

- Resistance to “biological corrosion”,
- low water vapor absorbency,
- interesting and unique colourful, arrangements of fibers.

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² PN-EN 338:2011/Ap1 Wood Construction - strength classes, <http://certlab.pl/certyfikacja-drewna/drewno-do-produkcji-tarcicy-konstrukcyjnej/>



African mahogany

Siberian larch

Picture 1. African mahogany and Siberian larch

Source: <http://www.dlh-poland.com/Oferta/Tarcica/Sapeli/opis.aspx>;

Both, African mahogany and Siberian larch, because of their features, are used as a material for woodwork. It is worth noticing that both of these kinds of wood are for years used as a material for equipment in saunas and traditional water-and-steam baths. Generally, Polish producers buy wood with higher moisture, because of its lower price, besides they have great own drying possibilities. For the analyzed example the material was delivered from the warehouses of the company DHL possessing a wide range of various kinds of wood and its distribution points are located in the area of Silesia, which significantly lowers the cost of material supply. Technological line producing now layered- laminated scantling, may be used for producing new products. There is no need for buying additional equipment and devices. The cutting capacity of the previously used devices should be analyzed (saws, cutters, planer knives). It will be essential to update the parameters of the wood-dryer (drying parameters for new types), the power and speed of the cutting machines. There is no need for organizational changes, but only organizing a training for the employees in order to get them acquainted with the new types of wood at the level of its structure and technological requirements in a process of laminating.

PRICE ANALYSIS AND COMPARATIVE ANALYSIS OF THE NEW SELECTION OF PRODUCT- LAYERED LAMINATED BOARD.

Introducing to the market a new product, it should be proceeded by a calculation of costs, connected with the statement of technological operations for production of laminated scantling made of given types of wood.

Table 1. Technological operations and the use of materials for production of 1m³ of laminated scantling made of African Mahogany

No.	Operation type	Operation time [min]	Initial material		Wood products made of the initial material [m ³]			Efficiency [%]
			Name	Amount [m ³]	Ready-made product	Salvaging waste	Caloric waste	
1.	Cutting with the use of multi-saw	180	Lumber of African Mahogany	1,3	1,0	0,1	0,2	77,0
2.	4-side whittling	120						
3.	Manipulating the length of the elements by transverse saw	40						
4.	Laminating	25						

5.	Clasping, transport to the machines	20						
Total:		385	-	1,3	1,0	0,1	0,2	77,0

Source: Own elaboration

The same calculation should be made for the suggested scantling made of Siberian larch.

Table 2. Technological operations and the use of materials for production of 1m³ of laminated scantling made of Siberian larch.

No	Operation type	Operation time [min]	Initial material		Wood products made of the initial material [m ³]			Efficiency [%]
			Name	Amount [m ³]	Ready-made product	Salvaging waste	Caloriic waste	
1.	Cutting with the use of multi-saw	195	Lumber of Siberian larch	1,4	1,0	0,2	0,2	71,5
2.	4-side whittling	125						
3.	Manipulating the length of the elements by transverse saw	45						
4.	Laminating	25						
5.	Clasping, transport to the machines	20						
Total		410	-	1,4	1,0	0,2	0,2	71,5

Source: Own elaboration

On the basis of the tables 1 and 2 and other indicators and processes, the production cost of individual 1m³ of laminated scantling may be estimated

Table 3. Presentation of the production costs of 1m³ laminated scantling

No	Product name	Value of the raw material, for production	Costs			Total costs	Suggested sales price
			Supply	Drying	Work		
			zł	zł	zł		
1.	Laminated scantling made of African Mahon	4160,00	130,00	520,00	245,00	5055,00	6150,00
2.	Laminated scantling made of Siberian larch	1680,00	149,00	560,00	265,00	2645,00	3050,00

Source: Own elaboration.

The calculated sales price of the scantling made of African mahogany is 24% lower than average price of the oak laminated scantling. In the context of the better durability and value in use, it should be an easy task to convince most of the recipients for changing the material for producing woodwork.

The price of the scantling made of Siberian larch, is 22% higher than the price of the laminated pine scantling. Nevertheless, the better durability, aesthetic value and a guarantee of a long durability of the product should encourage the producers for using it in production. In both cases, because of various reasons, the clients' reaction on the idea of changing the types of wood persuading the changes to other co-workers should be helpful in delivering to the client a sample product. Stable and fluent implementation of the suggested product guarantee the proper condition of the technical devices, knowledge and employee's experience.

SUMMARY

In the aspect of the changes in the EU standards, it appears to be intentional to develop innovation process of a given product. Realization of this aim is not difficult, or complex, but initial calculation of production costs of the scantling made of new types of wood does not raise objections in terms of the results of the project. In this case it is worth considering to conduct a research developed by the consultants from Boston, referred to as BCG matrix, thanks to which it is possible to group the products and consider the products in which it is worth to invest and in which it is better to withdraw, because excessive diversification is not always good, especially from economic point of view.

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Streszczenie: *Ekonomiczna ocena innowacji produktowej w przemyśle drzewnym – studium przypadku.* Celem niniejszego artykułu jest prezentacja analiz ekonomicznych, ukierunkowanych na ocenę ekonomiczną innowacji produktowej poprzedzających rozszerzenie produkcji o nowy wyrób. Oceny opłacalności dokonano w oparciu o konkretny przypadek.

Słowa kluczowe: innowacja produktowa, ocena ekonomiczna, opłacalność ekonomiczna.