

**DIGITALISATION AND CIRCULAR ECONOMY:  
forestry and forestry based industry implications**

12<sup>th</sup> International Scientific Conference WoodEMA 2019

Varna, September, 11-13, 2019

**IDENTIFICATION OF THE BARRIERS  
TO THE CIRCULAR ECONOMY –  
THE CASE OF THE FURNITURE  
INDUSTRY**



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# IDENTIFICATION OF THE BARRIERS TO THE CIRCULAR ECONOMY – THE CASE OF THE FURNITURE INDUSTRY

**The circular economy is still an unclear conceptual vision which could be difficultly put into the practice.**

There are many definitions for the term circular economy. What is common amongst these definitions is that all of them comprise of the following key elements:

- reuse,
- remanufacturing,
- recycling,
- disposal.



## IDENTIFICATION OF THE BARRIERS TO THE CIRCULAR ECONOMY – THE CASE OF THE FURNITURE INDUSTRY

The focus of the study will be put on the furniture industry.

This sector is of interest for number of reasons:

- there are a lot of large and small enterprises,
- innovative models and craft technologies are implemented,
- defragmented supply chain and high ecology standards are existing.



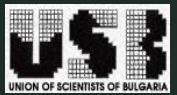
## IDENTIFICATION OF THE BARRIERS TO THE CIRCULAR ECONOMY – THE CASE OF THE FURNITURE INDUSTRY



### Distinction amongst linear, recycling and circular economy

There are many scientific publications which make readers perceive that circular economy is the next stage of the development of nations after the linear economy (e.g. *Garza-Reyes et al.,2019*). These implications come from the direct distinction between linear and circular economy, which is incorrect.

The EU linear economy is out of date since many years and it is replaced by the recycling economy. And the attempts the circular economy concept to be implemented is the next stage of development of nations after the recycling economy.



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## Literature review of the barriers that impede the circular economy concept implementation

- Thermodynamic Limits, Spatial and Temporal System Boundary Limitations, Limits Posed by Physical Economic Growth: Rebound Effect, Jevon's Paradox and the Boomerang Effect, Path Dependencies and Lock-in, Intra-organizational VS. Inter-organizational Strategies and Management, Definition of Physical Flows (*Korhonen et al., 2018*).
- Financial (profitability could hardly be measured), structural (unclear distribution of responsibilities), operational (changed supply chain), attitudinal (unclear perception of the term circular economy) and technological (complexed design of the products), (*Ritzén and Sandström, 2017*).
- Cultural (lack of information and customers interest), Regulatory (Limited circular procurement, obstructing laws and regulations, lacking global consensus), Market (lack of profitability of the circular-type business activities, lower prices of the virgin materials), Technological (lack of proven technologies for the implementation of the circular economy), (*Kirchherr et al., 2018*)



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## Specifics of the furniture industry in the circular economy context

According to *Chobanova and Popova, (2015)*, the furniture industry is characterised by:

- resource and labour intensity,
- competitiveness amongst local craft enterprises and large global enterprises,
- fragmented supply chain, low barriers to enter the sector.

**Key issue in this sector is the increasing global competitiveness of forestry raw materials.**



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## STUDY AREA and METHODS

The current study will focus on the quality of the institutional environment in the EU, related to the waste management, identified as a barrier which impedes the circular economy concept implementation and its influence over the development of the furniture industry. There will be used the methods of quality analysis and elements of the indicative statistical analysis.



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## Quality analysis

The main purpose of the quality analysis is to be studied to what extent the inefficiency of the extended producer's responsibility could be a barrier to the implementation of the circular economy. At the very beginning of the implementation of the extended producer's responsibility principle in the EU, many critical publications have emerged.





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**The effects of the expanded producer's responsibility in the furniture industry could be examined by an example for production of particleboard.**

In this production activity, the following waste flows are generated in accordance with Regulation (EC) No 2150/2002 (European Parliament, 2002): 07.52 Sawdust and shavings, 07.53 Other wood wastes (waste bark), 12.41 Waste from flue gas purification (flue gas dust), 12.41 Waste from flue gas purification (flue gas dust), 06.11 Ferrous metal waste and scrap (ferrous metal filings and turnings), 01.31 Used motor oils, 01.32 Other used oils, 03.14 Spent filtration and absorbent materials, 08.41 Batteries and accumulators wastes (lead batteries), 08.43 Other discarded machines and equipment components (fluorescent tubes and other mercury containing waste).



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## Indicative statistical analysis

The dependent variable is: **Generation of wood wastes** (tonne) and the independent variable is: **Secondary wood products** (thousand euro).

The calculations show the following values of the main coefficients:

- correlation coefficient  $R$  - (0,69),
- determination coefficient  $R^2$  - (0,47),
- and significance  $F$  - (0,03).

Approximately 47% of the aforementioned statement could be explained by the better management of wood waste.

The remaining 53% due to the usage of new artificial products (not made of wood).





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