

Circular Economy – A Game Changer for the Wood Building Industry
Gender Equality in the Wood/Construction Industry-Ostrobothnia, Finland
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Introduction

The construction industry is said to be a raw material intensive industry, contributing more than 30% to the extraction of raw materials and accounts for at least 25% of the global waste and about 40% of the material is recycled (Roberts, Tobias;, 2021). According to (International Energy Agency, 2019) the sector also accounts for almost 40% of energy and process related emissions. The need to combat climate change calls for sustainable solutions that will reduce the carbon footprint of various sectors. One way of improving the carbon footprint in the construction industry is by moving away from the traditional linear economy to a circular economy by reusing and recycling of the raw material. As sectors move towards more circular economy, women are expected to play a cardinal role to drive the implementations of sustainable solutions. According to research, women are the major drivers of consumption pattern due to their social roles and having a gender balance in different sectors in key roles will result in more sustainable choices (UN Women , 2018).

The Circular Economy- A Game Changer for the Wood Building Industry project is a cross-border partnership between some Finnish and Swedish higher learning institutes namely; Novia University of Applied Sciences, Seinäjoki University of Applied Sciences, Tampere University and Umeå University. The overall goal for this project is to boost regional companies' competitiveness on the international market by initiating new networks and business ecosystems and pilot Circular Economy solutions based on previous recognized success factors. The project will contribute to the Botnia Atlantica's business priority and offers an increased capacity for cross-border business cooperation for companies within the construction and property management industry.

This report shows empirical data collected through two separate surveys carried out aiming at the SMEs in the Ostrobothnia region and a follow-up survey aimed at the female students and supported

with national statistics from the Stats Finland page.



The analysis presented in this report is the author’s interpretation of the data collected and may be different from the actual situation on the ground.

Gender Equality in the Wood Building Industry-

Wood building companies in the BA region are typically SMEs. This chapter contains results from a survey collected from 19 companies from Ostrobothnia. Gender equality was covered in survey whose main object was to explore opportunities in circular economy in the construction/ wood industry as well as functioning of supply chains. As the role of women has been emphasized in achieving sustainable solutions (UN Women , 2018), this chapter will also try to compare on how the companies that have female representation compare to those with none in the perceptions of these companies on circular economy and sustainability as well as material flow.

According to the results obtained from this survey, the women workforce is only 6% though of the organisations that participated, only six companies had more than 10 employees, the rest are 10 and below giving a total of 168 employees with 10 being female as can be seen from **Figure 1** below, this correlates with the information that the building sector is the most dominant male sector in Finland with a 91% male majority in 2019 (Finnish Institute for Health and Welfare, 2020). All companies with over ten employees had female representation and only one for the 10 and below-employees companies.

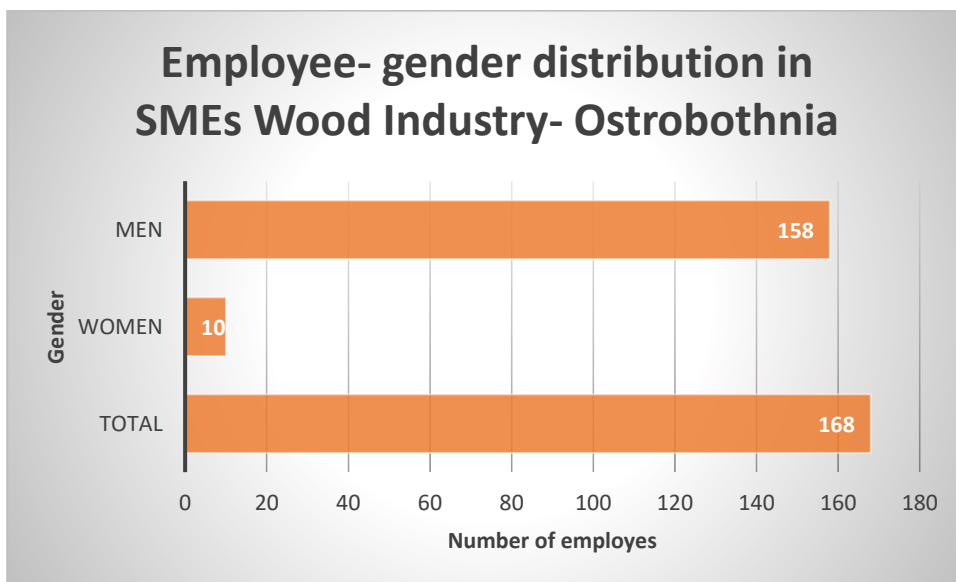


Figure 1: Number of employees by gender for 19 SMEs in wood industry-Ostrobothnia.

Women's Impact on Sustainability & Material flow in companies

This chapter analyses the results from the survey to the companies to see if there is a difference in behaviour between companies that have female representation towards sustainability and material flow. The focus area for most of these companies were the same, building of new structures, renovations, demolitions, and/or estate service. All the companies that had women working there had men in leading positions and but in five of the companies, women occupied senior positions. The results are divided into yes and no. Any response that is often and sometimes will be classified as yes and rarely and never as no.

From the survey, of the 7 companies that had women working there, they all expressed interest in reusing material from the demolition of buildings, but that was also a general interest for all the companies.

On material flow, all companies had interest in the origin of the building material and priority was on local manufacturers to cut down on transportation. However, only two of the companies did not usually have to make many trips to retrieve material needed on a job. Storage was cited as a challenge of having all the material on site and stages in which work is carried out

Gender Equality in the Wood Building Industry-Education

In order to understand the low rate of women in the construction /wood building industry, statistics from education have to be looked into. The following are the statistics for students in study programs that are directly linked to wood or have a relation to the wood industry in the Finnish higher education institutions. The higher learning institutions are divided into two, the university of applied sciences offering bachelor and master level degrees and the universities offering from bachelor's level to doctorates and **Table 1** below shows the study programs offered by the two types of higher learning institutions.



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Table 1: Study programs and qualification offered by universities of applied sciences and universities in Finland (Statistics Finland, 2021).

Study Program	University of Applied Sciences	University
Bachelor of Science in Architecture	✓	✓
Bachelor of Science in Wood Engineering	✓	✓
Bachelor of Science in Construction Engineering	✓	✓
Master of Science in Architecture		✓
Master of Science in Construction Engineering	✓	✓
Master of Science in Wood Engineering		✓
Licentiate of Science in Architecture		✓
Licentiate of Science in Construction Engineering		✓
Licentiate of Science in Wood Engineering		✓
Doctor of Science in Architecture		✓
Doctor of Science in Construction Engineering		✓
Doctor of Science in Wood Engineering		✓

According to the national statistics, universities of applied sciences had 16% female students taking construction related programs and about 40% at university level in 2017 in Finland as can be seen from **Figures 2 & 3** below and from the survey (Ostrobothnia companies) opinion is that the female populace in the industry can be increased by offering more study programs related to the field.

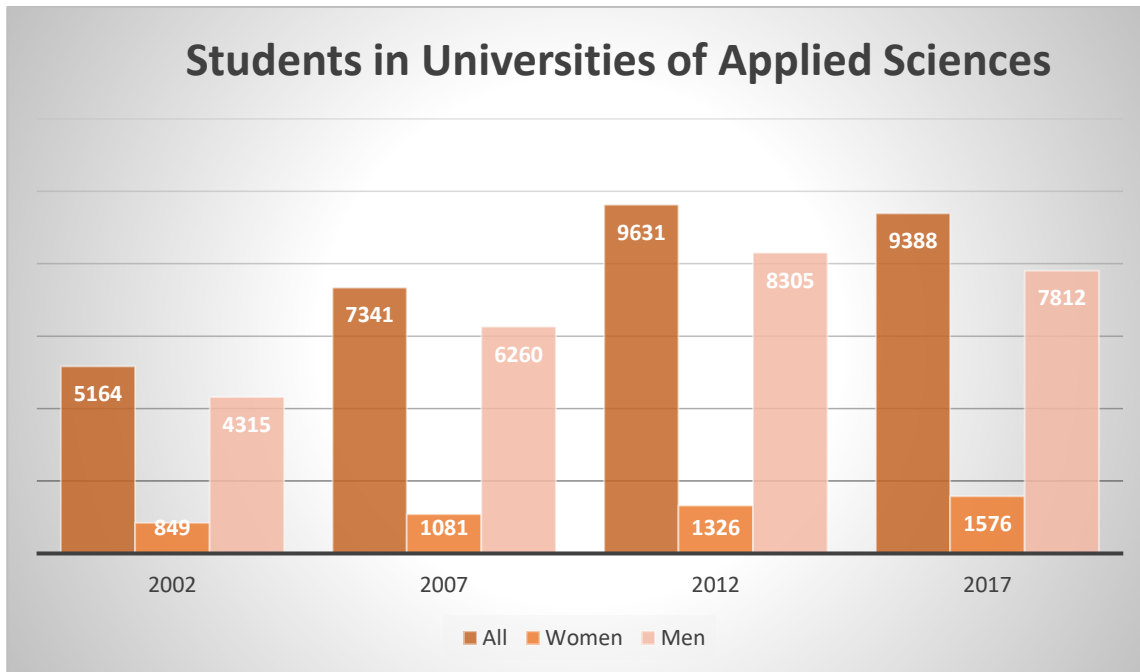


Figure 2 Number of students attending universities of applied sciences by gender in Finland. (Statistics Finland, 2021)[Compiled by Mikko Nevala, Seamk]

Figure 2 above shows the comparison of the genders in the construction and related study programs in Finland. From the figure above, it can be seen that although the number of female students has been increasing gradually over the 15 years, the percentage is roughly the same as the number of male students also increased.

In **Figure 3** below, it can be seen that the universities have a higher percentage than the universities of applied sciences, but this is clear from the range of qualifications that are offered by the universities as can be seen from **Table 1** above. The percentage difference has remained almost the same at 40% over 15 years like in the case of the universities of applied sciences.

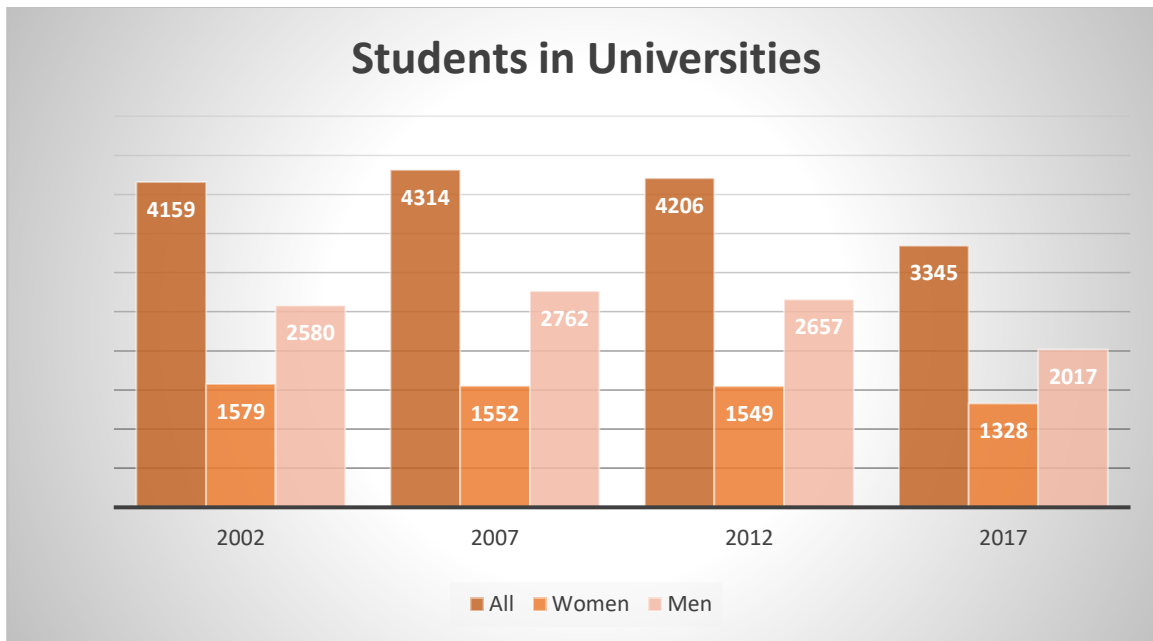


Figure 3: Comparison between male and female students studying in universities (Statistics Finland, 2021)[Compiled by Mikko Nevala- Seamk].

The stagnation in the percentage difference between the two genders cannot be concluded.

Gender Equality in the wood/construction industry-female student perspective

In the survey, views of the students on gender equality within the industry and their job application experiences were asked among other things. Novia University of Applied Sciences is one of the schools that offer a bachelor's level in Construction Engineering and has a female student populace that represents about 20-25% of the total number of students and were the main respondents to the survey. This chapter covers results from a follow-up survey that was aimed at female students studying within the branch. According to the results from the survey to the companies in Ostrobothnia, the general view is that the number of women in the industry could be increased by having more women studying in the programs and want to work within the branch. Looking at the statistics of the gender distribution in education and the percentage of the females in industry, the difference is broad. Could there be a crack where the female students fall through without reaching industry? Interviewing female students may give early indicators. The results contained in this chapter are views of students based on personal experience on how they view their future in the industry. The questionnaire was sent out to 33 female students in their 1st to 4th year of studies out of

which only 6 responded.

Whilst the number of respondents is small, the students had different experiences with job hunting and this seemed to have an impact on their views on gender equality in the industry. Some had gotten jobs with the first application and are more positive with gender equality, expressing even an advantage of being a female in the male dominated workplaces. On the other hand, for those that have searched for jobs actively with no luck felt that they had worse chances of finding jobs compared to their male counterparts and also felt like they would have to work harder than others to prove their competences, though they all agreed that employer played a bigger role in balancing out gender equality. Those working have managed to find employment without assistance from the school, they have contacted the employers either by mail or going there physically. One student already had a job before starting on the study program and has worked alongside studies.

When asked if they had any preference for the type of focus in the career, majority was in planning and less technical work. For those that have already had a chance to work have been satisfied with the work they have done and were also open to explore other possibilities within the branch.

Discussion & Conclusion

The results obtained from the survey to the companies gives an inconclusive result on the impact of women on sustainability. The size, age and focus area of the companies may influence the transition to a circular economy but also, many of these organisations are just stepping towards circular economy. One clear result is that all companies are interested in circular economy regardless of gender distribution and may all face similar challenges such as the limitations in the legislation in the handling of pre-used material in the building industry.

Based on the results obtained, it is difficult to reach a concrete conclusion on the low rate of women from this industry in compared to the number of students attending the studies. For instance, according to (Statistics Finland, 2021) the rate of students obtaining university of applied sciences degree in Novia applied science is about 18-25% female graduates over the last 10 years, a close correlation to the percentage total of the number of female students, but there is also the issue of students not graduating in record time or dropping out of the study programs which was not covered in the follow-up survey.



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Whilst the construction industry is the most male dominated industry in Finland, this seems to be a global trend. Some studies carried out in the Australia (Galea, et al., 2018) have shown that the low number of women in the sector could be due to the flaws in the recruitment system where jobs are gotten through pipelines(networks where recommendations are considered) for the majority of men, instead of a fair formal way in which most women have gotten their jobs through and the imbalance in opportunities for growth between male and females. In UK (Kollewe, Julia, 2014), one person interviewed stated that working on site was not popular with women because the job is very physically demanding. In the same article, Kollewe showed statistics from the Office for National Statistics which showed that between 1999 and 2014 saw a rise from 11.7% to 13.4% of women working in the construction industry though only 1.3% worked on site, a very slight increase from 1.2% in 1999. The article further attributes the low rate of female engineers to the lack of female pupil involvement in courses that will enable them study engineering programs but is also clear that the majority of the women are working off the construction sites in these companies. As the findings in these articles were outside the scope of the survey, the author does not tie these findings to the case in Finland. Separate studies have to be conducted to conclude on the low rate of women in the construction industry. One survey would be to big companies that have the more impactful dynamics to reach a better conclusion.

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