

ECO-ECONOMIC DECOUPLING: PERCEPTION OF CROATIAN AUTOMOTIVE CLUSTER

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Introduction

- *The Croatian automotive sector, consisting of more than 130 companies, is well accredited*
- *The most developed sub-sectors in Croatia are:*
- *manufacturing of automotive components and special-purpose vehicles*
- *Both sectors follow the goals of EU automotive associations, such as the **European Green Vehicle Initiative (EGVI)***



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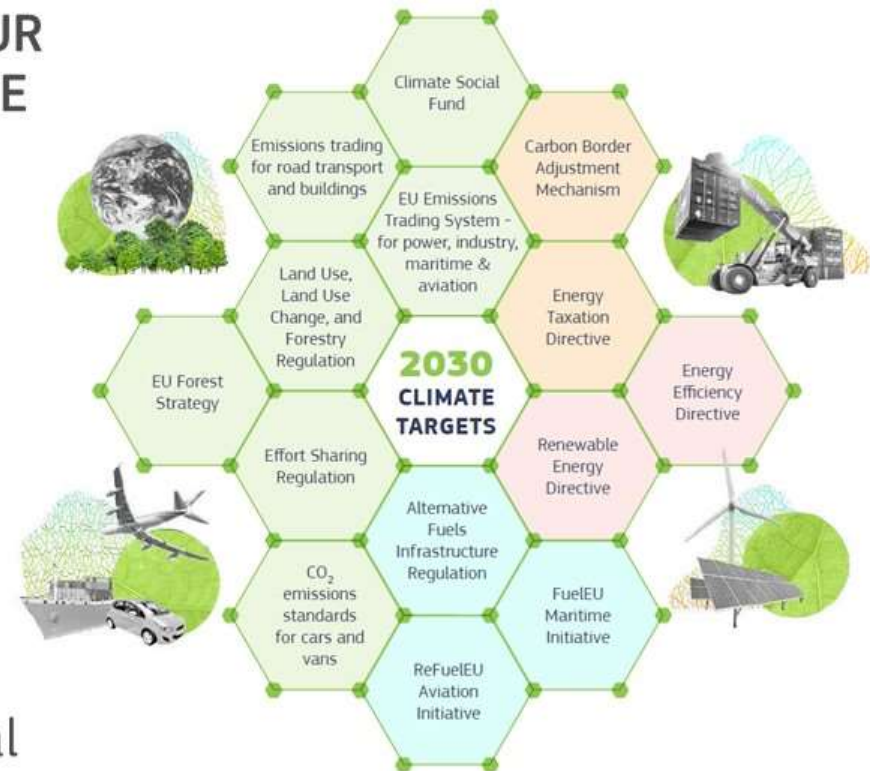
EGVI
European Green
Vehicles Initiative

Fit for 55

- Package of legislative proposals
- Information, options and incentives for EU citizens
- Preparing the EU for a climate-neutral future

EUROPEAN GREEN DEAL

REACHING OUR 2030 CLIMATE TARGETS



#EUGreenDeal



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Introduction

- *One of the key issues to be addressed, which is in relationship with sustainable green economic development of automotive industry is:*
 - *how to achieve decoupling between environment protection and economic development*
- *To satisfy the requirements of sustainable development, an economy should be capable to simultaneously sustain economic growth and minimize environmental pressure*



The UN Global Sustainable Development Report

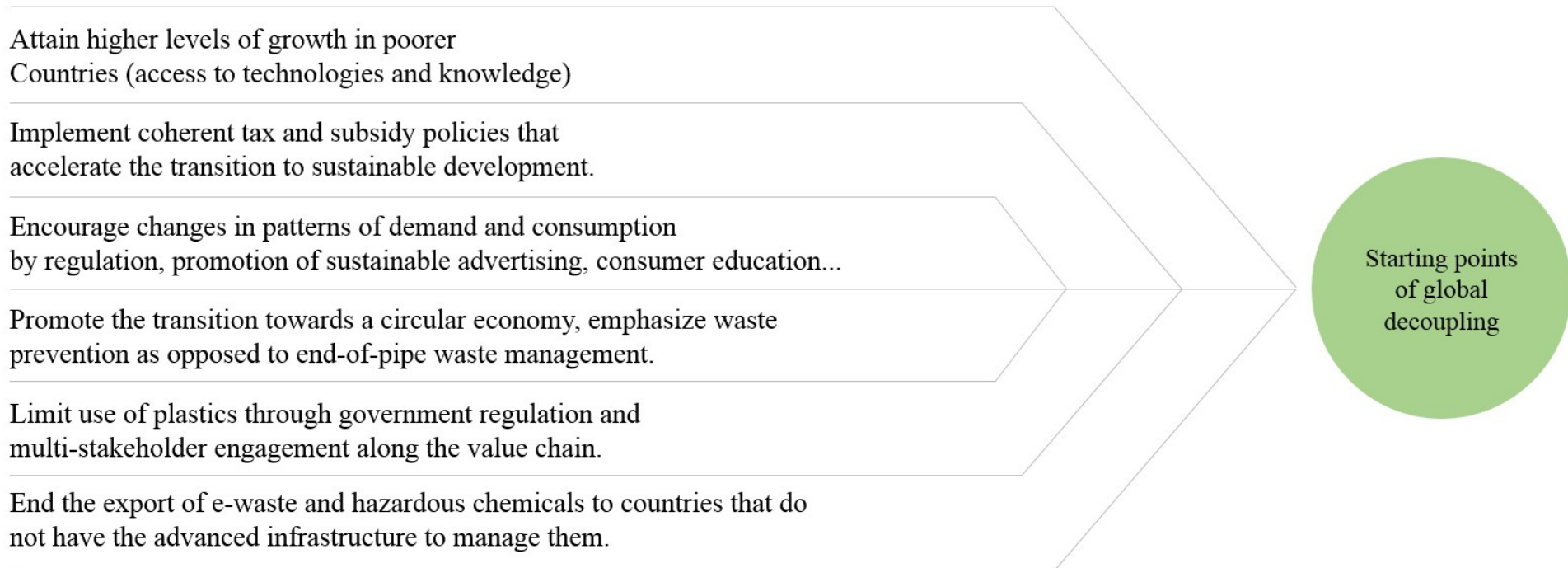
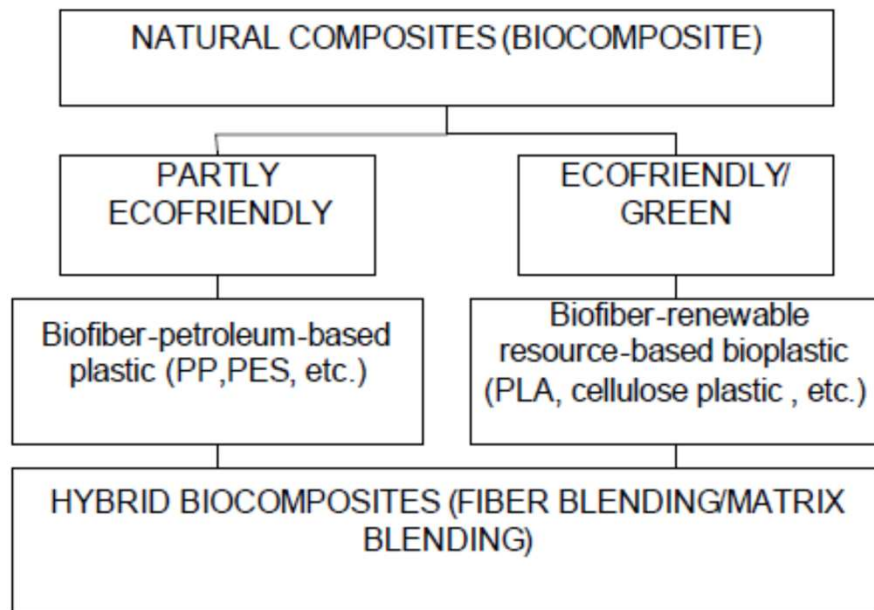


Figure 1: Global decoupling of GDP growth from the overuse of environmental resources (UN, GSDR, 2019)



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New & Green materials



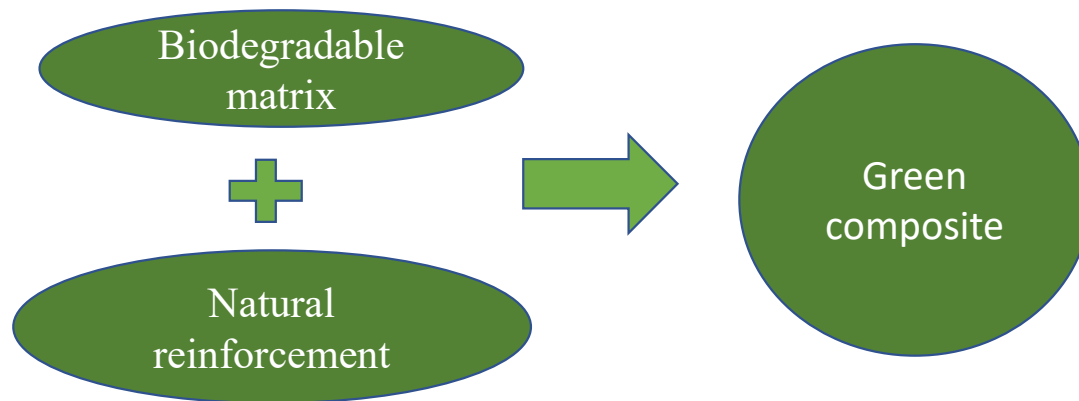
- Biocomposites are composite materials made of natural fibers and synthetic derivatives of non-biodegradable polymers such as PP (polypropylene), PE (polyethylene) and epoxy resin.
- On the other hand, they can be made of natural fibers and biodegradable polymers such as PLA (polylactic acids) and cellulose esters (Kovačević, 2015; Kovačević 2021).

Figure 2: Classification of natural composites or biocomposites



Green composites

- Biocomposites made from biopolymers (biodegradable matrix) and plant fibers (natural reinforcement) are environmentally friendlier and therefore called **green composites**.



- European car makers are already testing natural products because of the increasing pressure of European Commission criteria to meet requirement that:

70 % of car parts are made from recyclable material.

Weight decrease (Light construction)



Car parts:

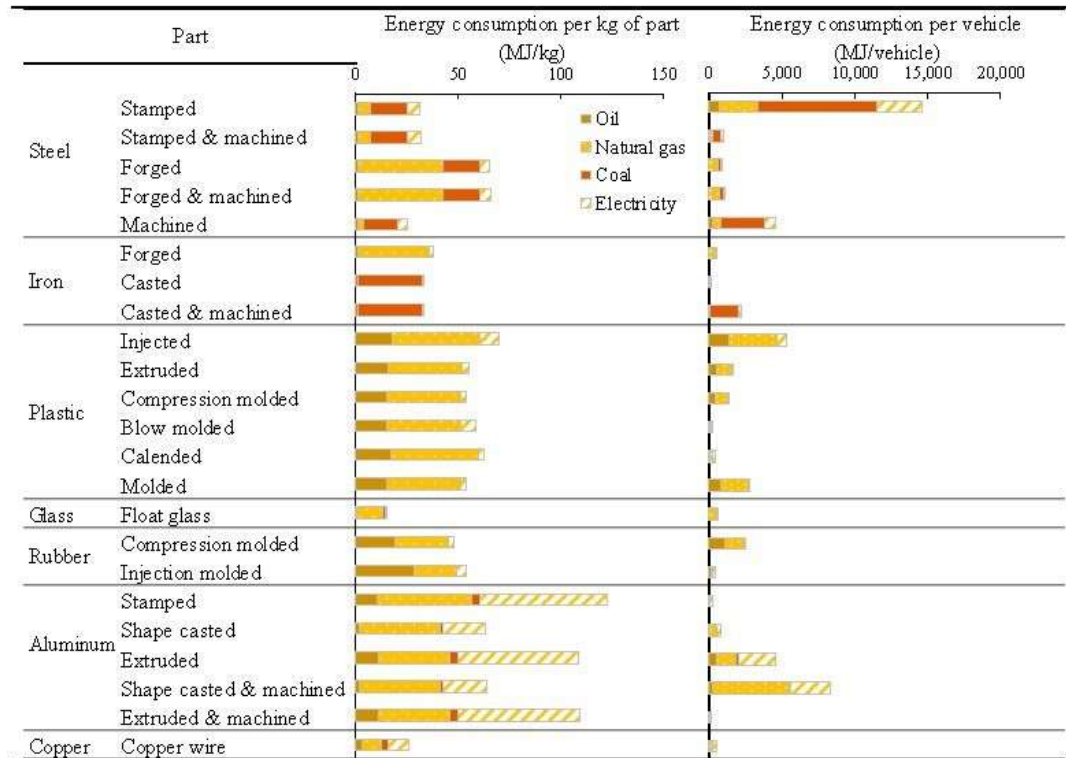
- 1 - underfloor protection trim;
- 2 - automotive instrumental panel;
- 3 - door panels;
- 4 - seat backs;
- 5 - rear deck trays;
- 6 - pillars;
- 7 - headliners;
- 8 - bumpers;
- 9 - engine shield;
- 10 - trunk trim.

Figure 3: Car parts made of natural fibre composites



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Energy consumption decrease



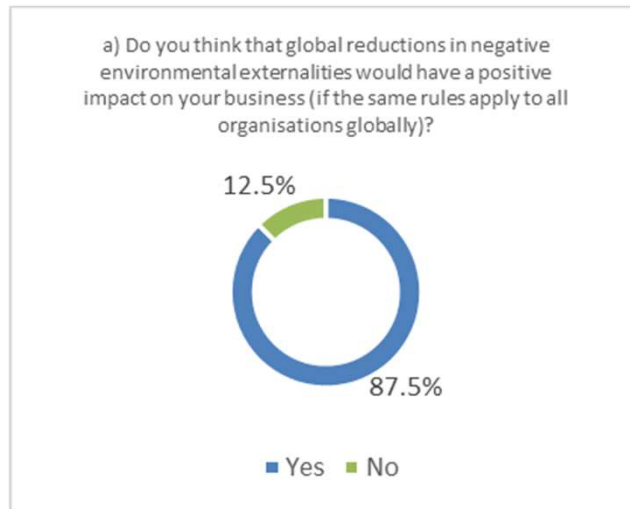
- Due to its complexity and overproduction, the automobile is still one of the least sustainable systems
- Its production is extremely dependent on economies of scale and technology (Nieuwenhuis and Katsifou, 2015) and is the third biggest (9.9%) end-use market for plastic (PlasticsEurope 2019)
- Real examples of innovative solutions are given by the AD Klaster (Cluster of Croatian producers of automotive parts) which are successfully connecting the segment of eco-economic innovation with the business results.

Figure 4: Energy required to produce vehicle parts



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Results



- The difference exists in the total number of companies that believe in global implementation of the same standards, which would bring greater profitability to all stakeholders
- If a certain model was successfully applied globally, the reduction of negative environmental externalities would be directly related to the decrease of final product prices

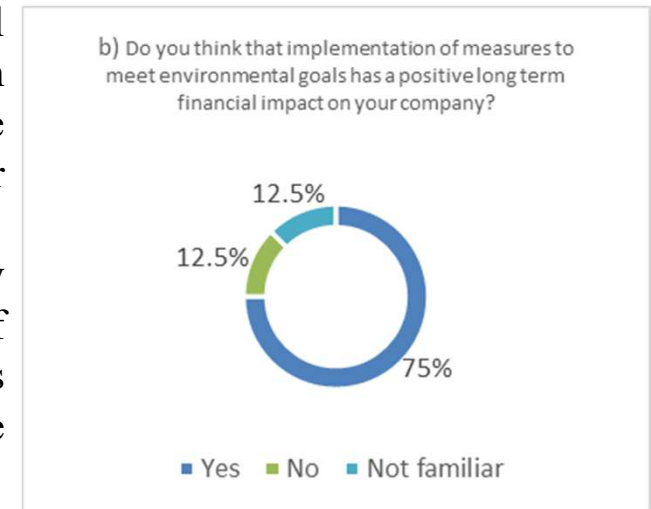
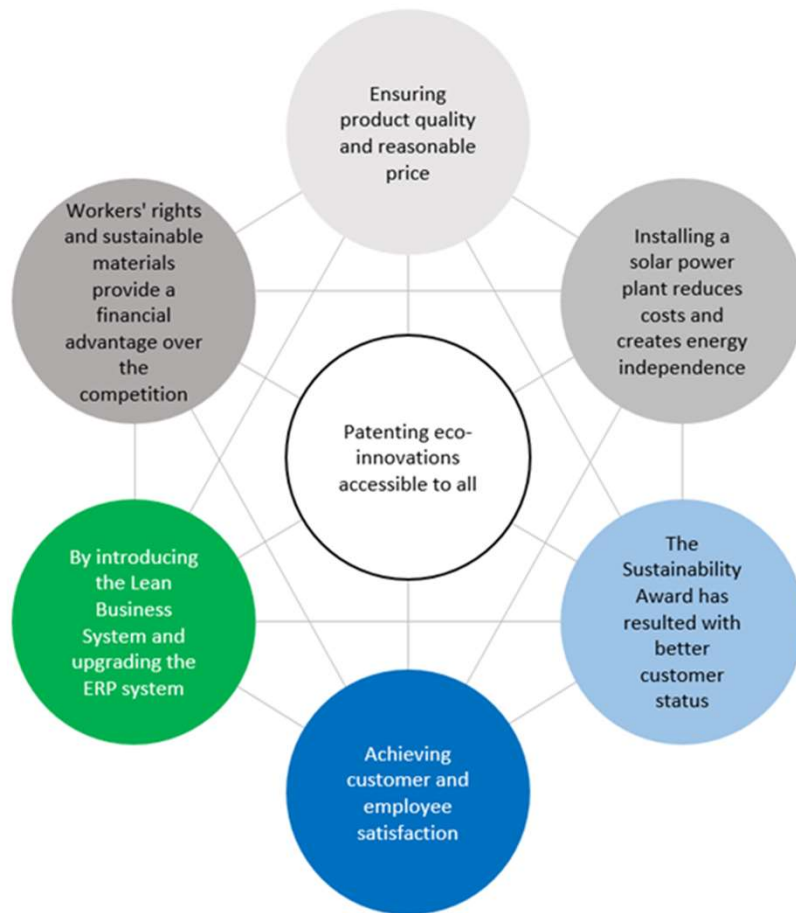


Figure 4: The connection between the implementation of measures for environmental goals and the long-term positive impact on the financial profit





- Concrete eco-economic examples of corporate social responsibility (CSR) practices provide an overview of key strategic actions.
- The diversity of these actions is manifested in the specialization of certain firms and their sustainability goals

Figure 5: Concrete examples of corporate social responsibility for company and business value strengthening cited by cluster members



Specific environmental and CSR parameters

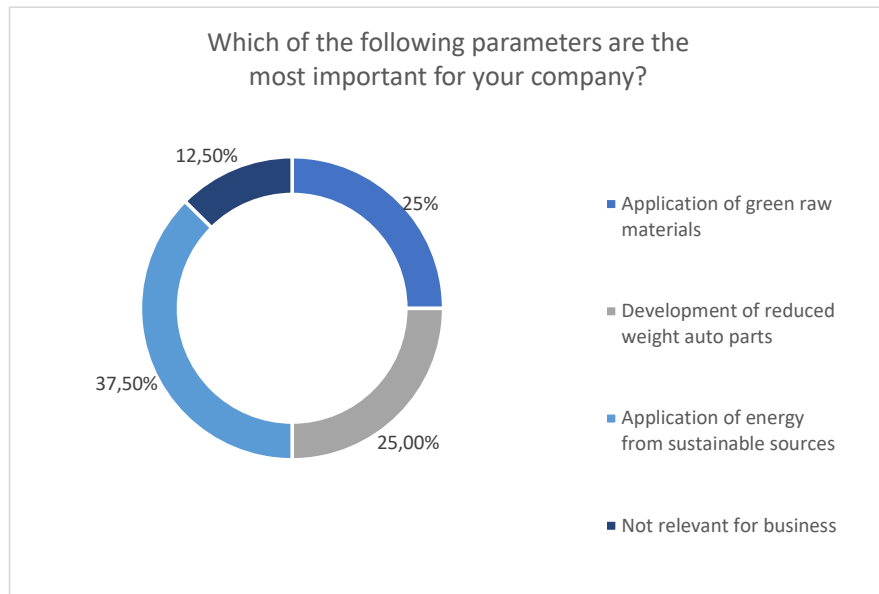


Figure 6: Ecological parameters as a competitive advantage

Most of the surveyed companies emphasize the importance of developing environmentally friendly and biodegradable composites consisting of textile fibres and matrix from sustainable sources.

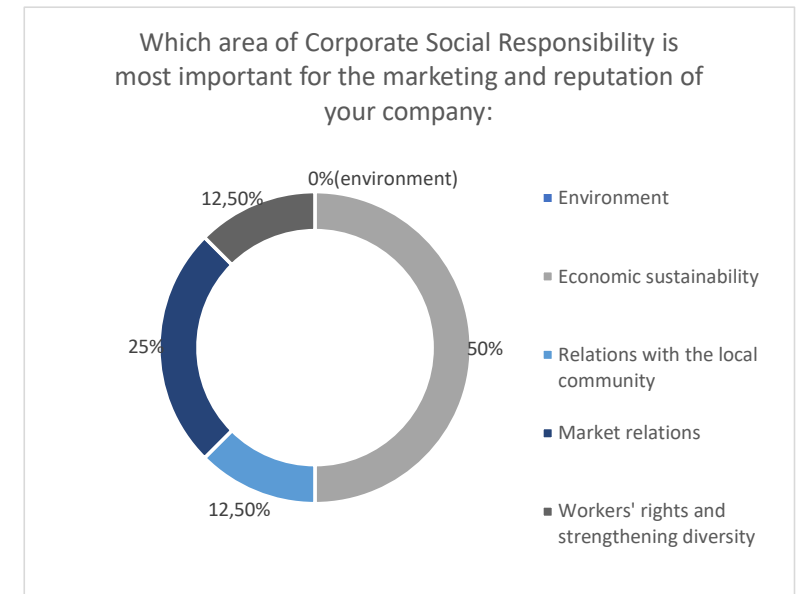
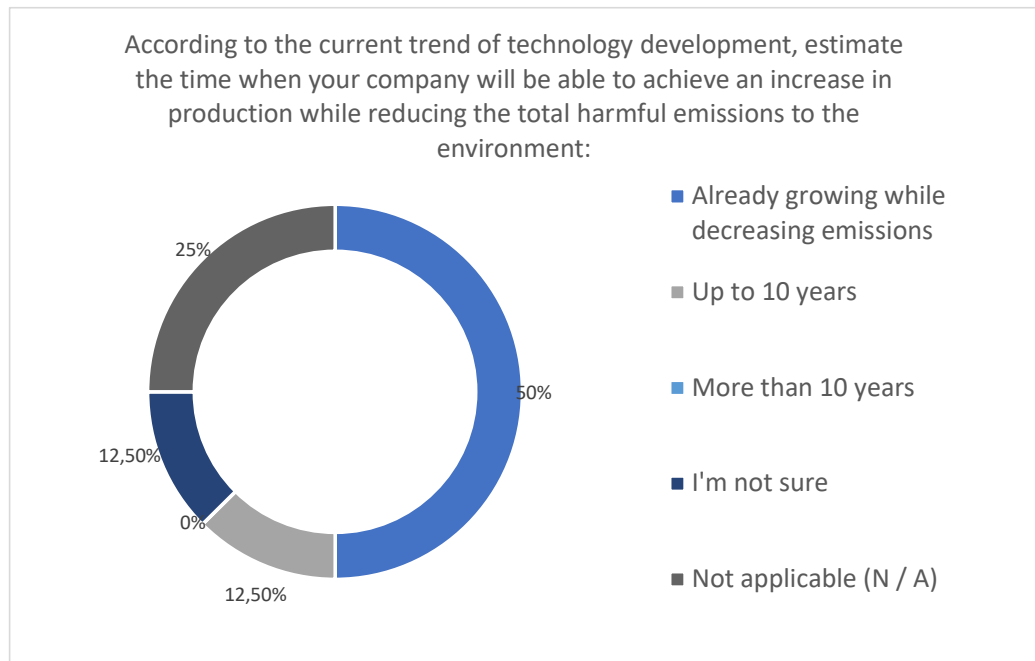


Figure 7: Corporate social responsibility and marketing



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Specific environmental and CSR parameters



- The encouraging fact is that 50% of the companies are already noticing a constant reduction in harmful emissions to the environment despite their growth, which is a small step in achievement of the 2030 climate and energy framework

Figure 8: Simultaneous increase in production with reduction of total harmful emissions to the environment



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Conclusions

- Textiles are being increasingly employed in vehicles because of their low weight and low cost, so the increase of their consumption is in line with the increased sustainability demand.
- The average weight of textile materials in a mid-size car has increased from 20 kg in 2000 to 35 kg in 2020
- Achieving decoupling between economy and environment is the key issue for implementing green economic development and ultimate achievement of automotive industry's sustainable development.
- To satisfy the requirements of decoupling, an economy should be capable to simultaneously sustain economic growth and minimize environmental pressure



Conclusions

- This increase is resulting from their excellent performance related to comfort, acoustics, safety and fuel economy.
- Direct consequence of weight reduction is lower fuel consumption and lower CO2 emissions.
- The results of survey indicate the members of AD Klaster as leaders of innovative changes in Croatia.
- Through the implementation of new and advanced technologies and materials the impact on the environment has been continuously decreasing, while followed by economic benefits



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Design of Advanced Biocomposites from
Renewable Energy Sources
(BIOCOMPOSITES)
<https://biokompoziti.eu/>



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Thank you for
the attention!

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