

## SUMMARY

In this work were taken and compared the most common passenger vehicle engines like internal combustion engines, hybrid powered engines and electric engines. They were compared in terms of efficiency and environmental impact by gathering and analysing materials from different sources and creating comparative tables and conclusions where it was tried to prove the lack of that many positive facts about electric engines for our world to this date.

The main reason, as it is claimed, for electric cars coming to the market and a wide usage between people are new global trends in sustainability and environmental friendliness. The comparative analysis done in this work once more reveals that achieving low CO<sub>2</sub> emissions which therefore lowers the environmental impact can't be accomplished simply by changing the technology of a passenger car in context of system of transportation and logistics.

Analysis has shown that EV's have benefits in efficiency and social impact as it is cheap to refuel, efficiency of electric engine is higher than of an internal combustion engine, EV's are more quiet which creates bigger comfort inside a car and outside it. They have 0 emissions from an engine as it is with ICE, which makes cities more clean but not the outer part of them as electricity is mainly created by burning fossil fuels.

The technological field behind it is wide and has great potential but as a great disadvantage is that most of countries are not ready for them. Saying that is meant that to make electric vehicles efficient in a topic of environmental impact, they need their own special ecosystem with advanced recycling and sustainable energy market. The recycle process means that from recycling the clean raw material is gathered. As lithium-ion batteries consist of many different complex materials they cannot be recycled as, for example, aluminium cans. For efficient recycling automated disassembly of LiBs is needed, which is impossible at current stage of technological progress. It is simply cheaper to mine new materials like lithium, cobalt, manganese and graphite or to buy them from countries with cheap labour like DRC or Chile.

It was found that mining results in child labour, polluting the environment, ruining the ecosystem, drying out the soil and creating wastelands. Creating a source of sustainable energy is the second important aspect. Electricity from burning fossil fuels has the big scale of ruining the environment. If engines with internal combustions will be dragged out from the market and people will be driving electric vehicles only, the amount of energy needed to refuel their cars will have to be times bigger meaning that the CO<sub>2</sub> from the amount of burnt fossil fuel for generation this amount of electricity will all go to the atmosphere which could worsen

the situation with emission of GHG. Nowadays only several countries like Iceland and Norway have the possibility to fully implement the potential of electric vehicles in the part of sustainable energy as they primarily generate energy from renewable sources like water, wind and earth. Despite this, in case of battery absolute destruction and impossibility of recycle, the utilization is needed which nowadays are being done by processes of hydrometallurgy and pyrometallurgy. Two of these ways on utilizing a LiB are not efficient and are destructive for an environment and the toxic waste in both scenarios finish buried in the earth.