



Sustainability & Materials

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Introduction

As time passes and technology advances, so is the consumption of materials. We started to become more sustainable with our resources to reduce the negative The impact that it will have on our lives, the future generations and the future of the planet we live on.

Sustainability

Firstly, the definition of sustainability is using materials with little to no damage to our environment or to be able to maintain the consumption of materials. This is linked to the term replacement rate in which we consume material at a rate the system can replenish. An example is cutting the trees down and letting them regrow back. The problem is that we are consuming resources much faster than the rate the ecosystem can replenish.

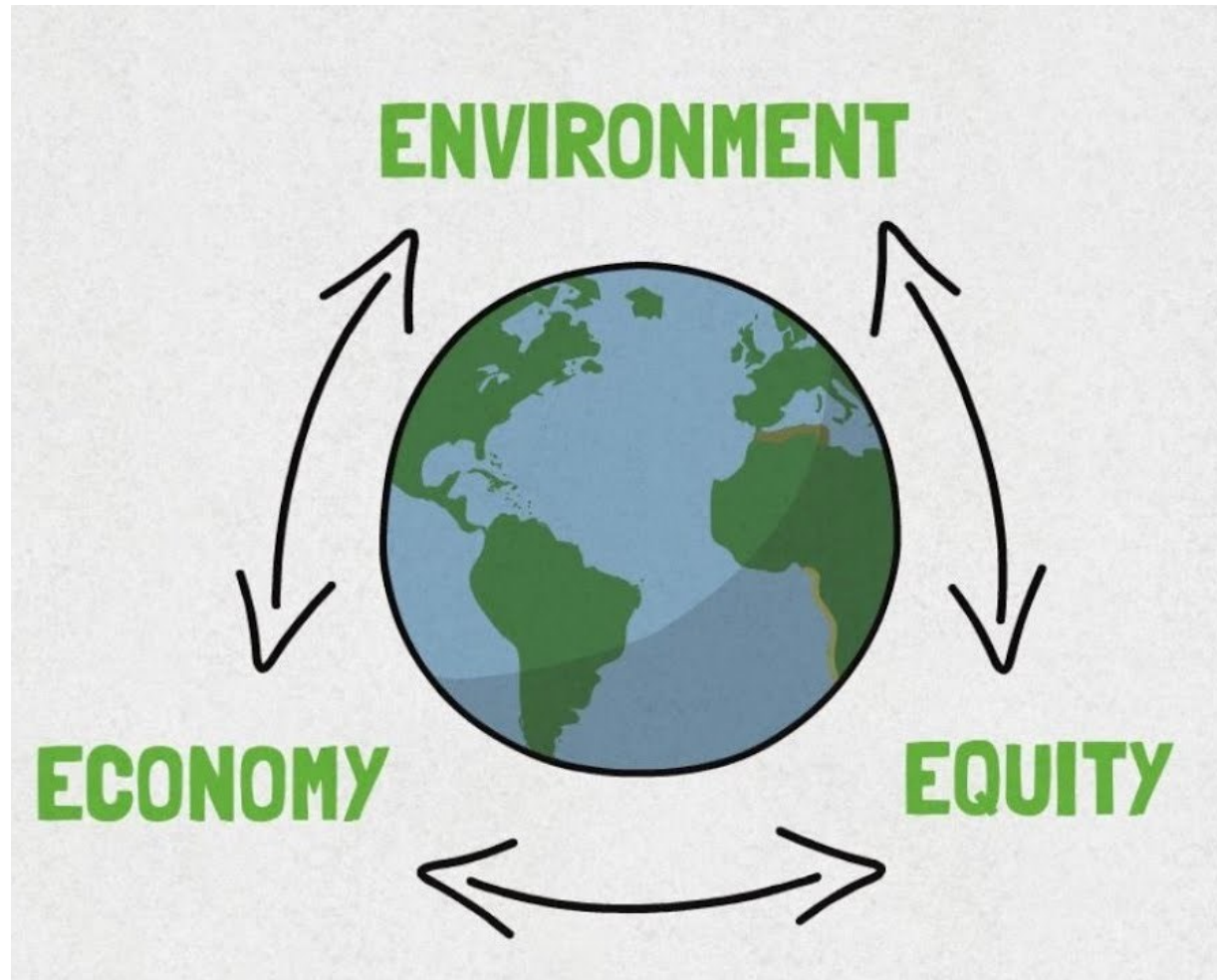


Image from UCLA Sustainability

There are movements for sustaining materials towards the industries as there have been climate changes that were recorded such as harsher weather and rising sea levels. Materials such as plastics have been found in the ocean due to the weather such as strong wind and rain. This affects aquatic life and also increases the size of garbage gyres.

Effects in Automotive Industry

Due to the major increase in CO2 emissions from vehicles, legislation for vehicle emissions was introduced in 1992. Currently, in 2024, the legislation is on Euro 6 soon to transition to Euro 7 in July 2025 which would include the impact of EVs.



Image from OperationsCommander

The government plans to ban the sale of petrol and diesel vehicles in 2035, this encouraged companies to research different alternatives. Electric vehicles are commonly used as alternatives but, there is research on creating synthetic or e-fuels that produce less greenhouse gases. A different alternative is hydrogen engines. Another factor of emission is the lifecycle emissions of vehicles. While traditional Internal combustible engines have the highest lifecycle emission. Electric vehicles have the lowest reduction up to 89%. When a vehicle reaches its end of life, the materials are recycled and reused due to having limited supplies of metals and metals are non-renewable resources.

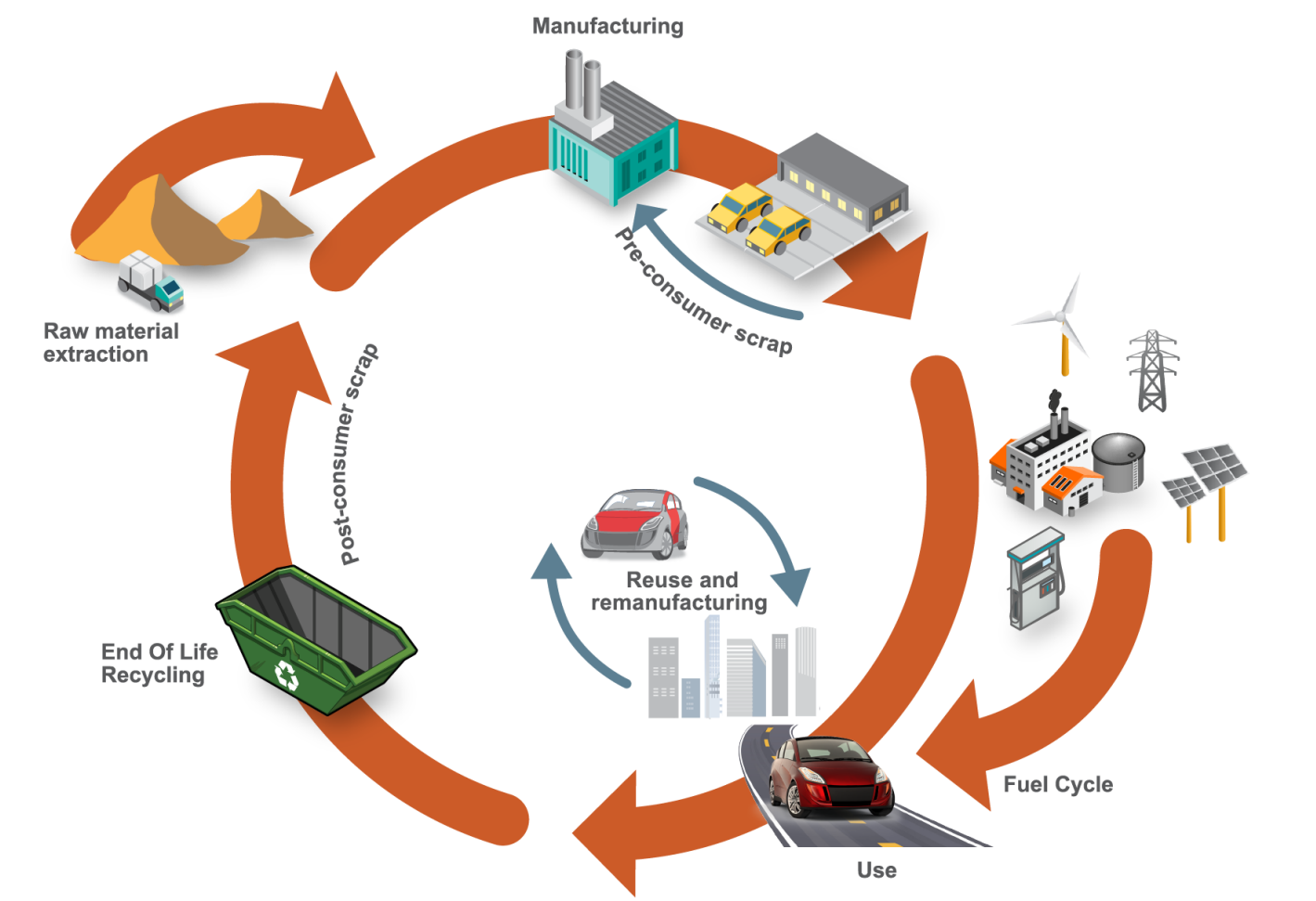
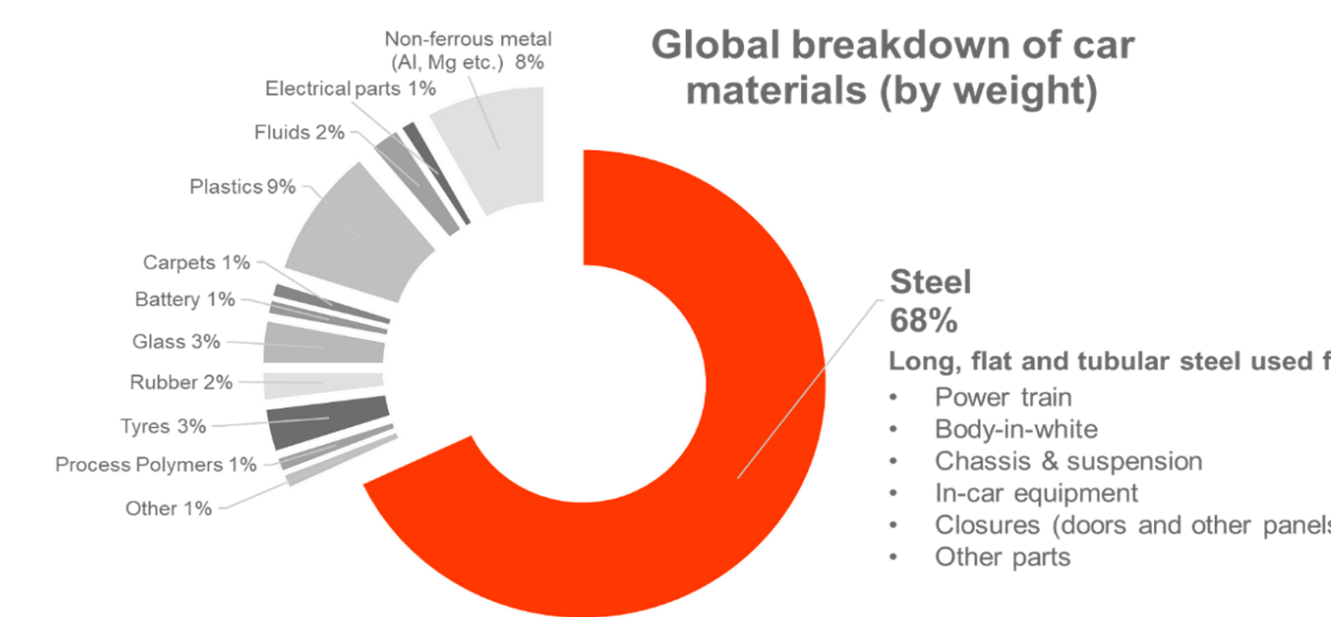


Image from Steel E-Motive

Materials



Data from ArcelorMittal

In the automotive industry, the most used material in vehicles is steel due to the properties of the metal being durable and their strength. It is the cheapest out of the other options and is widely available with more supply. It also has the lowest CO2 emission when manufacturing. For motorsport applications, carbon fibre is used more than steel as it is a lot durable and is a lot stronger while also being lightweight than steel.

References

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