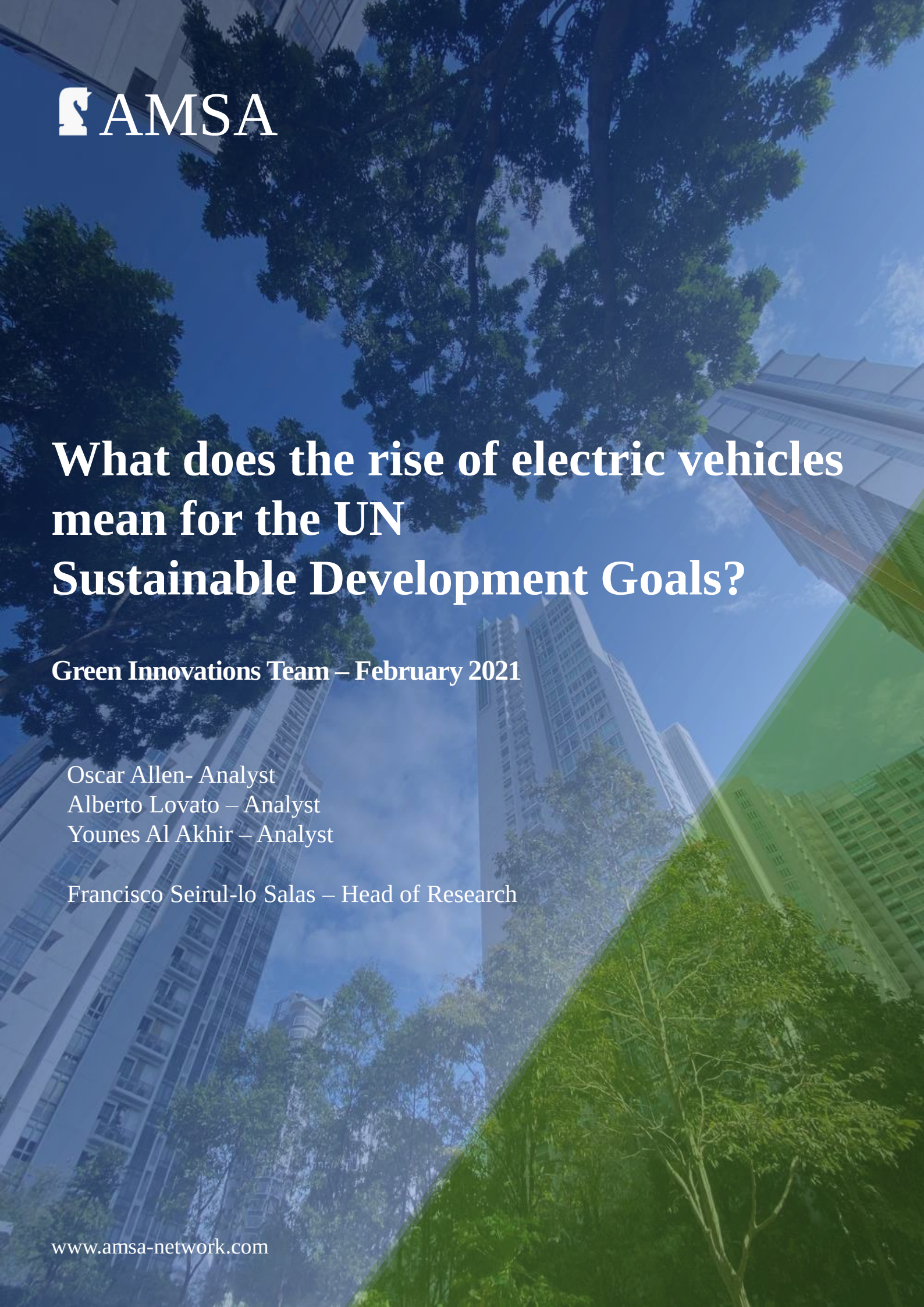

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What does the rise of electric vehicles mean for the UN Sustainable Development Goals?

Green Innovations Team – February 2021

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Introduction

The market for electric vehicles (EVs), either partially or fully powered on electric power, has risen significantly in the past years and has become an important sector in the finance industry. In 2020 over 10 million electric vehicles were registered, up around 70% since 2018 (IEA, 2021). The global electric vehicle market size was $246.70 billion in 2020 and is anticipated to grow at a CAGR of 24.3% to reach a $1.3 trillion market size in 2028 (Fortune Business Insights, 2020). Share prices of the largest electric vehicle firms by market cap have also drastically increased, outperforming the S&P 500 index. Tesla, the world's largest electric vehicle company by market cap, has returned 2540.40% over the past 5 years, compared to 100.86% return of the S&P 500, making the firm one of the largest firms in the world with a market cap of around $1 trillion (Google Finance, 2021). It can therefore be said that electric vehicles play a key role in the financial markets and, as a result, make the industry relevant to examine and analyze further.

There are varied opinions on the outlook of the electric vehicles industry. According to the Sustainable Development Scenario it is predicted that by 2030 there will be over 230 million registered electric vehicles, which would make up around 12% of the global vehicle stock (IEA, 2021). 18 of the world's 20 largest vehicle manufacturers, in terms of vehicles sold in 2020, have already indicated plans to offer more electric vehicle products and to rapidly scale up electric vehicle production (IEA, 2021). This predicted rapid increase is partially due to the central role that electric vehicles play in the European Commission's plan to become climate-neutral by 2050, for which over 30 million electric vehicles in Europe will be needed (Bloomberg, 2020). Additionally, in the US, President Joe Biden stated that over $174 million will be allocated to support electric vehicle innovation and adoption, in order to reach 50% electrification by 2030 (Power Technology, 2021).

As stated in the previous paragraphs, there is a widespread consensus that the rise of electric vehicles is important to reach sustainable development targets and to contribute positively towards the environment. In order to measure the usefulness of electric vehicles in achieving these overall goals, this paper will use the Sustainable Development Goals (SDGs) adopted by the United Nations in 2015 (Van Tulder, 2021). The impact of Electric Vehicles will be reflected on these goals both individually and collectively, defining the nexus between SDGs in order to learn how to maximise the positive effects, and minimise the negative outcomes of the flourishing electric vehicle industry.

This paper first introduces the policies of the United Nations (UN). Secondly, the Sustainable Development Goals are presented and an overview as to how to classify each goal is provided. Next, the manufacturing of electric vehicles and how it relates to the UN SDGs are discussed. Finally, this report indicates how electric vehicles contribute to the Sustainable Development Goals over their life cycle.

What does the UN do for the environment?

Facing environmental degradation and the realisation of its global impact, the European Union has gradually gained competence in this field. The 1979 Birds Directive, which concerns the conservation of wild birds, can be seen as the first building block of European environmental policy.

More formally, the 1986 Single European Act provides, for the first time since the beginning of European integration, for a specific competence of the EU in the environmental field. This policy then entered the realm of co-decision (now the ordinary legislative procedure) with the Treaty of Maastricht Another important step was the Treaty of Amsterdam in 1997. It is the latter that recognizes the principle of sustainable development - development that meets the needs of the present without compromising the ability of future generations to meet their own needs - as defined by the Brundtland report of 1987 and then specified at the Rio Earth Summit in 1992. Finally, more recently, the Lisbon Treaty of 2007 adds a new objective to the Union's environmental policy. This is the promotion, at international level, of measures to deal with regional or global environmental problems, and in particular the fight against climate change.

Over time, the European Union has also set itself increasingly ambitious numerical commitments. In the Green Pact, its new environmental roadmap launched in 2019, it has set itself the goal of achieving carbon neutrality by 2050. The law also establishes a scientific advisory council, made up of experts, to judge the conformity of all European legislative initiatives with the ambitions set out in the Green Pact and the Paris Agreement, the international climate treaty that came into force in November 2016. 4 Presented in July 2021, the Fit for 55 package consists of a series of legislative proposals from the European Commission aimed at achieving the target of reducing greenhouse gas emissions by 55% by 2030, compared to 1990 levels.

Europe is also taking action by funding environmental projects in all Member States. It does this firstly through the LIFE programme, its main instrument for the environment and nature conservation. This is subdivided into two pillars: environment and climate action. For example, it supports NGOs such as Birdlife, which works to preserve birds. The fundamental principles supporting European action on the environment are as follows:

- *The precautionary principle.* which is a concept born at the Rio Earth Summit in 1992. This principle aims to protect against unforeseeable and uncertain damage. It is at the origin of the international measures on the ozone layer (1980) and of a 2001 European directive on GMOs. However, it is hardly used in areas that do not directly affect the health of Europeans.

- *The principle of prevention* . This principle aims to protect against assessable and foreseeable damage.

- *The principle of correcting pollution at source.* It consists in seeking to go as far upstream as possible, by directly preventing the source of pollution. This treatment at source is considered preferable to eradicating the consequences of pollution downstream.

- *The polluter pays principle.* Polluters must bear the cost of the pollution for which they are responsible. They must therefore pay a sum of money to remedy the damage they have caused.

The Sustainable Development Goals

In September 2015, all of the United Nation member countries committed to achieve 17 global goals, with 169 sub-targets, by 2030. The aim of the SDGs is to simultaneously advance various important sustainable development themes on a universal basis (Van Tulder, 2021). These 17 goals can be seen in Figure 1 below.

Figure 1. The Sustainable Development Goals (Van Tulder, 2021)

In order to relate the costs and benefits of electric vehicles to the UN SDGs one must first be able to identify when a certain project relates to a specific Sustainable Development Goal. This report simplifies this by looking at the sub-goals of each main SDG and indicating what has to be done, according to the UN method (Van Tulder, 2021). The results are summarised in Appendix A and are used as a reference in Section 3 and 4, when analyzing the effect of electric vehicles on the UN Sustainable Development Goals.

Impact of Electric Vehicle Manufacturing

Whilst most people see the rise of electric vehicles as a positive for environmental and social goals, experts in the field have some concerns about the heavy reliance of electric vehicles on batteries. This is because the manufacturing of batteries that power electric vehicles have some hidden environmental and social costs that, compared with the manufacturing of engines for internal combustion engine vehicles (ICEV), have a net negative effect on society and the environment. Therefore, the current manufacturing process of EV batteries negatively affects the UN sustainable development goals.

Lithium-ion batteries have become the power source of choice for electric vehicles, mainly due to their low weight and high energy density (University of Utah, 2021). As a result, the recent growth in the electric vehicle market has also increased the demand for the raw materials used in the production of Lithium-ion batteries. These raw materials include the likes of mainly lithium, but also cobalt and nickel (The New York Times, 2021). Currently, global lithium prices are reaching record highs every other day. In 2021 alone, seaborne lithium carbonate prices rose by 413% and lithium hydroxide prices increased by 254% (S&P Global, 2021). Since the beginning of 2022, lithium has increased by 37.84% (Trading Economics, 2022). With over 10 million electric vehicles currently registered and the Sustainable Development Scenario predicting that there will be 230 million registered electric vehicles by 2030 (IEA, 2021), lithium demand will only increase further.

The issue with the increased demand for lithium, due to the rise of electric vehicles, lies in the extraction and processing of the raw metal. Firstly, mining companies employ energy intensive coal fired or gas-powered equipment (Nealer, Reichmuth, & Anair, 2015) which leads to high greenhouse gas emissions. A study by Nealer, Reichmuth and Anair in 2015 found that the battery production for an EV generates higher emissions than the manufacturing of an automobile. Comparing the manufacturing of battery powered electric vehicles to internal combustion engine vehicles, the authors find that EV manufacturing results in about 70% higher greenhouse gas emissions and that battery manufacturing accounts for the most significant difference (Nealer, Reichmuth, & Anair, 2015). In an interview, Stellantis CEO Carlos Tavares stated that “Given the current European energy mix, an electric car needs to drive 70,000 kilometres to compensate for the carbon footprint of manufacturing the battery and to start catching up with a light hybrid vehicle, which costs half as much as an EV” (CleanTechnica, 2022). Figure 2 furthermore indicates that in its current state, the manufacturing of an EV leads to more carbon emissions than the manufacturing of a fossil fuel car. Therefore, the continued manufacturing of electric vehicles compared to ICEV manufacturing at present, negatively affects Sustainable Development Goal 13 of Climate Action

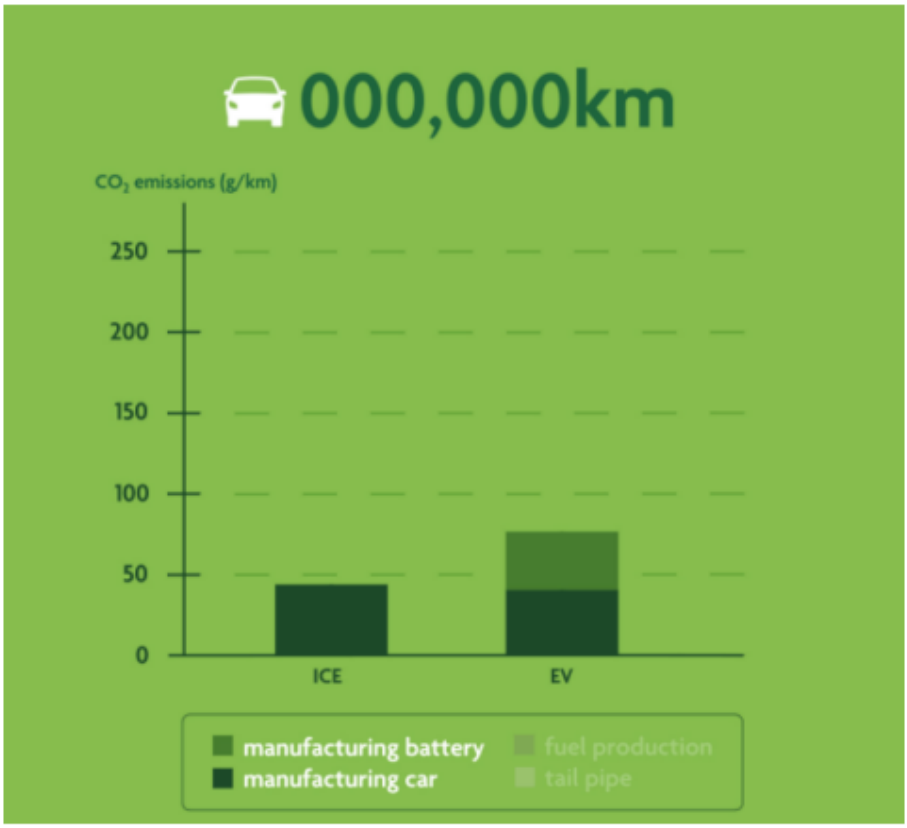

Figure 2. The cost of CO2 emissions to manufacture an electric vehicle (Allego, 2019)

The production of lithium, cobalt and nickel is dominated by only a few countries. In Europe, almost all of the battery-grade lithium is imported (The Guardian, 2020). In 2019, the world's top lithium producing countries were Australia, Chile, China and Argentina (Forbes, 2020). The lithium triangle, made up of Argentina, Bolivia and Chile, accounts for more than half of global lithium production (IER, 2020). Furthermore, nearly two-thirds of the world's cobalt comes from the Democratic Republic of Congo, the 8th poorest country in the world (Statista, 2021). The surge in manufacturing of these metals has the ability to create economic growth in the developing and emerging economies with reserves of these minerals (UtilityDive, 2020). However, historically, the mining boom has caused human rights problems and environmental devastation in these (mostly developing) countries. Some of these issues are outlined below.

First of all, lithium extraction and production tends to be a relatively cheap and effective process. However, it uses a lot of water. The lithium extraction process requires approximately 500,000 gallons of water per metric ton of lithium (Wired, 2018). This has caused an issue in the lithium triangle, made up of countries with a relatively dry and arid environment. For example, around 65% of the region's water supply was used in mining activities in Salar de Atacama, Chile (IER, 2020). Water is essential for agriculture, and an increased mining production in the area has therefore had a large impact on local farmers and the agriculture industry. Lithium production therefore has a trade-off with farming. Both industries are important for these regions and as a result, this presents a problem in achieving the first Sustainable Development Goal of having no poverty, the sixth SDG of having clean water and sanitation, the eighth SDG of having decent work and economic growth and the tenth SDG of reduced inequalities

Secondly, the mining, processing and disposing of lithium, cobalt and nickel has also had instances of contaminating drinking water and habitats. This goes against the sixth SDG of having clean water and sanitation, the 12th SDG of responsible consumption and production as well as the 15th SDG of life on land. One of many cases happened in May 2016, when the Ganzizhou Rongda Lithium mine in China had a chemical leak. This resulted in the deaths of fish in the Liqi river, as well as various Yaks and Cows that drank water from the river. Initially, after the incident the mining facility was closed but then reopened, after which more chemical leaks were reported (Wired, 2018).

Finally, cobalt production has seen rising environmental and social problems. In the Democratic Republic of the Congo, the world's largest cobalt producer (Statista, 2021), the production of cobalt is largely driven by artisanal mines. This refers to informal mining activities carried out using low technology or with minimal machinery (InforMEA, 2022). According to UNICEF, around 20% of the cobalt produced in Congo comes from artisanal mines, where an estimated 40,000 children work (UNCTAD, 2020). Cobalt extraction, using child labour and limited protective equipment, poses various health risks from the dust from excavation, containing toxic metals. One of these toxic metals is uranium, which has been linked to respiration diseases and birth defects. Taking all of this into account it can be said that increased cobalt production due to the rise of electric vehicles will negatively impact the ability to achieve the third SDG of having good health and well-being. Due to the use of child labor, the sixteenth SDG of peace, justice and strong institutions and the 8th SDG of having decent work and economic growth are also negatively impacted.

As a result of the many issues with mining lithium, cobalt and nickel, lithium-ion batteries used in EV manufacturing are most likely unethical and not green. This is a large hurdle that the electric vehicle industry faces with regards to positively impacting the UN SDGs.

However, some solutions exist which may help make electric vehicle battery manufacturing more sustainable in the future. The Natural Resource Governance Institute (NRGI) is working on improving sustainability and governance across the EV battery supply chain (Elkind, Heller, & Lamm, 2020). Additionally, there are various ongoing battery innovations. Currently, solid-state batteries are seen as a potential solution in the future. Solid-state batteries use solid electrodes instead of liquid electrolytes found in lithium batteries (Wired, 2017). As a result, the batteries tend to be smaller and of higher energy capacity than current lithium batteries. In the UK, tests found a solid-state battery system that costs less than 50% of a lithium-ion technology (S&P Global, 2021). Further, the solid-state batteries can be made without cobalt and nickel, removing the negative issues arising from the mining of these metals. However, it may take some time to replace lithium-ion batteries with solid-state batteries on a larger scale. Nissan hopes to launch a solid-state-powered car by 2028 and Stellantis and Daimler have a target of 2026 (Just Auto, 2021).

Impact of Electric Vehicles over their life cycle

In order to set Electric Vehicles and Internal Combustion Engine Vehicles side by side and compare their life cycles, five categories must be considered, namely: raw material production, vehicle manufacture, transportation, operation and decommissioning. Even if in terms of raw material production and decommissioning of EVs result in higher CO2 emissions, their largely lower impact within the operation phase leads to an overall advantageous position for EVs, both in terms of energy use and carbon emissions (Kukreja, 2018).

The results of a study carried out in 2018 by The University of British Columbia in a partnership with the City of Vancouver depict that the life cycle of the Ford Focus (representative of ICEVs) results in 392.4gCO2-eq/km against 203.0gCO2-eq/km for the Mitsubishi i-MiEV, representative of EVs (Kukreja, 2018). These results translate to an energy consumption of 4.2MJ/km for the Ford Focus and 2.0MJ/km for Mitsubishi i-MiEV. Another interesting result of this study is that for the Ford Focus emissions during operation represent 65% of the total LCA against a shocking 1.3% for the i-MiEV. This outcome is representative of the huge lead EVs have in operational efficiency but, it is essential to note, this only applies in regions with principally clean power sources, just as British Columbia. The energy mix in a region plays a huge role in the benefits that electric vehicles provide and represents the critical factor in establishing how much EVs can actually help in the achievement of the SDGs.

To clarify, the source of energy used to recharge the battery of EVs has a great impact on the LCA (all five categories together) of these vehicles. Volvo performed a detailed research to find out what their emissions were for their new model C40 Recharge, taking into consideration Petrol and 3 different sources of energy. These are: Global electricity mix, EU-28 electricity mix and lastly Wind electricity (Volvo, 2020).

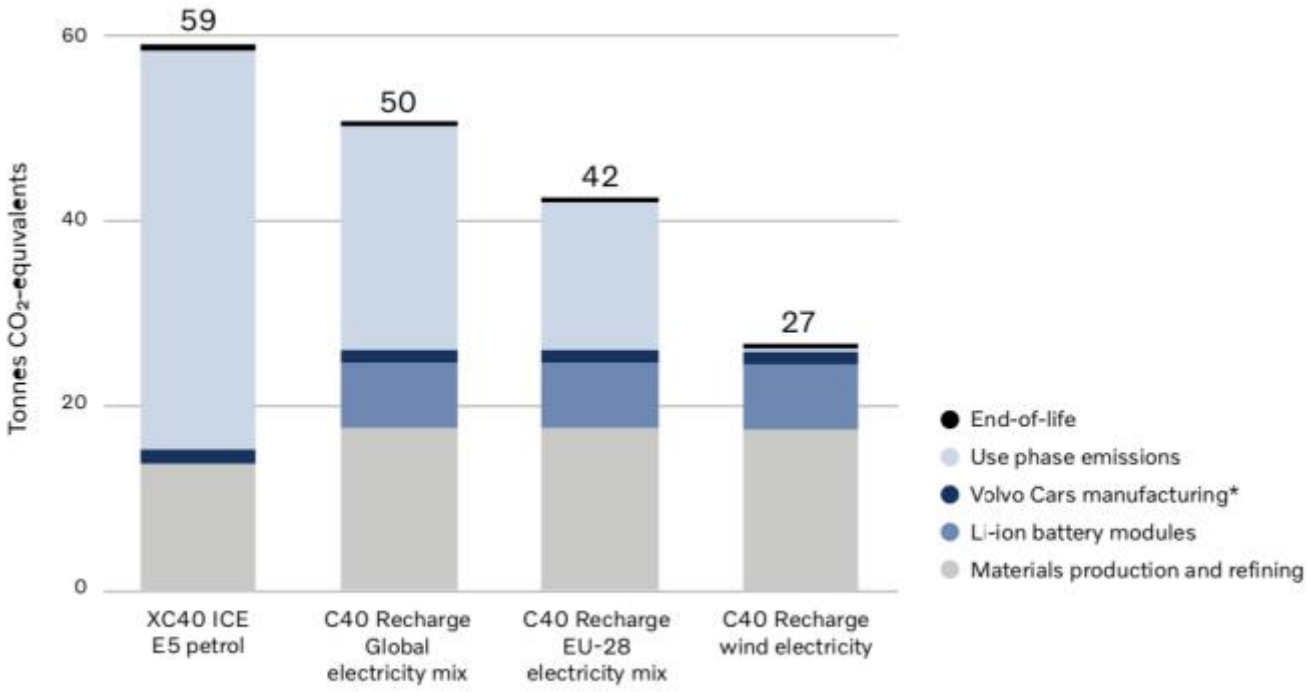

Figure 3. Carbon footprint with different electricity mixes Volvo, 2020)

Figure 3 indicates the results from their study. The results are measured in Tonnes CO2-equivalents for 200,000 km of total distance travelled and compared with the XC40 model. The conclusions reached by Volvo are representative of the importance of the source of energy used when considering EVs and their positive impact on the environment. Whilst EV's over their life cycles are overall better for the environment than an ICEV, if real environmental change is to be made with electric vehicles there must be greater development of renewable energy sources worldwide.

Concluding, when generalising the results one can say that over their life cycles, EVs have on aggregate a more positive impact on achieving the UN SDGs than ICEVs. For example, the use of electric vehicles will lead to more sustainable transport systems and reduce the environmental impact of cars, supporting the 11th SDG of sustainable cities and communities and the 13th SDG of climate action. Innovations in the electric vehicle industry and the growth of the EV market as a whole will also create a further incentive to improve the global energy mix and sustainable infrastructure, as this will exponentially increase the benefits of the use of electric vehicles. As a result, the rise of electric vehicles results in a positive outlook of potentially achieving the 7th SDG of affordable and clean energy and SDG number 9 on industry, innovation and infrastructure.

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Conclusion

Since the Birds Directive in 1979 there has been great progress in the competences of the UN on the achievement of environmental and social goals. Today, only 8 years away from the deadline set to achieve the 17 goals, there is still a lot to be done, but thanks to the rise of EVs multiple interrelated subgoals are being tackled. Specifically, raising awareness on the importance of the source of energy used to power electric vehicles can speed up the achievement of 7.2 and 7.3 (see appendix A). Consequently, cleaner energy sources will increase the sustainability of cities, specifically achieving goal 11.2 with more sustainable transport systems and, through stricter government policies on ICEV also 13.2. On the other hand, as highlighted in section 3 the extraction process of the minerals needed to produce Lithium-ion batteries has devastating effects on particular SDGs. To be more specific, the amount of water needed for lithium, the working conditions in the artisanal mines in Congo, the employment of children and contamination of habitats have slowed the achievement of 3.9, 6.3, 8.7, 8.8, 14.1, 14.2 and 15.1 (See appendix A). These negative externalities are being tackled by NRGI and looking forward, solid state or recycled batteries could present a brighter future.

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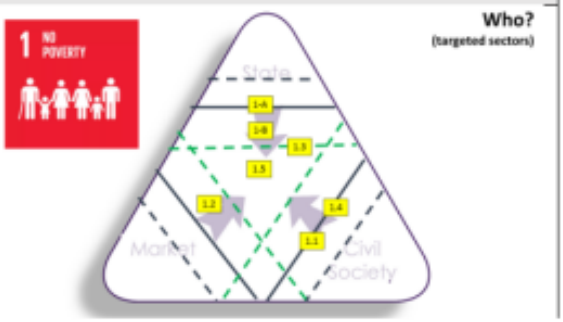
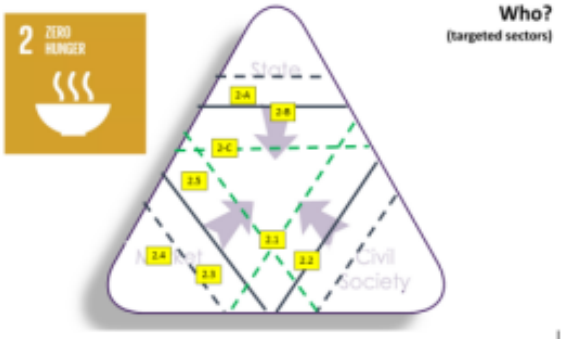
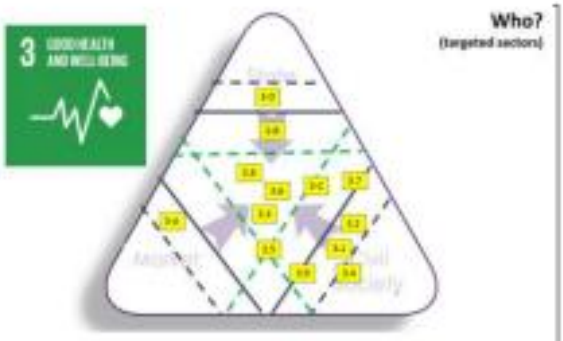
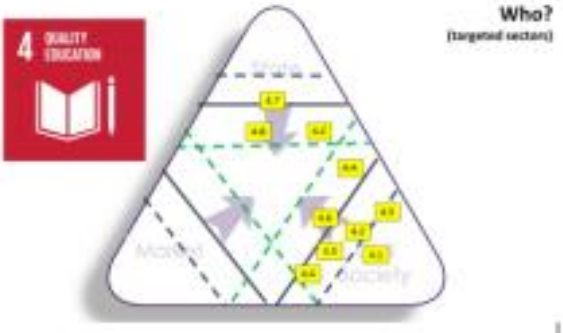
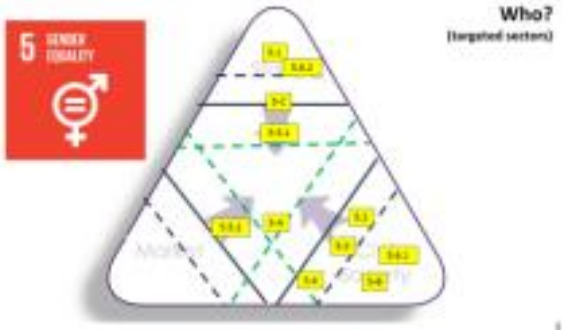
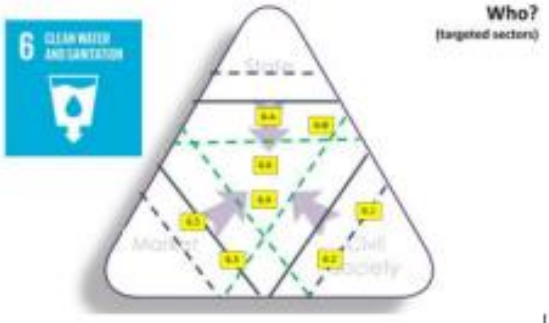
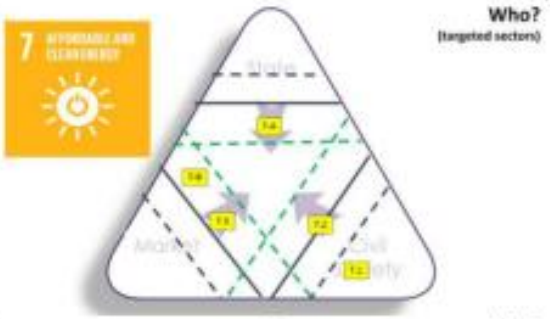
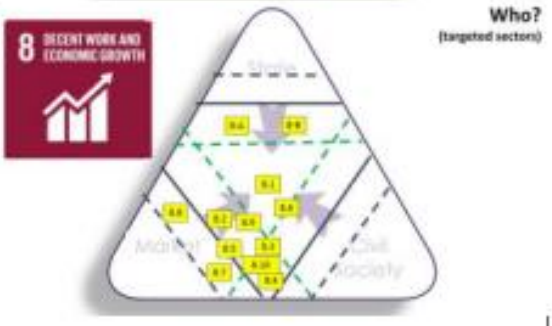
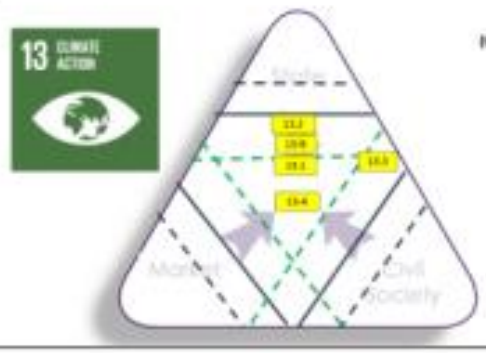
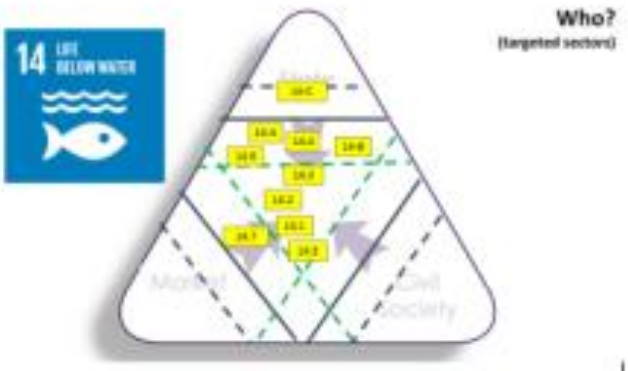
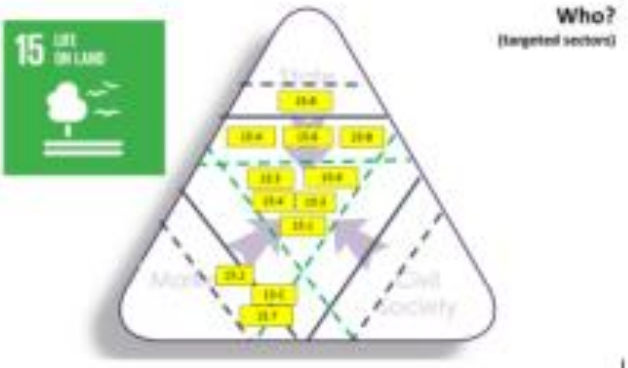
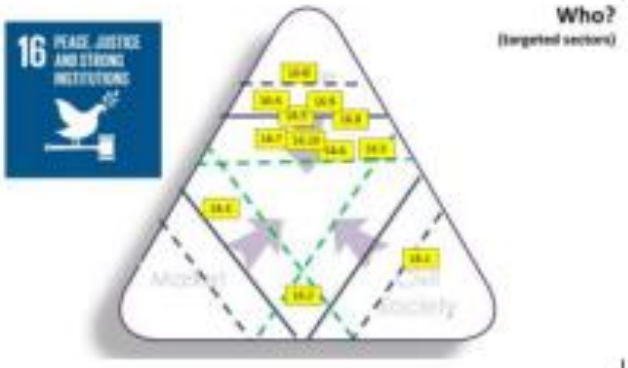
Appendix A (Van Tulder, 2021):

What?	Who?
1.1: Eradicate extreme poverty 1.2: Reduce poverty by at least 50% 1.3: Implement social protection systems 1.4: Equal rights to ownership, basic services, technology and resources 1.5: Build resilience to environmental, economic and social disasters 1-A: Mobilize resources to implement policies to end poverty 1-B: Create pro-poor and gender-sensitive frameworks	
2.1: Universal access to safe and nutritious food 2.2: End all forms of malnutrition 2.3: Double the productivity and incomes of small-scale food producers 2.4: Sustainable food production and resilient agricultural practices 2.5: Maintain the genetic diversity in food production 2-A: Invest in rural infrastructure, agricultural research, technology and gene banks 2-B: Prevent agricultural trade restrictions, market distortions and export subsidies 2-C: Ensure stable food commodity markets and timely access to information	

3.1: Reduce maternal mortality 3.2: End all preventable deaths under 5 years of age 3.3: Fight communicable diseases 3.4: Reduce mortality from non-communicable diseases; promote mental health 3.5: Prevent and treat substance abuse 3.6: Reduce road injuries and deaths 3.7: Universal access to sexual and reproductive care, family planning & education 3.8: Achieve universal health coverage 3.9: Reduce illnesses and death from hazardous chemical and pollution 3-A: Implement the WHO framework convention on tobacco control 3-B: Support research, development, universal access to affordable vaccines and medicines 3-C: Increase health financing and support health workforce in developing countries 3-D: Improve early warning systems for global health risks	
4.1:Free primary and secondary education 4.2: Equal access to quality pre-primary education 4.3: Equal access to affordable technical, vocational and higher education 4.4: Increase the number of people with relevant skills for financial success 4.5: Eliminate all discrimination in education 4.6: Universal literacy and numeracy 4.7: Education for sustainable development and global citizenship 4-A: Build and upgrade inclusive and safe schools 4-B: Expand higher education scholarships for developing countries 4-C: Increase the supply of qualified teachers in developing countries	
5.1: End discrimination against women and girls 5.2: End all violence against and exploitation of women and girls 5.3: Eliminate forced marriages and genital mutilation 5.4: Value unpaid care and promote shared domestic responsibilities 5.5: Ensure full participation in leadership and decision-making 5.6: Universal access to reproductive health and rights 5-A: Equal rights to economic resources, property ownership and financial services 5-B: Promote empowerment of women through technology 5-C: Adopt and strengthen policies and enforceable legislation for gender equality	

6.1: Safe and affordable drinking water 6.2: End open defecation and provide access to sanitation and hygiene 6.3: Improve water quality, wastewater treatment and safe reuse 6.4: Increase water-use efficiency and ensure freshwater supplies 6.5: Implement integrated water resources management 6.6: Protect and restore water-related ecosystems 6-A: Expand water and sanitation support to developing countries 6-B: Support local engagement in water and sanitation management	
7.1: Universal access to modern energy 7.2: Increase global percentage of renewable energy 7.3: Double the improvement in energy efficiency 7-A: Promote access to research, technology and investments in clean energy 7-B: Expand and upgrade energy services for developing countries	
8.1: Sustainable economic growth 8.2: Diversify, innovate and upgrade for economic productivity 8.3: Promote policies to support job creation and growing enterprises 8.4: Improve resource efficiency in consumption and production 8.5: Full employment and decent work with equal pay 8.6: Promote youth employment, education and training 8.7: End modern slavery, trafficking and child labor 8.8: Protect labor rights and promote safe working environments 8.9: Promote beneficial and sustainable tourism 8.10: Universal access to banking, insurance and financial services 8-A: Increase aid for trade support 8-B: Develop a global youth employment strategy	
9.1: Develop sustainable, resilient and inclusive infrastructures 9.2: Promote inclusive and sustainable industrialization 9.3: Increase access to financial services and markets 9.4: Upgrade all industries and infrastructures for sustainability 9.5: Enhance research and upgrade industrial technologies 9-A: Facilitate sustainable infrastructure development for developing countries 9-B: Support domestic technology development and industrial diversification 9-C: Universal access to information and communications technology	

10.1: Reduce income inequalities 10.2: Promote universal social, economic and political inclusion 10.3: Ensure equal opportunities and end discrimination 10.4: Adopt fiscal and social policies that promote equality 10.5: Improved regulation of global financial markets and institutions 10.6: Enhanced representation for developing countries in financial situations 10.7: Responsible and well-managed migration policies 10-A: Special and differential treatment for developing countries 10-B: Encourage development assistance and investment in least developed countries 10-C: Reduce transaction costs for migrant remittances		Who? (targeted sectors)
11.1: Safe and affordable housing 11.2: Affordable and sustainable transport systems 11.3: Inclusive and sustainable urbanization 11.4: Protect the world's cultural and natural heritage 11.5: Reduce the adverse effects of natural disasters 11.6: Reduce the environmental impact of cities 11.7: Provide access to safe and inclusive green and public spaces 11-A: Strong national and regional development planning 11-B: Implement policies for inclusion, resource efficiency and disaster risk reduction 11-C: Support least developed countries in sustainable and resilient building		Who? (targeted sectors)
12.1: Implement the 10-year sustainable consumption and production framework 12.2: Sustainable management and use of natural resources 12.3: Halve global per capita food waste 12.4: Responsible management of chemicals and waste 12.5: Substantially reduce waste generation 12.6: Encourage companies to adopt sustainable practices and sustainable reporting 12.7: Promote sustainable public procurement practices 12.8: Promote universal understanding of sustainable lifestyles 12-A: Support developing countries' scientific and technological capacity for sustainable consumption and production 12-B: Develop and implement tools to monitor sustainable tourism 12-C: Remove market distortions that encourage wasteful consumption		Who? (targeted sectors)
13.1: Strengthen resilience and adaptive capacity to climate related disasters 13.2: Integrate climate change measures into policies and planning 13.3: Build knowledge and capacity to meet climate change 13-A: Implement the UN framework convention on climate change 13-B: Promote mechanisms to raise capacity for climate planning and management		Who? (targeted sectors)

14.1: Reduce marine pollution 14.2: Protect and restore ecosystems 14.3: Reduce ocean acidification 14.4: Sustainable fishing 14.5: Conserve coastal and marine areas 14.6: End subsidies contributing to overfishing 14.7: Increase the economic benefits from sustainable use of marine resources 14-A: Increase scientific knowledge, research and technology for ocean health 14-B: Support small scale fishers 14-C: Implement and enforce international sea law	
15.1: Conserve and restore terrestrial and freshwater ecosystems 15.2: End deforestation and restore degraded forests 15.3: End desertification and restore degraded land 15.4: Ensure conservation of mountain ecosystems 15.5: Protect biodiversity and natural habitats 15.6: Promote access to genetic resources and fair sharing of the benefits 15.7: Eliminate poaching and trafficking of protected species 15.8: Prevent invasive alien species on land and in water ecosystems 15.9: Integrate ecosystem and biodiversity in governmental planning 15-A: Increase financial resources to conserve and sustainably use ecosystems and biodiversity 15-B: Finance and incentivize sustainable forest management 15-C: Combat global poaching and trafficking	
16.1: Reduce violence everywhere 16.2: Protect children from abuse, exploitation, trafficking and violence 16.3: Promote the rule of law and ensure equal access to justice 16.4: Combat organized crime and illicit financial and arms flows 16.5: Substantially reduce corruption and bribery 16.6: Develop effective, accountable and transparent institutions 16.7: Ensure responsive, inclusive and representative decision-making 16.8: Strengthen the participation in global governance 16.9: Provide universal legal identity 16.10: Ensure public access to information and protect fundamental freedoms 16-A: Strengthen national institutions to prevent violence, and combat terrorism and crime 16-B: Promote and enforce non-discriminatory laws and policies	

17.1: Mobilize resources to improve domestic revenue collection
17.2: Implement all development assistance commitments
17.3: Mobilize financial resources for developing countries
17.4: Assist developing countries in attaining debt sustainability
17.5: Invest in least developed countries
17.6: Knowledge sharing and cooperation for access to science, technology and innovation
17.7: Promote sustainable technologies to developing countries
17.8: Strengthen the science, technology and innovation capacity for the least developed countries
17.9: Enhance SDG capacity in developing countries