

Ranking Sustainability

Analysis on the environmental impact and the reporting performance of fifteen of the most significant companies in the footwear, fashion, automotive, aviation and energy industries.

Written by: Ambrosino Andrea, Campana Lorenzo, M.A. Freundt Thomas



**GREEN LIGHT
FOR BUSINESS**

INTRODUCTION

When faced with an investment choice, the first thing one is led to do is an in-depth analysis of the balance sheet, calculating the relevant KPIs, analyzing the cash flow structure and finally choosing an investment portfolio capable of maximizing returns. Over the last 20 years, the objective of profit maximisation has been increasingly combined with the concept of sustainable growth. The aim of changing the concept of business is to no longer see it only as a machine that produces dividends, but also as an active part of society crucial and capable of bringing positive change to society. This process led to the birth of corporate social responsibility as the highest expression of stakeholder theory. Moreover, in recent years it has become clear that considering environmental, social and governance issues as an integral part of investment analysis can be useful in identifying a good long-term investment.

In this paper, we will focus on environmental impact. When you want to evaluate the environmental performance of a company one of the main problems is the number of variables involved, in fact, calculating precisely how much a company contributes to environmental decay/sustainability is extremely challenging even to professionals who make environmental indices for a living.

First of all, there has to be a transparent value chain with sophisticated reporting mechanisms on emissions, waste and consumption of resources. We have made progress in this area with initiatives such as the GRI (Global Reporting Initiative) but, as the data will show, available information varies between companies and there is a lot of inconsistency between companies even in the same sector.

Secondly, it is necessary to define a perimeter in which the company is responsible for the impact it produces, both in terms of emissions (which is why the introduction of the "Scope 1,2,3" for CO2 emissions was necessary) and in terms of supply (Tier 1,2,3).

Often companies take advantage of this difficulty in reading data to prepare unclear sustainability reports, with the aim of highlighting good performance that in fact is only part of the whole picture. The most common phenomenon when reading sustainability reports is to see long talk about sustainability commitments but little clear data about the company's true impact. In short, "Green Washing" strongly influences company reports.

With all these limitations we have in this report analyzed the performance of 15 companies, trying to extract the most significant information so that we can have a clear and meaningful environmental comparison between companies . The research was divided into two sections to achieve this:

1) Company Ranking System:

In this section we have compared the 15 companies and used a grading criteria to give them scores out of ten in areas of importance when considering sustainability. The scores are primarily based on qualitative data—we considered the sector of origin as well as the combination of strategies implemented and results obtained.

2) Metrics & KPIs Analysis by Industry:

For this section we have focused on laying out companies’ performance based on quantitative metrics relevant to the primary industry they are present in. We then came up with KPIs based on these metrics.

SECTION 1: COMPANY RANKING SYSTEM

In this section the focus was on gathering qualitative data from the companies as well as some quantitative metrics and coming up with a score out of ten for each of them in different metrics. We based our metrics off environmental indices such as the ones by **Sustainalytics, S&P 500 Sustainability, and MSCI**. Our criterion was loosely based on similar data but mostly constructed by our team independently.

Grading Criteria	
10	Consistent metrics with ONU targets, Innovative technologies, best in class with good practices.
9	Nearly perfect sustainable practices, not the best in class but still consistent with ONU metrics
8	Good strategies, metrics are in a positive trend, still not great innovative strategies
7	Consolidated positive trend in metrics, strategies not completely implemented, low innovation rate
6	First year of reduction of the impact of the company, good strategies but not completely implemented
5	Strategies implemented are not enough powerful to have a decent impact on the sustainability of the company
4	Metrics in a negative trend, Green washing, strategies that not take into account all the aspects of the impact of the business
3	Metrics in a negative trend, little strategies linked on social practices, a decent amount of green washing
2	Some strategies on sustainability but without a good level of concrete action, a lot of green washing, metrics in a negative trend
1	No strategies, mainly green washing, metrics all in a negative trend
0	Metrics not available, Green washing, no future strategies

Once this was done we began the process of looking through reports and news articles of the companies so that we could come up with a conclusive score. In the downloadable file we added explanatory comments to some of the scores as well, giving insight into the companies’ strategies, goals, and

achievements. The final step in the process was adding up the scores and deciding on coefficients which reflected the importance of each metric on a given industry. This importance was measured based on how directly impactful each metric was to ensuring a sustainable future. For this reason you will find that metrics relating to “transparency and controversies” were given a low score in every case. This reflects its relative importance in relation to areas such as carbon and water footprint. The limited amount of data meant that we could not confidently.

Some of the limitations in this process included the presence of greenwashing and the resulting subjective nature in the grading process. A large part of the information gathered was based on company reports, so that achievements were highlighted while detrimental factors may have been often overlooked in these reports. The difference in what was mentioned in the report of each company also meant we could not always give scores comparatively but rather subjectively to some extent. To balance this, section two focuses instead on numerical metrics which would be easier to make a comparative study on.

Company	Footwear			Fashion			Energy			Aviation			Automotive		
	Nike	Adidas	Puma	Ferragamo	Cucinelli	Geox	Ørsted A/S	R.D. Shell	ENEL	Ryanair	Lufthansa	LATAM	Toyota	Tesla	FCA
Waste Treatment	7,3	7,0	5,0	4,7	6,0	6,3	8,7	5,0	6,7	7,3	7,0	4,0	7,0	7,7	7,3
Coefficient	0,1	0,1	0,1	0,1	0,1	0,1	0,2	0,2	0,2	0,1	0,1	0,1	0,1	0,1	0,1
Carbon & Water Footprint	7,0	7,0	4,5	4,3	4,8	4,5	8,8	6,5	7,3	5,8	6,0	3,5	7,3	7,3	7,0
Coefficient	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3	0,3
Transparency & Controversy	7,3	7,7	7,0	5,7	8,0	5,7	9,7	7,0	5,3	7,7	6,7	8,3	7,7	7,3	7,0
Coefficient	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1
Alternative energy	9,0	8,0	9,0	7,5	6,5	6,0	9,5	6,5	8,0	7,0	7,0	7,0	7,5	9,5	7,5
Coefficient	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,3	0,3	0,3	0,2	0,2	0,2
Efficiency	5,6	7,0	4,8	5,4	7,4	5,6	9,2	6,0	7,0	7,2	6,0	5,0	7,6	8,4	7,0
Coefficient	0,3	0,3	0,3	0,3	0,3	0,3	0,2	0,2	0,2	0,2	0,2	0,2	0,3	0,3	0,3
COMPANY SCORE	7,0	7,3	5,8	5,4	6,3	5,4	9,1	6,2	7,1	6,8	6,5	5,4	7,4	8,1	7,1
Waste Treatment	7,3	7,0	5,0	4,7	6,0	6,3	8,7	5,0	6,7	7,3	7,0	4,0	7,0	7,7	7,3
Company Exposure to	7	6	6	7	5	5	8	5	8	8	8	n/a	6	7	8
Company Exposure to	6	7	6	4	6	5	9	4	8	7	6	4	8	8	7
Product Recycling Rate	9	8	3	3	7	9	9	6	4	7	7	n/a	7	8	7
Carbon & Water Footprint	7,0	7,0	4,5	4,3	4,8	4,5	8,8	6,5	7,3	5,8	6,0	3,5	7,3	7,3	7,0
Reliance on Carbon-Supply Chain Miles	7	7	7	7	5	4	9	6	7	7	6	4	8	9	7
Carbon Footprint\GHG	6	6	3	3	3	5	8	7	n/a	5	7	n/a	8	6	6
Water Footprint	7	6	4	4	5	6	10	6	7	5	4	3	6	7	7
Transparency & Controversy	7,3	7,7	7,0	5,7	8,0	5,7	9,7	7,0	5,3	7,7	6,7	8,3	7,7	7,3	7,0
Climate Change	7	8	n/a	5	7	4	10	7	4	7	7	9	8	9	5
Accessibility to	8	7	7	8	8	6	9	8	8	9	7	7	8	5	9
Environmental Impacts	7	8	n/a	4	9	7	10	6	4	7	6	9	7	8	7
Alternative energy	9,0	8,0	9,0	7,5	6,5	6,0	9,5	6,5	8,0	7,0	7,0	7,0	7,5	9,5	7,5
Green Building	8	8	9	8	6	5	9	6	n/a	8	7	7	7	9	8
Alternative Energy	10	8	9	7	7	7	10	7	8	6	7	7	8	10	7
Efficiency	5,6	7,0	4,8	5,4	7,4	5,6	9,2	6,0	7,0	7,2	6,0	5,0	7,6	8,4	7,0
Energy Efficiency	5	8	4	4	6	5	9	5	7	8	5	4	8	9	8
Effective utilization of	6	7	6	5	7	6	9	5	6	8	6	3	8	7	6
Saving Levels due to	7	8	5	8	8	8	10	7	7	6	7	6	8	9	7
Carbon & Refinement	5	7	5	6	9	4	9	7	7	8	6	7	7	9	7
Waste reduction Rate	5	5	4	4	7	5	9	6	8	6	6	n/a	7	8	7

*note: downloadable table with grading evaluation can be found at the end of the document

Once evaluating our results, we found some interesting factors that stood out. On average, companies tended to score higher when it came to alternative energies and much lower in carbon and water footprint. This reflected the current shift we are seeing in multiple industries—more sustainable

methods of operations are being adopted, but still only in small scale for the most part, causing most companies to still consume excessively while releasing considerable amounts of polluting materials.

Some companies stood through their strategies and results, their transition was commendable and their stories should be highlighted.

SECTION 2: INDUSTRY METRICS AND KPIs

Industry 1: Footwear

Companies: Nike - Puma - Adidas

Footwear	Nike	Puma	Adidas
Revenues (2019 - \$)	37.400.000.000	6.677.550.000	29.138.400.000
<i>(EUR/USD) 31/12/2019</i>	<i>1,2141</i>	<i>1,2141</i>	<i>1,2141</i>
Emissions			
Scope 1(t CO2e)	51.493	6.326	46.112
Scope 2 (t CO2e)	230.451	40.986	12.071
Scope 3 (t CO2e)	10.471.781	272.540	5.341.817
Total GHG (t CO2e)	10.753.725	319.852	5.400.000
Δ 2019/2018 in GHG	-1,0%	17,3%	12%
Energy			
Energy Consumption (MWh)	830.854	246.160	558.000
Renewable energies	160.224	48.816	123.000
% of renewable	19%	20%	22%
Waste			
Waste generated (T)	160.313	27.359	NA
<i>Waste sent to landfill (T)</i>	5.451	26.249	NA
<i>Waste recycled (T)</i>	95.066	1.110	NA
% waste sent to landfill	3,40%	95,94%	NA
% waste recycled	59,3%	4,1%	NA
Water			
Total Freshwater Use (millions of m ³)	15.437,30	97.791,00	47.600,00
Δ 2019/2018	-6,6%	6,3%	6.6%

Metrics Evaluation

1) Emissions

Emissions are a critical factor as it is the main indicator for global warming. For this reason, we decided to include them in the analysis of every sector. Sneaker production is exceptionally carbon intensive, accounting for 1.4% of the global greenhouse gas emissions, which is significant given that air travel is responsible for 2.5 percent of all emissions.

2) Energy

Energy consumption is useful in understanding the needs for the production plant and especially how the company decides to source energy, whether through renewable resources or not. In terms of energy, we noted that all three companies considered outlined similar levels of use of renewable resources, around 20%. Reports often highlight excellent performance in terms of use of renewable resources, but in reality reference is almost always made to consumption by administrative offices and flagship stores.

3) Waste

In mass production companies, understanding the level of waste produced is critical. In recent years there have been difficulties in delivering on promises regarding waste reduction targets due to a growing consumer interest in having a customized product. This new trend, with its negative impact on environmental dynamics, needs to be taken into account for the future. Adidas did not make its waste data available, it just provided some reduction percentages as a future goal.

4) Water

The main sources of water consumption come from the production of the fabrics to make the shoe and the cooling to shape the sole. This implies that in general the industry is not extremely water demanding, but nevertheless the large differences within the considered sample are interesting. Probably these differences are explained by outsourcing some production processes combined with policies to reduce the water footprint.

KPIs	Nike	Puma	Adidas
Energy Productivity (\$/MWh) <i>Revenue/(Energy Consumption-</i>	55.768	33.837	66.985
GHG Productivity (\$/T CO2e) <i>Revenue/(GHG emission)</i>	3.477,86	20.877,00	5.396,00
Waste Productivity (\$/T) <i>Revenue/non recycled waste</i>	6.861.577,04	254.392,55	NA
Water Productivity (\$/mln L) <i>Revenue/Water consumption</i>	2.422.703,45	68.283,89	612.151,26

KPIs Evaluation

This table calculates the main performance indicators linked mainly to turnover. The data allows us to make a direct comparison between the companies considered, evaluating efficiency on environmental

impact, regardless of company size. Puma can be undoubtedly seen as the best in terms of efficiency of emissions, but Nike on the other hand is clearly superior in waste management. Adidas, despite good efficiency on the emissions side, has not made available reports clear enough to extrapolate data regarding waste management.

Regarding emissions, two types of attitudes were found. Nike on one side and PUMA as well as Adidas on the other. The latter two German companies are addressing the issue of carbon footprint reduction by relying heavily on RECs. RECs (Renewable Energy Certificates, released to anyone who produces at least 1 MWh from renewable resources) can be sold to those interested in making use of energy produced from renewable sources. In fact, when a person or a company connects to the electricity grid there is no way to understand whether the energy was produced with coal rather than in a wind farm. By purchasing and consuming RECs, you can be sure that the energy used comes from renewable resources. This greatly reduces the impact of a company's energy consumption and the amount of overall emissions.

Nike, on the other hand, does not make much use of RECs, but has preferred to pursue a policy of internal reduction in consumption and, above all, partnerships with large renewable energy producers, in order to build a foundation for a future that is increasingly less dependent on fossil fuels. Despite the good premises, Nike failed to reach any of the targets they had set in 2015 for 2020. Both in terms of emissions and in terms of renewable energy use, Nike is far behind its targets—even recording rising figures in some cases. The reasons presented in the sustainability report are numerous, but in general we can summarize them by saying that the company gives less attention to the environment than to other variables in decision-making.

In contrast to this trend, Nike has recorded excellent performance in managing water consumption. In fact, the company has created an innovative system to track the flow of water in the various production phases and to report in a very precise way the consumption, treatment and waste of water. This system is called Nike Water Minimum Program and it has proved to be very effective, especially if combined with the management of Nike suppliers. Nike has even begun to require that all its suppliers submit data on water management. Then, each supplier can see the performance of others in a dedicated dashboard, so as to achieve better efficiency through competitiveness and constructiveness in finding new solutions.

Although Nike has achieved its 2020 target to reduce water consumption, it is clear that the data reported in the first table is quite inconsistent with PUMA and Adidas, in fact, although not clearly specified in the report, we assume that Nike has considered only the water consumption resulting from its own production and not that of suppliers. However, we have not been able to verify this information.

Industry 2: Energy

Companies: Enel - Oersted - Shell

Energy	ENEL	Orsted	Shell
Revenues (2019 -\$)	80.327.000.000	11.020.000.000	307.644.480.000
<i>(USD/EUR) 31/12/2019</i>	<i>0,891</i>	<i>0,891</i>	<i>0,891</i>
Emissions			
Scope 1(t CO2e)	69.980.000		70.000.000
Scope 2 (t CO2e)	3.848.000	1.850.000	10.000.000
Scope 3 (t CO2e)	56.918.000	34.604.000	576.000.000
Total GHG (t CO2e)	130.746.000	36.454.000	656.000.000
Δ 2019/2018 in GHG	-23%	-9,07%	-1.3%
Energy			
Total Energy Production (GWh)	229.129	28.400	2.273.339
Termic Energy Production (GWh)	103.459	8.300	NA
Δ 2019/2018 in Termic Energy Production	-18,70%	-6%	NA
Nuclear Energy Production (GWh)	26.279	0	NA
Δ 2019/2018 in Nuclear Energy Production	9,20%	0	NA
Renewable Energy Production (GWh)	99.391	20.100	NA
Δ 2019/2018 in Renewable Energy Production	0,50%	17%	NA
Waste			
Waste generated (T)	7.219.719	138.000	2.112.000
Hazardous Waste	50.332	12.700	69.800
<i>Waste sent to landfill (T)</i>	<i>5.562.218</i>	<i>2.000</i>	<i>NA</i>
<i>Waste recycled (T)</i>	<i>1.365.008</i>	<i>136.000</i>	<i>NA</i>
% waste sent to landfill	77%	1,45%	NA
% waste recycled	19%	98,55%	NA
Water			
Total Freshwater Use (millions of mt3)	77,3	1,2	145
Δ 2019/2018	-19,70%	16%	-1.4%

Metrics Evaluation

1) Emissions

The energy sector is by far the worst sector in terms of carbon footprint. In aggregate it is responsible for almost 25% of global emissions (considering energy and heating).

2) Energy

In general, the industry understands that the future of energy production lies in renewable energy, in fact almost all companies are reconfiguring themselves to be less dependent on traditional resources. Orsted has shifted almost all of its production to sustainable, with the goal of a full transition in the coming years. Enel is also taking an increasingly renewable approach, scoring half of its production from non-fossil resources. Shell on the other hand has not made its data available in a clear and understandable way, despite being the largest company among those considered.

3) Waste

Management is a good indicator to understand the level of dependence of a company on non-renewable resources and nuclear energy production systems. In fact, renewable resources tend to have low waste production. It is also true that some systems, especially photovoltaic panels, require special processes for disposal.

4) Water

Generally speaking, it is not a very water-demanding sector, that's why we wanted to highlight that.

KPIs	ENEL	Orsted	Shell
Share of Renewable Energy Produced	43%	71%	NA
<i>Total energy/ Ren Energy</i>			
GHG Productivity (€/T CO2e)	614,37	302,30	468,97
<i>Revenue/(GHG emission)</i>			
Waste Productivity (€/T)	14.441,54	5.510.000,00	NA

KPIs Evaluation

Orsted appears to be the most advanced player on the renewable side, it is not surprising that it is a Danish company, traditionally more aware of environmental dynamics. In spite of this, however, it does not appear to be the most efficient in terms of emissions, probably it is also influenced by a much lower turnover compared to Shell and Enel. What we can see is that in the sample analyzed there are three different types of attitudes. Orsted has completely reinvented itself through the adoption of renewable energy for several years, limiting the production of electricity from fossil resources to only 29%. Enel, on the other hand, is at an intermediate stage. The company has understood that the future of the industry lies in renewables and in itself the company has historically been a promoter of renewables as an important producer of energy with its hydroelectric plants. In recent years, the firm has changed pace, achieving excellent results from the point of view of impact and percentage of energy produced through renewable resources—in 2019, it reached its 2020 target for reducing coal production by 42 percent compared to 2015 levels. Its carbon footprint is also on a downward trend that expects the company to be carbon free in 2050. In addition, it is intuitive to understand the company's enthusiasm for this change by the simplicity and accuracy in the distribution of data, in fact the information is clear and easily understood.

Shell, on the other hand, is struggling to make a real change. There have been several announcements by the CEO in favor of a green transition but in fact energy production is still heavily dependent on oil, gas and coal. It is no coincidence that the CEO has declared in the investment plan for 2021, 16 billion for plants used for fossil resources and only 2 billion for the development of renewable solutions, unlike Enel that has allocated almost half of the investment budget to plants for non-fossil resources. This strategy is reflected in the clarity of sustainable data in its reports. Shell has been criticized by the market for this lack of sensitivity to ESG issues, and not by chance the sustainability reports made available by the company are unclear, with partial information and difficult to interpret, although they have taken some interesting approaches to teaching the public about their operations and the energy industry in general through their web-report.

Industry 3: Aviation

Companies: Latam - Lufthansa - Ryanair

Aviation	LATAM	Lufthansa*	RyanAir
Passengers per year (2019)	74.200.000	145.000.000	146.000.000
Revenues (2019- \$)	10.430.000.000	36.400.000.000	8.914.000.000
Emissions			
Scope 1(t CO2e)	12.149.725	32.790.778	NA
Scope 2 (t CO2e)	18.423	194.559	NA
Scope 3 (t CO2e)	218.174	11.089.327	NA
Total GHG (t CO2e)	12.386.323	44.074.664	9.636.000
Δ 2019/2018 in GHG	7,8%	5.3%	4.6%
Off setting			
Off setting (tCO2e)	133.120	12.720	192.000
% Off setted emission	1,07%	0,03%	2%
Net GHG (TOT.GHG-O.S. Emission)	12.253.203	44.061.944	9.447.000
Other emissions			
Nitrogen oxides (NOx) – (t)	41.697	161.427	NA
Sulfur oxides (SOx) – (t)	1.847	23.197	NA
Δ 2019/2018 in Nox/Sox	6%	14%	NA
Fuel Consumption			
Jet Fuel (TJ)	166.787	13.051.985	443.338
Waste			
Total Waste	41.047	NA	NA
Hazardous waste	37.764	NA	NA
Non-hazardous waste	3.283	NA	NA
% Hazardous waste	92%	NA	NA

*based on 2018 levels. Comparisons are made with 2017 levels

Metrics Evaluation

1) Emissions

Like in the energy industry, we find extremely high levels of emission in aviation, which makes sense when we consider aviation is one of the main GHG producers in the world. The information on Lufthansa is inconsistent with that of the other companies, potentially because there is a difference

in how each company measures their emissions or because Lufthansa goes further than the other two companies in measuring their scope 3 emissions. Ryanair has a lot of information missing including their emissions by scope. This may be because of the logistical complexity of its operations, or because it has one of the lowest operations management to flight levels.

2) Off Setting

A key element to consider other than their own offsetting efforts, is whether the companies have an offsetting scheme available, which all but LATAM seem to have in this case. This may reflect the contrast in demand for offsetting schemes in the European vs. the Latin American aviation market. Even with a comprehensible off-setting programme, Lufthansa seems to be very behind on GHG off-setting.

3) Other Emissions

Important to consider as they can be extremely harmful in large quantities, nonetheless the small quantities in which sulfur and nitrogen are released in comparison to CO₂ makes their emission levels less alarming. While innovations have reduced the emission per capita of these gases, the overall emission has been continuously increasing, an issue which should be further looked at.

4) Fuel Consumption

Fuel consumption data for Lufthansa is extremely disproportionate to that of Ryanair and Latam. Overall, this should be somewhat proportionate to GHG emissions which it is for Lufthansa to some extent but not for Ryanair and Latam.

5) Waste

The airways industry does produce waste, but we see that in much smaller quantities than other industries—its operations do not demand as much packaging or any other sort of waste production as it is centered around the production of a few very valuable pieces of equipment. Overall we find that waste data is very limited, which could be in part because of how minimal it is in the industry

KPIs			
Jet Fuel Productivity			
<i>in terms of Revenues (\$/TJ)</i>	62.534,99	2.788,85	20.106,56
<i>in terms of Passenger (Pass./TJ)</i>	445	11	329
Net GHG Productivity			
<i>in terms of Revenues (\$/T CO2e)</i>	851	826	944
<i>in terms of Passenger (Pass./T CO2e)</i>	6	3	15
Waste Productivity			
<i>in terms of Revenues (\$/T)</i>	254.100	NA	NA
<i>in terms of Passenger (Pass./T)</i>	1.808	NA	NA

KPIs Evaluation

It is interesting to see that Latam, a young player in the airways industry which has been in constant state of expansion in recent years, has been so much more productive fuel-wise. This is highlighted by data from airways industry sustainability indices. They have also not received any significant penalties or fines due to mistreatment of resources or the environment.

Ryanair seems to be the per capita winner of GHG productivity, but this is at least in part because of their exclusively short- and medium-haul flights which tend to be more productive emission-wise against long-haul flights Latam and Lufthansa operate in. Nonetheless the information on fuel efficiency on their website is still misleading, showing numbers per capita to be lower than they would be if emissions in all scopes were considered.

In contrast to the other companies, Lufthansa got a mediocre score in carbon efficiency for flights recorded in the **International Energy Agency ranking**—one of the most reliable sources for comparative data between aviation companies. Their fuel consumption, although decreasing in the long term, has increased by about 8.5% between 2017 and 2019 and 8.5%.

While these companies have been becoming much more efficient when it comes to saving fuel and emitting less gas, this has for the most part not affected absolute results. This is because increased productivity has usually resulted in cheaper and more frequent flights offsetting the increase in productivity. It could be wise to check again this business model and put it under scrutiny.

Industry 4: Automotive

Companies: Toyota - Tesla - FCA

Automotive	Toyota	Tesla	FCA
Revenues (2019 - \$)	272.000.000.000	24.600.000.000	130.800.000.000
Emissions			
Scope 1(t CO2e)			
Scope 2 (t CO2e)	2.450.000	146000	1.058.367
Scope 3 (t CO2e)	397.940.000	NA	2.359.103
Total GHG (t CO2e)	400.390.000	NA	3.417.470
Δ 2019/2018 in GHG	1.4%	NA	-8,57%
Energy			
Energy Consumption (MWh)	19.444.444	2.800	11.618.780
Renewable energies	972.222	NA	1.905.480
% of renewable	5,00%	NA	16,40%
%Δ 2019/2018	0,40%	33,70%	-7,76%
Waste			
Waste generated (T)	261.000	NA	806.396
<i>Waste sent to landfill or incinerated (T)</i>	193.000	NA	205.372
<i>Waste recycled (T)</i>	68.000	NA	594.880
% waste sent to landfill or incinerated	35,00%	NA	25,47%
% waste recycled	65,00%	NA	73,77%
Water			
Total Freshwater Use (millions of liter)	44.000	1.060	5.540.000
Δ 2019/2018	-0,90%	14,90%	-67,73%
Car Production			
Total Cars Produced	8.985.000	367.500	4.300.000
Electric/Hybrid Cars	1.923.800	367.500	NA
% of Electric/Hybrid Cars	21,41%	100,00%	NA

Metrics Evaluation

1) Emissions

A very large percentage of emissions derive from scope 3, which is the emission by customers driving the cars after they were bought—therefore a lot of the GHG emission data is simply estimated

rather than concrete. Furthermore, companies seem to interpret GHG emission differently, and for this reason this part of data should be seen as inconclusive, but also an insight into how companies may be prone to greenwashing or data omission even with numbers and with pressure for more accountability by stakeholders.

2) Energy

Even when taking into account the difference in revenue, we find that energy consumption in this industry is far greater than in others such as footwear, even though both have intensive use of energy in manufacturing specifically. Tesla, even when showing data, seems to have information which may be unreliable due to its inconsistency with the other companies. Although this may also be because of their unique and innovative operations and production model.

3) Waste

It would be interesting to note what companies define as waste to see why there is so much more waste in the energy sector. Sadly companies themselves don't seem to put out this information. Toyota seems to be far more efficient in minimizing waste, which reflects their model of minimizing time and resource waste through JIT manufacturing for example since the 70s.

4) Water

Data is very inconsistent, possibly once more because of what each company takes as water consumption related to their business operations.

5) Car Production

Tesla is leading this area with their decision to only fabricate which can be fuelled with energy. Toyota has been an industry leader in hybrids which explain their high number of cars which can consume energy in comparison to FCA. While the data is not available for hybrid production, newer hybrid SUV models by FCA are promising and could be dominating the European market soon, especially as they move towards a merger with group Group PSA

KPIs Evaluation

KPIs			
Energy Productivity (\$/MWh)			
<i>Revenue/(Energy Consumption-Renewable)</i>	14.724,81	NA	13.466,07
<i>Energy per vehicle produced</i>	2,16	0,01	2,70
GHG Productivity (\$/T CO2e)			
<i>Revenue/(GHG emission)</i>	679,34	NA	38.273,93
Waste Productivity (\$/T)			
<i>Revenue/non recycled waste</i>	1.409.326,42	NA	636.893,05
Water Productivity (\$/mln L)			
<i>Revenue/Water consumption</i>	6.181.818,18	23.207.547,17	23.610,11

Tesla is surprisingly energy efficient, which may be in part because of their minimalist consumption model, although these numbers are still surprisingly low. This could be because over 85% of energy delivered by the Superchargers in their new car models is produced by clean, low-carbon energy sources, including solar, wind and hydropower. Furthermore, new facilities have gained high levels of approval for sustainability as have the Tesla vehicles.

Again, as a product of revenue the GHG emission by Toyota vs. FCA still seems too high. Toyota has received numerous prizes for new conservation efforts and maximization of productivity, something which the results do not reflect. Their sales from hybrids have been growing very slowly in the last few years as they have continued to sell non-hybrid models which are more popular in the consumer's market. This may be in part what has slowed their savings efforts in the last few years.

Fiat on the other hand has now begun to enter into the hybrid market with new models such as the fiat centoventi (F120) and the Fiat 500 electric. They have also made various improvements in the last few years— 40% reduction in water consumption, -27% reduction in CO2 emission, and a 64% reduction in waste levels against 2010 levels.

Especially when using revenue for the KPIs, Tesla should be outperforming the others due to its high levels of revenue vs. their size of operation. This could explain their low rates of energy consumption, but makes their water consumption levels more alarming.

Industry 5: Fashion

Companies: Cucinelli - Ferragamo - Geox

Fashion	Cucinelli	Ferragamo	Geox
Revenues (2019 - \$)	445.668.000,00	636.863.000,00	548.480.000,00
Emissions			
Scope 1(t CO2e)	1.845,00	1.308,00	1.429,21
Scope 2 (t CO2e)	3.778,00	13.268,00	2.789,80
Scope 3 (t CO2e)	1.999,00	41.250,00	731,00
Total GHG (t CO2e)	7.622,00	55.826,00	5.207,70
Δ 2019/2018 in GHG	0,05%	23,5%	-0,26%
Energy			
Energy Consumption (MWh)	76.501,00	139.220,00	121.886,36
Renewable energies	38.250,50	23.667,40	60.451,77
% of renewable	50,00%	17,00%	49,60%
Waste			
Waste generated (T)	1.006,40	1.051,00	1.876,26
<i>Waste sent to landfill (T)</i>	46,5	233,322	2,06
<i>Waste recycled (T)</i>	425,9	90,386	1874,2
% waste sent to landfill	4,6%	22,2%	0,1%
% waste recycled	42,3%	8,6%	99,9%
Water			
Total Freshwater Use (millions of liter)	29.888,00	1.300,00	34.700,00
Δ 2019/2018	46,97%	1,00%	63,00%

Metrics Evaluation

1) Emission

Fashion production is exceptionally carbon intensive. As it is possible to see, the difference between 2018 and 2019 is negative in terms of emission. As a matter of fact there was a raise in terms of emission in the considered period of time.

2) Energy

Energy consumption is useful in understanding the needs for the production plant and especially how the company decides to source energy, whether through renewable resources or not. In terms of energy, we noted that except for Ferragamo, both Cucinelli and Geox have a great percentage of renewable energy sources.

3) Waste

The common trend in recent years is to become more environmentally friendly. As a consequence of this trend, we can see that the percentage of waste recycled is very high except for Ferragamo which continues to recycle a low quantity of goods.

4) Water

Water represents a critical factor in terms of sustainability metrics. As a matter of fact, to produce a single pair of jeans it is necessary to use a huge quantity of water . To solve this problem, the companies in the industry sector are delivering new systems to produce in order to become more eco-friendly even if the numbers in the table give different information.

KPIs	Cucinelli	Ferragamo	Geox
Energy Productivity (\$/MWh) <i>Revenue/(Energy Consumption-Renewable Energy)</i>	11.651,30	5.511,46	8.927,87
GHG Productivity (\$/T CO2e) <i>Revenue/(GHG emission)</i>	58.471,27	11.408,00	105.320,97
Waste Productivity (\$/T) <i>Revenue/non recycled waste</i>	9.584.258,06	2.729.545,44	266.252.427,18
Water Productivity (\$/mln L) <i>Revenue/Water consumption</i>	14.911,27	489.894,62	15.806,34

KPIs Evaluation

As the footwear industry is a branch of the more general industry sector, we can make similar considerations about KPI's Evaluation. This table calculates the main performance indicators linked mainly to turnover. The data allows us to make a direct comparison between the companies considered, evaluating efficiency on environmental impact, regardless of company size.

In this table we can see that Ferragamo, which in the previous table worked in a bad way, now has the best value in terms of water productivity.

It is important to underline that the common trend in the last years, in the fashion industry, aim to be more sustainable and environmentally friendly.

However, between the goal and the effective performance there are many factors that do not help this noble purpose, factors as : costs; the whole supply chain management, which is difficult to change in a short amount of time and, last but not least, the current pandemic.

CONCLUSIONS

We structured the work using points to reward the most virtuous companies based on their sustainability data, hoping to also identify models that other companies could follow. In the end, our analysis didn't lead us to a winner or a loser but it rather led us to question the entire data set that the companies provided.

Considering that the companies analyzed are all relatively large and all make use of **GRI reporting systems**; the data we analysed proved to often be difficult to understand and especially difficult to compare with other companies in the same industry. Understanding the ecological impact of a company implies working with many variables, which leads to an inevitable complication in data management. This becomes more complicated as companies tend to emphasize the areas in which they perform best, sometimes aggregating data or showing them partially.

Through this research, we more than ever believe that sustainability reports are fundamental documents for the future of green business, but as of right now companies still have too much freedom in presenting this data. Greenwashing practices are very common, even within official documents of companies. It is right to continue on the path traced by GRI Standards, but it would be necessary both a greater transparency on the part of companies, and a reporting system that is clearer, more linear and easily comparable with companies in similar industries.

Consider an example: similar consumption is generally expected for similar companies., but this is not the case with water consumption for Nike, Adidas and PUMA. Nike is the largest footwear company in the world in terms of revenue, but according to data provided by the company it consumes just over 15% of the water consumed by Adidas and a third of the water consumed by PUMA. It is clear that the data must have been calculated differently. IF Nike was so much more water-efficient than the others, this would have been a trait highlighted in their report, but they gave no explanation for the apparent extreme efficiency.

Another consideration we can make concerns how different sectors react to environmental emergencies. Highly carbon intensive sectors such as energy and civil aviation are looking for ways to reduce their emissions through innovation. Regarding the production of electricity, the future seems to be dominated by renewable sources, global warming is now an issue universally recognized and even companies such as ENEL are basing their future forecasts on the **IPCC temperature rise scenarios**. As

far as in the civil aviation sector, companies are trying in any way they can to decrease consumption through better performing fuels and more efficient airplanes, without hiding the fact that this practice is a common advantage for the company's performance in general. Nonetheless, this reduction goal is usually set to lower ticket prices rather than reduce overall emissions. Furthermore, the level of GHG emissions is so high in this sector that off-setting practices are essential, as LATAM has demonstrated.

Other sectors tend to focus much more on optimizing processes and implementing reduction policies, leaving the drive for product innovation to the consumer, as happens in the fashion and footwear sectors.

In the end there are still various key improvements to be made in all sectors, but provision of easily accessible information which follows a common scale would be ideal. Only then can we properly keep companies accountable for their performance and properly quantify their impact on the environment.