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Formula for the Future:
Enhancing Sustainability in
Grand Prix Event
Management

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ABSTRACT

This thesis examines event management, and in particular Formula One Grand Prix management. The close relation between these practices and sustainability. As one of the main entities in the sport environment Formula One stands as a beacon for organizing large-scale event management strategies. This study examines the operational aspects of Formula One in event management, spanning from planning, execution, to post-event analysis. It analyses how these aspects are influenced by the commitment to achieving a net-zero carbon footprint by 2030.

This paper offers an insight of Formula One's and race promoters' practices for Grand Prix events and the initiatives taken from the sport to reach its sustainable goals.

INTRODUCTION

This paper aims to scrupulously examine event management in Formula One and the sustainability practices adopted to reach the goal of net-zero carbon footprint by 2030. Formula One, as a widely known organisation, operates in multiple business fields, but this thesis will primarily focus on Grand Prix events management.

This paper will analyse the strategic practices employed by the Formula One Group, and how these help a successful execution of Grand Prix events.

It will also explore the sustainability initiatives adopted by Formula One to reach its environmental goals. This includes reviewing all the sustainable practices to minimize the environmental impact of these huge events.

The role of stakeholders in event management strategies will also be evaluated in the study, with an emphasis on how all collaborations, sponsors, and local government relations are coordinated to support both commercial and environmental objectives.

This thesis will encapsulate Formula One's techniques in Grand Prix events management and how it will benefit from its green initiatives to reach a net-zero carbon footprint by 2030, envisioning a sustainable future for motorsports.

1. Formula One: History, Management, and Sustainability

1.1 Overview of Formula One

Formula One is the pinnacle of motorsports. The term “Formula” indicates a conglomerate of rules and regulations that drivers and teams must respect. The “1” highlights the concept that the sport represent the highest competitive level in motorsports.

The FIA (Fédération Internationale de l’Automobile) is an entity which governs the rules and regulations of many auto racing events, including Formula One. The number of teams and drivers competing in Formula One has changed several times over the years. In recent years, 10 teams take part in the championship, each one competing with two drivers.

To enter Formula One, drivers must meet several requirements that demonstrate their skill and readiness to compete at the pinnacle of motorsport. Drivers must hold a valid FIA Super Licence, which is the highest class of racing licence issued by the FIA. To achieve such licence drivers must compete in lower recognized series such as Formula 2, Formula 3, or IndyCar series. F1 drivers must be at least 18 years old, this is to ensure that all competitors are legally adults capable of handling responsibilities associated with their dangerous job. This regulation has been introduced recently. There have been years in which 16 years old drivers took part in the championship. The most common path for drivers who wish to enter Formula One is to start by national karting championships, then participating in Formula 3, then Formula 2. Once drivers have proved their talents and have impressed F1 teams in the lower categories they might end up as a reserve driver for one of the top teams and one or two years later make their debut in F1, usually in one of the weaker teams.

The term Grand Prix comes from the French language and alludes to the winner of a certain competition, generally sport events, receiving a prize or trophy. In Formula One, when saying mentioning Grand Prix we generally intend a race weekend. The number of Grand Prix per season changes every year. It varies from 18 to 24. With races taking place all around the world, Formula One has become a globally recognised sport and industry. The calendar usually starts in March with pre-season testing and it ends around November. During the winter manufacturers design and create the race car for the next season, although some teams already start the development of their new car during the current season. Pre-season testing is very useful for teams, it gives a precious insight to the cars’ real performance. Teams have only 24 hours in total to test the car before the start of the regular season. Teams cannot practice outside official testing; they can only let the drivers practice in simulators. During testing teams try different setups trying to replicate every situation they will encounter during the season. The

full potential of the cars isn't showed by the teams to hide their real speed. The season starts two weeks after testing.

There are two types of race weekends, regular race weekends and sprint race weekends.

Regular race weekends begin on Fridays, where teams have two practice sessions of one hour each. During this time teams practise and utilize different possible aerodynamic set-ups for the weekend. They simulate qualifying by performing their fastest lap times. And they practise their race pace, a good race pace is determined by low tire degradation and high performance of the car. Saturdays consist of a third and final practice and the qualifying session. Qualifying sessions are a crucial part of the weekend, they set the starting grid for the race. Qualifying is divided in three brief sessions: Q1, Q2, Q3. In Q1 the five drivers with the slowest lap times are eliminated from qualifying: so, drivers who came from sixteenth to twentieth are eliminated in Q1. The same happens in Q2 where drivers from eleventh to fifteenth are eliminated. Finally, in Q3 pole position is assigned to the fastest driver and the grid is set in order of best lap times. Finally, races take place on Sundays. During the race at least one pitstop per car is mandatory. During pitstops the car exits the racetrack temporarily entering the pitlane where the team mechanics change the old worn-out tyres with fresh ones in around two seconds. The points assigned in races changed during the years. In Figure 1 we can see the current points assignment system.

Figure 1: Race Points Assignment System

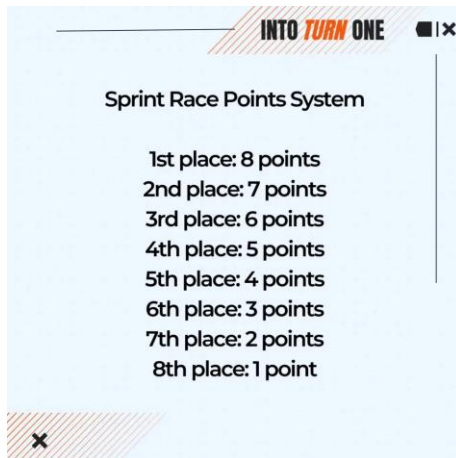
1st place	25 points
2nd place	18 points
3rd place	15 points
4th place	12 points
5th place	10 points
6th place	8 points
7th place	6 points
8th place	4 points
9th place	2 points
10th place	1 point

Source: https://www.tutorialspoint.com/formula_one/formula_one_racing_points_system.htm

Sprint race weekends are slightly different. They have been introduced in 2021 as part of a new initiative aimed at bringing more excitement during race weekends and engaging fans. Teams only have one practice session during the whole weekend which is on Friday. Then there is the Sprint qualifying session or Sprint Shootout. Which is a shorter qualifying session for the Sprint

race. On Saturdays there is the Sprint race, a shorter version of the regular race, generally it is one third of the regular race length, approximately one hundred kilometres. In Sprint races pitstops are not mandatory as they are in regular races. In Sprint races the points assigned are fewer than the race. In Figure 2 we can see the current point assignment system for Sprint races.

Figure 2: Sprint Race Points Assignment System



Place	Points
1st place	8 points
2nd place	7 points
3rd place	6 points
4th place	5 points
5th place	4 points
6th place	3 points
7th place	2 points
8th place	1 point

Source: <https://intoturnone.com/f1-points-system/>

Finally on Sundays we have the regular race. Its format is the same as the race on non-sprint weekends.

Some notable Sprint Weekends are the 2021 British Grand Prix, which was the first sprint race in F1 history, won by Max Verstappen. The 2021 Brazilian Grand Prix, remembered for the penalty given to Lewis Hamilton because of an irregularity of his car's DRS system, he qualified on pole position but was later disqualified from the session, and started his comeback that would bring him to the top step of the podium on Sunday. Another notable Sprint Weekend is the 2023 Qatar Grand Prix. In this sprint race drivers suffered from extreme heat and the race was overshadowed by health concerns. One driver also retired from the race because of the conditions.

There are two Formula One Championships, the Drivers' championship, and the Constructors' championship, points in races are valid for both championships. The Drivers' championship is generally considered the most prestigious one, the standings in this competition are determined by the drivers' personal points achieved in races. The Constructors' championship is determined by the sum of the points of both drivers of the team.

Depending on their car potential and drivers' talent, teams have different objectives during races and the season. Big teams such as Ferrari, RedBull, McLaren and Mercedes regularly fight for

race wins and for both championships. While smaller teams have different goals. Haas, Stake Sauber, Racing Bulls, Williams, Alpine and Aston Martin are teams which are recently struggling and fight every race to achieve points, to enter the top 10 finishers in the race.

The cars are designed and produced by the teams' constructors and engineers. They are the pedigree of aerodynamic four-wheeled vehicles. Constructors must follow some regulations while building and designing their cars.

There are three different tyre compounds for dry conditions and two tyre compounds for wet conditions. For dry conditions we have the hard tyre, which is generally the slowest tyre but lasts the longest, which means that the tyre has low grip but is more constant. Then we have the medium tyre which is mix between speed and constancy. And finally, we have the soft tyre, which is the fastest of the three, but its grip lasts few laps.

For wet conditions we have the wet tyre which is generally used when the racetrack is fully wet. It gives the car the highest possible grip in wet conditions. While the intermediate tyre is used when the track is drying up or is not completely wet. This compound is normally used either when the track is drying up or when it starts to get wet.

Formula One has witnessed periods of dominance both by drivers and teams. The sport's history includes legendary teams such as Ferrari, the only team to have competed in every championship season and the most successful overall; McLaren known for its iconic drivers; and Williams, which has seen its fortunes decline after past successes. In recent years, Red Bull and Mercedes have had the most success. There have been many dominant drivers in F1's history. Lewis Hamilton stands out with the most wins and championships, currently tied with Michael Schumacher. Historical figures like Juan Manuel Fangio, a five-time world champion in the sport's early years, and Ayrton Senna, who lost his life in a tragic accident in 1994, have left their mark in the hall of fame of the sport. Max Verstappen is the current World Drivers' Champion, leading Red Bull in a three-year winning streak. The eras of dominance are inevitable and sometimes may lead to boring races and championships. Starting from Fangio in the 50s, through McLaren and Williams in the 80s and 90s, to the recent stretches of supremacy by Ferrari, Red Bull, and Mercedes, showcasing great competition yet periodical dominance eras over the years¹.

To avoid these dominant eras and to make races exciting and unpredictable Formula One and the FIA periodically introduce new regulations that teams must follow. By doing so, teams that have a technological or aerodynamic advantage over competitors must redesign their car every

¹ Sky Sport. "Formula 1 Albo d'Oro Piloti". Available at: <https://sport.sky.it/formula-1/formula-1-albo-d-oro-piloti#02>. Accessed 2 May 2024.

time regulations change. This generally happens every few years. Some examples may be the introduction of the Drag Reduction System (DRS) in 2011, which is a driver-controlled aerodynamic device made to increase overtaking opportunities during races. By pushing a button on the steering wheel, the rear wing opens and reduces aerodynamic drag, therefore increasing straight-line speed. “Detection zones” on the track are specific zones in which the system checks if the trailing car is within one second of the car in front, if this is the case, the DRS can be activated in the following “activation zone”, which is generally a long straight. The DRS cannot be used if weather conditions are unsafe. During qualifying sessions and practices, it can be used freely in activation zones.

Another example of regulation change is the introduction of new aerodynamic designs in 2022. This was done to promote closer racing and permitting cars to follow each other closely without losing too much time. By changing the aerodynamic design of cars, the FIA aims to prevent domination by single teams. In this case it helped ending the dominant era of Mercedes, which lasted from 2014 to 2021. In 2022 Mercedes ended third in the constructors’ championship. Nonetheless the RedBull dominant era started and will probably last until at least 2025, since in 2026 new engine regulations will be introduced.

New regulations may comprehend also non-technical ones, in 2021 a teams’ budget cap was introduced. Teams could therefore spend maximum \$145 million on the development of their cars. This limited especially the top teams who had much higher economic power than the others. The cost cap includes limitations on car development and production, personnel costs, supplies and equipment and other operational costs. It does not include drivers’ salaries, top three personnel salaries, marketing and hospitality, legal and regulatory costs, travel costs and factory costs.

1.2 History of Formula One

Formula One, also known as Formula 1 or F1, is the highest class of international racing for ‘open-wheel single seater’ formula racing cars. The contemporary era of Formula One began in 1950, but Gran Prix racing has much older roots. Motor racing was introduced in France, and the first race took place in 1894. At first, countries competed against each other. These races were held in ordinary roads, from town to town. This was up until 1903, during the Paris to Madrid Road race, several people, both drivers and pedestrians, were killed and the race was stopped. From that moment motor races were held in closed circuits. In 1904 several French motor clubs created the Association Internationale des Automobile Clubs Reconnus (AIACR)

was introduced. Its name changed and it is now widely known as FIA. In 1922 the Commission Sportive Internationale (CSI) was empowered by the AIACR to regulate Grand Prix racing. Countries outside of France started hosting automobile races, from the U.S. to Italy, Belgium, Spain, and Britain. These races, that started becoming numerous, still were not part of a formal championship, they were a loose collection of races with different rules between each other. Just before World War I the first “formula” of rules was introduced: these included an engine size and maximum weight, but it was still not adopted globally. In 1928 these rules were abandoned temporarily, and racing events had almost no limitations, this era is known as Formula Libre. In these years, the number of races considered to have a Grand Prix status drastically increased: from five events in 1927, to eighteen in 1934. In the years before the Second World War many regulation changes occurred. In 1926, a first thought-out system, with flags and boards, giving drivers technical information during the race was introduced. And in 1933, at the Monaco Grand Prix, the grid was determined by a qualifying session for the first time. Until then the starting grid was given by a draw. Vehicles were painted in the international auto racing colours. They were blue for France, green for Britain, red for Italy, white for Germany, and yellow for Belgium². The French and the Italian cars shared the victories during the 20s, while in the 30s the Germans, pushed by a high sense of nationalism with the Nazi movement, started to win all but some races. The first automobile World Championship was introduced by the AIACR in 1925. At first it was a manufacturer only championship: which means that the drivers would race to earn points for their teams. The first Driver Championship, which was a European Championship, was instituted in 1931 and carried on until World War II. During the war Grand Prix were held only in America, especially in the southern countries. In 1947 the AIACR, which officially became FIA, announced the new International Formula, also known as Formula 1. By 1950 the FIA declared that they would link together several national Formula One Grand Prix to create a World Championship for drivers. During the following years many regulation changes took place, and many Grand Prix were added to the calendar. In 1958 the first Formula One constructors’ championship was introduced. And in the same year the length of races was reduced to 300 kilometres, which is the current format. The 1967 German Grand Prix marked the first F1 race broadcasted in colour. The following year the first sponsorship was made between Imperial Tobacco and Lotus. During these years aerodynamic downforce started influencing the design of F1 cars. The medical car was introduced in 1978. Its purpose was of following the cars during the first lap of the race to

² Rendall, Ivan (1995). *The Chequered Flag*. Weidenfeld and Nicolson. p. 26. ISBN 0-297-83550-5.

decrease the reaction time in case of accidents in the first lap. In the same year Bernie Ecclestone became the president of the Formula One Constructors' Association (FOCA)⁴. Ecclestone is widely regarded as the person who turned Formula One into the multibillion-dollar industry that it is today.

Many innovations were brought to F1 cars in the 1980s. The first electronic driver aids were introduced. Because of concerns that technology was influencing race results more than driver skill, many of these aids were banned for the 1994 season. They were reinstated in 2001 because they were used nonetheless, and it was difficult for the FIA to find the teams who did. Between 1984 and 2008 both championships were always won by Ferrari, McLaren, Williams or Renault. The safety car was introduced only in 1992. It intervened when accidents had occurred, and cars would queue up behind it at a low speed. After the 1994 San Marino Grand Prix, in which Roland Ratzenberger and Ayrton Senna lost their lives, many safety measures were taken. From that tragic Grand Prix only one more driver lost his life in a F1 car, Jules Bianchi in Japan in 2014. The halo was introduced in 2015 in motorsports, and it became mandatory in Formula One for the 2018 season⁵. It is a safety measure adopted by Formula One, consisting in a curved bar placed above the driver's head to protect it. During the years the Halo prevented many tragedies from happening. At first its introduction was controversial. Since its introduction, the Halo was criticized by many people, including drivers, for the look it gave Formula One cars, and for drastically reducing the level of danger in the sport, denaturalizing it. This changed from the moment it showed its crucial role during accidents. Many lives have been saved because of its adoption, and people who were sceptic have changed their minds. A visual representation of the importance of the Halo can be seen in Figure 3.

Formula One today stands as the pinnacle of motorsport. In recent times it also achieved a relatively high level of safety. Its goals are centred on sustainability, aiming to achieve a net zero carbon footprint by 2030, while enhancing fan experience and its global presence. It is a thriving sport with increasing viewership and high engagement⁶.

⁴ ESPN. "History of Formula One". Available at: <http://en.espn.co.uk/f1/motorsport/story/3836.html>. Accessed 27 April 2024.

⁵ Driving, "F1 Halo Explained". Available at: <https://www.driving.co.uk/news/motor-sport/f1-halo-explained/>. Accessed 28 May 2024.

⁶ Formula 1, "What is F1?". Available at: <https://www.formula1.com/en/page.what-is-f1.html>. Accessed 4 May 2024.

Figure 3: Utility of the Halo



Source: <https://techprincess.it/sistema-halo-f1/>

1.3 Sports event management

Sports event management involves the application of event management to the creation, development and execution of sports events. Management of this specific field encompasses a wide range of activities to ensure a smooth, efficient and impactful event for both participants and spectators. There are some key aspects that all managerial bodies must follow.

Planning represents the foundation for every successful event. A scrupulous and vigilant plan may result crucial for the correct event administration. It involves setting objectives for the event. These may vary according to the type of event. It may be maximizing attendance, promoting a sport, generating revenue or enhancing viewer experience. Planning involves the budgeting, scheduling and complying with legal requirements. It may seem the most abstract part of the event, but it is also the most crucial one. An incompetently and hasty plan lays the foundation for a poor event.

The organization part is a section which involves the operational tasks necessary for the correct carrying out of the event. It includes staffing, defining of roles and responsibilities, coordinating with third parties and ensuring everyone's alignment to the event's objective.

Logistics management is crucial. Its role is especially important for large-scale events. The details that logistics management encompasses vary from transportation, equipment setup, accommodation arrangements, and managing the ingress and egress of the crowd.

Marketing and promotion are fundamental for the events' finances. Attracting spectators and participants is one of the first goals of every event management. To do so they must be effectively marketed. Digital marketing, social media campaigns, and public relation efforts are only some of the main tools used by marketers. Sponsorship management is also a very

important aspect that falls under this category. Relationships with sponsors are cultivated to fund the event while providing value in return.

The day of the event everything must be kept under control, and the event schedule must be followed. If the planning part was properly managed any last-minute issues should be addressed without having to modify the original plan. A continued communication across different teams must be kept during all the event.

All the event managers must be prepared for potential risks during the entirety of the event. This includes implementing safety measures, emergency response plans, and insurance policies that may cover different risks varying from weather to security and health emergencies.

Progressively, people are expecting sports event managers to consider the environmental impact of their events. Managers should therefore ensure the correct implementation of many sustainable initiatives in their events.

After the event, managerial roles are not over. Activities such as cleaning up, putting everything back to place, returning equipment, paying vendors, and especially conducting debriefs to review the event. Management should involve also gathering feedback from participants and stakeholders to improve future events.

1.4 Importance of Sustainability in Sports Event Management

Sustainability in event management has become increasingly fundamental for many reasons. By implementing sustainable practices sports event managers can reduce the environmental impact of their event while also making profit.

The first aspect to consider when implementing sustainable practices is clearly the environmental impact of the event. Big sporting events can have a significant impact on the planet, including waste generation, high carbon emissions, from travel and venue operations, and a high level of resource consumption. By using renewable energy, enhancing waste management practices and promoting sustainable transportation options event managers help protecting ecosystems and reducing overall environmental footprint of their events.

The implementation of sustainable practices can lead to notable economic benefits. Efficient use of resources and energy can reduce costs. These practices may bring a good reputation for sustainability which can subsequently attract sponsors and partners. In the long term, sustainable practices contribute to the economic sustainability of the sports themselves by ensuring that the events remain attractive to sponsors, stakeholders and to countries.

Green practices may also ensure long-term viability of the sporting events. By promoting eco-friendly initiatives, organizers can help ensure a longer lifespan to their events bringing benefits also to the host location.

Today a big part of the market is environmentally conscious, therefore sustainability became a big part of brands images. Organizations which enhance sustainable values improve their reputation and build a good relationship with fans, participants and the community. This can lead to better brand recognition and a competitive advantage in the market.

To keep up with the strict environmental regulations, managers should incorporate sustainability practices ensuring compliance with local, national, and international laws. This approach may help preventing legal issues and fines.

Sports events are often global events, and being so important they have the power to influence large populations. Therefore, it is important for these organizations to set high standards for sustainability. Formula One is a good representation of this dynamic because of its global reach and influence on communities worldwide.

2. Principles and Practices of Formula One Grand Prix

Management

2.1 Organizational Structure and Management Contracts in F1

Liberty Media, a mass media company, finalized the acquisition of the Formula One Group in 2017 for US\$4.4 billion. As of 2024, Liberty Media owns three global motorsport businesses, Formula One, MotoGP and World Superbikes⁷. Mass media companies are organizations that produce and distribute content on a large scale. They have a global reach with different forms of communication. As the owner of the Formula One Group, Liberty Media plays several crucial roles in shaping the future of Formula One. From the moment of the acquisition, Liberty's key objective has been enhancing the global presence of the brand and expanding its business opportunities.

The F1 Group is a group of companies in charge of promoting the F1 world championship while exercising its commercial rights. The commercial rights of Formula One are controlled by Formula One World Championship Limited (FOWC). As the commercial rights holder, FOWC, negotiates the contracts for holding Formula One Grand Prix events⁸.

When talking about Formula One Grand Prix Management some distinctions must be made between Liberty Media, the Formula One Management (FOM), the Fédération Internationale de l'Automobile (FIA) and the Local Organizing Committee (LOC).

The FOM is the body responsible for the promotion and commercial aspects of the FIA Formula One World Championship. Its role is to handle media rights, sponsorships and the overall status of Formula One. The FOM's actions are significantly influenced by Liberty Media's goals and financial strategies. Liberty Media is also responsible for appointing the members of the FOM which better align with its strategic vision for the sport. Generally, the FOM takes decisions by itself following the strategic goals of Liberty Media, but for major financial decisions, involving large investments, expansions, or changes in the business model, an approval from Liberty Media is required.

The FIA is the governing body for many automobile events, including Formula One. It establishes the regulations and safety measures of the races.

⁷ Forbes. "Liberty Media Corporation Series A Liberty Formula One". Available at: <https://www.forbes.com/sites/greatspeculations/2021/03/25/liberty-media-corporation-series-a-liberty-formula-one>. Accessed 29 Mar. 2024.

⁸ Joe Saward, "Some Numbers from the F1 World", <https://joesaward.wordpress.com/2011/04/06/some-numbers-from-the-f1-world/>, accessed 26 May 2024.

The LOC operates during specific races, especially street races which involve local logistics, it cooperates with the FOM and the FIA.

Formula One Grand Prix management is one of the many big sporting events hosted around the world. Some events are classified as Mega Events if they fulfil four prerequisites, these are namely: i) to be of a fixed duration; to attract an extremely large number of people; iii) to appeal to large media outlets that broadcast the event globally; iv) and to create direct inward investment in the host country in the form of ne infrastructure, economic growth and urban renewal⁹. Formula One Grand Prix events tick out all these prerequisites.

Many aspects must be considered when planning a Formula One Grand Prix. Hosting mega events entails positive and negative repercussions that the hosting country must evaluate.

The main goal for the events of these proportions is clearly to attract tourism. These visitors generate a significant economic impact, which would also support local businesses. These events also bring temporary or permanent employment opportunities to locals. Another positive is that a country which has hosted mega events already will attract new stakeholders to host new ones.

These mega events may also have downsides such as a temporary increase in inflation. Hosting such events may bring to an increase in inflation which may raise the standard cost of living for residents. Tourists may not benefit from these events as well, trying to attend the Grand Prix but having to pay high prices for room and board.

Each Grand Prix has its race promoters or local organizing committees who agree on contracts with the FOM on the financial terms, duration and responsibilities of each party. To stay in the F1 calendar, Grand Prix events must receive the proposal to renew the contract from the FOM. These contracts entail fees that promoters must pay to the FOM besides commitments on attendance numbers and standards for track and facility conditions. Figure 4 shows some Grand Prix events' contracts, and how much race promoters pay F1 every year to stay in the calendar. Contracts are also agreed between the FOM and Racing Teams with sponsors. When made with teams, these contracts ensure the sponsors visibility with logo placements on cars, drivers' uniforms and on social media channels in exchange for economic adjustments. Whereas contacts made with the FOM give sponsors visibility through logos around the track, on various promotional materials and in the name of the Grand Prix event. Sponsors may be of different nature and size, the biggest are called main sponsors. Some examples of main sponsor for teams

⁹OpenAccess BCU, "Formula One Singapore Grand Prix Case Study"<https://www.openaccess.bcu.ac.uk/10088/1/Formula%20One%20Singapore%20Grand%20Prix%20Case%20Study%20%28RG%29.pdf>. Accessed 16 May 2024.

are HP for Ferrari that finance the Italian team with \$90 million per season¹⁰ Oracle for RedBull which generates \$100 million per season¹¹, and Petronas for Mercedes which pays the team \$75 million per season¹². Formula One itself has different main sponsors, these are present in every race and in official F1 websites. Some examples are Rolex, Heineken or Pirelli. Pirelli, rather than being just a sponsor, has been the exclusive tyre supplier of F1 since 2011.

Supplier contracts are agreements between FOM and Teams with Suppliers. These suppliers provide everything, from tyres and fuel to catering and hospitality services.

Another fundamental contract is the one between the FOM and Broadcasters. These contracts have a key role in the global success of Formula One. Contracts of this type, cover broadcast rights, fees, geographical coverage, exclusivity rights, and other technical specifications. Broadcasters may have various forms, the most common one is television networks, but they can also be cable channels or digital streaming platforms.

Contracts between F1 and the teams are the foundations of the sport. The teams, especially the most successful and historic ones, in this sense have the upper hand over F1, because their participation and commitment to the sport is crucial for the success of it. Therefore, agreements are always made to favour teams.

The most known agreement between teams, FOM and FIA is the Concorde Agreement. This contract covers aspects such as the terms under which teams compete, the distribution of television revenues and prize money, technical specifications, governance and regulatory compliance, and the commercial exploitation of the sport.

¹⁰ PlanetF1. "Staggering Financial Value of Ferrari HP Title Sponsor Deal Revealed". Available at: <https://www.planetf1.com/news/staggering-financial-value-of-ferrari-hp-title-sponsor-deal-revealed>. Accessed 11 May 2024.

¹¹ PlanetF1. "F1 Sponsorship Deals Value Teams". Available at: <https://www.planetf1.com/features/f1-sponsorship-deals-value-teams#:~:text=Red%20Bull%20%E2%80%93%20Oracle%20%E2%80>. Accessed 11 May 2024.

¹² Ibidem

Figure 4: Formula One Grand Prix Contracts

FORMULA 1 GRAND PRIX CONTRACTS			
COUNTRY	CIRCUIT	ESTIMATED ANNUAL AMOUNT (\$)	END OF CONTRACT
Great Britain	Silverstone	25 million	2024
Japan	Suzuka	25 million	2024
Italy	Monza	25 million	2025
Monaco	Monte Carlo	15 million	2025
Mexico	H. Rodriguez	25 million	2025
China	Shanghai	50 million	2025
Italy	Imola	20 million	2025
Belgium	Spa	22 million	2025
Netherlands	Zandvoort	32 million	2025
US	Austin	25 million	2026

Source: <https://racingnews365.com/f1-gp-contracts>

2.1 Management of Grand Prix events in regular circuits

Organizing Grand Prix in a regular racetrack involves logistics, planning and coordination. These circuits offer distinct advantages over street races in terms of control and management of the event. Many facilities are included in the circuit itself differently from street circuits, which are temporary installations.

Generally, a couple of months prior to the Grand Prix weekend some steps are followed for a correct planning and organization of the event.

The circuit requires regular maintenance, especially the track surface, which surface must be in optimal condition the weekend of the race. Infrastructures such as grandstands, pit buildings and hospitality areas must be maintained as well to keep with FIA's safety and operational standards.

Circuits must comply with the strict safety guidelines imposed by the FIA. This includes having sufficient runoff areas, regular barriers where needed, and up to date medical facilities. These guidelines also include the safety and health of workers and marshals at the circuit and during the event preparation.

Managing the arrival and setup of all the equipment necessary for the Grand Prix is another very important aspect. Coordination is needed for the logistics of moving this equipment around the world to different circuits.

During race weekends high-tech timing systems are required. They are crucial to analyse data and provide feedback. For qualifying and the race. To ensure functioning systems these must undergo regular testing and maintenance.

Ensuring that the racetrack is equipped with the necessary technology for global broadcasting is key. Firstly, the broadcast of Grand Prix brings to F1 the highest income out of all its sources. Selling media rights to television networks and streaming services generates significant income to support F1's operations, teams and the development of the sport. Through this visibility it manages to create an increasing fan engagement. Broadcasting channels increase the value of sponsorships. Sponsors must pay large sums of money to appear in a sport of this calibre and with such a large, diverse, and international viewership.

Event scheduling requires strategic planning. Organizing the schedule for practice sessions, qualifying and the race, along with additional races like F2 or F3, promotional races, or even fan interactions is important to keep the crowd entertained during the whole weekend.

Good spectator services are fundamental to improve customer experience. Some of the main services include parking and transport, this helps ensuring fast and easy access and egress to prevent bottlenecks. Providing food, beverages and enough toilet facilities is pivotal. It is fundamental to provide an adequate amount of food stands and toilet facilities with respect to the amount of people. An accurate proportion when planning must be made.

To further improve customer experience the LOC may think about organizing side attractions such as fan zones, leisure areas and live displays of the action around the circuit.

Relationships with sponsors may help the global expansion of the sport. Sponsor deals may include trackside advertising, event naming rights and may offer also VIP hospitality packages. The LOC must implement sustainable initiatives during Grand Prix weekends. In permanent racetracks the carbon footprint is substantially lower than street circuits which require construction and labour every year.

Usually, Grand Prix in permanent racetracks have a positive impact on the local community since they generally go back many years. Communities who live near the circuit are often involved in the events, they are passionate and extremely welcoming since sporting events of this type usually bring positive tourism.

2.2 Management of Grand Prix events in street circuits

Organizing a Grand Prix on street circuits presents numerous challenges respect to regular racetracks. These circuits are usually built in the heart of cities like Monte Carlo, Singapore, Baku and Jeddah. Public roads are turned into high-speed circuits, but to do so there is a huge work behind the scenes that not everybody knows.

The racetrack must be designed to ensure the safety of all people involved, drivers, spectators and marshals. It must meet the FIA standards of safety. Unlike permanent racetracks, street circuits require temporary grandstands, barriers, and pit facilities to be built. Also, road modifications may be necessary to ensure a flat surface for the race. This may involve removing traffic lights, lampposts, or traffic signs. Traffic management is a major issue during the Grand Prix, and to prevent disruption and severe traffic, detailed plans for road closures and deviations must be communicated in advance.

Safety measures are a crucial theme when organizing Grand Prix, especially in temporary venues such as street races. Usually in permanent racetracks there are medical wings and emergency exits with ambulances and helicopters always ready for any eventuality. Immediate access to emergency services is mandatory, and in congested city environments an instant response may be challenging. Also, safety measures for large crowds are more complex than regular races due to the proximity of the public and the urban environment, more comprehensive evacuation and emergency plans are required and security checks at entrance must be made.

Another important aspect of organizing street Grand Prix is the engagement of the local community. F1 must address all types of concerns from the locals, which may be related to noise, disruption and the economic impact of the event. If a verbal agreement cannot be found between the organization and locals for disruption and the disturbance, a compensation might be needed.

In crowded cities, where pollution and noise levels are already high it is important for the LOC to manage noise levels and environmental impact of the event. During these events the implementation of sustainable practices is critical. Use of environmentally friendly materials for temporary constructions, waste recycle, and use of water conservation measures are some of these practices.

When organizing street races, the LOC must conform with local regulations and must bear with many bureaucratic processes to gain the necessary permissions from city councils and the local government, unlike regular racetracks which are purpose-built and have permanent permissions.

Lately circuits, especially street circuits, are being meticulously reviewed in terms of fans enjoyment. In circuits like Monaco not many overtakes are made because of the design of the racetrack. The Monaco Grand Prix was one of the first circuits added to the calendar, it has a very significant role in the history of Formula One. Its track layout is known to be very narrow and in the past cars were remarkably smaller than today's ones. Overtakes could be made in

places in which today is impossible. Therefore, the race lacks overtakes and excitement. The Monaco Grand Prix nonetheless remains in the F1 calendar because of its importance and of the role it has for everyone inside the Formula One community. So, as stated before, new circuits are being thoroughly analysed, and the ones which may bring to boring races are not taken into consideration.

2.3 Adding new Grand Prix events to the calendar

When choosing a suitable location for a Grand Prix, many factors should be considered, such as the geographical location, the track design, adequate infrastructures, and local regulations.

The area in question needs to meet a few requirements to hold a Formula One Grand Prix. These are the appropriate off-track and on-track structures that are needed for events that require a high level of technical skill. general safety, both on and off the track, track conditions, sufficient medical services for emergencies, media centers and paddock areas, spectator areas, and regulatory compliances. The area also needs to have sufficient financial resources, human capital, and event-planning expertise to pay Formula One million of euros to arrange its presence in the calendar for the following year. The last requirement is to have a culture and passion for motorsports to draw crowds and encourage public support for a project of this magnitude. This last requisite is slowly disappearing since globalization brings fans to travel all around the world to attend a Grand Prix, and local fans are not required to fill stands and circuits.

The geographical location must be evaluated scrupulously because of eventual meteorological hazards. There have been cases in which races were cut off early because of storms and severe rain, such as the 2021 Belgium Grand Prix. In that case only a few laps were driven behind the safety car, so cars had to keep a slow pace. After it had been established it was too dangerous to have a race in these conditions the race ended, and half the regular points had been assigned to the top ten drivers which were the top ten from qualifying since no overtakes could be made behind the safety car. These cases are not very common since the calendar is organized to avoid these eventualities.

Facilities and transport for teams, spectators and media must be taken in account. The track must also meet the FIA's safety standards, this means that the circuit must have regular barriers, runoff areas, and medical facilities, as well as fan zone areas and regular stands which safety must be tested.

For such events, preparation begins months in advance to ensure safety and functionality.

2.4 Role of stakeholder management in event success

Formula One Grand Prix events are some of the most important events, and the role of stakeholders is key. It's important to identify, analyse and engage with the main stakeholders to align their interests with the event's goals.

Stakeholders have a direct impact on the planning, execution, and success of the event. There are different types of stakeholders in F1 Grand Prix events. Sponsorships support the event by funding and providing crucial resources, in exchange for promotional opportunities and brand exposure.

As FOM said in the Statement by the directors in performance of their statutory duties for the year ended 31 December 2021: "In addition to the company's parent and other fellow subsidiary companies of Formula 1, the directors consider the company's key stakeholders to be its employees; the Fédération Internationale de l'Automobile ("FIA") and F1's competing Teams; the Championship's race promoters and broadcasters; other key suppliers; Liberty; and the Group's external lenders"¹³.

As it is said in the statement, the FOM considers its employees as key stakeholders, giving them crucial importance by supporting and rewarding their development. Employees also receive comprehensive data and strategic guidance frequently. Employee engagement is furtherly emphasized by a periodic update of all employees' issues to the senior management.

The FIA and the competing teams strictly collaborate with the company's senior management. Regular meetings regarding technical, sporting, commercial and financial aspects are organized between Formula 1, the FIA and the teams.

Subjects of these meetings may vary as it is said in the statement: "Matters discussed during 2021 included the F1 Sprint format, the 2022 car, the future Formula 1 power unit, fully sustainable fuels, and the future regulatory, commercial and governance framework for the Championship, together with other ongoing sporting matters, including the impact of, and plans for mitigating, the continued risks arising from the coronavirus pandemic"¹⁴.

¹³ Formula One Management. "Statement by the directors for the year ended 31 December 2021", page 2. Available at: <https://corp.formula1.com/wp-content/uploads/2022/05/2021-FOM-S172-STATEMENT-2021-.pdf>. Accessed 12 May 2024.

¹⁴ Formula One Management. "Statement by the directors for the year ended 31 December 2021", page 3. Available at: <https://corp.formula1.com/wp-content/uploads/2022/05/2021-FOM-S172-STATEMENT-2021-.pdf>. Accessed 12 May 2024.

The F1 Sprint format was met positively by key stakeholders, as it increased action and excitement. Race promoters and broadcasters were positive because this new concept added value and brought new fans and visibility to the sport.

Race promoters address issues and challenges of their events regularly to management. The company also undertakes annual general meetings addressing strategies, operational plans and branding with the promoters.

Senior management engage with the company's other crucial suppliers via calls and meetings, although, when possible, they meet face to face during Grand Prix events to build strong relationships.

Directors and senior management have regular meetings with Liberty Media's executives, in which strategic and operational topics are discussed. Since Liberty Media is a US listed company, it has notable public reporting obligations, and being a material subsidiary, F1 is needs to fulfil regular reporting requirements to Liberty on a quarterly and annual basis.

In the statement, the importance of other stakeholders, such as fans and other commercial partners, is underlined.

Analysing past events may help organizers improve their implemented strategies and technologies in the future. It is important for organizers to deeply study past events to identify common risks and possible ones that may have not occurred but could in the future. It is crucial to measure the effectiveness of mitigation strategies used and for improving safety measures, emergency responses and risk management.

Each Grand Prix is different from the other, regulations may vary between different countries and practices applied in one may not work for another. Management practices vary also between regular circuits and street circuits, it is therefore important to analyse different Grand Prix events and recognizing the differences in strategies and procedures.

3. The numbers behind Formula One

Motorsports weekends, and especially Formula One Grand Prix events, require a meticulous planning alongside large investments. This section will analyse the data behind F1 Grand Prix events and report the main benefits and costs. The models of circular flows of incomes or work state that every effort made by one individual must be used by another, in economic terms, every cost. This brings up two crucial issues. Who finances Formula One races? Who gains from Formula One races?

3.1 Economic Impact and Financial Dynamics of Formula One Grand Prix Events

As Paulo Mourao states in “The Economics of Motorsports, the Case of Formula One” there are always three main groups of agents who pay for Formula One races: taxpayers, F1 fans, and sponsors, groups of local firms, companies and non-profit organizations¹⁵.

Regardless of the willingness of taxpayers, for regions in which F1 Gran Prix events are organized, they contribute to the financing of the race. The necessary fee to the FIA is paid by the national government which resources derive from taxpayers in the country. Formula One fans are one of the main sources of income. They finance this industry by acquiring tickets, food, drinks, merchandise and accommodation at the venue. Finally sponsors and local companies usually fund the remaining part of the event because of the expected dynamism of the local market. Opportunity costs must also be considered when acknowledging expenses for Formula One races. These costs appear when, for example ticket holders, do not consume goods or services provided by the event.

Mourao in 2017, together with Kesenne in 2005 and Cadima Ribeiro in 2004 suggested the main benefits from hosting Formula One races. These are direct tourism revenue, ticket revenues, TV right together with other broadcasting forms, branding and sponsorships, external effects such as museum visits or shopping expenses in local centres, creation of direct income such as catering, creation of indirect income, government tax returns on direct and indirect incomes, and pride shared with the local community¹⁶.

A common way to assess the economic impact of an event in a specific region is to measure the change in hotels’ revenues, occupancy rates and average rates paid by guests during the time of

¹⁵Mourão, Paulo. The Economics of Motorsports: The Case of Formula One. Palgrave Macmillan, 2017. Available at: <https://www.perlego.com/book/3501039>. Accessed: 22 May 2024.

¹⁶ Ibidem

the event. For the 2013 Austin Grand Prix, these indicators marked a US\$32 million revenue, a 97.8% occupancy rate and a mean of around US\$300 paid per guest. Considering that the USA is the home country of direct competitors of F1 such as NASCAR and Formula Indy, these are huge numbers. The US Grand Prix generated US\$900 million in economic impact to the Austin area in 2014 according to a study prepared by Greyhill Advisors¹⁷.

Based on Mourao's calculations found on reliable sources, promoters generally pay a mean of US\$45 million to host Grand Prix events. The only exception is for the Monaco Grand Prix, the second oldest Grand Prix in the F1 calendar. For this particular race, promoters do not pay any fees to the FIA. Official attendance numbers for the Monaco race have not been released since 2017, but it is believed that the Grand Prix attendance is around 200,000 people¹⁸. The average ticket is sold at around US\$764¹⁹, and considering no multimillion-dollar fee is paid to the FIA, the Monaco Grand Prix is one of the most profitable F1 event for its region. Races have also enormous impacts on the host countries. It is estimated that Monaco's GDP expands by around US\$110 million during race weeks. Monaco's population also quintuplicates during race weekends, boosting local activities which have the most profitable days during the Grand Prix. Due to COVID-19 the 2020 Monaco Grand Prix wasn't held, and Monaco's GDP suffered much higher losses than other hosting countries.

An analogue situation occurs for the Bahrain Grand Prix. The race hugely contributes to the economic wellbeing of the country, bringing an estimated amount of US\$100 million annually. The tourism hugely increases, it is shown by hotel occupancy rates which increase by almost 100% during the race period²⁰.

The Las Vegas Grand Prix, Formula One's latest addition to the calendar, has proved to be one of the most exciting and fructuous races. The race was often discussed during preparation stages. From traffic problems to initially high prices and stands which obscured the view of iconic landmarks. Despite the initial negativity the race was a huge success attracting 315,000 people to the circuit. During the aftermath of the event, Las Vegas and Clark County authorities released a comprehensive report which analyzes the economic impact of the Grand Prix.

¹⁷ Circuit of The Americas. "Study: Circuit of The Americas Annual Economic Benefit to Austin Area Is Close to \$900 Million." Available at: <https://circuitoftheamericas.com/blog/2014/10/28/study-circuit-of-the-americas-annual-economic-benefit-to-austin-area-is-close-to-900-million/>. Accessed 19 May 2024.

¹⁸ F1 Destinations. "Monaco Grand Prix: Need to Know". Available at: <https://f1destinations.com/monaco-grand-prix-need-to-know/>. Accessed 23 May 2024.

¹⁹ F1 Destinations. "2024 F1 Ticket Prices Ranked: China Cheapest, Vegas Most Expensive". Available at: <https://f1destinations.com/2024-f1-ticket-prices-ranked-china-cheapest-vegas-most-expensive/>. Accessed 20 May 2024.

²⁰ Etonomics. "Fueling Fortunes: The Economics of Formula One". Available at: <https://etonomics.com/2024/02/04/fueling-fortunes-the-economics-of-formula-one/>. Accessed 24 May 2024.

According to it, the economic impact amounted to US\$1.5 billion, including visitor spending of US\$884 million, the event generated US\$77 million, which is more than any other event organized in the city²¹.

Figure 5 reports the mean data from some Grand Prix events between the 2013 and 2015 seasons. The figure reports the costs and benefits race promoters have when organizing and hosting Grand Prix events. This table shows the two most expensive costs are the organization of races and the maintenance of circuits and related infrastructures. While the benefits deriving from broadcasting are null since the Formula One group receives them. It can be seen how two of the most profitable values are the direct tourism revenues and ticket sales. This shows how crucial fans are for every type of event.

This table does not consider the threat of the influence of black markets, which may influence revenues on ticket sales, broadcasting revenues and tax revenues. Considering the escalation Formula One had in recent years, these ten year old numbers are not reliable enough if we are searching for precise data, but they do give the idea of how expensive and profitable these mega events are²².

²¹ AS.com, "What was the economic impact of last year's Formula 1 race in Las Vegas?" Available at: <https://en.as.com/racing/what-was-the-economic-impact-of-last-years-formula-1-race-in-las-vegas-n/>. Accessed 17 May 2024.

²² Mourão, Paulo. *The Economics of Motorsports: The Case of Formula One*. Palgrave Macmillan, 2017. Available at: <https://www.perlego.com/book/3501039>. Accessed: 22 May 2024.

Figure 5: Balance of benefits and costs of a F1 race according to organizers
(Unit: Millions US\$)

COSTS		BENEFITS	
Fees and organization costs	40 (10)	Incremental direct tourism revenues	60 (12)
Renewal/maintenance of related infrastructure	45 (15)	External effects (other expenses made by fans)	0.5 (0.2)
Temporary staff	1.5 (0.4)	Ticket revenues	30 (10)
Opportunity costs, environmental costs and taxes/licenses	21 (3.2)	TV rights, trackside advertising and broadcasting	0
		Branding and other advertising	10 (5)
		Incremental direct income creation	7 (3)
		Indirect income creation	16.1 (8.2)
		Government tax returns on the previously created direct and indirect income: 30%	37.1 (8.5)
		Other tax revenues	6.1 (3.2)
		Government savings	0.2 (0.05)
Total Costs	107.5 (17)	Total Benefits	167 (20)

Source: Paulo Mourão, *The Economics of Motorsports: The Case of Formula One*, 2017, page 55

3.2 The Role of Sponsorships in Formula One Economics

Around 100 million people tune in to watch every Formula One race, making it the most popular motorsport in the world. Since the acquisition of Liberty Media in 2017, Formula One's value has doubled. But Formula One has not always been this popular, especially among youngsters. The Formula One Group was previously owned by Bernie Ecclestone, a failed racing driver who then bought the Brabham team and formed the Formula One Constructors Association (FOCA). Ecclestone became increasingly involved especially in negotiations for F1's television

rights. He then established the Formula One Promotions and Administration (FOPA), which consisted in the assignment of television revenues: 47% to the teams, 30% to the FIA, and 23% to the FOPA itself²³. Under Ecclestone's propriety Formula One has not reached the younger audience. In 2014, Bernie Ecclestone himself said: "I don't know why people want to get to the so-called 'young generation'. [...] Most of these kids haven't got any money. I'm not interested in tweets, Facebook and whatever this nonsense is. I'd rather get to the 70-year-old guy who's got plenty of cash." Viewership kept dropping until Liberty Media's acquisition. From the start, Liberty Media succeeded where Ecclestone failed. Younger generations wanted more involvement and wanted to get to know the drivers and their personalities. Therefore, social media strategies were created and for the first time fans got to see behind the scenes. This strategy proved to be successful, and for the next three years Formula One became the fastest growing sport²⁴.

This may also be attributed to the huge visibility it was given by the Netflix docuseries "Formula 1: Drive to Survive". The series brought drama and narrative to each race, following teams and drivers through weekends and reporting the internal dynamics. This initiative helped the sport in a delicate moment in which it was losing viewership because of the monotony of races dominated by Lewis Hamilton and Mercedes. Despite initial accusations from the F1 community arguing that the series did not depict the sport properly and created drama where there wasn't, the show gained popularity thanks to its ability to humanize drivers and relationships, and to the fact that it brought unseen facts that regular race broadcasts would not include. It is likely that the main reason for the 30% increase in viewership of F1 races between 2017 and 2021 is due to the Netflix show. In 2021, the number of users across the F1's website and app increased by 63%, which brought the number to around 113 million. Formula One generated a US\$2.5 billion revenue in 2022, which marked an increase of 17% from the previous year²⁵.

Considering that the Formula One circus moves to a different country every 1 or 2 weeks, leading to an audience of 2.1 billion people all around the world, sponsors are one of the main sources of income both for teams and for F1. The cost of F1 sponsorship deals may vary depending on the marketing benefits agreed and on the team. The main sponsors, or global

²³ F1 Chronicle. "Formula 1 Prize Money: How Much is the Prize Money in Formula 1?". Available at: <https://f1chronicle.com/formula-1-prize-money-how-much-is-the-prize-money-in-formula-1/>. Accessed 25 May 2024.

²⁴ GP Blog. "Liberty Media Revitalises Formula 1". Available at: <https://www.gpblog.com/en/news/167095/liberty-media-revitalises-formula-1.html>. Accessed 18 May 2024.

²⁵ Etonomics. "Fueling Fortunes: The Economics of Formula One". Available at: <https://etonomics.com/2024/02/04/fueling-fortunes-the-economics-of-formula-one/>. Accessed 24 May 2024.

partners, offer the most benefits, including high visibility of the logo on cars and uniforms, hospitality packages, media support, and PR stunts.

Brazil, Germany, Italy, UK, Netherlands being the top viewing markets according to Nielsen. Europe is the first market for TV audiences (66.7%), followed by Central and South America (22.1%), then Asia (5.1%), North America (3.4%), and finally Africa and the Middle East (2.8%). As per the same study, the average F1 viewer is 38 and they are 62% men and 38% women. a F1's audience is younger and more diverse compared to other major sports such as the English Football Premier League and the UEFA Champions League.

The cost of F1 sponsorship deals may vary depending on the marketing benefits agreed and on the team. The main sponsors, or global partners, offer the most benefits, including high visibility of the logo on cars and uniforms, hospitality packages, media support, and PR stunts.

Deals in this sports segment start from nothing under US\$1 million. Deals of this amount do not include much, exposure is limited, with close to no branding on cars and uniforms. The price essentially pays the right to call your brand a Formula One Sponsor, and the opportunity to exploit the team's fame, image and followers.

Sponsorships with a good amount of visibility and benefits usually cost around US\$5 million. While tier one deals might reach the US\$50 million mark, and sometimes also overtake it²⁶.

The concept is analogue for sponsors of Formula One race. Race events, in the same way as teams, require financial support from sponsorships. Sponsors pay race promoters to gain visibility during race weekends. The choice of which Grand Prix event to sponsor is not casual. Brands must carefully analyse and choose the Grand Prix which better aligns with the company's goals and values. For example, Heineken chose to sponsor both the Mexican and Las Vegas Grand Prix. Mexico is one of Heineken's key markets, with a significant consumer base. Because the Mexican Grand Prix is attended also by South Americans, Heineken exploits the exposure it gets by increasing its market share in Latin America. On the other side, Las Vegas is a globally recognized entertainment city. Sponsoring the Grand Prix allows Heineken to exploit Las Vegas' high-profile status and reach a wider audience. Heineken used this sponsorship. To launch its new product, Heineken Silver. Because of the huge visibility this event has, it is the perfect opportunity to launch a new product of an already well-known brand²⁷.

²⁶ RTR Sports Marketing, "Cost of Formula 1 Sponsorships." Available at: <https://rtrsports.com/en/blog/cost-formula-1-sponsorships/>. Accessed 17 May 2024.

²⁷ Formula 1, "Official Website." Available at: <https://www.formula1.com/>. Accessed 25 May 2024.

Sponsors are crucial for Formula One, they provide the financial resources for teams and races to keep performing at the highest possible levels. At the same time the sponsors' firms need teams and races for their global visibility and to the exposure they are granted. The relationship between F1 and its sponsors is key for the sport's growth and success.

4. Sustainable Development in Formula One

4.1 Importance of Sustainability in Formula One

Sustainability is becoming a crucial aspect in various sectors due to its role in addressing environmental concerns, promoting social responsibility, and ensuring economic viability to future generations. The growing impacts of climate change, resource depletion, and the increased societal awareness of environmental issues are bringing firms to deploy increased sustainable practices. These measures help reduce the environmental footprint of activities, foster innovation in resource efficiency, and enhance the reputation of the firms committed to sustainability.

When planning a sports event, the implementation of green initiatives has become extremely important due to the scale and visibility of such events. Major sports events generally involve a significant use of resources, including energy, water, and materials. Adopting waste management measures and reducing emissions makes a real difference in the economy of the event. Ensuring events are accessible to all, promoting healthy lifestyles, engaging local communities, using resources efficiently, creating job opportunities and including local businesses in the events are only some of the many possible steps an event manager can take to promote sustainability.

Formula One, like many other global organizations, has a significant environmental impact. Some of the main sources of its carbon emissions derive from logistics, event infrastructure, race operations and fan travel. Formula One, being one of the most renowned global sports in the world, has a significant responsibility in leading by example in sustainability. The FIA, together with the FOM have initiated many sustainable practices. The main one is to achieve a Net Zero Carbon Footprint by 2030. Others are making all the F1 events sustainable, advancing technologies by making cars and engines more sustainable, and lastly promoting environmental conscious awareness and partnerships.

The importance of sustainability is gradually increasing, and the role of firms as big as Formula One is crucial. Formula One especially, being a business who operates all around the world, with more than 20 races each year, and having operated for almost 80 years now, needs to embrace sustainability not only by addressing environmental impacts of its events and technologies but also by changing global business environments and consumer attitudes, ensuring the sport's long-term viability in an environmentally conscious world.

When asked about the future prospects of the sport, Chase Carey, Chairmen and CEO of F1, said: "In launching F1's first-ever sustainability strategy, we recognise the critical role that all

organisations must play in tackling this global issue. By leveraging the immense talent, passion and drive for innovation held by all members of the F1 community, we hope to make a significant positive impact on the environment and communities in which we operate. The actions we are putting in place from today will reduce our carbon footprint and ensure we are net zero carbon by 2030²⁸.”

4.1 Integration of Sustainability in Formula One

Formula One is deeply committed to sustainability and being at the forefront of automotive innovation it feels the responsibility to develop and showcase its commitment to eco-friendly practices. Nonetheless, Formula One never had a good reputation among ecologists up until 2010. In 2007, estimates recognized that each car was responsible for around 8.5 tonnes of CO₂ per season²⁹. However, it was then evaluated by the Trucost Report³⁰ that only 0.3% of Formula One’s emissions came from racing and testing the cars, and that the two biggest contributors to the sport’s carbon footprint were the electricity used to power computers and wind tunnels in F1 teams’ facilities, and the production and supply of raw materials and equipment to the team³¹.

In 2019 Liberty Media undertook an investigation to enquire the sport’s carbon footprint over an entire season, approximately 256.000 tonnes of CO₂e were generated³².

In recent years Formula One has introduced many notable sustainable initiatives and goals. Its main target is to reach 2030 with a net zero carbon footprint. As it is stated in the 2023 Formula 1 Impact Report³³, this very challenging objective includes the Formula 1 Group, all 10 F1 teams, race promoters, logistics and service providers, and key suppliers such as tyre manufacturers and Paddock catering. It plans to do so by implementing practices that encompass all aspects of F1’s operations: from the emissions produced by cars to the carbon footprint of the entire event organization and travel. This goal includes a comprehensive carbon

²⁸ Formula 1. "Formula 1 announces plan to be Net Zero Carbon by 2030". Available at: <https://www.formula1.com/en/latest/article.formula-1-announces-plan-to-be-net-zero-carbon-by-2030.51aX2AZHy7jqxl6wra6CZ.html>. Accessed 29 May 2024.

²⁹ Ornstein, D. "Formula 1 testing in Barcelona, day two as it happened". BBC Sport, 9 March 2011. Available at: <https://www.bbc.com/sport/formula1/12676804>. Accessed 30 May 2024.

³⁰ TRUCOST, "FOTA Environment Programme Baseline Report." Formula One Teams Association, Geneva, 2011. Available at: <http://www.f1fanatic.co.uk/wp-content/uploads/2010/06/FOTA-EnvironmentProgramme-Baseline-Report-2010.pdf>. Accessed on 30 May 2024.

³¹ MDPI. "Sustainability in Formula 1: A Baseline Report". Available at: <https://www.mdpi.com/2071-1050/10/6/1841>. Accessed 25 May 2024.

³² Ross, A. "Environmental Impact of Formula One". Available at: https://www.esru.strath.ac.uk/Documents/MSc_2020/Ross.pdf. Accessed 25 May 2024.

³³ Formula One. "2023 Formula 1 Impact Report". Available at: <https://corp.formula1.com/wp-content/uploads/2024/04/Formula-1-2023-Impact-Report.pdf>. Accessed 17 May 2024.

offsetting program where residual emissions will be counterbalanced by projects that remove an equivalent amount of CO₂ from the atmosphere, generally by reforestation and carbon capture initiatives.

In 2022 F1’s carbon footprint was 223,031 tCO₂e, this marked a 13% reduction compared to the baseline year in 2018. The data on the carbon emissions of 2022 is reported in Figure 7. One of the largest carbon footprints is left by the F1 calendar. In 2019 the calendar lacked efficiency as European races were not held consecutively, which would have ensured road transportation between them, reducing air and sea emissions. For the European races teams generally use road freight to reach venues. To calculate the potential CO₂e emissions assumptions are made on the possible routes taken by each teams’ trucks. Figure 6 shows the 2019 road freight distances and the estimated CO₂e emissions of road transport³⁴.

Figure 6: 2019 Road Freight Distances and Carbon Emissions

Road Freight Journey	Distance (km)	Road Freight Journey	WTW CO ₂ e (tonne) per truck
Spain - Monaco	686	Spain - Monaco	1.94
France - Austria	1130	France - Austria	3.20
Austria - UK	1579	Austria - UK	4.47
UK - Germany	580	UK - Germany	1.64
Germany - Hungary	953	Germany - Hungary	2.70
Hungary - Belgium	1219	Hungary - Belgium	3.45
Belgium - Italy	765	Belgium - Italy	2.16

Source: https://www.esru.strath.ac.uk/Documents/MSc_2020/Ross.pdf

If for example every team utilizes 30 trucks for road transport between European venues, the total CO₂e emissions produced by road freight would be around 5867.46 tonnes. With the estimated air freight and sea freight emissions, the 2019 F1’s logistics produced a total of 78.459 tonnes of CO₂e³⁵.

In 2023 F1 focused on reducing the amount of kit and people who travel, on changing the mode of travel, and especially on reducing the distance travelled. In 2024 the calendar has been changed to improve logistics and to reduce the kilometres travelled. The Japan Grand Prix has been moved to April while the Azerbaijan and Qatar Grand Prix have been moved to respectively to September and December. In this way the first part of the season is concentrated in the Middle East, Asia and Australia. The second part is in Europe with some exceptions in Miami and Canada. The third part of the season is in America and finally the last is in the

³⁴ Ross, A. "Environmental Impact of Formula One". Available at: https://www.esru.strath.ac.uk/Documents/MSc_2020/Ross.pdf. Accessed 30 May 2024.

³⁵ Ibidem

Middle East with races in Qatar and in the UAE. This calendar could still be improved but it offers a better alternative to the past in which races were not arranged in geographical areas.

One of the most impactful sustainable practices is the implementation of sustainable fuel. In 2023, all Formula 2 and Formula 3 cars trialed a 55% sustainable fuel³⁶. All F1 teams will be required to power their cars with 100% sustainable fuels by 2026. The graph shows that the fuel used by cars corresponds only to the 1% of F1's total carbon footprint. The fuel will be carbon neutral, meaning that the same amount of carbon used to produce that fuel will be the same as the carbon emitted by the engine. This new fuel developed by F1 can be used in regular road cars without alterations, and it may represent a valid sustainable alternative for everyone. This fuel is created from a combination of genuine waste sources, such as agricultural residues, or food waste, and non-food bio sources, which are crops specifically grown for biofuel production.

In 2023, eighteen trucks, powered by biofuel, travelled more than 10.000 kilometers between European races transporting tons of crucial freight each time. Since 49% of Formula One's carbon footprint derives from logistics, especially from transportation of cars, equipment and tires, the implementation of eco-friendly fuel has become crucial. Because of this new fuel, in 2023 the carbon emissions related to transport of these eighteen trucks were reduced by an average of 83% with respect to the traditional ones. Formula One aims to expand the use of this biofuel to all trucks and mode of transport in the F1 calendar.

As it is reported in the pie chart, event operations are responsible for 12% of Formula One's carbon footprint. This has been the only category in which carbon emissions increased. This is due to more events, every year more races are added to the calendar, to an increase in size of the events, they tend to get bigger each year, and finally to improved data quality, which means that as time goes by measuring tools get more precise.

Depending on the venue and requirements, Grand Prix are powered by on-site renewables, energy sources from the grid, and temporary generators.

An innovative low-carbon energy generation technology was tested during the Austrian Grand Prix in 2023. Crucial areas of the Paddock, Pit Lane, and F1 broadcast areas were powered by this new technology. Since Formula One, F1 teams, and the FIA carry their own generators to races, both the transportation of the generators to the circuit and their actual use result in carbon emissions. Emissions would drastically drop if a sustainable centralized system used renewable

³⁶ Formula 1. "Formula 1 announces plan to be Net Zero Carbon by 2030". Available at: <https://www.formula1.com/en/latest/article.formula-1-announces-plan-to-be-net-zero-carbon-by-2030.5laX2AZHy7jqxl6wra6CZ.html>. Accessed 29 May 2024.

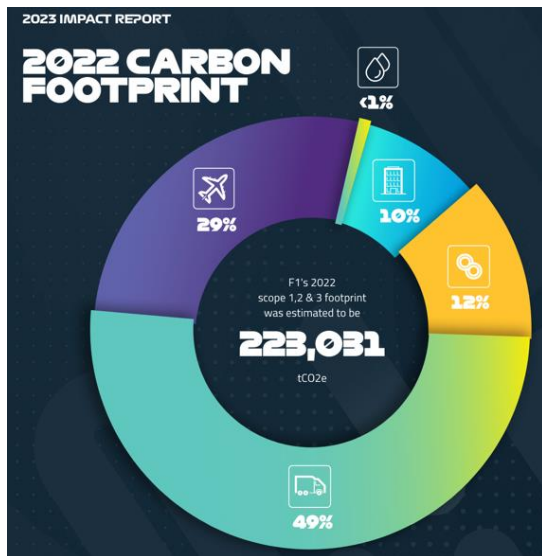
energy. The Austrian Grand Prix in 2023 provides evidence. In comparison to data from the 2022 Grand Prix, F1 was able to minimize carbon emissions in the previously mentioned locations by almost 90% during the race weekend. This energy system is powered by a hydrotreated vegetable oil biofuel and 600m² of solar panels. The solar panels were located on the racetrack, on the infield of the final turn. These provided an estimated 2.5MWh of energy during the event.

Paddock Clubs are spaces which provide fans with an exclusive race-watching experience in a premium environment. Fan Zones are areas at a Grand Prix event where fans can interactively engage with the sport through workshops, driver appearances, merchandise and interactive games.

More sustainable initiatives are being introduced in both zones. All the unnecessary equipment is getting removed. Solutions to reduce the weight of the equipment are being explored. Reusable textile-based panels are now being used at Paddock Clubs in place of conventional walls. In 2023, the Paddock Club's interior design was also changed. Succulents and trees from the area were used in place of single-use flowers. Fan Zones' kits are now stored in hubs in Europe, UAE, and USA, meaning equipment needed for races in these regions can be provided more locally reducing the distance travelled. All Fan Zone assets are now shipped via sea freight or road freight, which are more carbon efficient ways than air freight.

In 2023, Formula One retained its FIA Three-Star Environmental Accreditation, which is the highest honor awarded by the sport's governing body for environmental sustainability. Achieving these types of recognitions and environmental standards benefits all stakeholders, including teams, fans, sponsors, and local communities, aligning with Stakeholder Theory's focus on creating value for all parties involved.

Figure 7: 2022 Carbon Footprint Pie Chart



Source: <https://corp.formula1.com/wp-content/uploads/2024/04/Formula-1-2023-Impact-Report.pdf>

4.2 Sustainable events: practices and outcomes

Formula One is committed to sustainability and its initiatives prove it. It aims to leave a positive impact wherever the events take place. In this segment race promoters have a crucial task of delivering F1's commitment to sustainability. FOM and race promoters work closely and come up with eco-friendly plans to implement during race weekends.

These plans may be of different nature and involve different aspects. Some may be reducing single-use plastic through reusable cups and ensuring recycling streams are functioning properly, promoting the use of public transport, bicycles or other carbon friendly ways to get to the circuit, providing water refill areas, donating food to local communities and charities post-event, reporting carbon data annually for the event, and finally working together with the FOM to implement biofuel generators and solar panels in the circuits.

The 2023 F1's Impact Report³⁷ highlights some of the practical sustainable initiatives implemented by different F1 Grand Prix events during 2023. Some examples are the British Grand Prix in which the event was fully powered by green energy alternatives. For the event 2,764 solar panels were set up, and all temporary generators were propelled by biofuel which reduced CO2 emissions by 90%. For the Miami Grand Prix, a lottery was organized in which local restaurants entered and 14 local activities were selected to take part at the Grand Prix and sell their food. For the Mexico Grand Prix 60 dry toilets were set up as an alternative to regular

³⁷ Formula One. "2023 Formula 1 Impact Report". Available at: <https://corp.formula1.com/wp-content/uploads/2024/04/Formula-1-2023-Impact-Report.pdf>. Accessed 17 May 2024.

bathrooms, this saved an estimate of 44.166 litres of water during the race weekend. During the Dutch Grand Prix there has been a reduction on fuel consumption by approximately 80.000 litres, replacing it with HVO 100. This added to other sustainable initiatives brought to a decrease in the event's energy consumption of 94,5%. Finally, the Las Vegas Grand Prix, which has had its first edition in 2023, partnered with the local water authority and launched a water-saving system that captures vapour from the air and turns it into usable and drinkable water. Southern Nevada is in a federally declared state of drought. Water is the most precious natural resource in the region and the F1 community through the Las Vegas Grand Prix has the opportunity to help the community and lead by example. This system is being used in some dry areas of the world to create drinkable water. This project has proved to be successful during the race weekend and as the chair of the Board of Directors of the Southern Nevada Water Authority said: "This project has the potential to serve as a template for other events held in our community and reaffirming our collective commitment to water conservation in our destination"³⁸.

Fans have a key role in bringing plans and initiatives to life and improving the event's impact through their engagement. Most of the plans previously mentioned have an impact only if fans are engaged and adhere to the initiatives. Examples of green practices in which fans have an active role are refilling reusable water bottles, recycling waste in the appropriate bins and using reduced-carbon modes of transport.

Since Grand Prix events may be attended by hundreds of thousands of fans, fan travel is a critical aspect in terms of carbon emissions and impact on local communities. F1 is therefore taking action to provide fans greener ways to reach venues. Compared to the previous year, there has been a 15% rise in promoters offering more environmentally friendly means to get to the circuit in 2023. Several solutions have been found, including collaborating with the local government and public transportation providers, testing out new approaches like carpooling applications, starting walking campaigns, and providing essential infrastructure like shuttle buses, bike parking, and park and rides. The promotion of these activities is made through increased communication on how to get to the circuit with public transport, promotion of active travel messaging on F1's broadcast, incentives such as discounts on public transport when purchasing Grand Prix tickets, or joint campaigns with race promoters and F1 to increase the use of public transportation³⁹.

³⁸ Ibidem

³⁹ Ibidem

During the 2023 season, F1 launched its Green Champions campaign. It consists in on-site staff whose role is to conduct audits at every Grand Prix. After each event these audits report their feedback to Formula One, and with the data collected sustainable plans of action are decided for the next race. To reduce travel requirements and personnel, these roles are assigned to employees who are already part of the traveling staff. These Green Champions supervise all sustainable matters during an F1 Grand Prix. Green Champions has been a successful concept which has benefitted F1's sustainable plans and enhanced its engagement with the community and fans over sustainability issues. This success has attracted other businesses to implement Green Champions for their functions in the future⁴⁰.

4.3 Economic Impact of Sustainable Practices in Formula One

Grand Prix events provide economic and social benefits to a region. Due to the number of fans attending every Grand Prix, Formula One has an economic, social and environmental responsibility towards the community. Therefore, Formula One has set important sustainable goals and has undertaken many green initiatives. But what expenses and earnings has this led to?

For the development of sustainable fuel F1 has made a significant investment in collaboration with the FIA and fuel partners such as Aramco. Although this initial investment may be large, the long-term savings from reduced reliance on increasingly expensive fossil fuels could be substantial. These sustainable fuels are known to be highly efficient. This may reduce overall fuel consumption, which translates to cost savings.

Remote broadcasting is a particularly impactful initiative when reducing carbon emissions. By implementing remote broadcasting operations logistical expenses were reduced by 34% and eliminated almost 70 tonnes of freight each race⁴¹.

The transition to renewable energy sources for F1 offices and events has decreased energy costs. Grand Prix events like the Spanish race in the Circuit de Catalunya generate 100% of their electricity through renewable sources, which reduce energy expenses significantly.

The promotion of environmentally friendly modes of transport may bring different economic benefits to F1. Encouraging fans to use public transport, bicycles, or walking reduces the need for parking facilities. Lower car usage decreases the need for security and traffic management staff. Fewer cars lead to less air pollution, which consequently reduces the costs related to

⁴⁰ Ibidem

⁴¹ Ibidem

mitigation measures required to address pollution. By partnering with local public transport and providing discounts for event attending fans, ticket sales may increase⁴².

Green initiatives enhance the public perception of F1 as an environmentally friendly organization. This status may boost fan loyalty and lead to higher ticket sales, merchandise revenue and viewership. It may also attract new environmentally conscious fans who were not familiar with Formula One, therefore expanding the business' market.

By adhering to sustainability standards and implementing green practices, F1 avoids potential fines or sanctions. Governments may also provide incentives, subsidies and benefits for adopting such initiatives, these may include discounts in implementation costs.

Sustainable initiatives may also create jobs for locals and boost local economies through fans who visit local bars, restaurants and shops.

The main source of income provided by the implementation of sustainable practices are sponsorships. Companies are more eager to partner with an environmentally conscious brand. Especially companies with strong environmental credentials are more likely to engage with F1. For example, DHL, which is the official logistics partner of F1, partnered with Formula One and developed biofuel-powered trucks. For DHL, this partnership provided global exposure, brand enhancement and opportunities for innovation. For F1, DHL helped to provide efficient logistics, support its sustainability goals and offer cost savings⁴³.

⁴² Ibidem

⁴³ Ibidem

5. Conclusions and Recommendations

Formula One Grand Prix events contribute substantially to local economies. They boost tourism, create new jobs, and favour the development of new infrastructure. As previously reported, F1 races generate hundreds of millions of dollars in revenue.

F1 is a flourishing sport also because of its diverse revenue streams including race promotion fees, broadcasting rights, sponsorships, and merchandising. Race promoters benefit from organizing F1 races as well, especially through the sale of tickets. Furthermore, it is notable the commitment of the sport to green practices, its goal to achieve a net-zero carbon footprint by 2030 is admirable and it shows a strong dedication to sustainability. All of F1's initiatives are crucial for the achievement of its goal, from the sustainable fuel development to energy-efficient technologies and logistics optimization. Sponsorship deals with companies with sustainable commitments such as Aramco and DHL reflect F1's devotion to environmental responsibility.

It is difficult to find some recommendations to make to a multi-billion business, but some may be for example the adoption of comprehensive sustainability plans for every race; all circuits and teams should continue investing in renewable energy sources; diversify the sponsorship portfolio by including more companies committed to sustainability; optimize operational costs by implementing cost-saving measures such as efficient logistics and solving the black market issue; keep engaging fans as it is doing and encouraging them to take greener initiatives with discounted tickets; enhance fan experience through technology by implementing digital platforms and augmented reality; provide content that educates and engages fans about the sport's sustainability commitment; continue to invest in R&D for sustainable technologies that may be used both for Formula One and in general, as they did for the sustainable fuel; establish a transparent reporting system for the economic impact and sustainability efforts, these reports should update fans and investors on F1's future plans and progress towards its goals; and finally conduct regular audits of sustainability initiatives and financial operations to ensure compliance and improvement.

In conclusion, effective event management practices are key for the success and sustainability of F1 races. Meticulous planning and execution ensure a smooth run of the event, from logistics and infrastructure to fan engagement and race excitement. Formula One perfectly manages to integrate sustainable practices to this mechanism without altering the nature of the sport. By continuously investing and harvesting these green technologies F1 can lead as example in how huge events and high-performance sports can coexist with environmental responsibility.

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