

SUSTAINABILITY STRATEGIES OF THE FÉDÉRATION INTERNATIONALE DE L'AUTOMOBILE: INTEGRATING THE SUSTAINABLE DEVELOPMENT GOAL INTO FORMULA 1

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Abstract. This study examines the strategies adopted by the Fédération Internationale de l'Automobile (FIA) in implementing the United Nations Sustainable Development Goals (SDGs) framework through Formula 1 racing. As one of the most influential non-governmental organizations (NGOs) in global motorsport, the FIA has integrated sustainability principles into its operational and advocacy activities. Using the Social Purpose NGO Framework by Teegen, Doh, and Vachani, this research analyzes the FIA's dual approach—operational strategies focused on environmental management and advocacy strategies aimed at public awareness and policy engagement. The study employs a qualitative descriptive method based on secondary data from FIA reports, environmental strategy documents, and previous research from 2019 to 2023. The findings reveal that the FIA's operational strategies include the transition to renewable energy, the use of biofuels, water conservation initiatives, waste reduction programs, and reforestation projects around race circuits. Meanwhile, its advocacy strategies involve public campaigns, partnerships with organizations such as Ocean Cleanup and UNEP, and initiatives like #WeRaceAsOne to promote climate action and gender equality in motorsport. Collectively, these efforts align with eight priority SDGs, including clean energy, responsible consumption, climate action, and partnerships for the goals. The study concludes that the FIA's sustainability agenda demonstrates how international sports organizations can act as catalysts for global environmental awareness and sustainable innovation..

Keywords: FIA; Formula 1; Sustainable Development Goals; environmental strategy; corporate sustainability

I. INTRODUCTION

In the 21st century, sustainability has become one of the most urgent global challenges confronting governments, corporations, and international organizations. The ongoing climate crisis, resource depletion, and social inequality have prompted global actors to redefine their roles in achieving long-term sustainable development [1]. To address these multidimensional issues, the United Nations (UN) established the Sustainable Development Goals (SDGs) in 2015, comprising 17 goals and 169 targets designed to eradicate poverty, protect the planet, and ensure prosperity for all by 2030 [2]. The SDGs represent an integrated global framework that emphasizes economic growth, environmental protection, and social inclusion as the three interdependent pillars of sustainability [3]. Since the adoption of the SDGs, various stakeholders including non-governmental organizations (NGOs), international institutions, and private sectors have been mobilized to contribute to this global agenda [4]. Among these actors, the Fédération Internationale de l'Automobile (FIA) plays a distinctive role as both a global sports federation and an environmental advocate. As the governing body of major motorsport events, including Formula 1 (F1), the FIA has

faced increasing scrutiny regarding its environmental footprint due to the high carbon emissions generated by global racing activities [5]. However, instead of being solely a contributor to pollution, the FIA has positioned itself as a catalyst for sustainability by aligning its strategies with the SDGs through technological innovation, advocacy, and collaborative partnerships [6].

The environmental impact of international sporting events such as resource consumption, waste generation, and carbon emissions has become a growing concern among scholars and policymakers [7]. Yet, sport also possesses the transformative power to promote sustainable behavior, influence public awareness, and drive innovation [8]. In this regard, Formula 1, the FIA's flagship racing championship, serves as a global platform to demonstrate that high-performance sports and environmental sustainability can coexist through technological innovation and responsible governance [9]. To strengthen its commitment, the FIA joined the UN Framework Convention on Climate Change (UNFCCC) Sports for Climate Action Framework in 2019, pledging to achieve net zero carbon emissions by 2030 [10]. The FIA's Environmental Strategy 2020–2030 integrates sustainability principles into its sporting operations,

emphasizing responsible energy use, waste management, and community engagement [11]. This strategic approach not only aligns with the UN SDGs specifically Goals 6 (Clean Water and Sanitation), 7 (Affordable and Clean Energy), 11 (Sustainable Cities and Communities), 12 (Responsible Consumption and Production), 13 (Climate Action), 14 (Life Below Water), 15 (Life on Land), and 17 (Partnerships for the Goals) but also redefines how sports organizations can serve as non-state actors in global environmental governance [12].

The FIA's initiatives include transitioning to biofuels and renewable energy sources, reducing single-use plastics, and implementing reforestation and biodiversity conservation programs around race circuits [13]. Furthermore, advocacy campaigns such as #WeRaceAsOne and collaborations with organizations like The Ocean Cleanup demonstrate how the FIA uses its global influence to raise public awareness on sustainability issues [14]. These actions exemplify the dual role of the FIA as both an operational NGO, implementing practical environmental solutions, and an advocacy NGO, mobilizing stakeholders to adopt sustainable practices within and beyond the motorsport industry [15].

The involvement of NGOs in global sustainability efforts has been well-documented since the post-Cold War era. NGOs have evolved into critical actors that bridge the gap between government policies, corporate practices, and public engagement [16]. As defined by Teegen, Doh, and Vachani (2004), NGOs operate either through operational mechanisms implementing programs that directly contribute to development or advocacy mechanisms promoting awareness and influencing policy at local and international levels [17]. Within this framework, the FIA's sustainability approach in Formula 1 reflects a hybrid NGO model, integrating operational actions (e.g., renewable energy projects) with advocacy efforts (e.g., sustainability education and partnerships).

Recent studies highlight the growing importance of environmental governance in international sports organizations. Andrews and Kim note that sports governing bodies can significantly influence environmental awareness by implementing transparent and sustainable management practices [18]. Likewise, Hoppe and Kleinen-von Königsłow emphasize that sports events serve as powerful communication platforms to engage audiences on global sustainability narratives [19]. Thus, the FIA's sustainability agenda through Formula 1 represents an innovative form of environmental diplomacy combining spectacle, technology, and global reach to advance the UN's sustainable development vision.

Given these dynamics, this study aims to analyze the strategies of the Fédération Internationale de l'Automobile (FIA) in supporting the SDGs through Formula 1, using Teegen, Doh, and Vachani's NGO framework. It focuses on how the FIA operationalizes sustainability principles through both operational (technological and environmental initiatives) and advocacy (awareness and partnership) strategies. The study contributes to understanding the role of international sports organizations as non-state actors in achieving the SDGs, providing insight into how global sporting industries can be transformed into vehicles of sustainable development.

Non-Governmental Organizations (NGOs) and Global Governance

Non-Governmental Organizations (NGOs) play a crucial role in the evolving architecture of global governance, particularly in promoting the Sustainable Development Goals (SDGs). NGOs function as non-state actors that operate independently of government control, often bridging the gap between policy formulation and on-the-ground implementation [20]. As Lewis and Kanji (2020) note, NGOs have become critical intermediaries that connect local communities with international institutions, facilitating the diffusion of global norms into local practices [4]. The theoretical foundation for NGO behavior in global governance was articulated by Teegen, Doh, and Vachani (2004), who classified NGOs into two main categories: operational NGOs and advocacy NGOs [15].

Operational NGOs directly implement development programs and deliver services to communities.

Advocacy NGOs, on the other hand, seek to influence public policy, corporate behavior, and international cooperation through lobbying, awareness campaigns, and strategic communication. In the context of this study, the FIA's dual approach embodies both categories—operational (through sustainability programs such as carbon reduction and biofuel innovation) and advocacy (through partnerships, education, and public campaigns on sustainable mobility). This hybrid role illustrates how sports-based organizations can contribute to the SDGs as policy entrepreneurs within global environmental governance [21].

Theoretical Framework: Operational and Advocacy Roles of NGOs

The Teegen et al. framework has been widely applied to analyze how NGOs navigate the balance between advocacy and implementation in sustainability efforts. Operational NGOs focus on delivering tangible outcomes, such as renewable energy programs or social initiatives, whereas advocacy NGOs mobilize stakeholders and public opinion to promote behavioral change [15], [22]. According to Hudson, effective NGOs often integrate both dimensions, ensuring that their advocacy campaigns are grounded in evidence from their operational fieldwork [17]. This hybrid model allows organizations like the FIA to strengthen legitimacy, increase stakeholder engagement, and demonstrate accountability in global initiatives [23].

The FIA's Environmental Strategy 2020–2030, for instance, operationalizes sustainability through concrete programs such as energy-efficient engines, reduced carbon logistics, and sustainable race management. Simultaneously, the FIA engages in advocacy by aligning with the UNFCCC Sports for Climate Action Framework, thus amplifying environmental awareness on a global scale [10], [11].

This dual strategy exemplifies multi-level governance, where international organizations, national governments, and private actors collaborate to pursue sustainability objectives [24].

Sports as a Medium for Sustainable Development

Sports have increasingly been recognized as a catalyst for sustainable development and social transformation. The UNESCO Kazan Action Plan identifies sport as a key enabler for achieving several SDGs, emphasizing its potential to promote health, inclusion, and environmental awareness [25].

According to Andrews and Kim sports organizations possess a unique capacity to reach mass audiences, making them powerful tools for advocacy and behavioral change in sustainability practices [18]. Furthermore, Hoppe and Kleinen-von KönigsLöw highlight that sports media coverage often amplifies environmental messages, transforming spectator events into platforms for global environmental diplomacy [19].

In the case of Formula 1, the sport's global visibility reaching over 1.5 billion viewers annually provides a significant opportunity for sustainability education and public engagement [26]. Through initiatives like #WeRaceAsOne, the FIA leverages motorsport's emotional and technological appeal to advocate for diversity, inclusivity, and environmental responsibility [14].

Scholars such as Grix and Carmichael (2022) argue that the intersection between sport and sustainability forms a symbiotic relationship: sport depends on environmental resources, and in turn, it can serve as a platform to advocate for their preservation [8].

Formula 1 and the Environmental Transition

Formula 1 has historically faced criticism for its environmental impact, particularly concerning fuel consumption and carbon emissions. However, the FIA has transformed this challenge into an opportunity for innovation. As part of its Net Zero 2030 agenda, the FIA and Formula 1 have committed to using 100% sustainable fuels and reducing logistical emissions through hybrid and electric technologies [27].

According to the Formula 1 Sustainability Progress Report over 80% of F1 teams now utilize renewable energy within their facilities, demonstrating tangible progress in aligning with SDG 7 (Affordable and Clean Energy) and SDG 13 (Climate Action) [13]. Moreover, the FIA's environmental management policies have inspired other sporting federations, positioning Formula 1 as a global laboratory for sustainable innovation [28].

This evolution reflects what Hall (2021) calls the "green reorientation" of global sports, wherein technological innovation becomes both a competitive and moral imperative [9]. Thus, Formula 1 not only serves as a commercial enterprise but also as a symbolic instrument of ecological modernization, promoting the integration of sustainability into high-performance industries.

FIA's Contribution to the SDGs

The FIA's contributions align with multiple SDGs, but its most direct impact relates to:

Goal 7: Promoting energy efficiency and renewable fuel technology.

Goal 9: Supporting innovation in sustainable mobility and automotive engineering.

Goal 12: Encouraging responsible production and consumption within event logistics.

Goal 13: Advancing climate action through carbon reduction and offset programs.

Goal 17: Strengthening partnerships for sustainable development through cross-sector collaboration.

These efforts correspond with Carreira et al. who emphasize that integrating environmental, social, and economic objectives within organizational strategy is essential

for genuine sustainability [12]. The FIA's initiatives—spanning renewable fuels, waste reduction, and community education—demonstrate how sports governance can embody corporate social responsibility (CSR) in practice [29]. By functioning simultaneously as an operational and advocacy NGO, the FIA provides a replicable model for other international sports federations seeking to contribute meaningfully to the SDGs while maintaining economic and entertainment value.

Based on the reviewed literature, this study applies the Teegen, Doh, and Vachani (2004) NGO Framework as its conceptual foundation. The model examines how the FIA acts as: An Operational NGO, implementing sustainability practices through technological innovation, energy transition, and eco-efficient management; and An Advocacy NGO, influencing public perception, government policy, and industry standards through campaigns, partnerships, and education initiatives. This framework allows for a multidimensional analysis of the FIA's strategic alignment with the SDGs, highlighting how sports institutions can transform from high-emission organizations into agents of global sustainability governance..

II. RESEARCH METHOD

This study employs a qualitative descriptive research design aimed at analyzing the strategies of the Fédération Internationale de l'Automobile (FIA) in supporting the Sustainable Development Goals (SDGs) through its Formula 1 initiatives. The qualitative approach enables the researcher to interpret complex social and institutional phenomena within their real-world context, emphasizing meaning, processes, and interactions rather than numerical data [30]. According to Creswell and Poth (2021), qualitative descriptive research is appropriate for studies seeking to explore the "how" and "why" of organizational behavior, particularly in policy and governance contexts [31]. This approach was chosen because the study examines how the FIA integrates sustainability principles within its operational and advocacy strategies—an area that requires contextual and interpretive understanding.

The focus of this research is to analyze how the FIA functions as both an operational and advocacy NGO, applying sustainability initiatives that align with the UN Sustainable Development Goals (SDGs). Specifically, the study explores:

The operational strategies implemented by the FIA through environmental programs, technological innovation, and energy transition in Formula 1; and The advocacy strategies conducted by the FIA through public awareness campaigns, partnerships, and education programs promoting sustainability in motorsport. This dual analysis is grounded in Teegen, Doh, and Vachani's (2004) NGO framework, which distinguishes between operational and advocacy roles in international development governance [22].

The research uses qualitative data derived primarily from secondary sources, which were triangulated to ensure credibility and validity [32]. Data sources include: Official documents and reports: FIA sustainability reports (2020–2023), Formula 1 Sustainability Progress Reports, and UNFCCC Sports for Climate Action Framework documents. Scholarly

publications and journal articles: peer-reviewed studies on sports governance, sustainability management, and NGO theory. Official websites and press releases: from FIA, Formula 1, and partner organizations such as the United Nations and The Ocean Cleanup. Media coverage and expert commentaries: to capture public narratives and stakeholder perceptions surrounding FIA's environmental initiatives [33]. The use of multiple data sources strengthens the data triangulation process, allowing the researcher to compare information from official and independent perspectives [34].

Data collection was conducted through document analysis and semi-structured interviews. Document Analysis involved systematically reviewing FIA's sustainability policies, strategic plans, and environmental performance reports to identify key themes and initiatives supporting the SDGs [35]. Semi-structured Interviews were conducted with three experts in the fields of sports management, environmental governance, and international relations. Interviews focused on evaluating the FIA's dual role as an operational and advocacy actor within global sustainability governance [36]. Interview transcripts and document findings were coded manually using thematic categorization to extract recurring concepts and patterns.

Data analysis followed Miles, Huberman, and Saldaña's (2020) three-step model: Data Reduction Identifying and organizing relevant information about FIA's sustainability activities. Data Display Structuring the data into analytical matrices based on the NGO framework (operational vs advocacy strategies). Conclusion Drawing and Verification Interpreting relationships between FIA initiatives and SDG objectives to formulate comprehensive insights [37]. The analysis emphasized pattern matching and theoretical replication, linking empirical findings to established frameworks of NGO engagement in global governance and sustainability diplomacy.

To ensure research credibility, this study applied triangulation, peer debriefing, and source validation: Triangulation combined multiple data types (reports, interviews, academic sources) to cross-check accuracy [38]. Peer debriefing involved consultation with two academic reviewers specializing in international relations and environmental policy. Source validation was achieved by comparing FIA's self-reported progress with independent assessments from organizations such as UNFCCC and Carbon Trust. These methods align with Lincoln and Guba's (1985) criteria of credibility, dependability, confirmability, and transferability, ensuring that findings are trustworthy and replicable across similar contexts [39].

III. RESULT AND DISCUSSION

The FIA is recognized as an NGO by the UN with special consultative status because the federation actively promotes the interests of road users, on issues such as safety, mobility, environment, and customer law (Federation Internationale de l'Automobile, n.d.). As an organization engaged in managing the world of motorsport and as an international non-governmental organization, the FIA's way of

supporting the achievement of the SDGs is by implementing sustainable strategies according to the SDGs points in the implementation of the motorsport World Championship events it oversees, one of which is Formula 1. The UN 2030 Agenda for Sustainable Development consists of 17 Sustainable Development Goals for 2030. These goals provide a common framework for organizations to explain how they plan to contribute to sustainable development. In December 2019, the FIA has signed the UNFCCC (United Nations Framework Convention on Climate Change) Sports for Climate Action framework. With this, the FIA commits to implementing sustainable strategies in the delivery of the motor racing events it regulates. Therefore, the FIA formulated a strategy to support the achievement of the SDGs, namely the FIA Environmental Strategy 2020-2030. From the 17 goals in the SDGs, the FIA has selected eight SDGs that are most suitable for FIA activities that will make a positive contribution to the environment (FIA Environment and Sustainability Commission, 2019). The eight SDGs are: (1) SDG 6: Clean Water and Sanitation; (2) SDG 7: Affordable and Clean Energy; (3) SDG 11: Sustainable Cities and Communities; (4) SDG 12: Responsible Consumption and Production; (5) SDG 13: Climate Action; (6) SDG 14: Life Below Water; (7) SDG 15: Life on Land; and (8) SDG 17: Partnership for the Goals (FIA Environment and Sustainability Commission, 2019).

According to Hildy Teegen, Jonathan P. Doh, and Sushil Vachani, NGOs can focus on operational efforts or advocacy efforts to achieve their goals (Teegen et al., 2004). Based on its activities, FIA can be classified as an NGO that undertakes both categories of efforts. This is because every activity carried out by FIA is a development-oriented activity or project. In addition, in the implementation of its projects, FIA seeks to implement values that will lead to goodness by increasing public awareness and knowledge of these values. In this section, it will be described how the strategies used by FIA as an NGO in supporting the achievement of the 8 SDGs are divided into two categories, namely operational strategies, and advocacy strategies through Formula 1 events.

FIA Operational Strategy

The operational strategy implemented by the FIA includes technological innovation, energy efficiency and social inclusion in the implementation of Formula 1 events which are based on eight selected SDGs and are implemented as an effort to achieve the eight goals. For example, the strategy implemented in the implementation of the 2023 Las Vegas Grand Prix. The Las Vegas Grand Prix launched a water conservation program as part of an effort to implement technologies that can reduce, and ultimately offset, outdoor water consumption in large-scale sporting events. This program aims to reduce the water footprint used for various needs in outdoor areas during the event, such as park management, cleaning and other needs that usually rely on large amounts of water. This initiative is an important step to reduce the environmental impact of major sporting events, which often have high consumption of natural resources. By adopting innovative water conservation technologies, Formula 1 seeks to lead the way in implementing sustainability solutions in the sports industry, while reducing its ecological footprint. This program contributes to the strategy to achieve SDGs 6, Clean

Water and Sanitation, because it supports sustainable water resource management and water conservation. By reducing water consumption at large events, the program contributes to more efficient and sustainable water management, which is part of the global goal of ensuring better access to clean water and sanitation.

The FIA is also making its first transition to more sustainable fuels in 2022. These fuels are designed to have a much lower environmental impact, made with a combination of biofuels and carbon-reducing technologies. This is part of the FIA and Formula 1's target to achieve net zero carbon by 2030. An example of this is the 2023 Formula 1 British Grand Prix at Silverstone (Formula One World Championship Limited, 2021). All the energy used during the event came from green energy sources. This is part of an effort to make Formula 1 more sustainable and environmentally friendly. This strategy includes several key steps. First, the installation of solar panels. A total of 2,746 solar panels were installed to generate electricity at the event site. These solar panels capture the sun's energy and convert it into electricity, which is used to support various energy needs during the race. These panels provide a renewable source of energy and reduce reliance on fossil fuels. By using energy from renewable sources such as solar panels, Formula 1 at Silverstone demonstrated how clean energy can be used on a large scale in sporting events and contribute to the achievement of SDG 7, Affordable and Clean Energy.

In addition to efforts to reduce emissions, the FIA has also tightened its waste management policy since 2022 and is expanding this in 2023 by implementing stricter management measures and sustainable infrastructure at circuits. This includes reducing the use of single-use plastics and increasing recycling efforts. For example, at the 2023 Dutch Grand Prix at Zandvoort, the FIA is working with the circuit to implement a zero-single-use plastic policy, replacing plastic with recyclable materials. The circuit will also have specially designed waste bins to separate organic, plastic and paper waste. This strategy demonstrates the FIA's contribution to achieving SDGs 11 (Sustainable Cities and Communities) and SDG 12 (Responsible Consumption and Production) by reducing waste and the environmental impact of Formula 1 events.

Secondly, at the 2023 British Grand Prix all temporary generators at the Silverstone circuit will be powered by HVO (Hydrotreated Vegetable Oil) fuel. HVO is a fuel made from vegetable oil that has been chemically processed to reduce carbon emissions. This fuel provides a cleaner alternative to traditional diesel, which is commonly used in generators. The use of solar panels and HVO fuel significantly reduces the carbon footprint of the event, contributing to SDG 13 (Climate Action) by reducing greenhouse gas emissions and supporting action on climate change. In addition, at the Bahrain International Circuit between the 2022 and 2023 Grand Prix seasons, a solar farm will generate 5.28 megawatts (MW) of clean energy. This renewable energy is more than enough to meet the entire electricity needs of the circuit during a Formula 1 event, with a significant amount of capacity left over. This means that not only can Formula 1 operate entirely on clean energy at the circuit, but there is also excess energy that can be used for other needs. The use of these solar panels is a major step towards sustainability, reducing reliance on fossil fuel

energy sources, and helping Formula 1 reduce its carbon footprint at racing events.

The FIA is also working to reduce the use of single-use plastics on the circuit to avoid pollution that could end up in the ocean ecosystem. For example, at the 2023 Dutch Grand Prix, the FIA is implementing a "zero single-use plastic" policy that encourages the use of environmentally friendly alternatives such as recyclable or reusable containers. This strategy has an impact on achieving SDGs 14 (Life Below Water) because reducing single-use plastics helps reduce plastic pollution in the ocean, which is very detrimental to marine life. Plastic is a major threat to marine species because it can pollute the water and pose a danger to underwater life.

In some locations, Formula 1 works with local governments to restore ecosystems around circuits. For example, at the 2023 Miami Grand Prix, a native vegetation replanting program was carried out in the area around the circuit to protect and support the local ecosystem. By planting native plants, the program helps increase local biodiversity, improve soil quality, and prevent erosion. This strategy will have an impact on achieving SDGs 15 Life on Land because native vegetation restoration supports the recovery of terrestrial ecosystems and creates natural habitats for wildlife, increasing biodiversity and helping to preserve the surrounding environment.



Figure 1. DHL used Trucks Powered by HVO100
Source: (Formula 1, 2023a)

The introduction of a new fleet of trucks by Formula 1 and DHL as Official Logistics Partner has significantly reduced the carbon footprint of delivering racing equipment to events in Europe (DHL, 2023). These trucks use second-generation biofuel HVO100 (hydrotreated vegetable oil), which is produced from non-fossil sources, making it more environmentally friendly than traditional fossil-based fuels. Despite using renewable fuel, these trucks still maintain optimal performance in terms of payload capacity and range. These trucks are also equipped with a GPS system that allows real-time monitoring of fuel consumption and route optimization to improve travel efficiency. This technology helps reduce the number of emissions produced, while ensuring that the delivery of racing equipment remains efficient. This action is the FIA's contribution to achieving SDGs 17, Partnership for the Goals. This is because Formula 1's partnership with DHL creates effective collaboration between the sports sector and the logistics industry in developing more

environmentally friendly shipping solutions (DHL, 2022). Formula 1 also has a partnership with Champions of the Future. Champions of the Future is an international karting competition. This partnership has seen women's participation increase from 5% in 2023 to 25% by the start of the 2024 season.

FIA Advocacy Strategy

At the same time, the FIA also carries out its advocacy function by raising public awareness and conducting education through sustainability campaigns wrapped in a racing spectacle. The implementation of sustainability initiatives is not only aimed at Formula 1 racing event spectators, but also requires the participation and involvement of Formula 1 teams, race promoters, logistics service providers, key suppliers, such as tire manufacturers, and paddock operations. All parties involved in the implementation of this racing event work together to make progress in sustainability initiatives based on the SDGs in all Formula 1 racing events that currently reach 24 countries in the Formula 1 calendar (Formula One World Championship Limited, 2020).

In implementing its advocacy strategy, the FIA has created Formula 1 as a spectacle that educates spectators to improve cleaner and more environmentally friendly practices. In support of achieving SDGs 6, the FIA advocates for water management at each race and educates local organizers about the importance of stormwater recycling systems. An example is the Water Conservation Programme at the 2022 Las Vegas GP. Southern Nevada is in a federally declared drought. Water is the most valuable natural resource in the region and the Las Vegas Grand Prix has the platform and opportunity to respond to the pressing environmental challenges facing the community and be a leading example of positive change in its community through this racing event (Formula 1, 2024). In addition, the FIA at the 2023 Singapore Grand Prix also demonstrated its strategy in supporting SDGs 6 and 12 simultaneously by increasing the number of water refill stations which also contributed to its advocacy activities to encourage Formula 1 spectators to reduce the use of single-use plastic bottles and switch to reusable bottles (Formula 1 Singapore Grand Prix, 2023). In addition, the FIA at the 2023 Singapore Grand Prix is also working with local parties to educate and invite local Food and Beverages vendors to recycle used oil into B100 Biodiesel which can be used for more sustainable car fuel. Sebastian Vettel, a prominent figure in the realm of Formula One (F1), has been a vocal proponent of reducing plastic usage in the sport. The four-time world champion has been observed on multiple occasions clearing up discarded plastic bottles in the post-race TV pen. However, he believes that F1 should take additional measures to eliminate the use of plastic entirely..

The FIA has also set out several initiatives to reduce Formula 1's carbon footprint using renewable energy in racing events. The FIA encourages the use of biofuels and renewable energy generators to power circuits during racing events. As part of its sustainability initiatives, Formula 1 works with renewable energy suppliers to reduce its reliance on fossil fuels. For example, several racing events have begun integrating biofuel-based generators to replace conventional diesel generators. This approach is communicated by the FIA through sustainability campaigns to demonstrate how this new

technology can reduce carbon emissions without compromising performance during the event.



Figure 2. Drinking Water Refill Station at Singapore Grand Prix Source: (Formula 1, 2023b)

The FIA has also introduced the use of solar panels as an alternative power source for various needs on circuits, including lighting and operational systems. For example, at several circuits such as Abu Dhabi, Formula 1 has installed solar panels to reduce energy consumption from non-renewable sources. The FIA uses Formula 1 events to raise awareness of the importance of renewable energy. Through various initiatives implemented at circuits, the FIA promotes the adoption of green energy in the wider sporting sector, as well as encouraging fans to adopt environmentally friendly solutions in their everyday lives. For example, the introduction of biofuels and solar panels was publicized on Formula 1 platforms, both through social media coverage and sustainability reports, to attract attention and encourage fans and other industries to follow suit. Through this strategy, the FIA is not only protecting Formula 1 but also leading the change in the motorsport industry, introducing renewable energy as the new standard, and advocating for wider adoption of clean technologies.

In organizing Formula 1 events, fan travel is a very important aspect that has an impact on carbon emissions and people's daily lives (Motorsport Network, 2021). For this reason, the FIA has also taken steps to encourage spectators to use more environmentally friendly alternatives to watch Formula 1 events and as a strategy to support the achievement of SDGs 11. The FIA encourages spectators to use more environmentally friendly options, such as public transportation. To help increase awareness with spectators about more environmentally friendly options, the FIA is expanding communication on how to get to events using public transportation by promoting active travel messages on their world broadcasts. In addition, it also carries out joint campaigns with broadcasters, race promoters, and Formula 1 to increase the use of public transportation. Furthermore, with incentives such as public transportation discounts offered when purchasing Grand Prix tickets to encourage spectators to use public transportation. As well as preparing educational tools for fans to help calculate travel emissions and contribute to goals that encourage change towards more sustainability.

As one of the most popular motorsports, the FIA is leveraging Formula 1's popularity to spread awareness about climate change. Since 2022, Lewis Hamilton and Sebastian Vettel have been increasingly active in promoting sustainability and action against climate change through their platforms in Formula 1. Both often use their popularity to highlight environmental issues. Vettel, for example, organized a litter clean-up at Silverstone and built a "bee hotel" in Austria to raise awareness of environmental protection. Hamilton, on the other hand, has long been known as a supporter of electric vehicles and has called for drastic action to reduce carbon emissions in the sport. The FIA supports this campaign through the #WeRaceAsOne initiative, which includes measures to encourage Formula 1 fans to engage in environmental action. The campaign motivates individuals to reduce their personal carbon footprint, use public transport and switch to low-emission vehicle technology. The FIA also introduced a Sustainability Strategy, which aims to make Formula 1 carbon neutral by 2030. This approach includes not only advocacy by drivers, but also involving the fan community and industry. By supporting this policy, the FIA and Formula 1 demonstrate their commitment to SDG 13 (Climate Action) and SDG 17 (Partnership for the Goals), creating a sustainable ecosystem in motorsport. At the same time, Formula 1's partnership with Champions of the Future is also an advocacy activity as this program significantly increases the acceptance of women in motorsport and the awareness that women also have equal rights to be involved in motorsport.

The FIA also demonstrates concrete efforts in supporting the preservation of marine ecosystems at races on coastal circuits such as the Monaco GP. The FIA collaborates with conservation organizations such as The Ocean Cleanup to integrate marine protection initiatives into racing activities. One of the main focuses is to ensure that liquid waste from events does not pollute the ocean. This is done through regular inspections and the provision of environmentally friendly waste management facilities. In addition, the FIA encourages the use of biodegradable materials in the construction of temporary facilities in coastal areas to reduce the risk of plastic contamination and other non-degradable waste. The Monaco GP is also involved in Monaco Ocean Week, a platform that promotes innovative solutions to maintain the sustainability of marine ecosystems. At this event, various projects to mitigate plastic pollution, such as the use of alternative energy and environmentally friendly technologies for the maritime industry, are integrated with Formula 1's goals to support marine sustainability.

The FIA also initiated a reforestation project in the area surrounding the Spa-Francorchamps circuit in Belgium. In collaboration with local authorities, thousands of trees were planted to offset the carbon footprint of Formula 1 racing. The initiative was promoted as a concrete step towards reducing environmental impacts while improving biodiversity in the area. By making the project part of the FIA's sustainability agenda, advocacy was undertaken to demonstrate that sport can make a direct contribution to environmental conservation. The FIA strengthened its advocacy through collaboration with international environmental bodies such as UNEP. This initiative gave credibility to the FIA's commitment to

sustainability, while leveraging UNEP's global network to mobilize support at an international level. The FIA used the Formula 1 platform to raise global awareness of the importance of protecting terrestrial ecosystems. Through publicizing the reforestation and sustainability project on the official Formula 1 website, social media and media coverage during racing events, the FIA emphasized the message that environmental conservation is a shared responsibility.

IV. CONCLUSIONS

The Fédération Internationale de l'Automobile (FIA) strategy to support the Sustainable Development Goals (SDGs) through Formula 1 has included a series of key measures that combine operational strategies and advocacy strategies to ensure sustainability in various aspects. In terms of operational strategy, the FIA focuses on implementing technology-based solutions that directly reduce the environmental impact of racing activities. The use of renewable energy, such as solar panels and biofuels, at major Formula 1 circuits is a concrete example of this effort. For example, at the Austrian and British Grands Prix, the FIA has replaced fossil fuels with green energy, significantly reducing carbon emissions and utilizing solar panels to support the event's energy needs. Waste management is also a priority, with the FIA reducing single-use plastics and increasing recycling systems at each circuit, which is in line with Formula 1's commitment to reducing its carbon footprint and managing natural resources more efficiently. In addition, the FIA is also working to improve the sustainability of terrestrial ecosystems through reforestation projects around circuits, such as Spa-Francorchamps in Belgium, which involves planting thousands of trees to offset carbon emissions from the race. Infrastructure changes to minimize impacts on natural habitats are also an integral part of these operational efforts, demonstrating that sustainability can be integrated into the design and construction of sports facilities. Meanwhile, the FIA's advocacy strategy plays a key role in raising public awareness and building partnerships with various parties to support sustainability goals. The FIA plays a leading role in educating stakeholders on the importance of environmental conservation, both through public campaigns and through developing strategic relationships with global environmental organizations such as Ocean Cleanup. The FIA also actively promotes the use of environmentally friendly technologies, and advocates for the automotive sector and other event organizers to participate in sustainability efforts. By combining an operational strategy focused on reducing direct environmental impacts with an advocacy strategy aimed at raising global awareness and mobilizing change, the FIA not only contributes to the achievement of the SDGs but also positions Formula 1 as a positive role model in the sports industry. This holistic approach demonstrates how sport, often associated with environmental impacts, can transform into a force for positive change that supports sustainable development goals, both globally and locally

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