



Shell
Eco-marathon

WORLD
CHAMPIONSHIP
SERIES 2022

OFFICIAL RULES

CHAPTER III

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1. SHELL ECO-MARATHON WORLD CHAMPIONSHIP SERIES RULES

1A. GENERAL

ARTICLE 300: TERMS IN THIS DOCUMENT

World Championship Series:	Made up of three Regional Championships and one World Championship event.
Regional Championship:	Events for qualified Urban Concept teams participating in the Indianapolis, United States; Assen, Netherlands; and Indonesia (venue to be confirmed) Shell Eco-marathon Mini Events.
World Championship:	Global event for qualified Urban Concept teams from Regional Championship events.
Parc Fermé:	Secured area where competition vehicles are inspected and teams are not allowed to make modifications without approval.

ARTICLE 301: DEFINITION OF COMPETITION FOR THE REGIONAL CHAMPIONSHIP

The Shell Eco-marathon Regional Championship is a competition for the region's most energy-efficient Urban Concept teams to see who can match their energy efficiency with speed to make it across the finish line first and be crowned the Regional Champion. It also serves as a qualifying round for the Shell Eco-marathon World Championship.

- a) Competitors will be grouped into three energy categories: Battery Electric, Hydrogen Fuel Cell, and Internal Combustion Engine. The first, second, and third place team from each energy category will qualify based on their Mileage Challenge results (9 teams maximum).
- b) The Regional Championship will consist of a Mileage Challenge, and a Race.
- c) Each vehicle will be given a fixed amount of energy based on their Shell Eco-marathon Mileage Challenge performance.
- d) From a grid start, teams will race a predefined number of laps using their given energy allowance.
- e) The winner will be the first vehicle to cross the finish line of the Shell Eco-marathon Regional Championship. Teams who place 1 through 4 will qualify for the Shell Eco-marathon World Championship.

ARTICLE 302: DEFINITION OF COMPETITION FOR THE WORLD CHAMPIONSHIP

The Shell Eco-marathon World Championship is a competition for the world's most energy-efficient Urban Concept team.

- a) The World Championship will take place as a separate event from the Regional Shell Eco-marathon competitions. The top four teams from each of the Regional Championships will be invited to participate in the World Championship (12 vehicles maximum).

- b) The World Championship will consist of three components, a Mileage Challenge, Time Trial, and a Race.
- c) Participating teams will receive points for their placement in the Regional Championship Race, the Mileage Challenge, and the Time Trial.
- d) The total points will be used to select nine teams to participate in the World Championship Race and the grid starting position.
- e) For the World Championship Race:
 - A fixed amount of energy will be allocated to each vehicle based on their best mileage challenge result.
 - From a grid start, teams will race a predefined number of laps using their given energy allowance.
 - The Shell Eco-marathon World Championship winner will be the first vehicle to cross the finish line during the Shell Eco-marathon World Championship Race.

ARTICLE 303: DRIVER QUALIFICATIONS

Only registered drivers who have been approved during Technical Inspection can drive in the Shell Eco-marathon Regional and World Championship competitions.

ARTICLE 304: PRACTICE LAPS

There will be a designated practice session for teams that qualify for the Regional and World Championship. Drivers must NOT practice for the Regional and World Championship during the Shell Eco-marathon Mileage Challenge.

ARTICLE 305: FALSE STARTS

During the Regional Championship and World Championship Race, if a car moves before the start signal is given, the team will be penalised per discretion of the Organisers. Infringements will be signalled by the Race Marshalls.

ARTICLE 306: ADDITIONAL INFORMATION

The race distance, event schedule and a description of awards and prizes for the Regional Championship and World Championship will be provided by the Organisers prior to the event.

ARTICLE 307: CHAPTER I AND CHAPTER II RULES APPLY

Chapters I and II of the Shell Eco-marathon Official Rules all apply to the Regional Championship and World Championship.

ARTICLE 308: VEHICLE CLASS

The Regional Championship and World Championship are only open to Urban Concept vehicles.

ARTICLE 309: VEHICLE MODIFICATION

The same vehicle must be used in the Shell Eco-marathon Mileage Challenge, Regional Championship, and World Championship Race:

- a) Chassis and body must be identical.
- b) Powertrain can be repaired or modified but not be replaced, i.e. must have the same engine/motor.
- c) All modifications to the powertrain must be approved by the Organisers.

ARTICLE 310: ENERGY CATEGORIES

Teams must use the same energy category (including fuel type) used during the Shell Eco-marathon Mileage Challenge.

ARTICLE 311: NOT USED

1B. SAFETY

ARTICLE 312: MANDATORY BRIEFING

Attendance at briefings are mandatory for the Team Manager and Driver(s) of the participating teams. Only Drivers who attend the briefing can compete on track. If the Team Manager and Driver are not present at this briefing, the vehicle will be disqualified.

ARTICLE 313: NOT USED

ARTICLE 314: MAXIMUM TYRE PRESSURE

Tyre pressures must not exceed the maximum allowed tyre pressure stated by the tyre manufacturer.

ARTICLE 315: FUELLING

All fuelling operations must be performed by the Organisers.

1C. DRIVING RULES

ARTICLE 316: SPEED LIMIT

40 km/h is the maximum speed allowed on the track during practice and competitions. All teams must provide their driver with accurate speed information by speedometer display in the driver compartment.

Before the official winners are announced, there will be a delay while results are reviewed and confirmed by the Organisers. During this time, Organisers will review the recorded speeds for each vehicle during the race. Teams caught speeding may be disqualified.

ARTICLE 317: FLAGS

The following flags will be used during the competition:

- Green: Start
- Yellow: Danger on track, apply extra caution, reduce speed, and overtaking is not allowed
- Red: Stop immediately. Race Marshalls will take charge of Drivers and their vehicle

If a red flag occurs and the lead car has completed more than half the race distance, the current race classification counts as final.

ARTICLE 318: NON-STARTING VEHICLES

At the starting flag, Drivers have 20 seconds to start the vehicle. If the vehicle is not able to move after this time, the team will be disqualified, and the vehicle will be removed from the track by the Track Marshalls.

ARTICLE 319: DANGEROUS DRIVING IS NOT ALLOWED

- a) Drivers are not allowed to push another vehicle with their car.
- b) Overtaking will follow the same rules in Chapter I.
- c) Blocking another vehicle by changing track line is not allowed.
- d) If two vehicles arrive at the same time in a turn, each Driver must keep their line on track.

ID. TELEMETRY SYSTEM

The onboard computer and telemetry equipment will be installed prior to the Shell Eco-marathon Mileage Challenge and will also be used for the Regional and World Championship.

ARTICLE 320-322: NOT USED

ARTICLE 323: SPEED MEASUREMENT EQUIPMENT

The Organisers reserve the right to use track-based equipment and/or install additional telemetry equipment to measure speed during the Regional and World Championship.

ARTICLE 324: ELECTRICAL SHUTDOWN RELAY

For all participating vehicles, an electrical relay will be provided by the Organisers and must be installed by the teams. The relay will be controlled by the Shell Eco-marathon onboard computer. The relay will be wired into the vehicle electrical system so that the propulsion system will be disabled when the relay is activated.

ARTICLE 325: TECHNOLOGY EQUIPMENT INSTALLED

Participants are informed of the experimental nature of the proprietary technology installed in their vehicles by the Organisers. Teams accept the risk that using the technology may result in an invalid result or their vehicle not completing the Regional or World Championship.

2. REGIONAL CHAMPIONSHIP

ARTICLE 326: CRITERIA FOR PARTICIPATION

The Shell Eco-marathon Regional Championships will take place at the United States, Netherlands, and Indonesia Shell Eco-marathon events. Teams may participate by invitation only. The Organisers will issue a maximum of nine invitations per region. The invitations will be distributed by the Organisers as follows:

- a) Energy category rankings.
 - i. At each regional competition, Organisers will rank all valid attempts for each energy category for Urban Concept vehicles.
- b) Regional Championship invitations.
 - i. Regional Championship invitations will be issued to the top three teams in each energy category (Internal Combustion Engine, Battery Electric, Hydrogen Fuel Cell), for a maximum of nine teams. Refer to Article 301.
- c) Rules of Acceptance
 - i. All teams that receive Regional Championship invitations must return their signed invitation acceptance documents by hand to the Organisers within 15 minutes.

Accepting an invitation to the Regional Championship implies automatic acceptance to participate in the separate Shell Eco-marathon World Championship if the team qualifies.

ARTICLE 327: ENERGY ALLOCATION

For energy allocation, the Organisers will calculate the amount of energy required for each team to complete the Regional Championship distance based on their best attempt at the Shell Eco-marathon Mileage Challenge. This energy amount will be the team's energy allocation for the Regional Championship. If, at the end of the Mileage Challenge competition, there are at least 3 teams with valid runs in a given energy category, the first-place team will receive a 5% energy bonus to their energy allocation.

During the competition, when the energy allowance has been exhausted, the energy measurement and control system will disable the vehicle's propulsion system.

ARTICLE 328-329: NOT USED

ARTICLE 330: PARC FERMÉ

Vehicles must be present at the Parc Fermé at the date and time announced by the Organisers. Teams that are not present in the Parc Fermé will be disqualified.

An additional Technical Inspection will be performed on each vehicle when they enter the Parc Fermé. Both the Team Manager and Team Driver(s) must be present.

Once inside the Parc Fermé, teams wishing to make repairs or modifications to their vehicles must

receive approval from the Organisers.

Vehicles shall remain in the Parc Fermé until they are escorted to the start grid. Only two team members and one Driver can accompany the vehicle to the starting grid.

ARTICLE 331: STARTING GRID AND TRACK ACCESS

A maximum of two team members and one Driver may access the track. The Organisers will accompany the vehicle to and from the track. The Driver must be in their car while it is pushed by the two team members. One minute before the official start of the race, the two team members must exit the track.

ARTICLE 332: GRID POSITION FOR REGIONAL CHAMPIONSHIP

Position on the starting grid for the Regional Championship race will be based on a public, random drawing.

ARTICLE 333: REGIONAL CHAMPIONSHIP

The championship race is completed when the checkered flag is waved as the first vehicle crosses the finish line. If two or more vehicles cross the finish line at the same time, the winner will be the vehicle that started farthest from the start line. Once the checkered flag has been displayed, any team that crosses the finish line, regardless of the number laps completed, has officially completed the race.

1st through 9th place in the Regional Championship will be based on the number of completed laps and the order in which teams cross the finish line. If a team does not complete the required number of laps or does not cross the finish line, placement will be based on the total distance travelled. There will be a delay while results are reviewed and confirmed by the Organisers before the official winners are announced.

ARTICLE 334: PROTESTS DURING THE REGIONAL CHAMPIONSHIPS

Teams have 10 minutes after the end of the race to submit a protest to the Race Director. All decisions made by the Race Director and the Organisers are final and non-appealable.

ARTICLE 335: WEATHER/ENVIRONMENT

If the Regional Championship cannot take place, the Organisers will invite the teams to participate in the World Championship based on the Regional Mileage Challenge results.

3. WORLD CHAMPIONSHIP

ARTICLE 336: CRITERIA FOR PARTICIPATION

Only the maximum of four qualifying teams from each Regional Championship may participate in the Shell Eco-marathon World Championship.

At the time of publishing these rules, no decision has been made whether a World Championship will be possible in 2022 or not. The World Championship is planned to be held as a separate event. The location and timing of the World Championship will be announced in due course. If the event does take place, it will be as described in the following articles.

ARTICLE 337: IDENTIFICATION

Teams will receive a new set of official stickers before participating in the Shell Eco-marathon World Championship. The new stickers shall be fixed to the vehicle body before the vehicle is presented at Technical Inspection.

ARTICLE 338: WORLD CHAMPIONSHIP DESCRIPTION

The Shell Eco-marathon World Championship will consist of the following collective competitions:

- 1) World Championship Mileage Challenge
- 2) World Championship Time Trial
- 3) World Championship Race

Teams will receive points based on their performance in the Regional Championship, World Championship Mileage Challenge, and Time Trial. The total points will be used to determine which teams will participate in the World Championship Race and their respective grid positions.

ARTICLE 339: TENTATIVE PROGRAM

The World Championship will be conducted over three days. The programme will most likely be as follows:

Day 1 - Technical Inspection

Day 2 - Mileage Challenge

Day 3 - Time Trial, Practice & Race

ARTICLE 340: WORLD CHAMPIONSHIP MILEAGE CHALLENGE

The World Championship Mileage Challenge will be conducted as described in the Chapter I and II rules. Teams will be assigned points based on their World Championship Mileage Challenge ranking in their respective energy category.

Team mileage challenge results will be made available to the public and other teams at the closing of the World Championship Mileage Challenge.

ARTICLE 341: ENERGY ALLOCATION

The energy allocations for each team for both the Time Trial and the World Championship Race will be based on their best attempt at the World Championship Mileage Challenge.

ARTICLE 342: TIME TRIAL

During the Time Trial, teams will be allocated a limited amount of energy to complete a set number of laps on the Mileage Challenge track. The measured time will be recorded, and teams will receive points accordingly to their time ranking.

Speed limits will be enforced.

Teams are permitted two attempts. If a vehicle breaks down or runs out of energy that will count as an attempt. The best valid attempt will be used in the time ranking and associated points.

ARTICLE 343: POINT AWARDS

Teams will be awarded points based on the following:

REGIONAL CHAMPIONSHIP	
Ranking	Points
1	3
2	2
3	1
4	0

WORLD CHAMPIONSHIP MILEAGE CHALLENGE					
Mileage Challenge Ranking	<i>Points are based on the number of teams by energy category</i>				
	6 or more teams	5	4	3	2
1	18	18	18	18	18
2	15	14	13	11	9
3	12	10	8	6	
4	9	7	5		
5	6	4			
6	3				
7	0				
8	0				
9	0				

TIME TRIAL	
Ranking	Points
1	12
2	11
3	10
4	9
5	8
6	7
7	6
8	5
9	4
10	3
11	2
12	1

The total number of points awarded to a team is the sum of the points for the Regional Championship, the World Championship Mileage Challenge, and the Time Trial.

ARTICLE 344: QUALIFICATIONS FOR THE WORLD CHAMPIONSHIP RACE

The top nine teams with the highest number of points qualify for the World Championship Race.

Starting grid position will be based on total awarded points with the highest number receiving first grid position. In the event of a tie in total points, the team with the highest ranking in the Time Trial will break the tie.

ARTICLE 345: WORLD CHAMPIONSHIP RACE

The winner of the World Championship Race will be the first car to cross the finish line. If two or more vehicles cross the finish line at the same time, the winner will be determined based on the vehicle starting grid position that was farthest from the starting line.

Before the official winners are finalised, there will be a delay while results are reviewed and confirmed by the Organisers.

ARTICLE 346: PROTESTS DURING THE WORLD CHAMPIONSHIP RACE

The protest procedure will be the same as described in Article 334.

ARTICLE 347: WEATHER OR EVENT CANCELLATION

If a component of the Shell Eco-marathon World Championship cannot take place, the winners will be decided by the Organisers. If the entire Shell Eco-marathon World Championship is cancelled, there will be no winners. Please refer to Chapter I, Article 1 (c).