



# RACECARD

2019/2020 MICHELIN FORMULA-E



SATURDAY  
FEBRUARY 29

**ROUND 5**  
2019/2020 ABB  
FIA FORMULA E  
CHAMPIONSHIP

MARRAKESH  
MOROCCO



## MARRAKESH E-PRIX

4<sup>th</sup> RUNNING

The longest circuit  
of the season



2.971KM

**12**  
TURNS  
(5 RIGHT / 7 LEFT)

ANTICLOCKWISE

### THE CIRCUIT

The track visits parts of the Circuit International Moulay El Hassan and Avenue Mohammed VI  
The Circuit International Moulay El Hassan is a semi-permanent facility

### MARRAKESH E-PRIX WINNERS



2019

**Jérôme d'Ambrosio**  
(Mahindra Racing/Michelin)

2018

**Felix Rosenqvist**  
(Mahindra Racing/Michelin)

2016

**Sébastien Buemi**  
(Renault e.dams/Michelin)

TIMETABLE

FRIDAY, FEBRUARY 28	
2:10pm - 3:15pm	Shakedown
4:45pm - 5:30pm	Free Practice 1
SATURDAY, FEBRUARY 29	
9:00am - 9:30am	Free Practice 2
11:00am - 11:06am	Qualifying Group 1
11:10am - 11:16am	Qualifying Group 2
11:20am - 11:26am	Qualifying Group 3
11:30am - 11:36am	Qualifying Group 4
11:45am	Super Pole
3:04pm	Marrakesh E-Prix 45 minutes +1 lap
4:00pm	Podium ceremony

### THE 2019 RACE

**WINNER**  
**Jérôme d'Ambrosio**  
(Mahindra Racing), 31 laps



#### POLE POSITION

**Sam Bird**  
(Envision Virgin Racing),  
1min17.851s

#### FASTEST RACE LAP

**Lucas di Grassi**  
(Audi Sport Abt Schaeffler),  
1m20.296s

Victory for Jérôme d'Ambrosio, three years after his maiden Formula E success

BMW i Andretti Motorsport's Antonio Felix da Costa and Alexander Sims collided while leading



## THE MARRAKESH E-PRIX AND SUSTAINABLE MOBILITY

Morocco is Africa's number one nation in terms of renewable energy

Marrakesh hosted the Conference Of Parties (COP) in 2001 (COP7) and 2016 (COP22)



The Noor Power Station near Ouarzazate is the world's biggest solar plant. It was opened in 2017 and has a planned capacity of 1,600MW

The Tarfaya windfarm (131 turbines) generates more than 300MW, enough to supply a city like Marrakesh for a whole year

By 2030, it is expected that 52 percent of the electricity generated in Morocco will come from green sources

The Moroccan government has announced the imminent introduction of the first all-Moroccan electric car

## MICHELIN GREEN GUIDE

Discover Marrakesh, the Red City, thanks to the Michelin Green Guide Morocco and Michelin Weekend Green Guide Marrakesh/Essaouira.



## MICHELIN FACTOID



The recent Mexico City E-Prix saw Alexander Sims (BMW | Andretti Motorsport) become the 23<sup>rd</sup> driver to post a fastest race lap in Formula E on Michelin tyres. Daniel Abt (8) holds the record for the highest number of fastest race laps set.



**JÉRÔME MONDAIN**  
Formula E Programme Manager,  
Michelin Motorsport

## CONDITIONS USUALLY IMPROVE AS THE DAY

### PROGRESSES

"Last season, we had to cope with record low track temperatures for a Formula E e-prix, with 5°C for Free Practice 1. This year, the weather should be warmer, and perhaps even reasonably hot for the race. The anticlockwise circuit is the same as 2019 and features a number of long straights with mostly slow corners, except for

Turn 1 which offers good overtaking opportunities.

The track combines part of a permanent facility where the grip is quite good and ordinary roads where there isn't so much grip. The surface tends to be fairly dusty to begin with, but conditions usually improve as the day progresses."

## MICHELIN AND THE 2020 MARRAKESH E-PRIX

### MICHELIN PILOT SPORT



Developed specifically for the FIA Formula E Championship

The first 18-inch single-seater racing tyre

The first single-seater racing tyre capable of competing in dry and wet conditions

The first tyre capable of lasting an entire race meeting

<b>Size (front/rear)</b>	Front: 245/40 R 18 / Rear: 305/40 R 18
<b>Width (front/rear)</b>	245mm / 305mm
<b>Tread width (front/rear)</b>	240mm / 270mm
<b>Side wall height (front/rear)</b>	98mm / 122mm (i.e. 40 percent of tread width)
<b>Rim diameter</b>	18 inches
<b>Weight (front/rear)</b>	Front: 8kg / Rear: 10kg
<b>Type of tread pattern</b>	Asymmetric, non-directional
<b>Usage</b>	Circuits, street circuits, asphalt, concrete, wet or dry weather
<b>Number of tyres taken to each race</b>	192 (24 cars x 8 tyres)
<b>Weight saving per set of four tyres</b>	9kg for 4 tyres (season 6 vs season 1)
<b>Embedded Michelin tyre monitoring sensors (TMS)</b>	Automatic transmission of encrypted tyre pressure data







# MICHELIN PILOT SPORT

THE REVOLUTIONARY  
MICHELIN PILOT SPORT:  
LIGHTER AND MORE ENERGY-  
EFFICIENT THAN EVER

## A REVOLUTIONARY RACING TYRE, IN MORE WAYS THAN ONE!

Developed specifically for the world's first all-electric single-seater motor racing championship, the new MICHELIN Pilot Sport is an exceptionally versatile tyre that was designed by Michelin Motorsport's engineers to cover the entire race day (free practice, qualifying, race), whatever the weather, as required by the technical regulations that govern the series.

Another exceptional characteristic of the tyre is its size. The MICHELIN Pilot Sport was effectively the first ever single-seater tyre to feature an interior diameter of 18 inches, a disruptive concept put forward by Michelin Motorsport and approved by the FIA (Fédération Internationale Automobile). The fact that 18-inch wheels have become a common

feature of road cars enables Michelin Motorsport's engineers and chemists to carry over the lessons they learn on the racetrack to everyday tyres, in keeping with the firm's 'track to street' policy.

The MICHELIN Pilot Sport (front: 245/40 R 18 / rear: 305/40 R 18) is tall and narrow in the interests of energy efficiency, which equates to longer range. Its low sidewalls also flex less, resulting in the generation of less heat, which in turn means reduced energy consumption, a valuable benefit for Formula E's latest-generation 'Gen2' Spark SRT 05Es.

The MICHELIN Pilot Sport is a connected tyre, too, thanks to an embedded RFID chip which facilitates tracking, from production through to recycling.



## MICHELIN PILOT SPORT: THE WINNING TYRE RANGE



**FRONT**  
**Size**  
24/64-18 equivalent to 245/40 R 18  
**Side wall height**  
98mm



**Usage**  
Wet or dry weather  
**Type of tread pattern**  
Asymmetric, non-directional  
**Rim diameter**  
18 inches



**REAR**  
**Size**  
27/68-18 equivalent to 305/40 R 18  
**Side wall height**  
122mm

## FORMULA E: A LABORATORY FOR INNOVATIONS LIKE MICHELIN'S CONNECTED SOLUTIONS, TOO!

The 2019/2020 FIA Formula E Championship sees Michelin introduce Michelin Track Connect. This unprecedented technology uses a Michelin designed and developed sensor embedded in its Pilot Sport Formula E tyres to monitor pressures automatically, with no human intervention.

The data it collects is transmitted directly to the FIA in encrypted form. **While the system addresses a requirement of the championship's technical regulations, Formula E will also allow Michelin to:**

- Incubate and develop connected solutions in extreme conditions for the benefit of current and future Michelin Track Connect customers,
- Extend its expertise in the realm of data acquisition and analysis with a view to applying it to other fields and responding to consumer and market demand.

**Connected mobility technology fits perfectly with Groupe Michelin's approach to sustainable mobility.**

**MICHELIN TRACK CONNECT**



# ENTRY LIST MARRAKESH E-PRIX

## AUDI SPORT ABT SCHAEFFLER FORMULA E TEAM AUDI E-TRON FE06

CHAMPION  
2016/2017



**N°11 Lucas di GRASSI** (BRA)  
Starts: 62 Fasted race laps: 6  
Victories: 10 Podiums: 31  
Pole positions: 3



**N°66 Daniel ABT** (DEU)  
Starts: 62 Fasted race laps: 8  
Victories: 2 Podiums: 10  
Pole positions: 2



## ENVISION VIRGIN RACING AUDI E-TRON FE06



**N°2 Sam BIRD** (GBR)  
Starts: 62 Fasted race laps: 5  
Victories: 9 Podiums: 18  
Pole positions: 5



**N°4 Robin FRIJNS** (NLD)  
Starts: 39 Fasted race lap: 0  
Victories: 2 Podiums: 5  
Pole position: 0



## BMW I ANDRETTI MOTORSPORT MW IFE.20



**N°28 Max GÜNTHER** (DEU)  
Starts: 14 Fasted race lap: 0  
Victory: 1 Podium: 1  
Pole position: 0



**N°27 Alexander SIMS** (GBR)  
Starts: 17 Fasted race lap: 1  
Victory: 1 Podiums: 2  
Pole positions: 3



## GEOX DRAGON PENSKE EV-4

ROOKIE



**N°6 Brendon HARTLEY** (NZL)  
Starts: 4 Fasted race lap: 0  
Victory: 0 Podium: 0  
Pole position: 0



ROOKIE



**N°7 Nico MULLER** (CHE)  
Starts: 4 Fasted race lap: 0  
Victory: 0 Podium: 0  
Pole position: 0



## DS TECHEETAH DS E-TENSE FE20

CHAMPION  
2017/2018  
et 2018/2019



**N°25 Jean-Eric VERGNE** (FRA)  
Starts: 60 Fasted race laps: 4  
Victories: 8 Podiums: 20  
Pole positions: 9



**N°13 Antonio Felix DA COSTA** (PRT)  
Starts: 58 Fasted race laps: 2  
Victories: 2 Podiums: 7  
Pole position: 1



## MAHINDRA RACING MAHINDRA M6ELECTRO



**N°64 Jérôme D'AMBROSIO** (BEL)  
Starts: 62 Fasted race laps: 2  
Victories: 3 Podiums: 9  
Pole positions: 2



**N°94 Pascal WEHRLEIN** (DEU)  
Starts: 16 Fasted race laps: 2  
Victory: 0 Podium: 1  
Pole position: 1



# ENTRY LIST

## MARRAKESH E-PRIX

### MERCEDES-BENZ EQ FORMULA E TEAM

#### MERCEDES-BENZ EQ SILVER ARROW 01



**N°5 Stoffel VANDOORNE** (BEL)  
Starts: 17 Fasted race lap: 0  
Victory: 0 Podium: 3  
Pole position: 1



ROOKIE

**N°17 Nyck DE VRIES** (NED)  
Starts: 4 Fasted race lap: 0  
Victory: 0 Podium: 0  
Pole position: 0



### PANASONIC JAGUAR RACING

#### JAGUAR I-TYPE IV



**N°20 Mitch EVANS** (NZL)  
Starts: 41 Fasted race lap: 1  
Victories: 2 Podiums: 6  
Pole positions: 2



ROOKIE

**N°51 James CALADO** (GBR)  
Starts: 4 Fasted race lap: 0  
Victory: 0 Podium: 0  
Pole position: 0



### NIO 333 FE TEAM

#### NIO FE-005



**N°3 Oliver TURVEY** (GBR)  
Starts: 51 Fasted race lap: 0  
Victory: 0 Podium: 1  
Pole position: 1



ROOKIE

**N°33 Qing Hua MA** (CHN)  
Starts: 4 Fasted race lap: 0  
Victory: 0 Podium: 0  
Pole position: 0



### TAG HEUER PORSCHE FORMULA E TEAM

#### PORSCHE 99X ELECTRIC



**N°36 André LOTTERER** (DEU)  
Starts: 29 Fasted race laps: 3  
Victory: 0 Podiums: 5  
Pole positions: 2



**N°18 Neel JANI** (CHE)  
Starts: 6 Fasted race lap: 0  
Victory: 0 Podium: 0  
Pole position: 0



### NISSAN E.DAMS

#### NISSAN IMO2

CHAMPION  
2015/2016



**N°23 Sébastien BUEMI** (CHE)  
Starts: 60 Fasted race laps: 7  
Victories: 13 Podiums: 26  
Pole positions: 14



**N°22 Oliver ROWLAND** (GBR)  
Starts: 18 Fasted race lap: 1  
Victory: 0 Podiums: 2  
Pole positions: 3



### VENTURI RACING

#### MERCEDES-BENZ EQ SILVER ARROW 01



**N°19 Felipe MASSA** (BRA)  
Starts: 17 Fasted race lap: 0  
Victory: 0 Podium: 1  
Pole position: 0



**N°48 Edoardo MORTARA** (CHE)  
Starts: 26 Fasted race lap: 0  
Victory: 1 Podiums: 3  
Pole position: 0





# FIA FORMULA E

## DRIVERS' STANDINGS

			 SAU 22/11	 SAU 23/11	 CHL 18/01	 MEX 15/02	 MAR 29/02	 CHN 21/03	 ITA 04/04	 FRA 18/04	 KOR 03/05	 IDN 06/06	 DEU 21/06	 USA 11/07	 GBR 25/02	 GBR 26/02	TOTAL	
1	 <b>MITCH EVANS</b>		2	0	19	26												47
2	 <b>ALEXANDER SIMS</b>		7	28	0	11												46
3	 <b>ANTÓNIO FÉLIX DA COSTA</b>		0	3	18	18												39
4	 <b>STOFFEL VANDOORNE</b>		15	15	8	0												38
5	 <b>LUCAS DI GRASSI</b>		0	18	6	8												32
6	 <b>SAM BIRD</b>		26	0	2	0												28
7	 <b>OLIVER ROWLAND</b>		12	10	0	6												28
8	 <b>MAXIMILIAN GÜNTHER</b>		0	0	25	0												25
9	 <b>EDOARDO MORTARA</b>		6	12	0	4												22
10	 <b>ANDRÉ LOTTERER</b>		18	0	0	3												21
11	 <b>NYCK DE VRIES</b>		8	0	10	0												18
12	 <b>JEAN-ÉRIC VERGNE</b>		0	4	0	12												16
13	 <b>SÉBASTIEN BUEMI</b>		0	0	0	15												15
14	 <b>PASCAL WEHRLEIN</b>		0	0	12	2												14
15	 <b>ROBIN FRIJNS</b>		10	0	0	0												10
16	 <b>JAMES CALADO</b>		0	6	4	0												10
17	 <b>DANIEL ABT</b>		0	8	0	0												8
18	 <b>JÉRÔME D'AMBROSIO</b>		2	0	0	1												3
19	 <b>FELIPE MASSA</b>		0	0	2	0												2
20	 <b>BRENDON HARTLEY</b>		0	2	0	0												2
21	 <b>NICO MÜLLER</b>		0	0	0	0												0
22	 <b>OLIVER TURVEY</b>		0	0	0	0												0
23	 <b>NEEL JANI</b>		0	0	0	0												0
24	 <b>QING HUA MA</b>		0	0	0	0												0

# REGULATIONS

## 2019/2020 ABB FIA FORMULA E CHAMPIONSHIP

### CARS (SINGLE-SEATERS)

- » Spark STR-05e / chassis: Dallara / battery: McLaren Applied Technologies
- » Maximum length: 5,200mm
- » Maximum width: 1,800mm
- » Maximum height: 1,250mm
- » Minimum weight: 900kg, including driver and battery and/or capacitor (maximum: 280kg)
- » Maximum power, electric powertrain: 250kW (335hp) for free practice and qualifying, 200kW (270hp) during races.
- » Gearbox: six speeds maximum
- » Only 1 MGU may be used
- » Allocation per race number: 2 electric motors, 2 gearboxes, 2 inverters and 1 battery pack for the season

### TYRES

- » A single type of tyre (pattern and construction)
- » No mid-race tyre changes
- » Allocation of 4 new front tyres and 4 new rear tyres per race number per event
- » All tyres are returned to Michelin after every event
- » In the case of a puncture during a practice session, the use of a marked tyre is authorised
- » Can be inflated using air only
- » Minimum tyre pressures are checked before qualifying and before races
- » In the case of a 'Wet Track', tyre pressures may be adjusted in parc ferme
- » Tyres must remain visible in the team garages at all times
- » Tyres are identified by RFID chips
- » Tyre warmers not authorised

### POINTS-SCORING SYSTEM

**Race result:** 1<sup>st</sup>, 25 points • 2<sup>nd</sup>, 18 points  
3<sup>rd</sup>, 15 points • 4<sup>th</sup>, 12 points • 5<sup>th</sup>, 10 points  
6<sup>th</sup>, 8 points • 7<sup>th</sup>, 6 points • 8<sup>th</sup>, 4 points  
9<sup>th</sup>, 2 points • 10<sup>th</sup>, 1 point

**Pole Position:** 3 points

**Fastest drivers in the qualifying groups:** 1 point

**Fastest race lap:** 1 point  
(if driver classified inside the top 10).



### EVENT FORMATS

- » A **Shakedown** session of a maximum duration of 15 minutes + three laps may be organised the day before the race. Power is restricted to 110kW. A maximum of six laps per car.
- » **Practice:** Two practice sessions (45 and 30 minutes) in the course of the morning of Race Day. Maximum power: 250kW.
- » **Qualifying:** The drivers are divided into four groups of six cars as a function of their championship positions (or of the previous championship order in the case of the season's first race). Each driver has up to two flying laps (only one running at maximum power) to post a qualifying time. The six fastest drivers go on to take part in the Super Pole shootout. Maximum power: 250kW.
- » **Super Pole:** Start order is based on the times posted in qualifying, with the 'slowest driver' to lap first, etc. One flying lap only.
- » **Grid:** The six places at the front of the grid are reserved for the drivers who take part in the Super Pole session.
- » **Race:** Standing start. Maximum duration: 45 minutes + 1 lap. Use of two power outputs mandatory: Normal Mode (200kW / regeneration: 250kW) and Attack Mode (235kW / regeneration: 250kW).
- » **Attack Mode:** Power: 235kW (compared with 225kW in 2018/2019). The number and duration of Attack Mode activations is specific to each race and are notified at least one hour before the start. The cockpit halo lights up when a car is in Attack Mode.
- » **FanBoost:** A temporary 100kJ power boost (minimum: 240kW / maximum: 250kW) for five drivers chosen by a fan vote. To be activated once, but not before the 22nd minute of the race.

