

FACT SHEET XXL ROUND 3

FORMULA E PUNTA DEL ESTE

DECEMBER 19, 2015

SCHAEFFLER



IN URUGUAY AS FRONT RUNNER

Formula E is visiting South America: in round three of the season, Team ABT Schaeffler Audi Sport will be entering the race as the double front runner



INNOVATIONS
New technologies
for Formula E

p. **4**



MOBILITY FOR TOMORROW
How Schaeffler successfully tackles
the challenges of the future

p. **14**

Editorial



The Formula E season opener could hardly have gone any better from our perspective: two gripping races and, following Lucas di Grassi's victory in Malaysia, the lead of the drivers' and teams' classifications. We wouldn't mind if things continued this way. For Schaeffler, a new chapter in motorsports has begun this season. As the exclusive technology partner, we developed the powertrain of the 'ABT Schaeffler FE01' together with the team. We're pleased to provide you with background info and all the facts about the race in Uruguay in this paper.



Jörg Walz

Head of Communications and Marketing
Schaeffler Automotive



Teaming up for a new era of motorsports

Formula E instantly became a success model with fans and race drivers in its first year. The second season is starting with new locations, stars and technologies

Looked at with skepticism by some observers just a year ago, the series has since not

only firmly established itself in the motorsports world, but has actually become a hot spot for

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drivers, fans and new technologies. On October 24, FIA Formula E opened its second season in Beijing. Following the race weekend in Malaysia, round three in Uruguay is now coming up. Three other races will be held in South and North America before the series will be moving on to Europe. The rounds in Paris and Mexico City are new on the calendar. The German home round is scheduled for May 21, 2016.

► SCHAEFFLER AND ABT CONTINUE TO FORM A TEAM

Together with ABT, Schaeffler forms the 'German national team' in an illustrious field of ten international outfits. The company's role by far exceeds that of a sponsor. As its exclusive technology partner, Schaeffler developed the entire powertrain

of the new race car together with the team that is now named ABT Schaeffler Audi Sport. And the development has been a success. Following a podium finish in Beijing and victory in Malaysia, the team is leading the drivers' and teams' classifications.

Daniel Abt (23) and Lucas di Grassi (31), who captured third place in the teams' classification in the inaugural season, are sitting in the cockpits of the fully electric single-seaters again. Lucas di Grassi was even in contention for the drivers' title up to the last race.

The German-South American duo will be meeting with prominent competitors. The former Formula One World Champion Jacques

Villeneuve, as well as Nico Prost, Bruno Senna and Nick Heidfeld, will be on the grid. The Brazilian Nelson Piquet jr. is the title defender. ■



In-demand interview partner: driver Daniel Abt answers questions

ABT Schaeffler FE01 is ready to go

The season opener in Beijing saw the return of Formula E to the world's race tracks. Team ABT Schaeffler Audi Sport faces the challenge with new technologies

When in the heart of the Chinese capital, on October 24, all the red lights were extinguished to start the race a new chapter in motorsports began for Schaeffler. As the exclusive technology partner of Team ABT Sportsline, the company has developed the powertrain of the new 'ABT Schaeffler FE01.'

While in the Formula E's inaugural season all the teams were still competing with standard-specification cars, the development of the entire powertrain has been allowed for the 2015/2016 season. Its core element is the electric motor named 'ABT Schaeffler MGU 01.' The project was focused on achieving

the best possible efficiency, high reliability and optimal thermal management due to modified cooling. "Our motor has better torque and higher efficiency than its predecessor," says Prof. Peter Gutzmer, who as Chief Technology Officer is responsible for the developments at Schaeffler and was faced with a tight



schedule: "The first meetings took place about ten months ago and, only half a year later, the first parts were produced. The timing was tight, as always in motorsports, but we managed it."

► NEW TRANSMISSION IS STIFFER AND MORE COMPACT

Schaeffler also developed a new transmission that is coordinated with the motor and was produced by the company's renowned partner Hewland according to special



Joining forces for success: Prof. Peter Gutzmer (in the middle), Daniel Abt and Lucas di Grassi are again forming a strong team in the second Formula E season

specifications. It is stiffer and more compact. To achieve the goal of minimizing the number of shifting events per lap, the engineers opted for a three-speed variant. The suspension has been optimized as well, now featuring higher stiffness and improved kinematics. The connecting link between all the elements is the newly developed software that manages the interaction between all the components. The perfection of its functionality has been one of the focal aspects of the tests.

"For us, it was clear from the beginning that we wouldn't do anything by halves. That's why we looked at all the areas released by the regulations and developed optimized solutions of our own together with our partners," says Prof. Peter Gutzmer. This is a standard to which Schaeffler is committed outside motorsports as well. Gutzmer: "Electric

mobility as a whole, including hybrid solutions as well as fully electric driving, will significantly define mobility of the future. The Formula E commitment is an ideal way of being at the forefront of this technology and sets an example: we want our engineers to push limits and to seek competition – in production just like in motorsports."

► PERFECT AMBASSADOR FOR THE SCHAEFFLER VISION

Schaeffler has been involved in Formula E as a partner of the only German team from day one and is now taking the next step. "The collaboration with ABT Sportsline is outstanding. The team gelled in the first season, goes about its work in a professional and success-oriented manner, and is the perfect ambassador for our vision of 'Mobility for tomorrow,'" says Gutzmer. ■



Ready to attack: the ABT Schaeffler FE01 sporting a new livery

AERODYNAMICS

Front and rear wing adjustable

SUSPENSION

Optimized suspension featuring higher stiffness and improved kinematics

STEERING WHEEL

Specification steering wheel with paddles for shifting and recuperation, controls for various motor settings and display for all the key information

TIRES

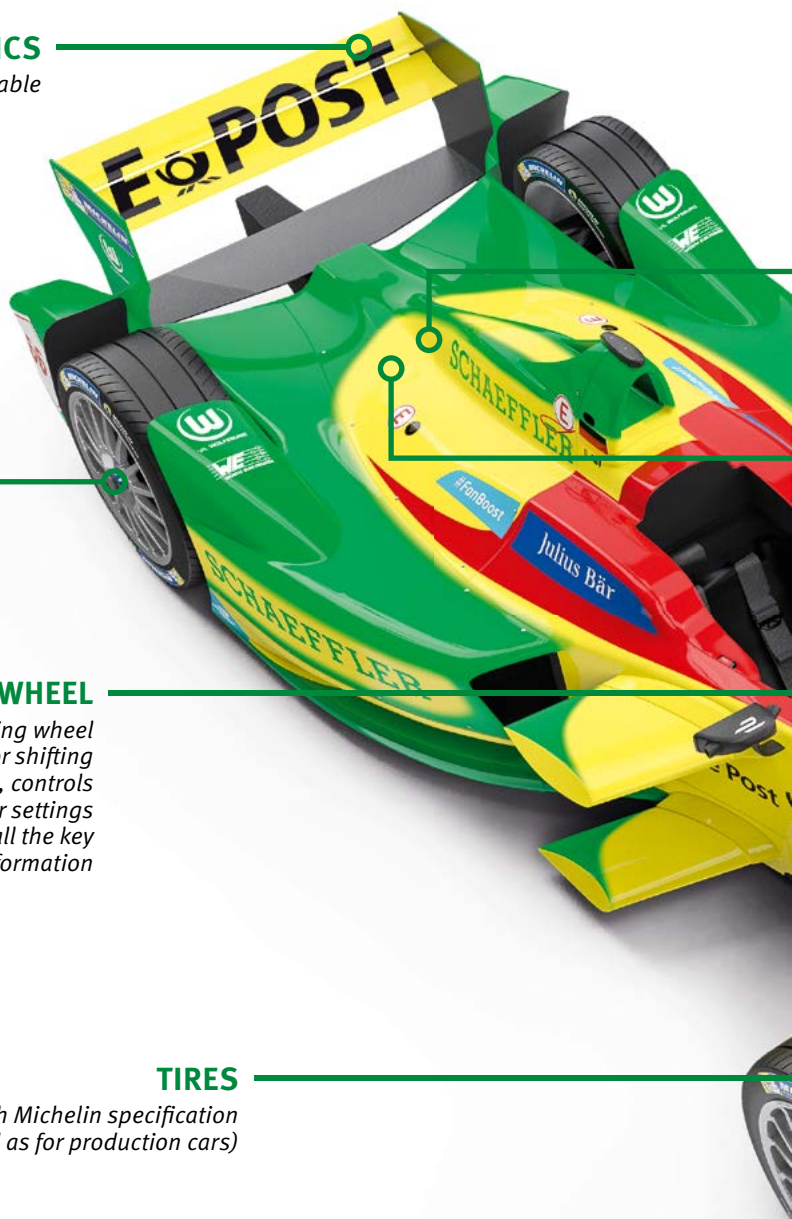
18-inch wheels with Michelin specification tires (same tread as for production cars)

POWER OUTPUT

Practice and qualifying: 200 kW (270 hp)
Race: 170 kW (231 hp) plus FanBoost

DIMENSIONS

Length: 5,000 mm
Width: 1,800 mm
Height: 1,250 mm
Weight: min. 888 kg including driver



High-tech for the race track

The ABT Schaeffler FE01 is a true race car loaded with high tech. While most of the components, including the battery and the entire aero kit, are still identical for all teams, ABT and Schaeffler have developed the entire powertrain

POWERTRAIN

*Electric motor ABT Schaeffler MGU 01,
three-speed transmission*

BATTERY

*Developed by Williams Advanced Engineering,
charging time: approx. 45 minutes*

CHASSIS

*Specification carbon fiber/
aluminum chassis by Dallara*

BRAKES

*Hydraulic dual-circuit
braking system,
adjustable brake force
distribution*



Globetrotting Formula E

From Asia via South and North American to Europe: Formula E travels around the world again in its second season, before the new Champion is named in Great Britain at the beginning of July 2016. A summary of events so far



1 BEIJING CHINA

LUCAS DI GRASSI ON THE PODIUM

76,000 spectators, the iconic bird's nest stadium as backdrop and action aplenty on the track: the opener in Beijing was everything motorsport fans could have hoped for. A cool head coupled with a perfect pit stop saw Brazilian Lucas di Grassi race from fourth to second and cross the finish line after 26 laps behind only the Swiss driver Sébastien Buemi. Teammate Daniel Abt lost the points for a hard fought ninth place after being awarded a time penalty after the race. From Beijing it was a journey of about 4,400 kilometers to the second round in Malaysia.



2 KUALA LUMPUR MALAYSIA

DI GRASSI STAYS IN CONTROL IN HEAT CHAOS

The race in Kuala Lumpur was one of the most chaotic ones Formula E's 'young' history has seen to date. Again and again, positions would change, the favorites be involved in a certain amount of drama, and various strategies be brought to the fore. Lucas di Grassi was the driver to keep the coolest head in brutally hot temperatures of about 35 degrees centigrade. The Brazilian won the race thanks to perfect teamwork and took the lead of the drivers' standings. Daniel Abt completed the good result in seventh place, which meant the lead for ABT Schaeffler Audi Sport in the field of the teams.



This is what winners look like: Lucas di Grassi celebrates his first victory in the 2015/2016 season in style

DRIVERS' STANDINGS

P	Driver	Team	Pts
01	Lucas di Grassi (BR)	ABT Schaeffler Audi Sport	43
02	Sébastien Buemi (CH)	Renault e.Dams	35
03	Sam Bird (GB)	DS Virgin Racing FE Team	24
04	Nick Heidfeld (D)	Mahindra Racing FE Team	17
05	Robin Frijns (NL)	Andretti FE Race Team	16
06	Stéphane Sarrazin (F)	Venturi FE Team	14
07	Loïc Duval (F)	Dragon Racing	12
08	Bruno Senna (BR)	Mahindra Racing FE Team	10
	Jérôme D'Ambrosio (B)	Dragon Racing	10
10	António Félix da Costa (P)	Team Aguri	8
	Oliver Turvey (GB)	NEXTEV TCR FE Team	8
12	Daniel Abt (D)	ABT Schaeffler Audi Sport	6
13	Nathanaël Berthon (F)	Team Aguri	4
	Nelson Piquet jr. (BR)	NEXTEV TCR FE Team	4
15	Nicolas Prost (F)	Renault e.Dams	1
16	Jacques Villeneuve (CDN)	Venturi FE Team	0
	Jean-Éric Vergne (F)	DS Virgin Racing FE Team	0
	Simona de Silvestro (CH)	Andretti FE Race Team	0

TEAM STANDINGS

P	Team	Pts
01	ABT Schaeffler Audi Sport	49
02	Renault e.Dams	36
03	Mahindra Racing FE Team	27
04	DS Virgin Racing FE Team	24
05	Dragon Racing	22
06	Andretti FE Race Team	16
07	Venturi FE Team	14
08	NEXTEV TCR FE Team	12
	Team Aguri	12

2015/2016 CALENDAR

October 24	Beijing (CN)
November 7	Kuala Lumpur (MAL)
December 19	Punta del Este (ROU)
February 6	Buenos Aires (RA)
March 12	Mexico City (MEX)
April 2	Long Beach (USA)
April 23	Paris (F)
May 21	Berlin (D)
June 4	Moscow (RUS)
July 2/3	London (GB)



A tradition of innovation

The world's leading tuner of vehicles from the Volkswagen Group and successful motorsports team in the DTM: together with Schaeffler, ABT Sportsline enthusiastically tackles a new motorsports challenge in Formula E

ABT Sportsline is one of the most successful motorsport teams in Germany and Europe. Its history in racing dates back more than 60 years and began with initial victories scored by Johann Abt in the 1950s. The first recorded success took place in a dirt track race, followed by victories and titles in touring car, sports car and formula racing. 2009 has gone down in the company's history as the most successful one to date: Timo Scheider won

the DTM, Christian Abt the ADAC GT Masters in the Audi R8 and youngster Daniel Abt was victorious in the ADAC Formel Masters. Previously, in 2007, Schaeffler and ABT had jointly celebrated success as well: with the logos of LuK, INA and FAG on his A4, Mattias Ekström won his DTM title number two.

Founded as a smithy in 1896, the ABT company has been continually developing ever since. Just one

thing has never changed: the family still runs the company with about 170 employees and partners in 50 countries around the world. CEO Hans-Jürgen Abt now represents the fourth generation at the helm. For ABT, the commitment in Formula E also marks a return to the roots, as the team celebrated success in formula racing as far back as in the early 90s – among others, with Ralf Schumacher in the cockpit back then. ■

“We operate as a team”

Dr. Simon Opel is responsible for motorsports special projects at Schaeffler. In an interview, he looks back on the Formula E season opener and explains Schaeffler's commitment

What findings have you gained from the season so far?

Following the successful tests, the opener in Beijing proved highly promising. The race in Malaysia showed that we operate as a team and have been making the right decisions to date. The lead of the drivers' and teams' classifications is the reward for the hard work that has been done. Basically, the competition between the teams is on yet another level compared with last year. Formula E has evolved into a top motorsports event.

Last year, the teams competed with identical cars. Since this

season, individual powertrain concepts have been permitted. Your concept seems to have panned out.

For the development of powertrains and technologies, motorsports provide an ideal environment. At Schaeffler, we look at the motor, the electrical components and the transmission as a composite. This is one of the great strengths of our company on the road toward optimum total system solutions. We would like to tackle the fierce competition in motorsports and use Formula E as a testbed. The future might belong to electric mobility.

How is Schaeffler positioned in this field?

With its expertise and experience in electric mobility, Schaeffler is the perfect partner for the challenges of the future. We offer solutions and innovations across the entire range of powertrain electrification. From the electric axle, to hybrid modules and through to wheel hub motors, Schaeffler products can be integrated with hybrid and fully electric vehicles. Our global research and development team in the field of electric mobility is working full-speed on solutions for tomorrow's mobility. ■



Dr. Simon Opel witnesses Lucas di Grassi's first victory of the season live

A strong team in the cockpit

In Lucas di Grassi (31) and Daniel Abt (23) the squad of Hans-Jürgen Abt has its dream team filling the cockpits of the two Formula E race cars. The experienced Brazilian and youngster Daniel Abt are not only fast and technically adept but perfectly harmonize with each other off the race track as well

#11 LUCAS DI GRASSI (BR)

VITA

Date of birth August 11, 1984

Place of birth São Paulo (BR)

Domicile Monaco (MC)

Height / weight 1.79 m / 75 kg

HIGHLIGHTS

2005 1st in GP Macau

2006 Formula 1 test

2007 2nd in GP2 series,
Formula 1 test driver

2008 3rd in GP2 series,
Formula 1 reserve driver

2009 3rd in GP2 series,
Formula 1 reserve driver

2010 Formula 1

2013 3rd in Le Mans 24 Hours

2014 2nd in Le Mans 24 Hours, 4th in WEC

2015 4th in Le Mans 24 Hours,
3rd in FIA Formula E

SOCIAL MEDIA

🐦 @LucasdiGrassi

🌐 lucasdigrassi.com.br



Formula E is a young racing series. What is your interim conclusion? “We can only pay a big compliment to the organizers: Formula E has been successfully turned into a top motorsports event within a single season – off-track with professional marketing and a wealth of new ideas and on-track with eleven thrilling races.”

How do you rate the start of the new season? “Second place in Beijing was a good beginning and victory in Malaysia a highlight. Everyone could see that Formula E is not just about pure speed, but also about perfect teamwork and the optimum strategy.”

What are your sporting aims for 2015/2016? “They’re the same as those of our team and our partners. We want to be in contention for victories and battle for the title.”



Side jobs: Lucas di Grassi is an Audi factory driver and in 2016 will be competing in the WEC and at Le Mans in an R18. In June 2015, he took fourth place in the 24-hour race. Daniel Abt, with Team Rebellion Racing (pictured right) clinched a class victory in the LMP1 category at his Le Mans debut.



#66 DANIEL ABT (D)



VITA

Date of birth December 3, 1992

Place of birth Kempten (D)

Domicile Kempten (D)

Height / weight 1.79 m / 70 kg

HIGHLIGHTS

2007 2nd in ADAC Kart Championship

2008 8th in ADAC Formel Masters

2009 1st in ADAC Formel Masters

2010 2nd in ATS Formula 3 Cup

2011 4th in FIA Formula 3 International Trophy, 7th in Formula 3 Euro Series

2012 2nd in GP3 series

2013, 2014 GP2 series

2015 1st in Le Mans 24 Hours (class), 11th in FIA Formula E

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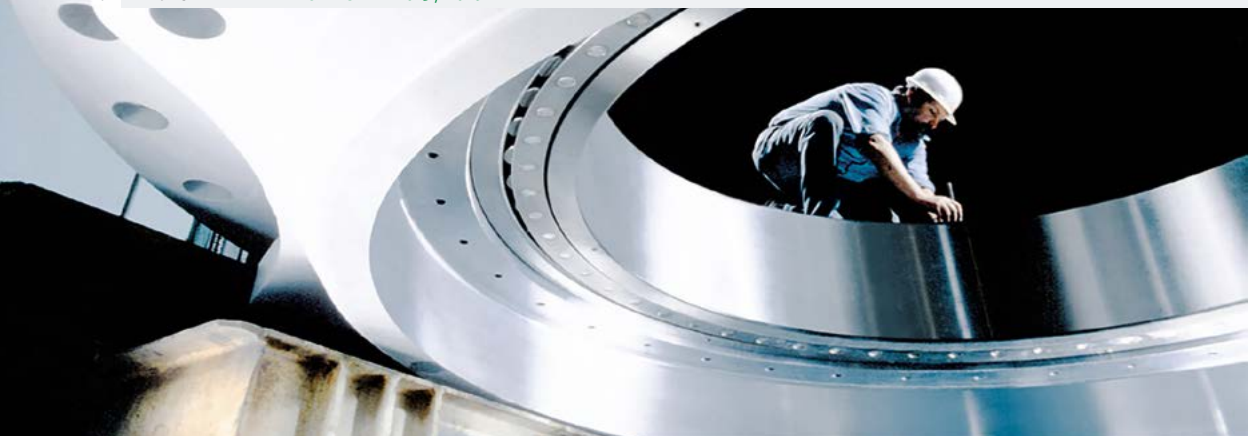
t @Daniel_Abt

e danielabt.de

How satisfied are you with the way the season has gone so far? “The team and our technology partner Schaeffler worked hard to prepare a perfect car for us. The tests and the beginning of the season were positive even though I scored no points in Beijing due to a penalty. Seventh place in Malaysia was a step ahead.”

What do you particularly like about Formula E? “The tremendous locations, the fact that we race on narrow city street circuits, plus the special challenges of this series: not just accelerating, braking and steering, but also thinking about energy management and clever driving.”

What do you expect of the season? “The first season was a year of learning for me with a number of highlights and a number of setbacks. Now, I'd like to consistently battle for points.”



Mobility for tomorrow

Sustaining mobility for the future and helping to successfully shape it – this is the strategy pursued by Schaeffler. Alternative drive systems or the continuous development of renewable energy sources are just two key words in this context

Environmental pollution, global warming, traffic gridlocks and the finite nature of fossil fuels – the challenges posed to future mobility are massive. Therefore, Schaeffler has been committed to the 'Mobility for tomorrow' growth strategy that aims to find sustainable solutions for tomorrow's world.

The Schaeffler success story begins more than 130 years ago when in 1883 Friedrich Fischer designs the ball grinding mill and thus not only lays the foundation for FAG but also for the entire modern roller bearing industry. In 1946, INA is founded by the brothers Dr. Wilhelm and Dr. Georg Schaeffler in Herzogenaurach,

where the Schaeffler headquarters is still located today. The Schaeffler subsidiary LuK in 1965 introduces the first diaphragm clutch in Europe, causing a sensation immediately after the company was founded. In 2003, the Schaeffler Group is formed from the three brands INA, LuK and FAG. Schaeffler has been listed on the stock exchange since October 9, 2015.

► 170 LOCATIONS IN 50 COUNTRIES

Since then, Schaeffler has evolved into a true global player represented on all continents.


Around 84,000 employees at 170 locations in 50 countries ensure Schaeffler's proximity to customers and the resultant development of market-specific products, short lead times and fast support.

► 225,000 PRODUCTS IN THE PORTFOLIO

Today, Schaeffler's portfolio includes about 225,000 products – from tiny high-precision bearings for dental drills, to roller bearings and linear guides for machine tools, to heavy-weights for roadheaders or wind turbines. The customer base covers 60 sectors. ■

The world of Schaeffler: since 2001, a gigantic FAG roller bearing has been operating in the 'London Eye' Ferris wheel (above), the 48-volt concept car combines the pleasures of driving and saving (far right), double clutch (right)



361,500spectators attended the races
in the 2014/2015 season**10.76** billionworldwide media contacts
in the 2014/2015 season**56** kWhof energy is available
to a driver per race**=** 2-person
household (6 days) refrigerator, 150 l
(210 days) light bulb, 60W
(39 days non-stop) TV set
(15 days non-stop) dishwasher
(70 washing cycles)The ABT
Schaeffler FE01
accelerates from
0–100 km/h in**2.9**
seconds **200** kW
output in
qualifying**170** kW **NEW**
output in the race**NEW RULES****NEW****3**driver changes
per team/
season max**5****NEW**drivers compete
in Super Pole**1****NEW**FanBoost in
the second car**10,000**conventional AA batteries have the
same energy as the battery of the
ABT Schaeffler FE01**SCHAEFFLER FACTS**

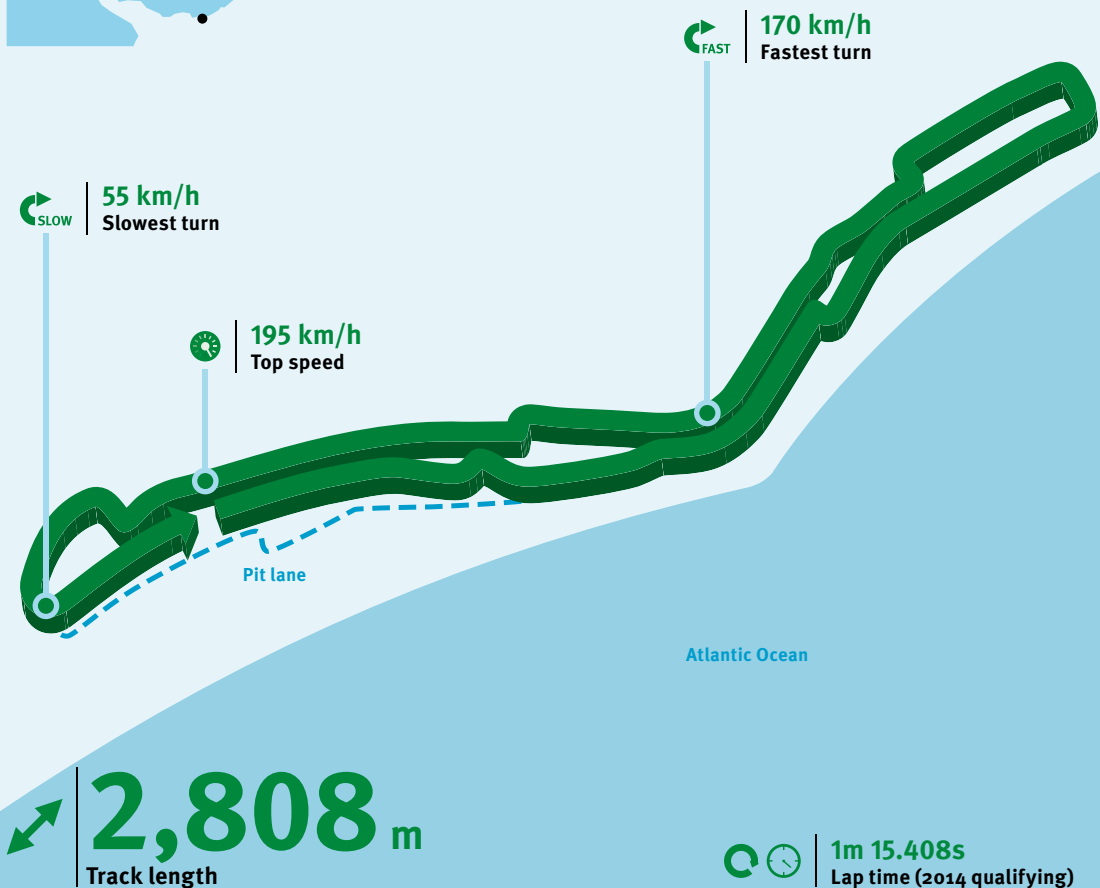
≈ 84,000.....employees
 12,124.....bn. revenues in 2014
 2,518.....registered patents in 2014
 23,000.....active patents and patents pending
 170.....sites in 50 countries
 74.....factories worldwide
 60.....Schaeffler components in automobiles worldwide (average)
 4.....titles for Schaeffler touring cars in DTM

NEW**3**drivers receiving
the most votes
in the #FanBoost
have 100 kJ more
energy

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FACTS ABOUT FORMULA E AT PUNTA DEL ESTE

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SCHEDULE SATURDAY, DECEMBER 19 (local time, CET-4)

08:15 – 09:00	Free practice 1
10:30 – 11:00	Free practice 2
11:10 – 11:40	Pitwalk
12:00 – 12:36	Qualifying (4 groups)
12:45 – 13:00	Super Pole
13:50 – 14:30	Autograph Session (eVillage)
14:10 – 14:40	VIP pitwalk and VIP laps
15:23	Pit lane open
16:00	Race
17:15 – 17:30	Press conference (Media Center)



Learn
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