
ABB FIA Formula E World Championship

Season 7 Press Kit

At ABB, we have always taken a sustainable approach to business. Sustainability is a key part of our company Purpose and of the value that we create. This starts with helping our customers reduce their emissions and preserve resources, which is where we make the biggest impact, and extends to our own operations, to our partners and suppliers, and the communities we serve.

Our partnership with Formula E brings together two great teams that are pushing the boundaries of technology to support the shift to e-mobility.

The ABB FIA Formula E World Championship is a showcase for the world's most advanced e-mobility technologies. This partnership, now in its fourth season, allows us to use this competitive race environment as a testbed to further develop our technology, while demonstrating the benefits of e-mobility to a global audience. Ultimately, it is helping us to drive progress towards a more sustainable future.



Björn Rosengren
CEO ABB

Working with COVID-19 restrictions in Season 7

Plans for the Season 7 race calendar continue to evolve amid the ongoing COVID-19 pandemic, while the health and safety of the entire Formula E community, as well as the residents of E-Prix host cities, are of the utmost priority.

As it is almost inevitable that attendance at E-Prix will remain restricted, ABB is developing virtual experiences that will allow guests and key customers to enjoy much of the race weekend experience, even if they are unable to attend in person. In addition to a dedicated microsite filled with news and content from the event and a link to view the on-track action, ABB will provide a multi-media experience focusing on the series itself and the connected topics of sustainability, mobility and energy efficiency, featuring presentations and contributions in collaboration with ABB's partners.

Table of contents

02	CEO welcome letter
04	About ABB and its four leading businesses
06	ABB's Sustainability Strategy
07	Smart Cities
08	Smart Transportation and Infrastructure
10	10 years of ABB e-mobility
12	The Mobility Revolution
14	The ABB FIA Formula E World Championship
15	What do the Presidents of ABB's leading businesses expect from ABB Formula E?
16	Porsche Partnership
17	Technology in the series
18	ABB FE ambassadors
20	Under the skin of the ABB Formula E Gen 2 car
22	Rules and regulations
24	Season 7 teams and drivers
28	Contact information

About ABB and its four leading businesses

About ABB

ABB is a leading global technology company that energizes the transformation of society and industry to achieve a more productive, sustainable future. ABB is passionate about creating success, enabling customers to reach new levels of performance. By connecting software to its electrification, robotics, automation and motion portfolio, ABB pushes the boundaries of technology to drive performance to new levels.

As pioneers in electricity and automation, ABB helps to address the world's energy challenges. Its innovative solutions make homes, offices, factories and transport more energy efficient and safer, and energy more affordable. With a history of excellence stretching back more than 130 years, ABB's success is driven by about 110,000 talented employees in over 100 countries. ABB envisages a future where the physical and digital worlds merge, making operations safer, more intelligent and more productive. By transforming industries, ABB is helping to create a more prosperous and sustainable future.





Meet ABB's leading businesses

ABB is today a leader in digital industries with four customer-focused, globally leading businesses: Electrification, Process Automation, Motion and Robotics & Discrete Automation.

Electrification

Writing the future of safe, smart and sustainable electrification.

ABB's Electrification business offers a wide-ranging portfolio of products, digital solutions and services, from substation to socket, enabling safe, smart and sustainable electrification. Offerings encompass digital and connected innovations for low- and medium-voltage, including EV infrastructure, solar inverters, modular substations, distribution automation, power protection, wiring accessories, switchgear, enclosures, cabling, sensing and control.

Process Automation

Writing the future of safe and smart operations.

ABB's Process Automation business offers a range of solutions for process and hybrid industries, including industry-specific integrated automation, electrification and digital solutions, control technologies, software and advanced services, as well as measurement & analytics, marine and turbocharging offerings. Process Automation is #2 in the market globally.

Motion

Writing the future of smart motion.

ABB Motion keeps the world turning, while saving energy every day. Its pioneering drives, motors, generators, mechanical power transmission products and integrated digital powertrain solutions are driving the low-carbon future for industries, cities, infrastructure and transportation. Through a global presence ABB Motion is always close to its customers, helping them optimize energy efficiency, improve safety and reliability and achieve precise control.

Robotics & Discrete Automation

Writing the future of flexible manufacturing and smart machines.

ABB's Robotics & Discrete Automation business combines machine and factory automation solutions with a comprehensive robotics solutions and applications suite. The business is #2 globally, with a #1 position in robotics in the important, high-growth Chinese market, where it is expanding its innovation and production capacity by investing in a new robotics factory in Shanghai.

ABB's Sustainability Strategy



Theodor Swedjemark
Chief Communications &
Sustainability Officer

At ABB, we see technology as a key enabler for a more sustainable future and the ABB FIA Formula E World Championship as a great platform to drive excitement and awareness for the world's most advanced e-mobility technologies.

ABB leads by example by embedding sustainability in everything it does. Its solutions reduce harmful emissions and preserve natural resources. ABB champions ethical and humane behavior to contribute to better lives for people across the globe.

At ABB, sustainable development means progress towards a healthier and more prosperous world for future generations. This means balancing the needs of society, the environment and the economy. To achieve this, ABB acts and embeds this approach to business across its value chain, creating superior value for all stakeholders.

Through ABB's leading technologies and responsible business practices, it also contributes to the United Nations' Sustainable Development Goals, of which the company has always been a strong advocate.

Working alongside Formula E, the company is helping to encourage the global adoption of clean mobility by enhancing technologies and highlighting the benefits of electric vehicles. The ABB FIA Formula E World Championship provides a platform to push the boundaries of technology, which can be transferred from the race track to real-world situations, helping to preserve resources and enable a low-carbon society.

Smart Cities

ABB believes in providing a world for future generations that is at least as healthy and prosperous as the one we inherited. Therefore, the company remains firmly committed to the United Nations Sustainable Development Goals, including Goal 11 – making cities inclusive, safe, resilient and sustainable. Through its products, services and digital capabilities, ABB is helping to reduce the impact that urbanization has on the planet.

Today, half the world's population lives in towns and cities and it is projected that by 2050 this figure will be 68 percent. According to the International Energy Agency, urban areas, which are at the center of most economic activity, account for 64 percent of global energy consumption and are responsible for 70 percent of global carbon dioxide emissions.

Reducing the negative environmental impact of cities is clearly a huge task but if achieved, there will be enormous benefits. Around the world, smart, energy-efficient and low-carbon technologies are already being deployed to significantly reduce the environmental impact of cities.

A smart city is a continuously evolving ecosystem, empowering individuals to live, work and move in a safer, smarter and more sustainable way. Innovations from ABB support aspirations for improved quality of life, safety, efficiency and sustainability.

By leveraging achievements in digital and operational technologies, ABB helps societies to manage the pressures of rapid urbanization and to meet the growing demand for sustainable, intelligent and reliable energy and water supply, transportation solutions, buildings and industries.

An online tool showing how these different elements come together to create a sustainable society can be accessed via <https://abbsmartsocieties.com/>.



Smart Transportation and Infrastructure

ABB is leading the way to a future of zero-emission mobility, with its mission and purpose being to power e-mobility forward.

ABB engineers the electrification solutions for the transport of tomorrow, today. Including smart transportation solutions from EV chargers for the home, through electrified fleet depots and opportunity charging for electric buses and trucks, to high-power chargers for the highway stations of the future.

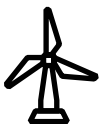
Transportation is a major contributor to CO₂ emissions in the EU.



30% of CO₂ emissions from transportation

of which **72%** come from roads

of which **60%** come from cars



Electric mobility paired with renewable energy generation can significantly lower global CO₂ emissions. This not only helps to achieve CO₂ emission targets but will have a positive effect on people's health and comfort due to reduced pollution and noise.

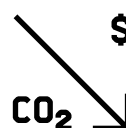


ABB Electric Vehicle Charging Infrastructure

ABB lays the foundations for a future of smarter, reliable and emission-free mobility, accessible by everyone, everywhere. ABB offers a total EV charging solution from compact, high quality AC wallboxes, reliable DC fast charging stations with robust connectivity, to innovative on-demand electric bus charging systems. The company deploys infrastructure that meets the needs of the next generation of smarter mobility.

ABB Ability™ connected chargers enable fast global service and pro-active maintenance. ABB has years of experience in creating, installing and maintaining charging infrastructure, including several nationwide charger networks.

Terra AC and DC Wallboxes

As the global leader in sustainable transport solutions, ABB took another significant step in driving the e-mobility revolution forward over the next decade with the launch of its new Terra AC wallbox in 2020.

The wallbox is designed not only to meet the surging demand for quality yet affordable connected charging in homes and businesses, but also supports the growing generation of renewable energy users who want to harness and manage the consumption of their own power.

The new Terra AC wallbox is available in up to 22kW variants to ensure compatibility with the electrical systems of homes and buildings across the world. It offers a safe, smart and sustainable charging solution which supports ABB Electrification's Mission to Zero for smart cities, a vision for a zero-emission reality for all.

ABB also offers a Terra DC wallbox. Developed with leading electric vehicle manufacturers, trusted by energy suppliers and governments, this solution makes fast charging safe, smart and future-compatible, in an ultra-compact footprint.

It provides the ideal solution for the charging of EVs at offices, dealerships and public parking places. Benefitting from a maximum current of 60A delivering 24 kW peak power directly to the vehicle's battery, it allows for a shorter charging time than the typical on-board converters, usually rated between 3 to 7 kW.

Available with single or twin outlets, the DC Wallbox supports both CCS and CHAdeMO standards. Day to day operation is simple thanks to a seven-inch full-color, daylight readable touch-screen display. Key functions include: starting and stopping of charge sessions, progress indication during charging, help menus, language selection and PIN code access.

High Power Charging

Several electric vehicle (EV) models with larger batteries and longer ranges are coming and infrastructure needs are growing. Therefore, more fast charging points with higher power demands will be needed. ABB has solutions today that will enable this future.



10 years of ABB e-mobility

2020 marked a decade of ABB's e-mobility leadership. Since 2010, the company has powered forward the global e-mobility transition with a host of technological achievements. Here are some of the most notable highlights.

2010 ABB provides Europe's first 50kW charger (Netherlands)

The first commercial EV charging station in Europe is opened in Holland, equipped with a 50kW ABB fast-charger. The station is located within a conventional petrol station in the city of Leeuwarden. A local taxi company immediately converts some of its larger vehicles to run as EVs, to take advantage of the new facility.

2012 First demo of CCS charging by ABB & CCS alliance (U.S.)

ABB is first to display a working prototype of a Combined Charging System (CCS) fast-charger at U.S. and German trade shows in 2012. Open-standard CCS chargers are designed to promote EV use, by simplifying the charging experience for any user.

2012-2013 ABB chargers for the first nationwide DC charging networks (Estonia, Denmark & Netherlands)

The growth of country-wide charging networks in Denmark, Estonia and the Netherlands is supported by ABB. Networks with more than 100 ABB DC Fast Chargers are installed in those countries jointly with entrepreneurial first-to-market Charge-Point-Operators.

2014 ABB supplies first certified multi-standard charger with 3 plugs (CCS, ChaDeMo and AC) globally

ABB is first to supply a certified multi-standard charger – the Terra 53 fast charger – around the world. Terra 53's broad charging compatibility supports all current and next-generation EVs, thanks to open industry interfaces.

2016 ABB provides Europe's first electric

bus chargers

Europe's first e-bus charging system, using ABB OppCharge technology, is installed in Arendal, Gothenburg, Sweden. The open-standard system is developed in partnership with Volvo but designed to allow buses made by other manufacturers to benefit from the charging facility.

2018 ABB named official charging partner for the Jaguar I-PACE eTROPHY race series

Custom ABB fast chargers are supplied to the all-electric Jaguar I-PACE eTROPHY race series – a world-first for motorsport.

2018 ABB supplies Europe's first electric truck chargers

With eTrucks predicted to make up 15 percent of total truck sales by 2030, ABB developed a portfolio of heavy vehicle charging solutions from 3 to 600 kW.

2018 ABB is first to market with liquid cooled high-power chargers

Chargers enable 500A or 350kW. Two cross-continent Charge-Point Operators (Electrify America and IONITY) select ABB to supply these Terra HP chargers.

2018 ABB powers world's first autonomous electric passenger bus pilot

The pilot autonomous bus project at Singapore's Nanyang Technological University (NTU) relies on two ABB Heavy Vehicle Chargers (HVCs) to power the world's first electric, fully autonomous 40-seater buses. Two HVCs charge a pair of 12-meter autonomous Volvo eBuses in 3-6 minutes.

2019 ABB signs agreement to charge

Singapore's first electric buses in 2020

Smart-charging solutions from ABB are chosen as the electric bus charging infrastructure for a fleet of 40 eBuses in Singapore.

2019 ABB supplies EV charging solutions for Germany's first fully electric bus depot

ABB supplies end-to-end EV charging solution for Germany's largest electric bus depot at Hamburger Hochbahn, using 150kW sequential charging overnight.

2020 ABB provides integrated e-mobility solution to Singapore's first fully automated shipping terminal

The first application of ABB chargers to serve a fleet of automated guided vehicles (AGVs) in commercial operation, at Singapore's Tuas Port. The first berth will be in service in 2021 and the port fully operational by 2040.

2020 ABB provides first chargers to emerging

e-mobility markets, Mongolia and Pakistan

The Terra 53 charging station installed in Ulaanbaatar, Mongolia, is the country's first DC EV fast charger station. Emerging markets are enjoying rapid growth in EV use.

2020 It was announced that ABB will provide charging technology for the Gen3 cars in the ABB FIA Formula E World Championship – the first all-electric global race series.

By Season 9 of the series, in 2022-23, ABB will be the Official Charging Supplier to the ABB FIA Formula E World Championship.



The Mobility Revolution



Frank Muehlon
President E-Mobility
Division

We're really at a disruption point in the e-mobility sector. The automotive world is becoming a part of the electrical world – the two worlds have merged together, whereas in the past they were distinct industries. In the next 10 years, we expect to see them coming even closer together.

It's really interesting to just look back over the past 10 years at the pace and advancement of the industry. In 2010, ABB installed the first commercial Fast Chargers, in Europe in the Netherlands. Back then we could charge a car potentially with a maximum of 50 kilowatt hours, but the cars were not ready yet. That could give a range of about 150 kilometers in about 30 minutes. We're the market leader in the Western world with about 17000 DC fast chargers globally in more than 80 countries, many of which actually have power ranges of up to 350 kilowatts. These Terra High Power fast chargers can charge a car in less than 15 minutes, to about 80 per cent capacity of the battery.

This development is true not only for cars, but also for public transportation. Today, in a lot of cities, buses are charged in five to six minutes to give a 150 km range.

The world's top 20 car makers spent about 100 billion on research and development in the last year alone in order to accelerate their transition to produce and develop electric and autonomous vehicles. On top of that, countries such as the UK announced £47 million of government finance to design, test and produce electric transportation solutions in the country. So, we actually see this investment and development from both the industry and from governments.

In 2020, we inaugurated our new R&D e-mobility center in Delft in the Netherlands, on the campus of Delft University. There we have the capability to test vehicles and chargers

together. The facility is even built in a way that we can drive buses or trucks inside. We also recently announced that we will open a new factory in Italy to cope with the high demand we have for EV chargers.

We first saw electric cars on the streets in the 1900s, but the rate of progress since then with long haul EV trucks, fully electric fleets, autonomy, extensive charging networks, people have said for a long time, this is the future. It's the revolution that needs to happen.

We're not there yet but we have seen a tremendous push and increase. In 2019, there were 7.2 million EVs on the road globally, an increase of 2.1 million from the year before. So, although we are still in the early phases, you can look at it and see that the growth rate in EVs is not linear, it's exponential. I think what we tend to believe is that by about 2030, around 25 percent of the cars coming to the market might be electric.

If you look at public transportation within cities, in particular buses, you soon realize that the quality of life inside a city is dependent on these methods of transportation. When diesel buses are replaced with electric, the air quality is much cleaner inside the city. So that is a clear driver for a lot of forward-thinking cities to make these changes.

There's a lot of cities leading with good examples. Santiago de Chile has the largest e-bus fleet outside China and the city of Shenzhen has 100 percent electric buses and taxis. So, we're already moving forward.

Trucks are another major factor. If you take diesel buses out of the cities, you don't want to have garbage trucks driving around and making a lot of noise and emitting CO₂. So you really want to take out that part of noise and carbon emission too. And so 'last mile delivery' here is the phrase. We see a lot of trucks, light commercial vehicles, but also heavy commercial vehicle trucks switching to electric in addition to aviation, shipping and water taxis. And although there is always a certain threshold to jump over as soon as you're over that and see the benefits, the growth can be exponential.

It feels like there's an almost tangible electric future just within touching distance, maybe not quite today but very soon. We see a low uptake rate right now, which is why we still say the future is electric. It's not there yet, but we're shaping it. And I think we have come a long way. If you think how old the e-mobility industry is and how much progress has been made in the last 10 years, imagine where we will be after the next 10. So we are really turning that corner from where we only see technophile people driving electric to it really becoming a mass phenomenon.



The ABB FIA Formula E Championship

—
01 Global Web index

The idea for this all-electric motorsport series was sparked over a Paris dinner between series founder and chairman Alejandro Agag and Jean Todt, President of motorsport's governing body, the FIA. They concluded, back in 2011, that this idea drafted on the back of a napkin would fit perfectly with global mega-trends in sustainability and city pollution. It was launched in 2014 with the inaugural race taking place in Beijing.

For Season 7, the series has been awarded 'World Championship' status, which elevates its standing to the elite level of motorsport. It has become a destination for the world's best motorsport teams and talent, boasting the participation of ten global car manufacturers, as well as one of the world's largest and most innovative technology leaders as title partner. This underlines the sport's growing popularity as a platform for e-mobility and other sustainable technologies to an ever-broader global audience of 93 million interested consumers¹.

ABB Formula E brings electrifying wheel-to-wheel action to the world's leading cities, racing against the backdrop of iconic skylines.

It was created with the primary purpose of accelerating the adoption of electric vehicles and promoting sustainable practice, raising awareness of the benefits of driving electric and how clean mobility can counteract climate change. Events are delivered with sustainability at the forefront of our mind.

This drive for sustainable practices has led to the ABB FIA Formula E World Championship becoming the first global sport to be certified with a net zero carbon footprint from inception and the first and only category in racing to receive third-party

ISO 20121 certifications – the international standard for sustainability in events. It has invested in certified climate-protecting projects in all race markets to offset emissions from all six seasons of electric racing, in addition to initiatives such as optimizing transportation and logistics, extending end-of-life options for lithium-ion battery cells and cutting out single-use plastics on site.

ABB's partnership with Formula E began in January 2018, bringing together the global leader in electric vehicle fast-charging with the world's first fully electric international motorsport class. It is an opportunity for technological development and represents ABB and Formula E's shared vision for the future of a cleaner, more sustainable world for all. It is a natural fit at the forefront of the latest electrification and digital technologies, providing ABB with a unique opportunity to engage with customers around the world while building a more sustainable future.

The metropolitan settings for races around the world offer the ideal platform to highlight ABB's technologies for e-mobility, smart cities, sustainability and energy solutions, amplified by the appeal of the championship. It also is a great way to get people excited about the possibilities of engineering and technology.

The partnership is an opportunity for ABB to continue to bring more of its technology to this global platform as the company seeks to push the boundaries to take performance to new levels, drive progress and help encourage a greater adoption of e-mobility solutions worldwide. The season is scheduled to start with a double-header night race in Diriyah, Saudi Arabia (26th/27th February). Previously announced races in Santiago, Chile, Mexico City, Mexico and Sanya, China have been postponed until later in the year. The world championship will once again enjoy a 24-car grid, with the 12 Season 6 teams resuming competition – though with several driver changes. Season 7 is sure to witness characteristically fierce competition to succeed reigning champions Antonio Felix da Costa and DS Techeetah in the Drivers' and Teams' categories.

What do the Presidents of ABB's leading businesses expect from ABB Formula E?



Tarak Mehta

President,
Electrification

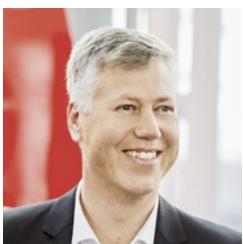
The ABB FIA Formula E World Championship offers a fascinating glimpse into the future of electric mobility. For ABB's Electrification business, it's more than just a competition, it's a platform to develop and test e-mobility-relevant electrification and digitalization technologies. Each race brings awareness of what is possible and feasible. The races themselves are inspiring, combining the excitement of a major sporting event with the knowledge that we are writing the future of sustainable transport.



Peter Terwiesch

President,
Process Automation

As we evolve towards a new energy future, the ABB FIA Formula E World Championship offers a unique opportunity to engage with our customers in process and hybrid industries on how to jointly shape the future of affordable, reliable and sustainable energy. With the races taking place in the hearts of cities, it is a great way to get the public and especially young people excited about the possibilities of engineering and technology. Moreover, e-mobility exemplifies rapid technology evolution, from race to race and from racing to serial production.



Morten Wierod

President,
Motion

The ABB FIA Formula E World Championship is a great example of how the combustion age is giving way to the electrical age. Today, electric motors consume nearly 30 percent of the world's electricity and that proportion is rising as economies industrialize, and transport networks, vehicles and vessels are increasingly powered by electricity. As the global leader in electric motors, generators and drives, ABB's Motion business improves energy efficiency in all industries and applications for the benefit of our customers and the entire planet.



Sami Atiya

President,
Robotics & Discrete Automation

The ABB FIA Formula E World Championship stands for a truly transformative new generation of cars – electric, sustainable and eco-friendly. ABB's Robotics & Discrete Automation business is helping to drive the digital transformation of the automobile industry – by providing automation and robotics solutions to electric car manufacturers, so ABB Formula E is a natural fit for us and for our customers. It highlights the benefit of future technologies and helps manufacturers test solutions across the e-mobility value chain. ABB Formula E provides the perfect setting to work with our customers and to show them how our robotics offerings can help them manage the transition to e-mobility smoothly, quickly and cost-efficiently, including with our portfolio of flexible robotics solutions for e-motor, battery and tray assembly.

Porsche Partnership

In Season 6, ABB entered into a new and exclusive partnership with automobile manufacturer, Porsche, to jointly promote e-mobility.

As part of a multi-level agreement, ABB became an official partner of the TAG Heuer Porsche Formula E team. The partnership benefits include industry exclusivity, branding and content rights, Porsche experiences and behind-the-scenes access and collaboration on e-mobility topics.

The shared ambition to write the future of e-mobility underpins the common set of values uniting ABB and Porsche. This new partnership in ABB Formula E realizes the benefits of combining

expertise from two technology leaders to further develop electric vehicle charging and pave the way to a zero-emission future.

In addition, it creates a visible and practical link between ABB's Formula E motorsport engagement and ABB's world-leading e-mobility solutions and leading position in EV charging infrastructure. It also showcases the company's ability to offer customized solutions to partners, while further establishing ABB as a driving force in the technological development of the ABB FIA Formula E World Championship.



Technology in the series

For ABB, the championship is more than a race, it is a test-bed for innovative electromobility technologies, driving development to the production line of electric vehicles and ultimately contributing to a cleaner environment for all.

ABB, entering its fourth season as title partner, is continuing to implement leading technologies such as ABB Uninterruptible Power Supply (UPS) in the all-electric championship.

UPS is installed in the race series' TV compound. It guarantees that power continues to reach broadcasters in the event of a grid power failure at a race circuit, ensuring that live race broadcasts never go 'off air'. There is no standard solution to meet the requirements of the fast-paced global championship, so a bespoke unit was developed by a specialist team at ABB.

The resulting UPS system is wheel-mounted and weight-optimized for mobility, in a package small and robust enough to be shipped by courier or on a passenger airplane. It has plug-and-play functionality to simplify installation for the on-site team and can provide 15 minutes of autonomous 60kVA power with input/output voltages of 230/400VAC 50 Hz.

UPS, combined with the charging solutions ABB will provide for the Gen3 cars to be introduced from Season 9, continue to position ABB at the forefront of sustainable technology development within the series and beyond.

ABB to supply charging technology to Gen3 cars racing in the ABB FIA Formula E World Championship

In 2020, ABB announced that it will provide the charging technology for the Gen3 cars which will be racing as of Season 9 (2022–2023).

Together with engineers from motorsport governing body the FIA and Formula E, ABB's Electrification teams are currently working on the specifications and requirements to develop an innovative and safe solution for charging the Gen3 cars through portable charging units that can charge two cars simultaneously.

These chargers, which benefit from the newest technology in power electronics and the smallest possible footprint, will be used to charge the racecars ahead of the race. They will ensure reliability and consistency of performance, wherever in the world the chargers are used, from whatever power source.

Each charger will deliver 80kW of power to two vehicles simultaneously, for a total of 160kW output per charger. This means each race team will benefit from a 'simultaneous charging' capacity from one unit, resulting in a significant reduction in the charger footprint.

These chargers will draw upon the experience, challenges and learnings of supporting a global race series, gained when ABB was the official charging partner of the Jaguar I-PACE eTROPHY race series in Seasons 5 and 6.

The eTROPHY chargers were based on the Terra 53 50kW chargers, of which ABB has installed many thousands around the world, but packaged more compactly to make them easier to freight and meet transportation requirements for the race calendar.

With more than 17,000 DC fast chargers installed across more than 80 countries worldwide, ABB has a wealth of proven technology and experience which will be incorporated into these chargers for Gen3 and adapted in a bespoke way to meet the particular needs of the racing environment.

ABB Formula E ambassadors

Sébastien Buemi

Sébastien Buemi has competed in ABB Formula E since it began in 2014, winning the drivers' championship in Season 2. He currently races for Nissan e.dams and with 13 wins, holds the record for the most victories in Formula E.

The 32-year-old continues this season as an ABB ambassador in ABB Formula E, to help the company convey its key values around e-mobility and sustainability.

Buemi's participation in ABB Formula E continues his long career in single-seater race cars.

After successful formative years in go-karts, Buemi moved to the Formula BMW Championship in Germany for 2004, finishing third in his debut season – just behind the future four-time Formula 1 World Champion, Sebastian Vettel.

He progressed up the motor racing ladder and had his first taste of Formula 1 machinery at the age of just 15, when he was given the chance to drive an Arrows F1 car.

Buemi's consistently strong performances in other racing categories caught the eye of Red Bull, who signed him to drive for their Toro Rosso junior team in 2009, making him the first Swiss Formula 1 driver since 1995. Buemi competed in 55 Formula 1 Grands Prix for the team between 2009 and 2011 and remains test and reserve driver for Red Bull Racing.

Buemi has also been a leading light of the World Endurance Championship (WEC) for many seasons, winning accolades including three victories in the 24 Hours of Le Mans (2018, 2019 and 2020) and the WEC title in 2014 and 2018/19.



Simona De Silvestro

Simona De Silvestro, one of the world's leading female racing drivers, joined ABB as an ambassador for Season 5 of the ABB Formula E Championship.

"I'm delighted to be part of such an exciting partnership as ABB and Formula E," said De Silvestro, "particularly as the championship is growing in strength every year. Its values relating to sustainability and e-mobility are such important topics for all of us and I'm proud to be able to contribute to their shared mission."

De Silvestro became the first woman to score points in the all-electric series in 2016 and she has recorded several other notable motorsport achievements. In 2010, racing in America, she was named 'Rookie of the Year' for the world-famous Indy 500 race and in 2014 she test-drove for the Swiss Sauber Formula 1 team. Since 2016, De Silvestro has raced in the Australian Supercars Championship.

During Season 5 of ABB Formula E, she collaborated closely with Venturi's engineers at their headquarters in Monaco, primarily doing simulator work. In Season 6, she joined Porsche's Formula E team as their test and development driver – their first female works driver. She will continue this role in Season 7.

Nicknamed 'The Iron Maiden' by her rivals on account of her competitive determination, De Silvestro believes gender should not be a deciding factor in motorsport, stating "Gender doesn't matter when you're doing 225 km/h into a turn".



Under the skin of the ABB Formula E 'Gen2' car

Top speed
280 km/h
174 mph

Power in race mode
200 kW
270 HP

Power in attack mode
250 kW
335 HP

Battery capacity
54 kWh
(full race length)

Battery voltage
900 volts

Motor

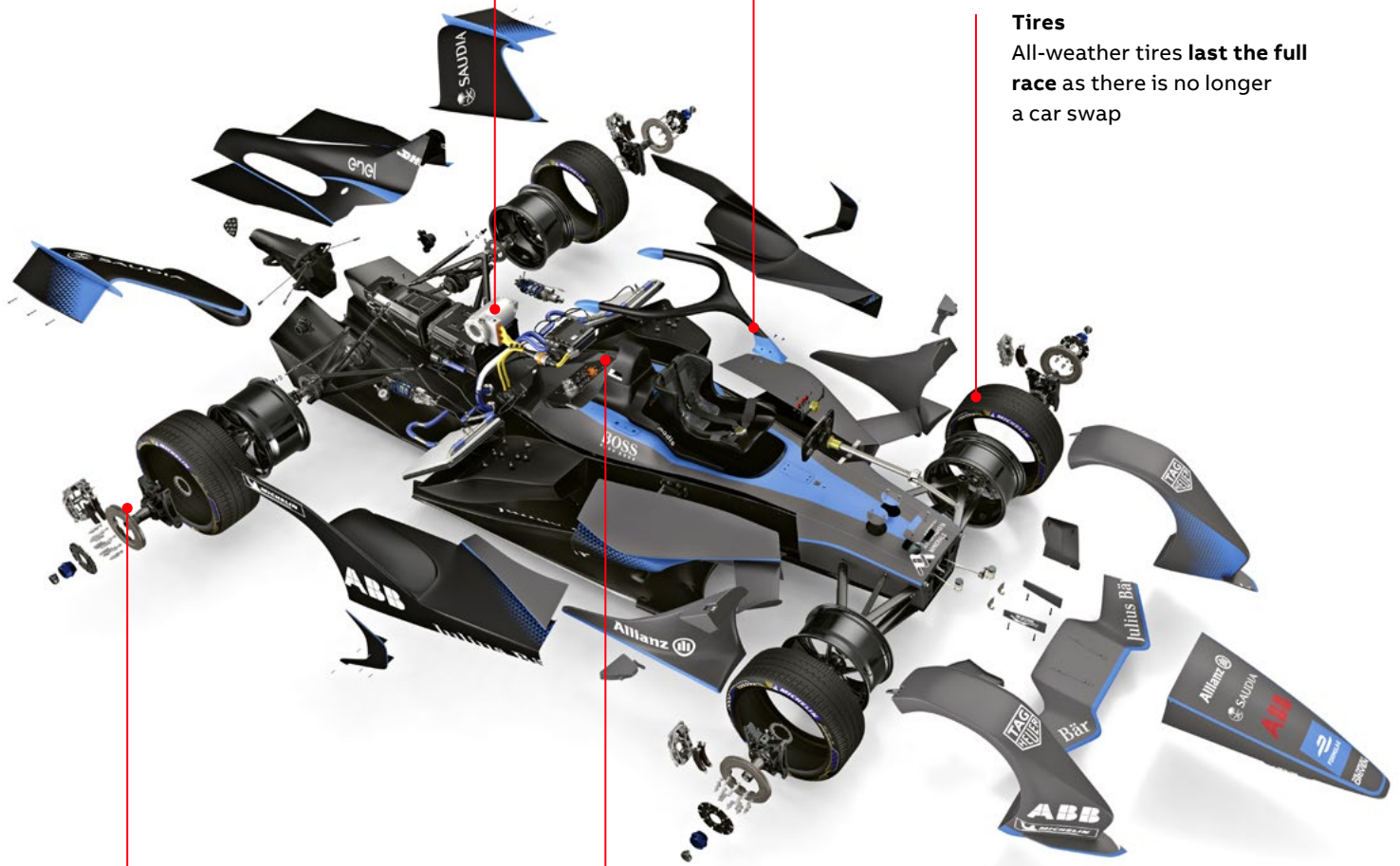
Peak power increased to **250 kW**. Top speed of **280 kph** / 174 mph

Safety

New 'halo' head protection incorporating **LED lights** to show Attack Mode and Fanboost are active

Tires

All-weather tires **last the full race** as there is no longer a car swap



Brakes

New **brake-by-wire** system improving regenerative braking system

Battery

Gen2 battery gains **95% more energy** for just 20% more weight



Rules and regulations



Practice

Each event has two practice sessions – an opening 45-minute session followed by a further 30-minute session. This is reduced to only one 45-minute session on the second day of a double-header. This is the first time the teams and drivers will take to the track under timed conditions as they get a feel for the circuit and adapt the car set-up. Although the timer is on, it doesn't count towards the final result.

Qualifying

Qualifying determines the order in which the drivers will start the race: the fastest driver lining up in first place and slowest at the back. The session lasts one hour, during which drivers are divided into four groups of up to six cars, defined by their position in the championship. For the first race of the season, however, the order is decided by where they finished overall in the previous season. Once out, each driver has six minutes to set their best time, with the top-six drivers proceeding to the Super Pole shoot-out in a bid to secure Julius Baer Pole Position and an additional three points. During the Super Pole shoot-out, the drivers go out one-by-one, with the sixth-fastest driver from the group stages going out first. When they cross the line to start their flying lap, the pitlane light turns green and the fifth-fastest driver heads out. This is repeated until all six drivers have completed a lap.

Shakedown

At most events a shakedown session is held on Friday – the day before the main event – but this is dependent on the track (in this case, city streets) being available. Drivers use this session to check

the electronic systems and the reliability of the car, but not the overall performance as the cars run at a reduced speed. At this time, the track layout, curbs and features can be checked by the FIA (the world governing body of motorsport), taking into account feedback from the competitors provided in the driver briefing.

E-Prix

Formula E races, or E-Prix, begin with a standing start, i.e. the cars are stationary until the lights go green. The drivers line up on a dummy grid – a short distance behind the actual grid – and slowly file into position to start the race. The E-Prix lasts for 45 minutes. Once the 45 minutes are up and the leader has crossed the finish line, there's still one more lap to go until the race finishes.

FANBOOST

FANBOOST is a fan interaction system, allowing fans to vote and give a driver an extra energy boost during the race – to be used for attack or defense, either making a passing move on your nearest rival or fending off an attempt to overtake. It allows fans to actively influence the outcome of the race – something unique in competitive sport. Fans can vote once per day on each eligible platform – via social media or the official Formula E website – in the six days before, and up to 15 minutes into, each race.

ATTACK MODE

Introduced in Season 5, ATTACK MODE is a power boost system, which drivers can activate by driving off the racing line through marked activation zones. This gives the driver an extra 30kW of power for a period of time. The number, duration

and minimum amount of times drivers can arm ATTACK MODE will be communicated to teams one hour before the race. ATTACK MODE can't be activated under a full course yellow or when the safety car is deployed.

Championship

The ABB FIA Formula E World Championship consists of both a drivers' and a teams championship. The drivers' championship is decided by their end of season total, made up of their best results over the entire campaign. The teams championship, meanwhile, is calculated from both drivers' scores at each race throughout the season.

Points

Formula E follows a standard points system, as used in other FIA-sanctioned series, awarding points to the top 10 finishers: 25-18-15-12-10-8-6-4-2-1.

Position	Points
1 st	25
2 nd	18
3 rd	15
4 th	12
5 th	10
6 th	8
7 th	6
8 th	4
9 th	2
10 th	1

Additional points are also awarded for securing Julius Baer Pole Position and clinching the VISA Fastest Lap – more details on both of these below. The driver starting at the front (Julius Baer Pole Position) receives an extra three points, while the driver setting the pace during the race (VISA Fastest Lap) receives one additional point. However, as a new rule introduced for Season 4, the driver must finish in the top 10 places to gain an extra point. If not, then the driver in the top 10 with the fastest lap takes the honor.

E-license

Just like a driving license for the road, Formula E drivers must qualify to participate. In order to enter the ABB FIA Formula E World Championship, drivers must comply with the following:

- Drivers must conduct a specific FIA training session focusing on electrical safety, specific features of the fully electric Formula E car, and reviewing both technical and sporting aspects of the series.

- Drivers must have accumulated at least 20 points in the past three years, in conjunction with the FIA points system – used to qualify for a Super License; or have previously held a Super License; or to have participated in at least three events of the previous ABB FIA Formula E World Championship.
- The champion from the previous season automatically qualifies for a Super License the following year. If these requirements are not met, a driver judged by the FIA to have consistently demonstrated outstanding ability in single-seater categories, but with little or no opportunity to qualify, can still participate.

Car charging

Charging the car is forbidden during both qualifying and the race, as well as throughout parc fermé and scrutineering. Teams can charge the cars in between sessions and during practice.

Drivers

A total of 24 drivers from 12 teams will compete in season 7 of the 2020/21 ABB FIA Formula E World Championship.

Tires and tire allocation

The bespoke 18-inch treaded all-weather tires are supplied by Michelin – official tire supplier of the ABB FIA Formula E World Championship. For each event, every driver is supplied with a new set of tires – two new front tires and two new rear tires.

Double-header

The majority of races take place over a single day in order to minimize disruption to the host city. However, where possible some events stretch to two days with double the amount of action – these are referred to as double-headers. The schedules are mirrored from each day, with only one 45-minute practice session on the second day.

Season 7 teams and drivers

Audi Sport ABT Schaeffler



Championship entrant with team partner, ABT. The team won the first ever race in Beijing, 2014, and became a fully-backed Audi works team in Season 4, when they also won the team's championship. Audi has announced its withdrawal from the series at the end of Season 7.

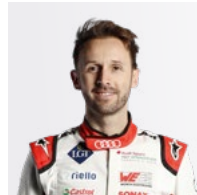
Powertrain: Audi e-tron FE07

Team Principal: Allan McNish



#11 Lucas di Grassi

Nationality: Brazilian



#33 Rene Rast

Nationality: Germany

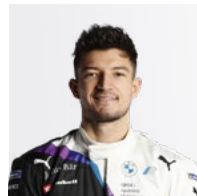
BMW i Andretti Motorsport



Provided the entire fleet of safety and officials cars from Season 1, before becoming a full manufacturer works team ahead of Season 5, when it partnered up with Andretti Autosport. BMW has announced its withdrawal from the series at the end of Season 7.

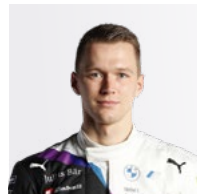
Powertrain: BMW iFE.21

Team Principal: Roger Griffiths



#27 Jake Dennis

Nationality: British



#28 Maximilian Günther

Nationality: Germany

Dragon/Penske Autosport



After seven years in IndyCar, the team entered the all-electric series for the very first race in Beijing and has competed in every race since. Its highest team championship finish was runner-up in the inaugural season.

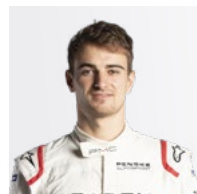
Powertrain: Penske EV5

Team Principal: Jay Penske



#7 Sérgio Sette Câmara

Nationality: Brazilian



#6 Nico Müller

Nationality: Swiss

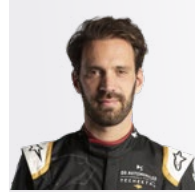
DS TECHEETAH



Joined the series in Season 3. Current defending champions having claimed the teams' title in Season 5 and Season 6.

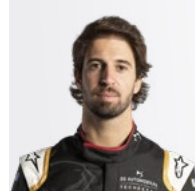
Powertrain: DS E-Tense FE20

Team Principal: Mark Preston



#25 Jean-Éric Vergne

Nationality: French



#13 António Félix da Costa

Nationality: Portuguese

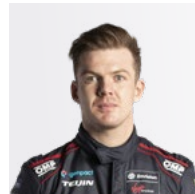
Envision Virgin Racing



Another team which has been competing in the championship since the start, Virgin Racing has been partnered with Envision since Season 5.

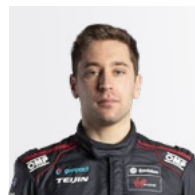
Powertrain: Audi e-tron FE07

Team Principal: Sylvain Filippi



#37 Nick Cassidy

Nationality: New Zealander



#4 Robin Frijns

Nationality: Dutch

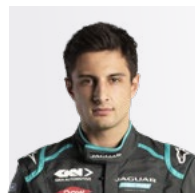
Jaguar Racing



With one of the richest histories in motorsport of any manufacturer, Jaguar joined the championship in Season 3. The team achieved its first race win in Rome in 2019. It has recently confirmed its commitment to the series as it is an important part in the manufacturer's transition to electric mobility.

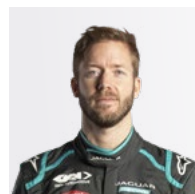
Powertrain: Jaguar I-TYPE 5

Team Principal: James Barclay



#20 Mitch Evans

Nationality: New Zealander



#2 Sam Bird

Nationality: British

Season 7 teams and drivers

Mahindra Racing



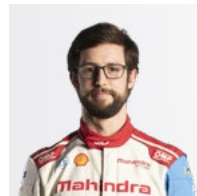
The championship is Indian car manufacturer, Mahindra's, first foray into international single-seater racing. Having joined the series in 2014, the team was the first to commit to the Gen3 era of the series.

Powertrain: Mahindra M7Electro

Team Principal: Dilbagh Gill



#94 Alex Lynn
Nationality: British



#29 Alexander Sims
Nationality: British

Mercedes-Benz EQ

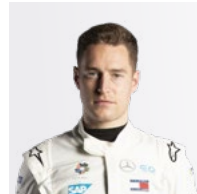


Mercedes-Benz EQ Formula E Team joined the grid for Season 6 after transitioning from HWA Racelab. HWA will continue to take responsibility for managing the cars on race weekends.

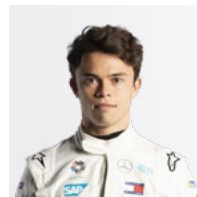
Mercedes-Benz has 125 years of motorsport experience, having competed in the very first motor race between Paris and Rouen.

Powertrain: Mercedes-Benz EQ Silver Arrow 02

Team Principal: Ian James



#5 Stoffel Vandoorne
Nationality: Belgian



#17 Nyck de Vries
Nationality: Dutch

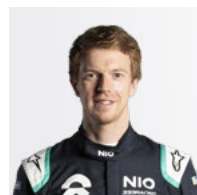
NIO 333



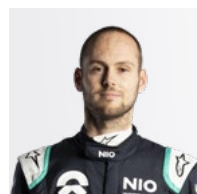
NIO 333 is the evolution of Team China Racing with whom Nelson Piquet Jr. claimed the inaugural drivers' championship. It's the racing arm of Chinese car maker, NIO, makers of the record breaking EP9 hypercar that set a new Nürburgring lap record in 2017.

Powertrain: NIO 333 001

Team Principal: Christian Silk



#3 Oliver Turvey
Nationality: British



#88 Tom Blomqvist
Nationality: British/Swedish

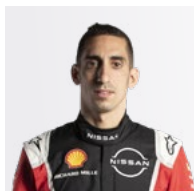
Nissan e.dams



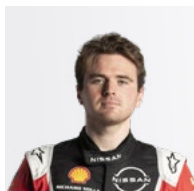
Joined the series in 2017, partnering with seasoned outfit e.dams (formally racing partner of Renault) to become Nissan e.dams. Driver Buemi is an ambassador for ABB.

Powertrain: Nissan IM02

Team Principals: Gregory and Olivier Driot



#23 Sébastien Buemi
Nationality: Swiss



#22 Oliver Rowland
Nationality: British

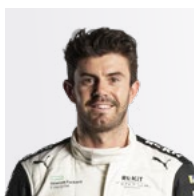
ROKiT Venturi Racing



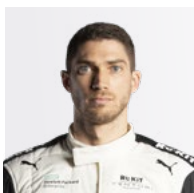
Venturi has been a part of Formula E since the very first race and clinched its first win at the 2019 Hong Kong E-Prix. It was founded by Monaco-based manufacturer, Venturi Automobiles, which holds the electric land-speed record, set with the VBB-3 'bullet car' in 2016.

Powertrain: Mercedes-Benz EQ Silver Arrow 02

Team Principal: Susie Wolff



#71 Norman Nato
Nationality: French



#48 Edoardo Mortara
Nationality: Swiss

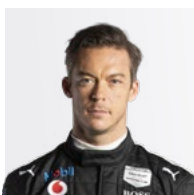
TAG Heuer Porsche



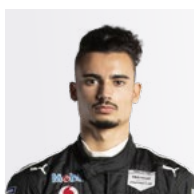
ABB partner team, Porsche, recently re-committed to remaining in the championship "until they win". Porsche's debut in Formula E in Season 6 marked its return to single-seater racing after more than 30 years. Test and development driver, Simona de Silvestro, is an ABB ambassador.

Powertrain: Porsche 99X Electric

Team Principal: Amiel Lindesay



#36 André Lotterer
Nationality: German



#99 Pascal Wehrlein
Nationality: German

For more information, please contact



Daniel Smith

Head of Global Media Relations
abbformulae-media.relations@abb.com



