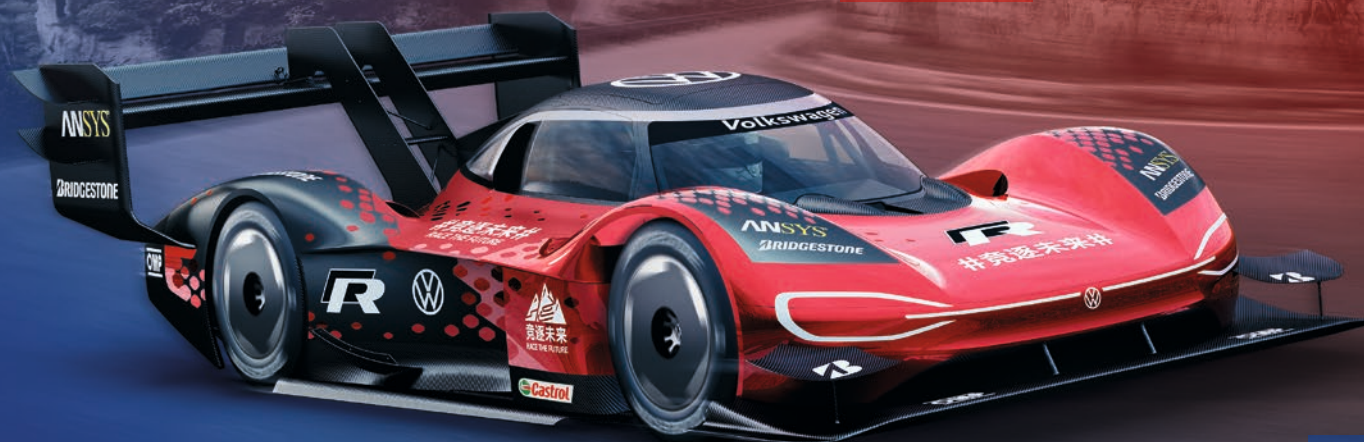




Volkswagen

ELECTRIC TO THE MAX SUCCESS STORY ID.R



Tianmen Shan Big Gate Road
01-02 September 2019



Dear members of the media,

Last year, the all-electric ID.R made history at Pikes Peak in Colorado Springs. For the first time in the more than 100-year history of the traditional hill climb, an electric race car set the absolute track record.

This year, the ID.R, which has been continuously developed by Volkswagen Motorsport, is taking on new challenges; at the Nürburgring-Nordschleife, driver Romain Dumas has already set a new lap record for electric vehicles, while he also beat the previous 20-year-old best time at the Goodwood Festival of Speed in England. Furthermore, on Tianmen Mountain in China, another exciting mission awaited the ID.R this year.

As the racing ambassador for the future electric production vehicles from the ID. family, the ID.R combines Volkswagen's technical expertise in the field of electric drive with the emotions and the fascination of racing. With the ID.R's next outing imminent, we are seeking once again to demonstrate the performance potential of today's Volkswagen cars with

electric drive. In this regard, the ID.R symbolises Volkswagen's electro-mobility offensive, which is set to launch with the world premiere of the first model from the ID. product family – the ID.3. In implementing this strategy, we will ensure that electric vehicles are attractive and affordable for as many people as possible. The Volkswagen brand will roll out more than 20 fully electric models by 2025.

When it comes to technology and performance, the ID.R race car is the pioneer of electro-mobility 'made by Volkswagen'. In the following pages, we will introduce you to the next evolutionary stage of the record-breaking car and the ambitious plans we have for it. I hope you enjoy the read.

Dr. Frank Welsch
Member of the Board of Management in charge of development of Volkswagen passenger cars

ELECTRIC TO THE MAX **SUCCESS STORY ID.R**

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#challengeacceptID



Introduction



Last year, the ID.R emphatically underlined the potential of electric drive technology on Pikes Peak.

THE ID.R

THE RECORD HUNT IN DETAIL

Pikes Peak, Nürburgring-Nordschleife and Goodwood – the success story of the ID.R and Romain Dumas continued in 2019. They took on a special type of challenge in China.

Within 15 months, Romain Dumas has set five records at the wheel of the fully electric ID.R. On 02 September 2019, the Volkswagen Motorsport team faced another test. An overview of the ID.R's successes to date.

Pikes Peak: electric drive beats the internal combustion engine

In June 2018, Volkswagen Motorsport lay down a marker in one of the most ambitious projects in its history with the absolute track record at Pikes Peak. "There was no preceding race car for the ID.R – we started with a blank sheet of paper," recalls François-Xavier Demaison, Technical Director of Volkswagen Motorsport, at the start of the project in October 2017.

Just 250 days later on 24 June 2018, Romain Dumas completed the 19.99-kilometre course on Pikes Peak in Colorado in 7:57.148 minutes, thus undercutting the previous track record set by a race car with an internal combustion engine by more

than 16 seconds. Never before in the history of the hill climb – held since 1906 – had a driver reached the 4,302-metre-high summit in less than eight minutes.

Goodwood 2018: the fastest time in 15 years

The next record followed only a few weeks later. On 15 July 2018, Dumas drove the ID.R to a new course record for electric vehicles at the Goodwood Festival of Speed in England in 43.86 seconds – which was also enough to clinch overall victory. His best time was also the fastest on the track for 15 years, and the third-fastest time ever. At the end of 2018, Volkswagen made the decision to continue the project and to tackle further challenges on the basis of its successes so far.

Evolutionary version for the special conditions of the Nordschleife

On 03 June 2019, Dumas drove the fastest lap by an electrically powered race car on the Nürburgring-Nordschleife. The



ID.R lapped the 20.8-kilometre-long track in 6:05.336 minutes. Dumas improved upon the previous record, set in 2017 by Peter Dumbreck (GB, NIO EP9), by an impressive 40.564 seconds. With an average speed of 204.96 km/h, the ID.R again underlined the impressive performance capabilities of electric drive from Volkswagen.

For Dumas, who has already won the 24-hour race on the Nürburgring four times, the record drive with the ID.R was another highlight on his favourite track. "To be a record-holder on the Nordschleife makes me unbelievably proud," says Dumas. "For me, this is the best and most difficult race track in the world. I want to thank the team at Volkswagen Motorsport, who once again have done a fantastic job. The ID.R was perfectly prepared for the Nordschleife and it was so much fun to experience the blistering acceleration and rapid cornering speeds."

In just five months, Volkswagen Motorsport had comprehensively developed the ID.R for the Nürburgring-Nordschleife challenge, in comparison to the version at Pikes Peak and Goodwood. "For this evolutionary version of the ID.R, the aerodynamic configuration was more strongly adapted to the highest possible top speed, rather than maximum downforce," explains François-Xavier Demaison. "With extensive test laps in the simulator and on the race track, we have modified the ID.R for the unique conditions of the Nord-

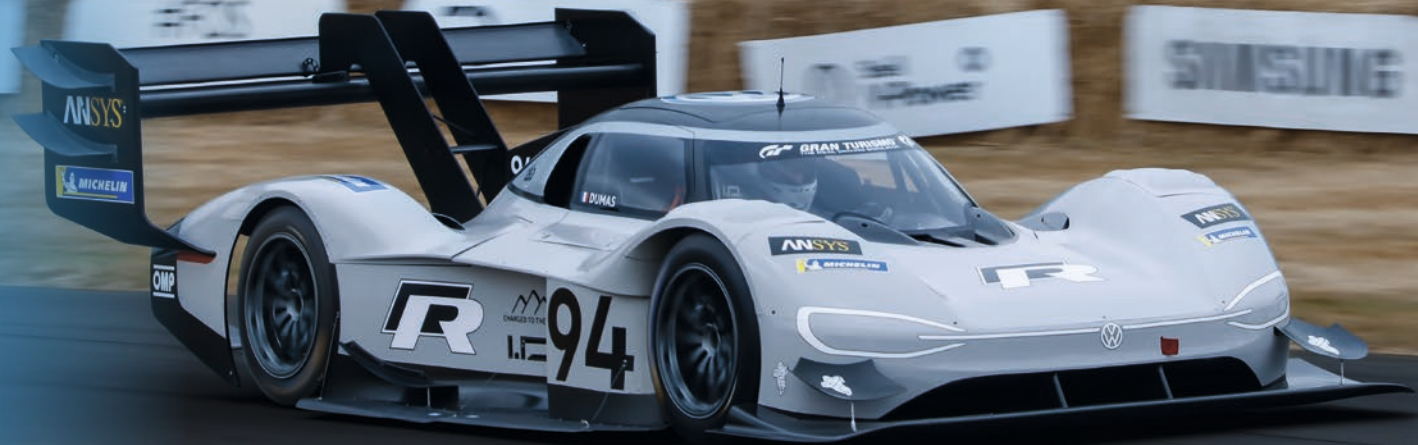
schleife. This concerned above all the tuning of the chassis, energy management, as well as the optimal tyre choice for the record attempt."

The differences between the mountain race track at Pikes Peak and the traditional circuit in the Eifel were the real challenge for the engineers and technicians. For example, at the US classic event on Pikes Peak, with the start line at 2,862 metres and the finish line at 4,302 metres, the thin air required a huge rear wing. On the Nordschleife, which winds only between 320 and 617 metres above sea level through the Eifel, top speed plays a decisive role. Therefore, the ID.R was equipped with a Drag Reduction System (DRS), as is also used in Formula 1. "With the resulting reduced drag, the ID.R achieves maximum speed on the long straights with less energy output," explains Demaison.

Goodwood 2019: a new record in England

Four weeks later, at the Goodwood Festival of Speed, Romain Dumas beat the 20-year-old Formula 1 record in the Goodwood Hillclimb. For the title-defence in 2019, the ID.R was adapted once again. This included modified battery management as well as the reduction in size of the lithium-ion batteries used in order to increase the efficiency in weight versus power output for the 1.86-kilometre track. The Goodwood Hillclimb, hosted by the Festival of Speed, challenges drivers and technology alike with standing starts and an often dirty





At the 2018 Goodwood Festival of Speed, Romain Dumas and the ID.R drove the fastest time for 15 years – and set a new e-record in the process.

A great success for Volkswagen Motorsport:
the ID.R set a new Electric Lap Record and beat
the previous by more than 40 seconds.



track surface. With the new version of the ID.R at his disposal, on 06 July 2019 Dumas beat the previous 20-year-old fastest time of Nick Heidfeld (D, McLaren MP4/13) by 1.7 seconds. 39.90 seconds – a new record.

Tianmen Mountain 2019: a different kind of record

The start of September took the ID.R to the Middle Kingdom: the Tianmen Mountain, approximately 1,300 kilometres away from the capital of Beijing as the crow flies, is the link between heaven and earth according to a Chinese legend. For the first time, racing driver Dumas took on this unique track with the ID.R. The objective: completing the mountain passage as quickly as possible and setting a benchmark for the 10.906-kilometre track since no universal record for racing cars has been set. The ID.R took on this spectacular challenge with new aerodynamics, which were based on those of the record-breaking car at Pikes Peak. The chassis tuning also underwent greater changes: the road mainly consisted of concrete slabs with challenging cross joints. In some sections, the

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“The reduction in aerodynamic drag allows the ID.R to achieve top speed with less energy consumption on the long straights.”

François-Xavier Demaison,
Technical Director Volkswagen Motorsport

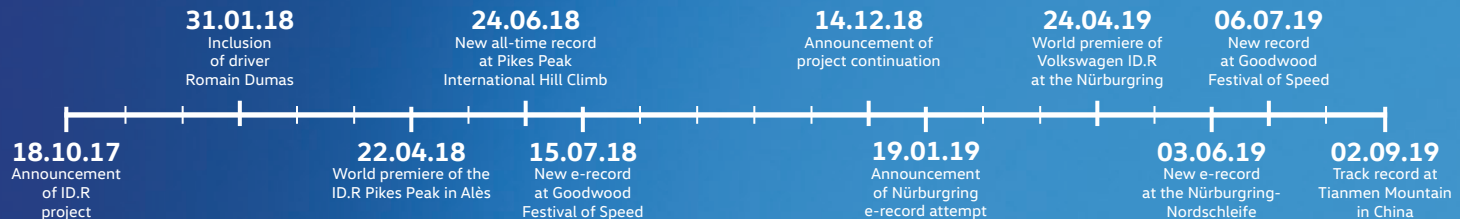


surface was asphalt, in others there were only loose surfaces. This was a challenge for the driver and chassis alike and was more like a rallycross track than a racetrack.

And the preparation was not easy for the Volkswagen Motorsport engineers and Dumas: "The record attempt in China on Tianmen Mountain is a very special technical and sporting challenge," said François-Xavier Demaison, Technical Director of Volkswagen Motorsport, ahead of the attempt. "Nowadays, it's normal in motorsport to be able to access very accurate data in order to perform detailed simulations, optimise the vehicle set-up and give the driver an opportunity to learn the track. However, since the Tianmen road is not usually accessible and we did not have any usable data, we had to take our own different path to prepare as best we could and collect, process and evaluate the data ourselves."

At the beginning of 2019, the engineers drove the 10.906-kilometre track multiple times. The data they collected doing this, as well as the information on the track characteristics, formed the basis for an abstract 3D model, which was used to determine the most important parameters. At particularly challenging points – such as turn 88, which is extremely narrow with a radius of six metres – the engineers even reached for the tape measure to get the most exact values possible for the challenges for the car.

This new approach was crowned with success: on 02 September 2019, Romain Dumas and the ID.R set the first record for racing cars on the Tianmen Mountain. Despite many uncertainties, the French racing driver completed the 10.906-kilometre track in the fully electric ID.R in a superb 7:38.585 minutes. Other racing drivers are invited to break this benchmark.





THE TIANMEN CHALLENGE RECORD AT HEAVEN'S GATE

Volkswagen is directing its strategy towards e-mobility with the ID. product family. The topic of electric cars is also progressing at full throttle in China. At the 'Heaven's Gate' in China, Romain Dumas faced a unique challenge in the ID.R on 02 September.

Tianmen Mountain in southeast China is one of the most primeval mountains on the planet. Over 3,000 mighty lime sandstone pillars, several hundred metres in height, stretch up into the sky. Their summits are almost always shrouded in thick fog or low-hanging clouds. It is this seemingly extraterrestrial landscape on the outskirts of the city of Zhangjiajie, with a population of over one million, roughly 1,300 kilometres from the capital Beijing as the crow flies, that is said to have been the inspiration behind director James Cameron's stunning scenery in his hit film 'Avatar'.

Where heaven and earth meet

According to Chinese legend, Tianmen Mountain forms the passageway between heaven and earth. The natives had no other explanation for a 131-metre high, 57-metre wide and 60-metre deep opening in the rock. The so-called 'Heaven's Gate' is of great mystical significance, as are the 999 steps that form the final 'stairway to heaven'.

The 'Tianmen Shan Big Gate Road' starts in the valley around 200 meters above sea level and ends at an altitude of about 1,300 meters. The road winds up the mountain like a vast, asphalt snake. Few straight sections are longer than 50 meters. The narrow track crosses itself with overpasses several times, while a total of 99 hairpin bends overcome the steep climb. They symbolise the nine palaces of the sky.

And it is exactly in this labyrinth of turns that the fully electric powered ID.R took on its most unusual challenge to date. "The Volkswagen ID.R is an icon, which perfectly embodies the passion for e-mobility in China and our expertise in the development of electric drive technology," says Dr. Stephan Wöllenstein, Member of the Board of Management of the Volkswagen Passenger Cars brand and CEO Volkswagen China. "We can use the experience gained in the field of motorsport to further enhance that expertise, and can incorporate it into the assembly of electric production models."





"The Volkswagen ID.R is an icon, which perfectly embodies the passion for e-mobility in China and our expertise in the development of electric drive technology."

Dr. Stephan Wöllenstein,
Member of the Board of Management of the Volkswagen
Passenger Cars brand and CEO Volkswagen China





Tianmen Mountain Facts & figures



99

Hairpins symbolise the
nine palaces in heaven



10.906 km

Total length of road



1,110 m

Change in elevation

Volkswagen Motorsport Director Sven Smeets adds: "Tianmen has a mystical status in China, where it is known as 'Heaven's Gate'. The route to Tianmen is one of the most extraordinary and difficult roads in the world – another special challenge for the ID.R. Our objective was to set a new milestone for electric vehicles and, in doing so, to support Volkswagen's e-strategy in China, which is really picking up speed this year."

It was certainly the most unusual record attempt for the ID.R and driver Romain Dumas to date: "The route was very winding, extremely narrow in places, and very uneven. It was certainly a special experience. We learned a great deal about the car and are delighted to have set a record here that other car manufactures can try to break in the future."

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"The route is one of the most extraordinary and difficult roads in the world – another special challenge for the ID.R."

Sven Smeets,
Volkswagen Motorsport Director



Volkswagen Motorsport continues to improve the electric race car ID.R in the ongoing year and continues to prepare it for the challenges that lie ahead.

THE CONTINUOUSLY DEVELOPED ID.R **BETTER IN EVERY ASPECT**

Volkswagen is making great strides in the field of electro-mobility. The ID.R represents a racing spearhead in this regard. For the outings in 2019, the thoroughbred sports car was continuously developed.

Following the spectacular performances at Pikes Peak (USA) and Goodwood (United Kingdom) last year, the ID.R faced the challenge of the Nürburgring-Nordschleife (Germany) in June 2019. In July, at the Goodwood Festival of Speed, Romain Dumas and the ID.R not only successfully defended the title from the previous year, but undercut the previous course record. On 2 September 2019, the next mission awaits: Tianmen Mountain (China).

A medium-fast mountain race track with an altitude of over 4,000 metres, a sprint course with a length of just 1.86 kilometres, the most challenging circuit in the world in the Eifel and now a narrow track with 99 hairpin corners – the demands on the IDR could hardly be more different.

With its variable technical layout, the all-electric race car can be perfectly adapted to the new challenges. “Based on the Pikes Peak specification, we were able to continuously develop the ID.R for the Nordschleife, Goodwood and Tianmen Moun-

tain, making it even more efficient. The biggest changes for the Nordschleife related to the aerodynamics and energy management of the electric drive. Furthermore, we adapted the ID.R in numerous details to the specific conditions of the Nordschleife,” says François-Xavier Demaison, Technical Director of Volkswagen Motorsport. “For the title defence in Goodwood, we have developed a lighter sprint version with modified battery management.”

Simulations drive development

Just 250 days passed between the start of the ID.R project and victory on Pikes Peak on 24 June 2018 – that alone must be some kind of record. Volkswagen Motorsport had even less time this year to prepare for its assault on the record lap time for electric cars on the Nordschleife. With the pressure on, the team led by Dr. Benjamin Ahrenholz, Head of Calculation/Simulation at Volkswagen Motorsport, played a significant role in the preparations.



“We have applied simulations in several areas to further develop the ID.R, thus saving a lot of time. The computer performance required for many calculations is so high that we receive support from the Volkswagen Production Development department in Wolfsburg. If required, we can access their computer network with several hundred processors,” says Ahrenholz.

For example, when designing optimised chassis components, structure simulation was used to calculate the loads that the chassis of the ID.R would have to cope with on the Nordschleife. The driving dynamics simulation allowed Romain Dumas to practice and find the optimum strategy for managing battery power. At the same time, the computer also completed virtual laps of the Nordschleife in order to test the effects of various different set-ups and energy management strategies.

Before the further developed ID.R was subjected to airflow in the wind tunnel, the aerodynamic simulation had already calculated the effects of dozens of different wings, spoilers and flaps. The battery simulation was primarily used to research different energy management strategies, which control the power output and charging during the lap (regeneration).

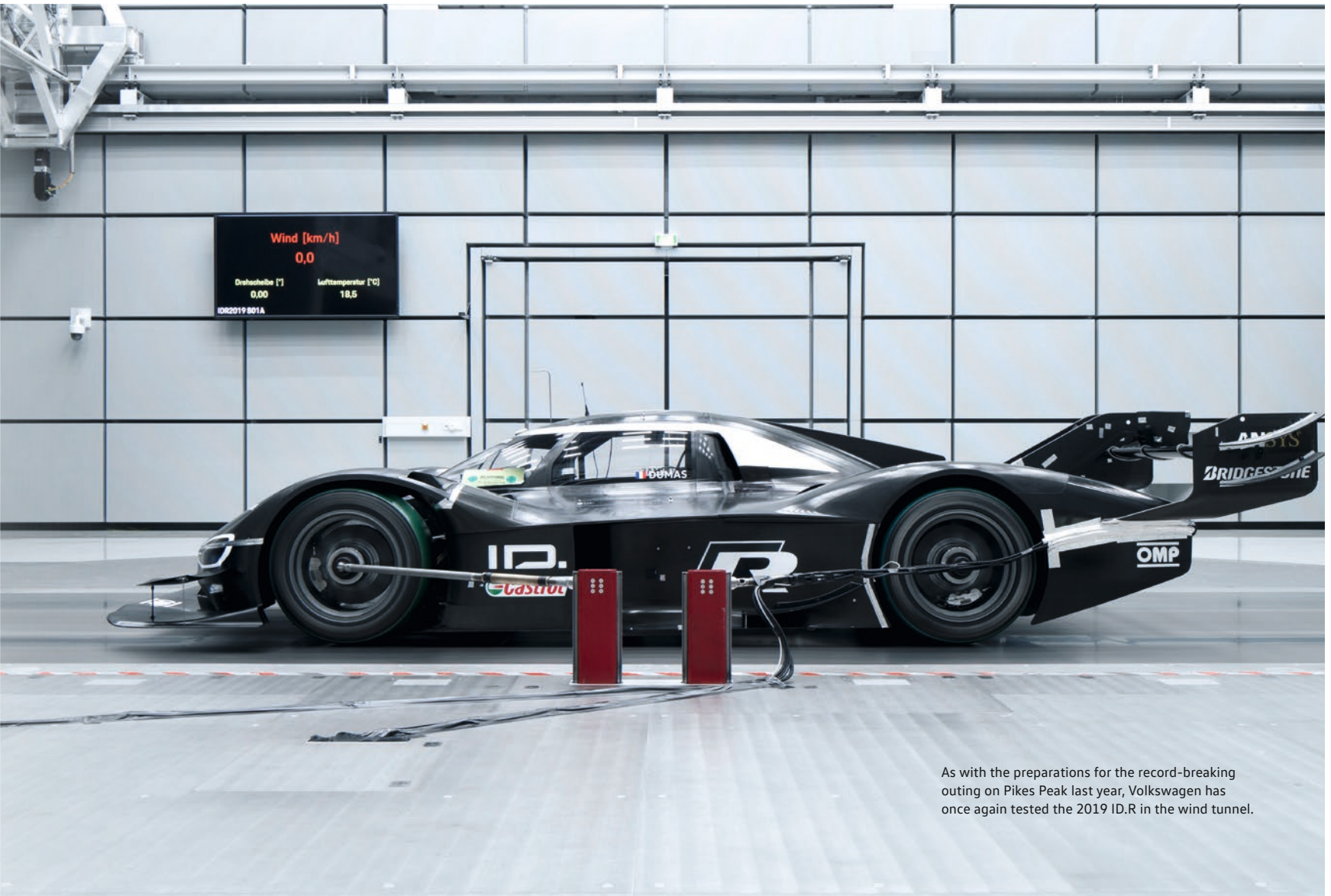
“As an engineer, the good thing about the challenges on the Nürburgring-Nordschleife, Goodwood and Tianmen is that we are given completely free rein. We can develop the most efficient solutions without being restricted by regulations,” says Willy Rampf, Technical Advisor to the Volkswagen Motorsport team.

Variable aerodynamics with a Drag Reduction System

The basis of the ID.R remains unchanged from that of last year. The 2019 evolution of the Pikes Peak winner is also powered by two electric motors with a system performance of 500 kW (680 PS). The drive concept, with one electric motor per axle, as well as the lithium-ion batteries in the ID.R, are comparable to the technology set to be used in the ID. product family – Volkswagen’s range of fully-electric production vehicles that are to be launched over the coming years – such as, for example, the ID.3. The design, with its stylish light signature, also underlines the role of the ID.R as a racing ambassador to the ID. family.

The outing on the Nürburgring-Nordschleife demanded a completely new strategy with regard to aerodynamics.





As with the preparations for the record-breaking outing on Pikes Peak last year, Volkswagen has once again tested the 2019 ID.R in the wind tunnel.



Formula 1 technology in the ID.R

Without DRS (drag reduction system) activated, the ID.R generates roughly twice as much downforce as a Formula 1 car. Activating DRS reduces aerodynamic drag by about 20 percent. Compared to the record-breaking outing on Pikes Peak in 2018, the aerodynamic drag generated by the ID.R without DRS activated is roughly 33 percent lower.

“The Nordschleife has many straights, the longest of which is almost three kilometres,” says Dr. Hervé Dechitre, the engineer responsible for the aerodynamics of the ID.R. “The air is also far denser than it was at such a high altitude on Pikes Peak. For this reason, we developed a completely new aerodynamic configuration for the ID.R, with less downforce for the Nordschleife.”

In order to reduce aerodynamic drag, the ID.R was given a modified floor and a front spoiler tailored to high speeds. The most distinctive feature is the modified rear wing. It is significantly flatter than it was for the record-breaking drive in June 2018. However, as higher downforce is required in the slower of the 73 corners on the Nürburgring-Nordschleife, the rear wing also uses technology that has become a familiar feature in Formula 1 – a drag reduction system, DRS for short. “Buttons on the steering wheel allow the driver to change the setting of the main elements of the rear wing,” explains Dechitre. Steeply-angled airflow deflection areas help generate greater downforce at lower speeds, while a flat wing reduces aerodynamic drag on the straights. “The difference in downforce is about 20 percent,” says Dechitre.

Unlike in Formula 1, where the DRS is primarily designed to facilitate overtaking, the system helped the ID.R to manage the energy stored in the batteries more efficiently during its record lap on the Nordschleife. The adjustable rear wing allowed the ID.R to reach a high speed with less energy. In addition, less energy was needed to maintain the maximum speed on some sections of track.

In order to achieve this, the software in the ID.R was completely re-programmed. “We practically started from scratch again with regard to the energy management,” says Bertram. The technicians spent the tests in Spain and France working meticulously to find the optimal strategy for energy regeneration on the Nordschleife. The energy regenerated under braking was less than on Pikes Peak, due to the different characteristics of tracks. In the US, the ID.R generated roughly 20 percent of the energy required on board. On the Nordschleife, this figure was about ten percent.

“With regard to the set-up of the chassis, an important change compared to 2018 is our new tire partner Bridgestone,” adds Cedric Delnatte, ID.R Project Manager. “Finding the right set-



up was a priority in the preparations. However, we were able to obtain the necessary knowledge in relation to this with test drives on race tracks other than the Nordschleife." Other new features included the brake system of the 2019 ID.R, which was converted to use carbon-fibre brake disks for the record-breaking lap of the Nordschleife. These are not only more resilient than the previously used ceramic discs, but they also help to reduce the so-called 'unsprung' masses.

This term refers to the mass of all the parts of the car that are not supported by the chassis springs. In the case of the ID.R, these include the wheels and brakes. The unsprung mass affects handling; as a general rule, the lower the unsprung mass, the better the driving properties.

More work for the driver

Romain Dumas, who has been behind the wheel of the ID.R in 2019 following last year's record-breaking drives, is extremely impressed by the job done by the Volkswagen Motorsport engineers. "It is hard to believe that the 2019 ID.R is better

and more efficient in every aspect than the car with which I set the record on Pikes Peak in June 2018," says the Frenchman. "Back then, we did not know exactly what awaited us. We had to make compromises in certain places. For the Nordschleife, we were much closer to the limit with the whole car. That obviously also puts more demand on me as a driver. For example, the centrifugal forces I was subjected to in the corners were far greater."

The record attempt on the Nürburgring-Nordschleife was as much a home event for Dumas as it was for Volkswagen Motorsport. "The Nordschleife is by far the most beautiful race-track in the world – I love it," says the four-time winner of the Nürburgring 24 Hours, giving an insight into his particular motorsport tastes. The electric lap record was exactly the right challenge for him – and perfect preparation was once again the key to success in China.



Nürburgring-Nordschleife instead of Pikes Peak.
Racetrack instead of hill climb. The aerodynamics of
the fully-electric ID.R have been further developed
accordingly.

TECHNICAL DATA VOLKSWAGEN ID.R (TIANMEN 2019)

ENGINE

DESIGN	Fully-electric motor
POWER OUTPUT	500 kW (680 PS)
TORQUE	650 Nm

BATTERY

BATTERY	Lithium-Ion, 8 modules of 56 battery cells each, located in 2 blocks next to the driver and behind the monocoque
CHARGING POWER	Up to 90 kW
CHARGING TIME	20 minutes

POWER TRANSMISSION

FINAL DRIVE	Permanent four-wheel drive with active torque distribution
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CHASSIS

FRONT/REAR AXLE	Double wishbone suspension
TYRES	Bridgestone Potenza 330-40/18





BODY

DESIGN

Safety/crash structure at front, carbon monocoque with steel roll cage

DIMENSIONS AND WEIGHT

LENGTH/WIDTH/HEIGHT	5,200/2,350/1,200 mm
TRACK WIDTH	1,600 mm
WHEELBASE	2,850 mm
WEIGHT	<1,100 kg (incl. driver)

PERFORMANCE FIGURES

ACCELERATION	0-100 km/h in 2.25 seconds
TOP SPEED	270 km/h

"THE ID.R HAS ALREADY CREATED QUITE THE BUZZ"

Volkswagen Motorsport Director Sven Smeets reflects on the ID.R's appearances in 2019 and explains the role of the fully-electric race car as the racing spearhead of Volkswagen's electromobility strategy.

How do you rate the success of the ID.R so far?

Sven Smeets: We have demonstrated with the ID.R what emotions electric cars can awaken. The response to the all-time record on Pikes Peak was truly overwhelming. We then added to the success story with a new lap record for electric cars at the Nürburgring. The project has also created a huge buzz inside the brand. We have managed to significantly raise awareness for the future production models in the ID. family. The message is getting through that electric cars are not only environmentally friendly, but can also be high-performance and captivating.

You followed Pikes Peak last year with the Nordschleife this year. How did you come up with this new challenge for the ID.R?

We wanted to use the ID.R again to show that Volkswagen is constructing electric cars that are capable of taking on the biggest challenges a car can face. The Nürburgring-Nordschleife was the next logical step. No other racetrack is more challenging or more captivating than the 'Green Hell'.

How did you prepare the ID.R for the Nordschleife – particularly compared to the record-breaking run on Pikes Peak?

We know the Nordschleife fairly well and we managed to gain a lot more experience with the ID.R. In order to prepare the car for this challenge, we had to make some modifications – particularly to the aerodynamics. For example, we lowered the rear wing by about 22 centimetres and installed a drag reduction system, similar to what is seen in Formula 1. Our driver, Romain Dumas, could activate this when necessary during the record attempt, in order to reduce aerodynamic drag on in the faster sections. We also made adjustments to the battery management.

And with great success. What goals have you set after the lap record for electric vehicles on the Nordschleife?

In July 2019, we repeated our victory at last year's Goodwood Festival of Speed. In 2018, we set a new course record for



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“The message is getting through that electric cars are not only environmentally-friendly, but can also be high-performance and captivating.”

Sven Smeets,
Volkswagen Motorsport Director





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“The motorsport industry is also going through a period of change and I see us as a pioneer in the field of electric drive technology with the ID.R.”

Sven Smeets,
Volkswagen Motorsport Director

electric vehicles – 43.86 seconds – with the ID.R, which was also the fastest time in 15 years on this track. This year, for the first time, we were able to beat the previous 20-year-old all-time record, with a sprint version of the ID.R specially prepared for Goodwood. And then, another special challenge in China awaited us on 02 September ...

In September, Romain Dumas drove the ID.R on Tianmen Mountain. What were you hoping to achieve there?

Tianmen has mystical significance in China as the 'Heaven's Gate'. Special events there can attract a lot of attention in Asia. The primary aim with the ID.R's appearance there is to support Volkswagen's electric strategy in China, which is picking up speed in 2019. The country is subject to an extraordinary mobility change – the registrations of electric cars have been growing at an above-average rate for years. Furthermore, our visit to China was worth the effort from a sporting perspective.

Electromobility is the topic of the future at Volkswagen. How do you see the role of ID.R in this regard?

Development is progressing with great strides in the field of e-mobility. The ID.R's appearance's show Volkswagen's clear

commitment to electro-mobility and underline the impressive performance potential of electric drive technology. The motor-sport industry is also going through a period of change and I see us as a pioneer in the field of electric drive technology with the ID.R. Within a very short period of time, we have developed a huge amount of know-how with e-drive, which we are only too happy to share with our colleagues in production development.

How are Volkswagen Motorsport and the Production Development department at Volkswagen working together in the field of e-mobility?

The cooperation with Volkswagen's Production Development department is a key element in the continuous development of the ID.R – for us, of course, but also for our colleagues as well. For example, we are engaged in intense exchanges on the development and manufacture of battery systems – the range of new ideas is vast, and we can produce real innovations with our motorsport prototypes. At the same time, we are able to call upon the technical resources of the Technical Development department in Wolfsburg for the continuous development of the ID.R, which significantly facilitates our work.

PIONEER FOR SUSTAINABLE MOBILITY

Volkswagen is taking responsibility by initiating a step-by-step conversion of vehicles, production and other value creation stages to achieve CO₂-neutral status in the coming years.

The Volkswagen Group is continuing to drive systemic change in individual mobility and is aiming resolutely for the introduction of electric drivetrains. Volkswagen will be introducing nearly 70 new e-models to the market by 2028. The number of electric vehicles projected for the next decade is set to rise to 22 million.

Volkswagen has also affirmed its support for the objective of restricting global temperature increase to less than two degrees by 2050, as agreed at the Paris climate summit. With this in mind, the Group intends to achieve CO₂-neutrality by 2050. This will be the case for the fleet, for production and for management as well. By 2025, the CO₂ footprint of the vehicle fleet is to be reduced by 30 percent across the entire life cycle, compared with the figures from 2015.

To achieve this, the Volkswagen Group will be investing more than 30 billion euros in electro-mobility by 2023, with the upcoming electro offensive alone set to cost the Volkswagen

brand 9 billion euros. Volkswagen views the transformation to battery-powered electric drive systems as an important way of reaching those climate-related objectives. The proportion of electric vehicles in the fleet is to rise steadily, reaching at least 40 percent by 2030.

Following on from the ID.R, racing forerunner of Volkswagen's ID. product family, the first production model based on the new MEB electro platform (modular electric drive matrix) will be constructed at the Volkswagen factory in Zwickau. During regular production operations, the factory will be converted from the current 100 percent focus on combustion engines to 100 percent electric drive technology.

This process is a global first, representing the first complete, comprehensive transformation of a major automotive factory to e-mobility. From 2022 onwards, fully-electric vehicles will also roll off the line at the Volkswagen factories in Emden and

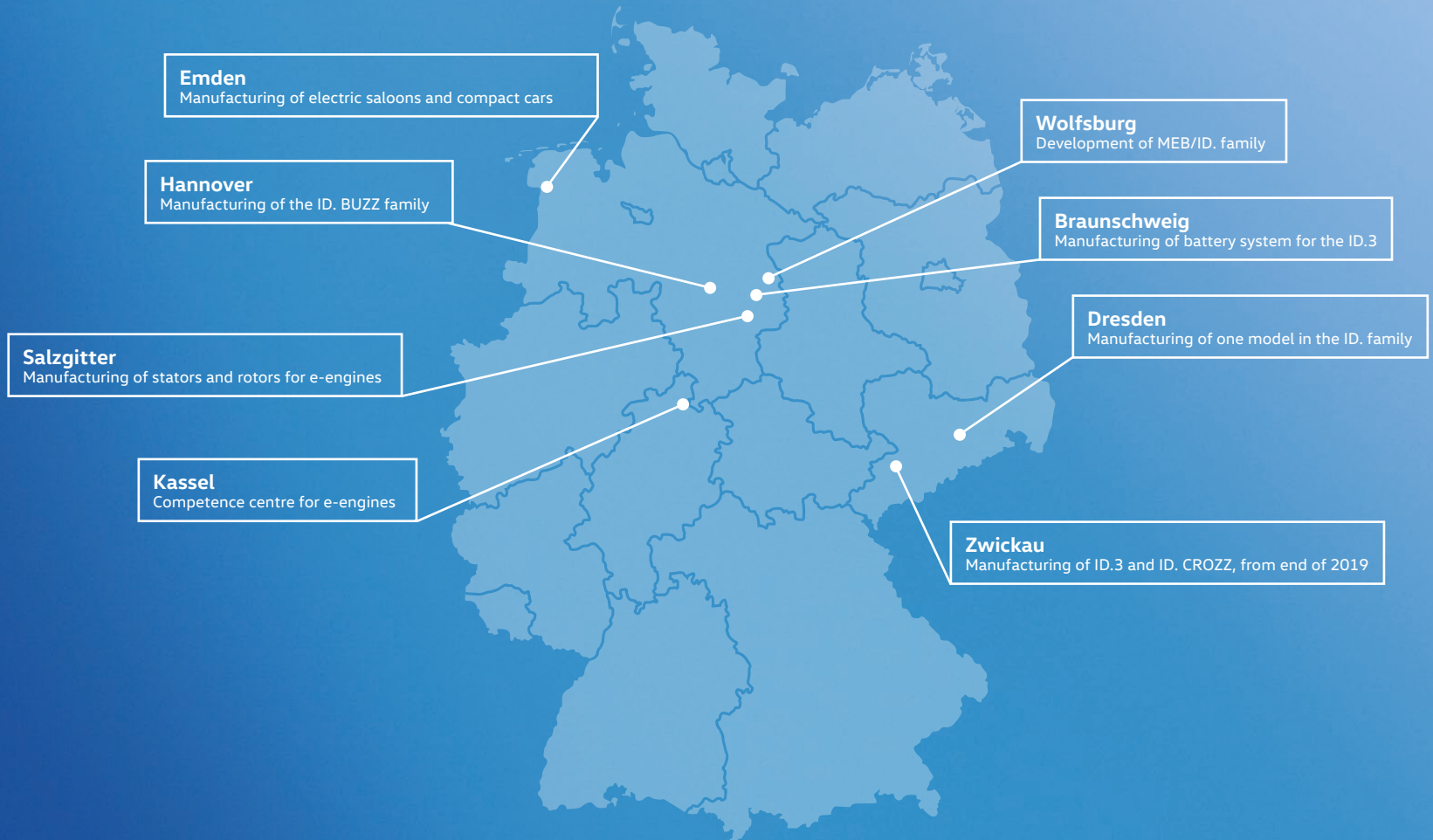




Efficient reuse

The batteries in the ID. range of models consist of many cells. They fill almost the entire area of the car floor, between the two axles. Each battery is efficiently recycled and reused in its so-called "second life" – such as in mobile charging stations.

Volkswagen locations in Germany involved in MEB production



Hannover. Together, these three locations will form the largest high-performance e-production network in Europe.

Opening up the MEB to other manufacturers will extend the reach of the platform and can lead to significant cost reductions for electric vehicles, thanks to economies of scale. The cooperation planned with Aachen-based e.GO Mobile AG is an example of one such partnership.

Volkswagen has selected LG Chem, SKI, CATL and Samsung as strategic battery cell suppliers to safeguard the electro offensive. Volkswagen is also looking ahead to the potential of increased demand and investigating opportunities for involvement in battery cell production in Europe. Volkswagen is also working on increasing battery cell expertise at the company's own Center of Competence in Salzgitter. The Volkswagen factory in Braunschweig is producing the battery systems for e-vehicles based on the MEB.

The ID. family, a milestone in CO₂-neutral mobility

Attractiveness, a wide range of options, sustainability and affordability are of prime importance for the Volkswagen electric cars, alongside the key values of emotionality and digitisation. The ID.3¹, the first compact car from the fully-electric

ID. family will be followed by the production versions of the ID. CROZZ², ID. BUZZ², ID. VIZZION² and ID. ROOMZZ² concept cars.

The brand launch of the ID. family will mark the start of the largest e-offensive in the automobile industry and will be a milestone in the history of climate-neutral mobility. The pioneering role is reserved for the ID.3, which will go into production in Zwickau at the end of the year: the first electric car produced by the Group will be CO₂-neutral throughout its life cycle, assuming that customers consistently charge the battery with renewable energy. The carbon footprint of the ID.3 for the production phase will be reduced by more than one million tonnes of CO₂ per year. That corresponds approximately to the climate-related impact of a coal-fired power station supplying 300,000 households with electricity.

Europe-wide network of fast-charging stations

The market launch for the ID.3 will be preceded by a succession of solutions to the issues facing private and commercial e-mobility customers – including movable assets, billing and digital additional services and complete consulting packages. All of this underlines Volkswagen's intention to become the leading provider of sustainable mobility.

¹This vehicle is not yet for sale ²Concept Car



It will also be possible to maintain CO₂-neutrality when using the ID.3 – assuming that customers choose to use sustainably-generated electricity. The new Volkswagen subsidiary Elli will be offering a wide range of wallboxes and charging solutions with sustainably-generated energy in time for the market launch of the ID.3 in 2020.

Volkswagen is also working with the joint venture IONITY to build up a high-performance and sustainable fast-charging network in Europe. The first target is the construction of 400 fast-charging stations on motorways across Europe. Around 100 of these will be in Germany, at intervals of approximately 120 kilometres.

Customers will be able to choose between various wallbox variants for safe, quick and easy charging at home. These variants are set to include 11-kW wallboxes, while the introduction of fast 22-kW wallboxes with a charging time of three to four hours is also planned. Volkswagen will also increase the number of charging points available at employee car parks from 1,000 to 3,500 by 2020.

In this timeframe, all Volkswagen dealers and service partners in the EU will be equipped with charging stations that will be available for customers and the public. The Volkswagen mobility

platform “We” will allow customers to search for charging stations and provide a payment service with “We Charge”.

Efficient reuse

The lithium-ion battery is not just an important part of the success strategy for the ID.R race car, but is also a vital element of the Volkswagen e-offensive. The new and independent Volkswagen Group Components brand will assume end-to-end responsibility for the battery – from building expertise in cell production to recycling. Once the life cycle of the vehicle is complete, the battery can be reused in second life concepts – or established recycling procedures will transform it into a valuable source of raw materials.

In this case, the lithium-ion battery will be a treasure trove of scarce raw materials that can be reused once its operational life has come to an end. From 2020, Volkswagen will recycle batteries at the component location in Salzgitter to put valuable materials back into circulation. In addition to the recovery of aluminium, steel and copper, this process will focus on the retrieval and reuse of nickel, manganese and cobalt. The long-term objective is to reuse up to 97 percent of all recyclable material when the market starts to return large quantities of batteries at the end of the next decade.



This is what the future looks like: efficient charging at an IONITY fast-charging station.



THE ID. FAMILY A LOOK AHEAD INTO THE FUTURE

The fully-electric models from the ID. product family embody the technological and social evolution of individual mobility.

The countdown has begun: from 2020, Volkswagen will move into a new automobile age with the ID. family. The brand will be introducing an entire family of fully-electric models to the road for the very first time. It will range from the compact ID.3¹ to the SUV coupé ID. CROZZ², the multi-variable full-size lounge SUV ID. ROOMZZ² and the luxury limousine ID. VIZZION², as well as the production edition of the ID. BUZZ² – the electric reincarnation of the legendary “Bulli” van. The open ID. BUGGY² represents dynamic, limitless driving enjoyment and provides the opportunity for future development of other vehicles on the MEB platform.

The basis for all six models is the MEB vehicle architecture (modular electric drive matrix), conceived and designed for fully-electric drive systems. The drive concept of the ID.3 and the ID. BUGGY stipulates a rear-axle electric motor, while the other four models each have an electric motor on the front and rear axles – making them four-wheel drive vehicles. Drive can be provided by the rear axle alone, or by both axles. Whenever required for reasons of drive dynamics, power is distributed to the four wheels within milliseconds via an electric cardan shaft.



This drive control allows the ID. cars to adjust swiftly to virtually any situation, whether racing through fast turns on tarmac roads, or – with the permanent all-wheel-drive options provided by the ID. CROZZ and the ID. ROOMZZ – through snow or mud on dirt tracks.

The entire drivetrain is contained in a compact unit. Thanks to the battery integrated into the vehicle floor and their low centre of gravity, the ID. vehicles boast even weight distribution and pleasant, balanced driving dynamics. The capacity of the high-voltage batteries varies from model to model. Customers will also have the option of choosing increased storage capacities.

The floor-mounted batteries are charged via a cable. The rapid charging system supports charging performances of up to 125 kW, and ensures that battery charge can reach 80 percent within around 30 minutes.

The design of the ID. family

Visionary design with a human focus – and exuding a fascination for electro-mobility – is at the core of the vehicles in the ID. family, all of which are based on the MEB platform. The charismatic front end is as intriguing as the flowing, sculptured surfaces of the outer skin. The large wheels were chosen deliberately for enhanced expressiveness: they are one of the primary design features that characterise electro-mobility by Volkswagen.



The ID. family



The production version of the ID. BUZZ (left) will be launched in 2022. However, the future is just around the corner: the compact ID.3 heralds a new era of mobility in 2020. Registrations are possible now at Volkswagen trade partners.





All the cars in the ID. family are based on the new MEB platform (modular electric drive matrix).

The new language of form corresponds to innovative technical solutions: the ID. family concept cars do not have fixed centre pillars. Instead, the front and rear doors join to form a protective composite when closed. The rear doors open backwards to allow easy access to the open space. This is where the traditional workspace for the driver becomes the interactive centre of a lounge-like digital living space. The fully automated "ID. Pilot" mode emphasises the spatial effect of this open concept.

The start of the electric car offensive: ID.3

In 2020, the first production model in the ID. Family – the ID.3 – will launch Volkswagen's offensive in the electric car segment. Similar to the study, the ID.3 will be just over four metres long. The front and rear ends are separated by a considerable wheelbase to give the impression of size, despite the relatively short exterior. In contrast, the crisp chassis overhangs are noticeably shorter.

Depending on the battery package, the range according to the new WLTP procedure will be between 330 and 550 kilometres. Either way, for the majority of customers – such as commuters travelling short distances – the battery charge should easily last a week or more.

The ID. BUZZ: a legend reborn

The production variant of the ID. BUZZ is set to hit the market in 2022, transporting the feeling of freedom from the legendary "Bulli" into the next era of mobility. Volkswagen Head of Design, Klaus Bischoff, explains: "We have not used the ID. BUZZ as a retro design on 22-inch rims. Instead, we conceived the logical next step in the development of what is certainly the most successful van design in the world."

The zero-emission all-wheel drivetrain in the ID. BUZZ consists of two electric motors, one on the rear axle and one on the front (150 kW each). The electro-Bulli is a spatial miracle, providing up to eight seats and two luggage compartments, front and rear. The steering wheel has been completely redesigned: the functionality by far outstrips that of a typical multi-func-



tional steering wheel. It does without traditional design elements such as spokes and buttons, replacing these with a type of touchpad that employs capacitive panels.

The ID. range also boasts another new feature: the heads-up display. It uses augmented reality to perform navigation tasks in the ID. BUZZ. Information, such as directions from the navigation system, is projected virtually 7 to 15 metres ahead of the front of the car.

The ID. CROZZ crossover

The production model of the ID. CROZZ is scheduled for launch at the end of 2020. The four-door coupé and sport utility vehicle (SUV) with 4MOTION four-wheel drive powertrain is characterised by a wide front end and contoured wings. The 4.625-metre ID. CROZZ appears powerful and masculine, thanks to the high-gloss black roof area. The two electric motors generate a system performance of 225 kW (305 PS). The car can reach speeds of up to 180 km/h and travel up to 500 kilometres on one battery charge.

The ID. CROZZ boasts a variable, lounge-style space concept. The occupants can look forward to four separate integral seats with luxury levels of legroom. It is also possible to completely fold away the rear seats for efficient maximization of the

available space. The newly-developed CleanAir system provides the best in tailored air conditioning on board. Regardless of environmental conditions, in-car air will always be of the highest quality.

The luxury ID. VIZZION limousine

The ID. VIZZION transfers the design DNA of the ID. models to the world of grand limousines. The controls transport you to 2030, while automated driving to level 4 could well be available on certain routes in 2025. Speech and gesture controls allow the ID. VIZZION to drive completely autonomously. As a smart device, the car becomes the chauffeur, as there are some situations in which it does not require the driver's attention. This allows the ID. VIZZION to provide its passengers with the freedom they need on the road – to relax, to communicate, or to work.

The electric all-wheel drivetrain shows that the future is very much now, as its two motors produce a system performance of 225 kW and a range of up to 600 kilometres.





The ID. CROZZ (top) combines the authority of an SUV with the dynamics of a coupe. The ID. VIZZION transfers the design DNA of the ID. models to the world of large saloon cars.



The ID. family

The chassis design of the ID. ROOMZZ has the same clear, homogenous lines as the rest of the ID. family. At the same time, it is also exploring new horizons in many details.



The luxury ID. ROOMZZ SUV

The ID. ROOMZZ is the multi-variable all-round model in the ID. family, based on the MEB. It is the sixth concept car and provides a first look at the upcoming production versions of the lounge-style, zero-emission SUV.

In addition to an exterior design that sparkles with seamless transitions, the special feature of this car is a new interior architecture that concentrates on individuality and variability. It has a range of seating configurations that can be adjusted to each driving mode. Top quality materials are used throughout, combined with the option to personalise the lighting elements. To allow the driver to get full enjoyment of this interior, the production version will also have the full range of IQ.DRIVE systems on board. Intelligent driver assistance will turn any drive into a relaxing journey for all passengers. The fully-electric luxury SUV will be on the market in China in 2021. Further markets will follow.

The ID. BUGGY is the reinterpretation of the thoroughbred buggy – true to the original style, without a fixed roof or conventional doors.

Automobile attitude to life: the ID. BUGGY

The ID. BUGGY conveys the same attitude to life as the legendary Californian dune buggies from the 60s – with a fully-electric drivetrain and entirely MEB-based. 150 kW performance and the open-topped, doorless construction of the passenger compartment allow for dynamic movement – in harmony with nature.

The aluminium-steel-plastic body composite is self-supporting. Thanks to the modular design, the upper body area can be detached from the MEB chassis. This would allow other manufacturers to use the base to produce the emission-free dune buggy of the next era.



ROMAIN DUMAS

AN ALL-ROUND TALENT AT THE WHEEL

Romain Dumas is a true all-rounder. The Volkswagen driver is as much at home in the 24-hour race at Le Mans as he is at the Dakar Rally, the hill climb on Pikes Peak or the Nürburgring-Nordschleife. A portrait.

Were he a footballer, Romain Dumas would probably be a utility player: someone who can play any position, from defender to striker. However, Dumas is a racing driver. One who has driven in pretty much every category over the course of his career. His CV includes no fewer than eight victories in 24-hour races. He has triumphed in Le Mans at the wheel of Audi and Porsche sports car prototypes, and with the Porsche 911 at the Nürburgring and Spa-Francorchamps. He has also won the R-GT Cup in the World Rally Championship and started at the Dakar Rally.

However, even for the multi-talented driver from Alès in the south of France, a fully-electric prototype was something completely new last year. "The motors buzz quietly and there are no gears – at first, I thought I was sat in a spaceship. Only the view through the windscreen, the instruments and the centrifugal forces give you any idea of the speed you are flying at. It took me a while to get used to," says Dumas, recalling his first drive in ID.R in April 2018.

Fast learner – fast driver

During the season, he spends nearly every week behind the wheel of a race car somewhere in the world. "Endurance races are my job, rallies and hill climbs are a hobby," says Dumas. He has spent time in the cockpit of the ID.R again in 2019, first during test drives in preparation for the successful record attempts on the Nürburgring-Nordschleife in June and at the Goodwood Festival of Speed as well as the challenge on Tianmen Mountain in China.

To cope with this packed schedule, Dumas heads to the Alps to recharge his batteries: skiing in the winter, jogging in the summer. He lives with his partner Elysia and their son Gabin near Geneva, Switzerland. However, even at home he simply cannot stay away from motorsport – his basement is home to a professional race simulator.

Career at a glance

- 2019 Track record at Tianmen Shan Big Gate Road (Volkswagen ID.R) in 07:38.585 minutes
E-record on the Nürburgring-Nordschleife (Volkswagen ID.R) in 6:05.336 minutes
Victory and track record at the Goodwood Festival of Speed (Volkswagen ID.R) in 39.90 seconds
- 2018 Victory and track record at Pikes Peak International Hill Climb (Volkswagen ID.R) in 7:57.148 minutes
Victory and e-record at Goodwood Festival of Speed (Volkswagen ID.R) in 43.86 seconds
- 2017 Victory at Pikes Peak International Hill Climb (Norma RD Limited)
Victory FIA R-GT Cup (Rally, Porsche)
- 2016 World Champion FIA World Endurance Championship, et al
Victory at 24h Le Mans (Porsche)
Victory at Pikes Peak International Hill Climb (Norma RD Limited)
- 2014 Victory at Pikes Peak International Hill Climb (Norma RD Limited)
- 2013 Class victory 24h Le Mans (GT Pro, Porsche)
- 2011 Victory at 24h Nürburgring
- 2010 Victory at 24h Le Mans (Audi)
Victory at 24h Spa-Francorchamps (Porsche)
- 2009 Victory at 24h Nürburgring (Porsche)
- 2008 Winner of American Le Mans Series (LMP2, Porsche)
Victory at 24h Nürburgring (Porsche)
- 2007 Winner of American Le Mans Series (LMP2, Porsche)
Victory at 24h Nürburgring (Porsche)
- 2003 Victory at 24h Spa-Francorchamps (Porsche)
- 1995–2002 Various single-seater racing series
- 1992–1994 Karting



Record-breaking cars

Modest engine power, huge top speed:
the aerodynamically-sophisticated
ARVW test vehicle.



RECORD-BREAKING CARS RECORDS FOR ETERNITY

Volkswagen vehicles have set many records. Some of them still stand to this day. Take a look in the history books.

As well as success in motor racing, world records are a good way of showcasing the potential of new technology. The most important “World Land Speed Records” are officially approved by the International Automobile Federation, the FIA. They exist for distances from a quarter of a mile (about 402 metres) to 100,000 miles (about 161,000 kilometres), or for a period of time – up to 24 hours nowadays, up to a remarkable 168 hours in the past.

Although the importance of extreme endurance records has decreased nowadays, in light of regular tests amounting to several million kilometres, manufacturers still like to go in pursuit of records. Whether with production cars or modified vehicles, they are forever pushing the boundaries of what is possible. Volkswagen has regularly set benchmarks in this field. Here’s how.

ARVW, the diesel ambassador

The success story of the diesel engine in the passenger car sector began in the 1980s. Volkswagen wanted to use its ARVW test vehicle (Aerodynamic Research Volkswagen) to show what this new technology “made in Wolfsburg” was capable of. One of the best locations to do so was the high-speed track in the Southern Italian town of Nardò. In October 1980, the five-metre long ARVW, with its aerodynamically-sophisticated plastic bodywork (cw value: 0.15), embarked on a momentous record attempt.

Despite its unimpressive power output of 129 kW (175 PS), the concept car achieved a massive top speed of 362 km/h. Even more remarkable was the fact that the ARVW set an average speed of 355.88 km/h in the first hour. The three-man team of drivers set two world and six class records, two of which still stand today¹.



¹As of 07/2019

G-Lader survives litmus test

Volkswagen introduced a special forced-induction technology – the so-called G-Lader – in the Polo in the mid-1980s. The name refers to the inner structure of the G-Lader, which resembles the letter “G”. Technically speaking, the G-Lader was a scroll compressor. While the turbocharger is rotated by the flow of exhaust gas, the G-Lader is driven by a belt.

To promote this technology, which was new to the passenger car sector at the time, three modified Polo G40 cars with 1.3-litre engines embarked on an endurance run at the Volkswagen Group test facility in Ehra-Lessien, near Wolfsburg, in August 1985. With their power ramped up to 94 kW (129 PS), they set their sights on the 24-hour record – and broke it: the G-Lader turbocharger passed the litmus test. Over the course of the 24-hour record attempt, the team set a new average speed record for its class of car – 208 km/h – and also cracked the 5,000-kilometre mark for the first time.



W12 Nardo provides the basis for the Phaeton

Shortly after the turn of the millennium, Volkswagen launched the Phaeton, a luxury-class saloon, the top-of-the-range model of which was eventually available with a twelve-cylinder petrol engine. To once again underline the brand’s technological expertise, the CEO of Volkswagen AG sent another team to Nardò in pursuit of more records in October 2001. The performance of the new engine was increased to 441 kW (600 PS) – a spectacular achievement at that time. The concept car, the heart of which beat with twelve chambers, was named the W12 Nardo. Six drivers alternated at the wheel of the super sports car. By the end of the 24 hours, they had set ten world and class records.

The average speed over 24 hours was just under 300 km/h. However, those involved were plagued by the fact that they had just missed the magical 300 mark. A second attempt was authorised. In February 2002, the team actually far surpassed their own achievements and added another two records, taking their total number of world records to six. The most prestigious of those was the average speed of 322.891 km/h over a duration of 24 hours. Remarkably, the W12’s records still stand today¹.

¹As of 07/2019

BLOCK A



Record-breaker par excellence: the W12 Nardo quite rightly bears the name of the high-speed circuit in the Apulia region.

A SUCCESS STORY FROM RACE TRACK TO PRODUCTION

At Volkswagen, the letter R is intrinsically linked to success in motorsport. In the future, the Group's performance brand will focus on cars with electric drivetrains.

Volkswagen R – a success story, the likes of which you might find in a book: four-time world rally champions with the Polo R WRC and two titles with the Polo R Supercar in the World Rallycross Championship. Last year, a new approach was taken with the ID.R Pikes Peak. For the first time, the division responsible for Volkswagen's top performance cars was involved in a project centred around a fully-electric drivetrain. And success was not long in coming, in the form of a new all-time record on Pikes Peak.

Volkswagen R is preparing for a future in which Volkswagen will offer a whole range of electric production vehicles: the ID. family. "We will use technology developed in motor racing for performance-enhanced electric vehicles," says Jost Capito, Managing Director of Volkswagen R. "More driving pleasure with zero emissions. The close cooperation with Volkswagen Motorsport, as we saw with the ID.R Pikes Peak, is vital in this regard."

Complete vehicles like the new T-Roc R¹, Golf R² and Golf R Estate³ as well as Volkswagen R's line of equipment that goes by the name R-Line, are symbolic of the performance, know-how and details transferred from motorsport to production vehicles. Developed under extreme conditions at the racetrack, the technology gives the customer every confidence that their car will still reliably do its job under even the toughest of conditions, whilst at the same time still being great fun to drive.

"Motorsport was a strong catalyst to technical innovations in the early days of the automobile. It will play a similar role in the development of high-performance electric cars in the future," says Capito, drawing parallels with the history of the combustion engine.

¹T-Roc R: Production-based study. This vehicle is not yet for sale.

²Golf R: Fuel consumption, l/100 km: combined 7.2–7.0; combined CO₂ emissions, g/km: 164–158; efficiency class: D

³Golf R Estate: Fuel consumption, l/100 km: combined 7.2–7.1; combined CO₂ emissions, g/km: 164–161; efficiency class: D–C

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“We will use technology developed in motor racing for performance-enhanced electric vehicles. More driving pleasure with zero emissions.”

Jost Capito,
Managing Director of Volkswagen R



A STRONG TEAM VOLKSWAGEN AND ITS PARTNERS

Motorsport is a team sport, and only a well-coordinated team can win races and titles. That is why Volkswagen Motorsport settles for nothing but the best in its partners.



In 2002, the letter 'R' for 'racing' was placed on the first Volkswagen R model. By just 2010, with the founding of R GmbH as the sports brand of the Group, a unique success story came of age – with numerous, customised vehicles that fascinate their owners every day. 'R' stands for a passion for motorsport – designers and engineers push the development a step-further before introducing the car to the road, for people with a taste for the extraordinary. In motorsport, this is currently to be found in the project involving the purely electric powered ID.R.



ANSYS is the world's leading provider of technical simulation solutions and helps the most innovative companies in the world to significantly improve the products for their customers. Thanks to its extensive portfolio, ANSYS is able to help master the most complex design challenges and to develop products. In the case of the Volkswagen Pikes Peak project, ANSYS played a crucial role in the development of the victorious ID.R by allowing the simulation of batteries, cooling systems and the resulting aerodynamic conditions on Pikes Peak, which could not be replicated in the wind tunnel.



In 2019, the world's largest tyre manufacturer, Bridgestone, joins forces with Volkswagen in motorsport for the first time. The first successes were to set the new lap record for electric vehicles on the Nürburgring-Nordschleife and the track record at the Goodwood Festival of Speed, in each of which the ID.R sported Potenza slicks. With its focus on pioneering technology and innovations, Bridgestone has been a valued partner of Volkswagen for a long time in the provision of original equipment for the entire range of vehicles. In 2017, Bridgestone was honoured in the category "Innovation & Technology" at the Volkswagen Group Awards.



From specialists in steam locomotive lubricants to a global company: Castrol develops bespoke lubricant solutions for the automotive industry. Castrol's success story is based not only on more than 100 years of experience in lubricants, but also on long-term partnerships with leading car manufacturers. Castrol has been a partner of Volkswagen Motorsport since 2005, contributing to, among others, three wins in the Dakar Rally and twelve world championship titles in the World Rally Championship. Castrol is partner of all projects at Volkswagen Motorsport.



The Italian company OMP is the leading manufacturer of safety clothing and tuning supplies in the motorsport sector. OMP products are renowned for their quality and the constant pursuit of higher standards— just two of the reasons why OMP and Volkswagen Motorsport have already been working closely together for years. For the ID.R project, OMP produced the fire-proof race overall for driver Romain Dumas, as well as the seat padding and six-point harness, which were made of particularly lightweight material. Even the sponsors' logos on Dumas' race overall were printed on, rather than using the more conventional patch, in order to save weight.

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