

FEEL THE FLOW

Bosch eBike Systems 2022



9 dream routes
for eBikers

This is how we will
travel in the future

Which eBike
suits you?







Enjoying the Uphill Flow: Freestyler
Ryan Howard (photo, back) on a trail in
Kamloops in British Columbia, Canada.
Find out more >> p. 42

EDITORIAL



Tamara Winograd,
Vice President of Marketing, Communications and
Brand Management, Bosch eBike Systems

What will the cities of the future look like? How will we combine everyday routine, work and leisure? And how will we get around in ten or twenty years' time?

I am convinced that mobility will continue to play a decisive role in our lives in the future. Our ideas about mobility will be revised and practised differently, electrified, automated, connected and personalised. Mobility that meets people's general need for safety, sustainability and health. Already closely associated with these values today, the eBike will play a key role in shaping the mobility of the future. Of course, this will also be helped by innovative digital technologies. They will enrich the eBike experience and open up a wealth of new possibilities. They are the key to our mobile future in a connected world. The eBike will automatically adjust to the individual needs of the rider and communicate with other road users as well as the entire environment. This will help people become more flexible, safer and more relaxed on the road.

We at Bosch eBike Systems are driving the development of smart eBiking, redefining mobility - on daily trips in the city as well as adventurous tours of the countryside and mountains. We look forward to continuing to shape the digital and sustainable mobility revolution with you.

Best wishes,

A handwritten signature in black ink, appearing to read 'T. Heogroh', written in a cursive style.

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**"NO TWO WAVES ARE ALIKE AND
WHEN I BECOME ONE WITH
THE SURF, I FEEL COMPLETELY FREE
– IT'S PURE EUPHORIA"**

Pauline Ado, the professional surfer's story >> p. 44

eBIKE PASSION

More and more people are riding eBikes. Destinations that previously seemed almost unattainable are now within reach thanks to an electric drive. The eBike is about to change our lives, whether in the city on the way from A to B, as a means of transport, as a travel companion or as sports equipment that allows everyone to experience the special Uphill Flow. The following stories show why the eBike arouses so much passion, how versatile it is – and the experiences new digital solutions have in store.



TRAVEL FEVER

Activity and recreation: the perfect combination for many people. That's why more and more people are saddling up on eBikes while on vacation. It keeps you fit and allows you to explore new destinations. An insight into how easy travel can be.





Peak happiness: Sissi (left) and Kathi Kuypers take a break during their eBike trip.

"BEFORE THE TRIP I FOUND MYSELF ASKING: CAN WE REALLY DO THIS?"

Kathy Kuypers, Dirt jumper

Travel has never been as easy as with the eBike. Here's what Kathy and Sissi Kuypers experienced in the Alps.

Kathy, 31, a professional dirt jumper, completed the endurance test with her mother Sissi, 59. Two generations, two eBikes, one great love - the joy of being active in nature. And one big goal in mind: to cross the Swiss Alps on the Haute Route in the canton of Valais, from Vercorin to Zermatt - which means negotiating several thousand metres of altitude differences in three days. A challenge, even for an experienced biker like Kathy. "Before the trip I found myself asking: Can we really do this?"

Just like Kathy Kuypers and her mum, more and more people are setting out for new destinations. They are looking for new ways to enjoy the great outdoors away from the hustle and bustle of the city. The eBike promises a lot of support and allows riders to master even technical slopes and steep uphill climbs. eBiking brings cycling to another level. Over mountains, along riverbanks and lakes, on rough or smooth terrain - an electric drive allows many destinations to be discovered on two wheels.

Cycling is booming

According to estimates by cycling associations such as the Allgemeiner Deutscher Fahrrad-Club (ADFC), the number of short trips by bike rose by 40 percent last year. One third of all cyclists already use an eBike. This offers many advantages on the road.

- Greater comfort thanks to electric drive technology. The drive provides enough thrust to cope with headwinds and hills.
- Greater freedom through long ranges. Depending on the route and the battery, distances of well over 100 kilometres can be achieved.
- Covering longer distances without arriving at your destination in a sweat.
- Couples or groups with different performance levels can also take trips together more easily thanks to eBikes.
- Important additional effect: eBikers protect the environment and save money in the process. Electricity costs for 100 bike kilometres are approx. 15 cents, in comparison, the same trip by car would cost around 15 euros.



Let's go! Sissi and Kathy Kuypers are ready for their alpine adventure.



Relaxing in the mountains: Kathi Kuypers (right) with her mother Sissi.

**BEFORE WE GET STARTED, THE QUESTION
ARISES: DO I HAVE ENOUGH BATTERY POWER
FOR THE PLANNED TRIP?**



So far, so good: Involving just a few climbs, the cycle path along the Danube leads through picturesque landscapes and a total of ten European countries over a distance of 2850 kilometres.


Range assistant:
bosch-ebike.co.uk/range

Tourism:
bosch-ebike.co.uk/tourism

Always with the flow

Many travel destinations in Europe have long since adapted to the eBike boom. Hotels, communal huts and restaurants offer charging stations along the routes. This enables batteries to be conveniently charged, so the eBike is ready for the next stage. Particularly attractive is the region around the Kitzbühel Alps in Austria, which is considered one of the largest unbroken eBike areas in the world. Whether you follow the Loire in France or the Adige in Italy's Trentino, or take in Lake Garda or Flanders in Belgium, there are plenty of bike routes to choose from when eBiking.

What do I have to consider if I have decided to take a trip by eBike?
Careful planning and speedy connections

Good route planning is the key to finding the right trip and making the best possible preparations. eBike on-board computers are helpful when it comes to planning. Alternatively, eBikers can map out their trip from the comfort of home using apps like eBike Connect and the Connect portal, and change things on-the-fly during the trip. Out on the road, they have the option of using their own apps, such as komoot, in conjunction with Bosch solutions.

Before setting off, eBikers face an important question: Do I have enough battery power for the planned trip? Or do I need to schedule a stopover? It's best to check the range assistant and to keep the network of battery charging stations in mind.

Into the wild: Get going and experience the great outdoors - the eBike pushes the boundaries of any trip. The achievable range can be well over 100 kilometres.



Staying on track

Travelling is fun when you can enjoy the landscape and environment along the way. To keep you on course via navigation, connected eBike on-board computers offer access to free maps worldwide. Another advantage: the maps can be accessed even if there is no Internet connection while you are on the road. This keeps eBikers flexible and always on the right track. The map material contains various references to hotels, restaurants and public points of interest.

It is also worth checking out the on-board computer for another reason: During the journey the range indicators show whether the destination can be reached with the available battery charge.

Another concern is how safe is it to park your eBike while on the road. As soon as the eBiker removes the connected on-board computer, the motor support is deactivated via the 'Lock' premium function.

What's next?

Having arrived at their destination, many eBikers like to see what distance they have actually covered. The eBike Connect app provides fast access to trip and fitness data. In addition, the rider can share the results with the community and friends by means of the komoot and Strava apps. This acts as a motivator, as well as arousing anticipation for the next trip.



On course:

The Nyon on-board computer guides you to your destination and helps with route planning.

DREAM RIDES

On your eBike, get set, go! Nine fun routes in Europe – from the Iberian Peninsula to Scandinavia.

City, country or river?

Why not experience all three in one trip? The eBike gives you many options.

1

Following the Danube

Untamed nature and lively cities: as diverse as the 10 countries through which the Danube flows.

Length: 2850 km

Stages: approx. 30

utracks.com/Danube-Cycle-Path

2

Through Flanders

This beautiful route takes you through northern Belgium from Antwerp to the nature reserve around Brabant.

Length: 58 km

Stage: 1

komoot.com/user/bosch/collections

3

Chateau Tour

A relaxed ride from Tours through the garden of France with the chateaus of the Loire.

Length: approx. 300 km

Stages: 5-6

biking-france.com

Climb every Mountain

Rough surfaces, steep terrain: The eBike reveals its particular strengths in the mountains.

4

Matterhorn in View

The 'Family & friends 'Haute Route offers breathtaking views in Switzerland's Valais region.

Length: approx. 140 km

Stages: 3

e-alps.com

5

Transalp

The Via Claudia Augusta from southern Germany to Italy is also suitable for families thanks to the eBike.

Length: approx. 500 km

Stages: 5-6

viaclaudia.org/en

6

Pilgrimage on Two Wheels

Scenic route from Lisbon via Porto to Santiago de Compostela.

Length: 590 km

Stages: 7-9

bikemap.net

Sea and Lakes

The eBike means you always have support – even if the wind is in your face.

7

Surf and turf

Varied route between Groningen and Zeeland with dunes and flower-filled meadows.

Length: approx. 360 km

Stages: 4-5

komoot.com/user/bosch/collections

8

Large chain

The new "Mountains & Lakes eTrail" connects many lakes of the Salzkammergut in Austria.

Length: 630 km

Stages: 10

salzkammergut.at/en/bergeseen-et trail

9

Cultural Trip

Delightful seaside route from Copenhagen to the Louisiana Museum for Modern Art.

Length: 36 km

Stage: 1

visitdenmark.com



Featured products

Nyon

You can plan your routes conveniently in the eBike Connect online portal and transfer them to the Nyon on-board computer. Nyon users can choose between a variety of bike routes in the online portal; routes from komoot can also be imported.



bosch-ebike.co.uk/nyon

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Always charged

Tips and tricks for your battery when on the road.
bosch-ebike.co.uk/battery-guide

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Claim your voucher now and discover even more routes.

The komoot voucher lets you choose one regional package and download it for free: It includes voice-based navigation, offline maps and a route export function for your GPS device.



VIENNA

Renowned magazine "The Economist" has named Vienna the world's most liveable city twice in a row. Yet the city on the Danube has much more to offer than magnificent buildings and a rich cultural scene. It is on its way to becoming a green showcase city and wants to promote environmentally friendly mobility. A foray with Viennese enjoying their city on two wheels.



"MY eBIKE HAS
ENABLED ME
TO DISCOVER A
WHOLE NEW SIDE
OF THE CITY"



Flaneur on two wheels: Like here in the new development area of the Nordbahnhof quarter (photo on the right), architecture lover Oliver Oth cycles through Vienna in search of exciting photo opportunities.

M

Meeting point Prater. The amusement park with its amusement rides and the giant wheel that can be seen from afar is still a landmark in Vienna today. It's the perfect starting point for a bike ride with Oliver Oth, hobby photographer and passionate eBiker. He takes us on an eBike ride in his city.

Year after year, Vienna occupies top positions in the popularity scale of travellers and residents. The business magazine "The Economist" named the metropolis the world's most livable city twice in a row. This is not only due to its special charm, the baroque architecture and the stylish coffee houses. No other major city in Europe has more green space for every one of its 1.9 million inhabitants. Forests, vineyards, gardens and parks make up almost 50 percent of the city's territory.

But how much fun is it to explore this city by bike? Hardly anyone can judge this better than the people who cycle there every day, on their way from A to B, to the office, to kindergarten – or in search of the new sides of the city. Like Oliver Oth. The 47-year-old is a flaneur on two wheels, who roams Vienna in his spare time with his eBike and alert eyes, always on the lookout for new photo opportunities.

We leave the amusement park behind us and head towards "Viertel Zwei", one of the new residential and office districts. In the direct vicinity of the racetrack, modern glass and concrete facades are clustered, broken up by fountains, moats and parking spaces. Contrasts, as Oliver Oth calls them. His attention is focused on architecture and nature, and he finds enough of both in this city. "With my eBike, I can travel great distances in a day, discovering more remote places for my photos."

The trained hotelier inspires many followers on Instagram with his work. They appreciate his pictures, which fascinate with unusual perspectives or light reflections. Oth also finds exciting photos in Donau-City, the new district on the other side of the river. The cycle path there, from the 2nd district over the Reichsbrücke Bridge, with its wide lanes running in opposite directions, offers enough space to enjoy the view. In the distance rises a glittering black tower called DC Tower 1, Vienna's modern landmark, soaring 250 metres into the sky.

Oth pointed his smartphone at the second tower next to it, which is half finished. "If you haven't been here for a week, something new will have already sprung up." For example, the new bicycle rental with eBike charging station on the Danube Island, the 21-kilometre-long belt that serves as a large recreational area. "Vienna is very green," Oth says, recounting his recent eBike ride, which took him from the city to the Vienna Woods. A 120-kilometre route where Oth listened to a podcast and his favourite music using the COBI.Bike app. "I need that sometimes to clear my head on the road."

Vienna has a network of 1654 kilometres of cycle paths. A handsome number. But do the paths also permit safe movement?

On the way back from DC Tower 1 through the inner-city traffic, it becomes clear that Vienna is doing many things right. Numerous streets have been opened to two-way bicycle traffic, turning lanes have been separated from car traffic, and where cars have two lanes, protected routes lead through the city centre in lanes marked in green. The municipality invests 27 million euros annually in the expansion of cycle lanes, separated cycle lanes and charging stations for eBikes. Because more than every third bike sold in Austria is now an eBike.



**"120 KILOMETRES A DAY – WITH THE
eBIKE IT'S REALLY EASY."**

Oliver Oth, Hobby photographer and eBiker

Covers a lot of ground: With the Active Line Plus drive even long rides are no problem.
Oth clocks 7,500 kilometres a year with his eBike.

While for Oliver Oth the eBike is the perfect vehicle to discover new places and take pictures, the physiotherapist Angelika Puntigam uses an eCargo bike as a practical all-rounder for her everyday life. In the morning, she uses it to take her children to kindergarten, and then she rides on to visit her clients.

For a while she used a bike without electric drive for this. But that became too tedious for her. "With the eCargo, I can get around the city in a relaxed and sustainable way – and the children enjoy it just as much as I do." A car would be out of the question for the sporty Viennese woman. "I wouldn't be any quicker and then there's the nuisance of looking for a parking space. I'm much more carefree on the road with the eCargo."

Even when she parks her eCargo bike, she feels safe because it has an electronic anti-theft device called 'Lock' that supplements the mechanical lock.

Fasten your seatbelts, please:

Physiotherapist Angelika Puntigam takes her two children and bear Muzi to the after-school care centre every morning on the eCargo bike. She then starts her route of home visits to her clients.





1654

kilometres is how
comprehensive
Vienna's network of
cycle paths is.

More than every **3rd**
bike sold in Austria is
an eBike.

73%

of Vienna's population
move on foot, by
bike or by public
transportation.

"THE eBIKE IS FOR ME THE FASTEST MODE OF TRANSPORTATION IN THE CITY"

Laura Manschein, Marketing Manager Austria



Sponsor: With the project 'Austria cycles' Laura Manschein, Marketing Manager of Bosch eBike Systems, sparks the interest of companies in eBikes.





Angelika Puntigam has observed that more and more people in her circle of acquaintances are switching to an eBike. An experience that Laura Manschein from Bosch eBike Systems shares.

With 'Österreich radelt (Austria Cycles)', she supports a nationwide project providing companies with eBikes as test bikes. "Most of them are enthusiastic after just a short time and want to have it as a company bike," says the 26-year-old marketing manager.

The eBike is her first choice when she travels from the company headquarters in Vienna's 3rd district to cooperation partners in the city centre. "The route along the Danube is optimal, there is a lot of space and you can get through quickly." Sometimes she and her colleagues make an internal competition: Car vs. eBike – which is faster in the city? "The result," says Manschein, "is almost always the same: The car takes around 25 minutes, and with the eBike I get there 10 minutes earlier."

This experience is also shared by Oliver Oth and Angelika Puntigam, who move through their city daily by eBike. "It's faster, and you get some exercise," Oth says. "It's just that when you ride out of town, you sometimes run into a patchwork of bike lanes. There is still room for improvement here in Vienna as well."

Featured Products

Active Line Plus

Quiet and powerful eBike drive. Powerful 50 Nm supports the rider on voyages of discovery.



bosch-ebike.co.uk/activeplus

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COBI.Bike app

Info at a glance: including speed, distance, performance plus weather info.

bosch-ebike.co.uk/cobi-bike

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Lock

The electronic anti-theft device as a supplement to a mechanical lock.

bosch-ebike.co.uk/lock

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MAKING FITNESS FUN

Physical activity is good for you. The World Health Organisation recommends 150 minutes of exercise each week to strengthen the cardiovascular system and prevent disease. This doesn't necessarily mean having to work up a sweat. Moderate exercise is enough to promote health. Anyone riding an eBike is not just keeping the body and mind active, but also enjoying plenty of fun.

But does eBiking involve any physical exertion at all? And at what point does it become a sport? After all, you are assisted by an electric drive while cycling. Researchers at the University of Basel compared eBike riders with conventional cyclists. The results were surprising: after four weeks, the fitness of both groups had developed to a similar degree.

In fact, according to a study by the Norwegian Institute for Transport Economics, cyclists tend to use electrically assisted bikes much more often and cover more than twice the distance. This indicates that regular eBiking improves stamina quite significantly.

An effective work-out on two wheels. Exercise strengthens the immune system, reduces the risk of cardiovascular disease by 24 percent, the risk of cancer by 16 percent, and has positive effects on blood sugar levels and adrenaline. Anyone who rides an eBike in a normal riding style for an hour



Win-win: the eBike not only makes you fast, but also keeps you fit.

burns an average of around 300 calories. This is equivalent to about half an hour of jogging or 30 minutes on a cross trainer.

The eBike offers a particular benefit as a fitness device: the support provided by the motor can be regulated and adapted to the rider's stamina and fitness level. This makes eBikes an attractive prospect even for those who don't like cycling and those who are returning after a number of years. This allows them to gradually build up their fitness levels.

More fitness, more time. eBiking not only keeps you fit; exercising in the fresh air also releases endorphins. Then there is the time saved: the eBike is the fastest means of transport on a distance of up to ten kilometres. This makes it ideal for the journey to the office or from A to B – traffic jams hold no fear for you. Whether you're shopping or dropping the kids off at kindergarten, an eCargo bike combines the benefits of physical activity with environmentally friendly transport.

If you prefer something a little more sporty, you can also use the eBike as a personal trainer: the Kiox and Nyon on-board computers, as well as the COBI.Bike smartphone solution with the corresponding app, display performance and health data. The COBI.Bike app allows you to share ride data with friends by linking to fitness services like Apple Health, Strava or Google Fit. This arouses your sporting spirit – as well as bringing you lots of fun.

300

calories are burned
in about one hour
on the eBike.

There is a **24%** decrease
in the risk of cardiovascular
disease through exercise such
as on the eBike.

The eBike is the fastest
means of transport on a
10 distance of up to
kilometres.

Always connected:
The COBI.Bike app
can be used to record
trip and fitness data
and to share this
with others.



Featured products

Kiox

The on-board computer provides all key training data and shows the rider's cadence, calorie consumption and personal performance.



bosch-ebike.co.uk/kiox

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COBI.Bike app

This app turns the smartphone into a digital trainer by connecting to fitness and health services like Apple Health, Google Fit and Strava.
bosch-ebike.co.uk/cobi-bike

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CONQUERING THE ALPS WITH FLOW

The Alps have been a special place for adventure and pioneering achievements for centuries. Located in the heart of Europe, these peaks have been inspiring countless people to turn their dreams into reality for decades. 30 years ago it was Andi Heckmair who set a milestone for mountain bikers when he crossed the Alps. Starting from Oberstdorf in Germany he took a very direct line over the passes in Austria and Switzerland to reach Riva on Italy's Lake Garda.

The Heckmair route is considered an absolute classic and covers about 400 kilometres and 13,500 metres of altitude. The bike has to be pushed or carried at certain points along the way. Is that fun when you've got an eMTB? Claus Fleischer, CEO of Bosch eBike Systems, and mountain bike pro Stefan Schlie tried it out.



The idea

"Ötzi made the crossing on foot, Hannibal took a pack of elephants, Paulcke used skis – but no one had done it with a mountain bike." This is how Andi Heckmair is quoted when he set a milestone in mountain biking history by crossing the Alps on his bike in 1990. His father Anderl was the first to climb the Eiger north face, but Andi took to his bike instead: The Heckmair route leads from Oberstdorf in Bavaria to the shores of Lake Garda, about 400 kilometres across the Alps, on narrow paths and over a total of 13,500 metres in altitude. It was an endeavour Heckmair said in an interview that you'd have to have "masochistic tendencies" to attempt with a 25-kilogram eMTB.

That statement was the goad to try just that. Every summer, Claus Fleischer, CEO of Bosch eBike Systems, and multiple runner-up Trials World Champion Stefan Schlie take a research trip together to get to know the various mountain bike tourism concepts in the Alps, gather new ideas and explore the possibilities of modern eMTB systems.

Their journeys reflect the spirit in which Bosch eBike Systems was founded in 2009 as a start-up within the Bosch Group, leading to significant advances in eMTB development in recent years. Now, 30 years after Andi Heckmair's first crossing of the Alps, they decided to try the Heckmair 2.0 adventure – this time with electric drive units.

Planning

"You guys are nuts - that's a crazy idea. We're in" – the response from everyone Claus and Stefan asked for support. Markus Greber, photographer and journalist, eventually accompanied them on the Tour, while transalpine expert Uli Stanciu assisted with GPS tour planning. The route included various sections where the eMTB needed to be pushed or carried, a real grind on the Schrofen Pass on the border between Germany and Austria, the Schlappiner Joch on the way into Switzerland and finally at Passo di Campo in Italy. They decided to do it anyway, four countries in four days instead of six, including a number of tricky passages. Claus says: "Otherwise, it wouldn't be a true Heckmair Route 2.0 for us."

Claus and Stefan prepared for the trip using the GPS data on their Nyon display units. They decided on four stages covering all original passes of Heckmair's route plus one reserve day. The only exception was the section after Livigno, an Italian ski resort on the border with Switzerland, where Uli Stanciu planned a more scenic variant through the Valldidentro and Val Verva, instead of the paved route over the Gavia Pass.

**"FOUR COUNTRIES IN FOUR DAYS
– OTHERWISE IT WOULDN'T BE A
TRUE HECKMAIR ROUTE 2.0"**

Claus Fleischer



On the legendary trail: mountain bike pro Stefan Schlie (left) and Claus Fleischer (right), CEO of Bosch eBike Systems, are accompanied by transalpine pioneer Andi Heckmair for the first 15 kilometres.

Day 1

Departure at the foot of the Alps



Pioneer: 79-year-old Andi Heckmair (photo left) also came up with the concept for the world's first bike rucksack. His pioneering spirit inspired Claus Fleischer.

The adventure starts early in the morning in Oberstdorf on the German side of the Alps, with spare batteries and a charger in a rucksack and other spare parts in the support vehicle. On the first 15 kilometres to the entrance to the Schrofен Pass, which takes them from Germany to Austria and which represents the highlight of many trips, especially for mountain bikers, Claus and Stefan are accompanied by the now 79-year-old pioneer Andi Heckmair.

When he set out 30 years ago, tourism in the Alps was quite different. It was only later, when increasing numbers of people were attracted to the Alps, that discussions flared up: hikers and mountain bikers share centuries-old mule trails and trade routes. The eMTB is now also part of the debate. The electric drive and the range of the rechargeable battery can help keep congested routes clear, as well as enabling paths far off the beaten track to be explored. "The Alps are not generally overcrowded, however conditions can get congested at certain points," said mountaineering legend Reinhold Messner. "One valley further over, the Alps are completely empty." The battery support is a great help in leaving the hotspots behind, but consideration, tolerance and respect between people as well as for nature always helps. This is true whether you enjoy the mountains on foot or by bike.

For Claus and Stefan the first day in the saddle ends after five hours and 32 minutes of active time in the saddle – with two batteries and recharging during the breaks they have covered the first 92 kilometres and 3,250 metres of altitude.



Steeplechase: from Oberstdorf in southern Germany, the route first leads over the Schrofен Pass to Austria.

Day 2

Uphill Flow fireworks in Switzerland

The second day starts with a feat of strength at the Schlappiner Joch on the way from Austria to Switzerland, 400 metres in altitude over 1.5 kilometres. Barely rideable, a narrow, steep climb, part of which is still blocked, forces you to push – or carry your bike. But after a lunch break in Davos-Dorf, Switzerland, Claus and Stefan can fully enjoy the fascination of the eMTB on the ascent to the Scaletta Pass as they head for Italy. "An Uphill Flow trail full of fireworks," Stefan says. Uphill Flow, the feeling of being at one with the trail – only uphill instead of down. Claus and he had already hatched this idea in 2013.

Spurred on by exhilaration, the team traverses Switzerland from north to south and finally reaches Livigno via the completely rideable Chachauna Pass – 5:44 hours of riding time, 85 kilometres, 3,700 metres of altitude difference. In the skies of the Italian Alps, low rain clouds and high winds already herald the challenges of the coming days.



After a long day Claus and Stefan arrive exhausted but happy in Livigno.



Blocked trail in an idyllic setting: the Scaletta Pass from Davos into the Engadine is a genuine Uphill Flow pleasure for experienced mountain bikers.



The calm before the storm: on their way to the Scalettapass Claus and Stefan ride their eMTBs up the trail, which is still easy going.

Day 3

Italian bad weather test

Dark clouds and strong winds accompany the pair from Livigno through the Val Alpisella as they head for the man-made lakes north-west of Bormio. The trails become a real challenge due to the weather, so good riding technique becomes essential. The ideal bike and foot position, the correct pedalling sequence and pedal position – if you want to push the limits with your eMTB and still be safe, good riding technique is key.

It's raining cats and dogs as they pass through the Italian Alps in Valdidentro and Val Verva, but still in good spirits. At the top of the pass, the wispy clouds part and isolated rays of sunlight light up the bizarre mountainous world, as the mist rises from between the boulders. After 118 kilometres, 3,450 metres of altitude and almost six hours of riding, the group reaches the finish at the foot of the Adamello mountains.

Dark omens: strong winds and clouds herald bad weather. Heavy rain makes the trails through Val Alpisella, Valdidentro and Val Viola a challenge.



Ready to jump:

The steep, slippery trail over roots and rock gardens demands balance and skill.



Day 4

Arrival and outlook

The final leg is delayed. Stormy weather settles on the Alps for two days, making the last and decisive stage seem impossible. What now? Leave or wait for one last opportunity? That would mean two days of enforced rest and crossing the notorious Passo di Campo at dawn.

They still want to complete the Heckmair 2.0 and, after 48 hours of waiting around, set off up to Passo di Campo. Partially blocked, a steep, slippery cart path leads ever upwards through a fairytale forest still wet from the rain.

Were they able to use their eMTBs? Of course, in Uphill Flow! Contrary to the warnings, they only have to walk a little and can ride more than expected, crossing sections of knotted roots, rock gardens and slabs. Here, too, the best riding technique and alpine experience are required. This pass is not for beginners. At 2,250 metres there is a nice surprise after the last challenge of the Passo di Campo. Uli Stanciu and his wife Gio are already waiting for the group with a well chilled Nosiola from Trentino.

A vertical photograph of a mountain landscape. The foreground is filled with green grass and scattered grey rocks. The middle ground shows a steep, grassy slope leading up to a rocky peak. The background is dominated by a large, overcast grey sky.

A vertical photograph of a mountain landscape. The foreground is filled with green grass and scattered grey rocks. The middle ground shows a steep, grassy slope leading up to a rocky peak. The background is dominated by a large, overcast grey sky.

Milestones in eMTB innovations from Bosch eBike Systems

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Premiere of the Performance Line CX drive unit

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**Introducing the smart system,
the new system generation from
Bosch eBike Systems**

ONE BIKE, ONE GOAL AND PLENTY OF COURAGE

All are passionate athletes in various disciplines. Always ready to take on new challenges and satisfy their curiosity. The eBike helps them to feel the flow, even when on the way to training. Sometimes it provides powerful support and other times it simply extends the rider's range. Here, five athletes share how they experience the inspiring feeling and how it drives them onward.



Léa Deslandes

Climber and mountain biker, France



When former professional climber Léa Deslandes dons her climbing boots these days, it's just for fun. It's also to be in even better shape for her second sporting career with the eMountain bike. In 2020, the 35-year-old athlete won the E-Tour du Mont Blanc, a three-day adventure race covering over 300 kilometres and 16,000 metres difference in altitude, together with her compatriot Nadine Sapin. She aims to defend the title in 2021. Adding to her training workload, every day she rides her eMTB from her home in Landry in the French Alps to

Bourg-Saint-Maurice, where she runs the "Wood Bear Café", involving an altitude difference of 1,200 metres. She draws inspiration from the wide range and the Uphill Flow feeling that electric support gives: "For example, I could take out my bike tomorrow and cover 440 kilometres and a 10,000-meter difference in altitude, reaching the city of Dijon 40 hours later." Just a mind game? Who knows – she may have already crossed the mountains and be on her way to Burgundy in the centre of France ...

Ryan Howard

Freestyler, California, USA



Faster. Further. Bolder. Since Ryan Howard started riding his Trek Rail, his passion for the work has increased even more. For the 33-year-old, work means riding his bike and enjoying the time in the saddle. Few people try such daring aerial tricks as the pro from Aptos in California, and he does it with such style. However, he also enjoys the Uphill Flow and the exhilaration of flying up the mountains on an eMTB. This saves strength, which he can then use in a few more training rounds. He has won prestigious

Crankworx Whip-Off races in Europe and New Zealand and always pushes himself to the limit. Sometimes this puts him in situations that demand a certain respect even from experienced riders like himself. "But that's part of self-development," says Ryan Howard, who is known in eMTB circles simply as "R-Dog." That's because he can chew down on a sporting challenge like no other.

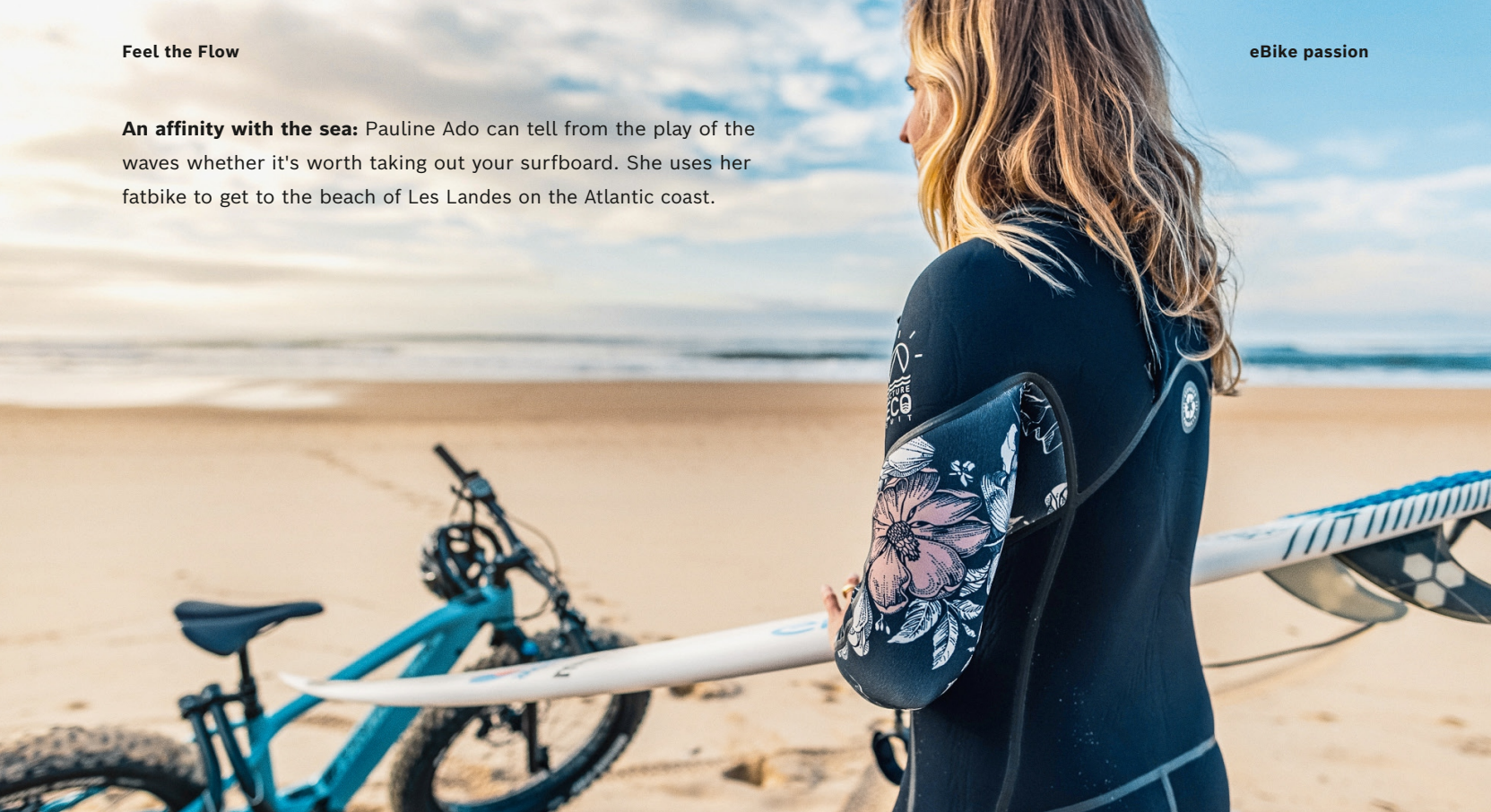
Full throttle:

Ryan Howard is a virtuoso on two wheels. The wild landscape of Kamloops in British Columbia, Canada is the ideal place for him to practise his stunts and several-metre-high jumps.

Videos and information about Ryan and the legendary trails of Kamloops can be found online: bosch-ebike.co.uk/british-columbia2020



An affinity with the sea: Pauline Ado can tell from the play of the waves whether it's worth taking out your surfboard. She uses her fatbike to get to the beach of Les Landes on the Atlantic coast.



Pauline Ado

Surfer, France



Pauline Ado has ambitious plans that include the Olympics and the Women's Championship Tour of the world's best professional wave riders. The 30-year-old surfer, who finished 1st at the World Surfing Games in 2017 in Biarritz, France, enjoys the best training conditions right on her doorstep: the Atlantic waves on the beach of the French coastal town of Anglet, not far from Biarritz itself. "I love moving fast on the water," says Ado. "No two waves are alike and when I become at one with the surf I feel completely free – it's pure euphoria!" Pauline Ado

experiences this fantastic flow when she is absorbed in the action. This is something she often experiences even on the way to the Atlantic coast: Her fatbike, an eMTB with extra wide tires, allows her to carry up to three boards, lashed along the side of the bike. "I can even ride through heavy sand with it, which is fantastic!" she says. It enables her to reach the waterline effortlessly with her equipment long after her competition days are over. Pauline Ado is certain of one thing: "I'll be in the water every day!"



Feeling the flow in wild water: the professional kayaker from Tennessee plunges his boat into the abyss at the Godafoss waterfall in Iceland.

Nick Troutman

Kayaker, Tennessee, USA



For professional kayaker Nick Troutman of Rock Island, Tennessee, the world is made up of rivers. And waterfalls. Or preferably a combination of both, enabling him to plunge in his boat like an arrow from a bow. "This year I'm aiming to break the 100-foot barrier," explains the 32-year-old former world champion freestyle kayaker. That would be a good 30 metres. His highest waterfall to date was 25 metres (approx. 80 feet). Whenever possible, he uses his eBike to scout for suitable locations for his adven-

tures. For this purpose, the native Canadian travels around the world for up to ten months a year. You might find him in bays on the Zambezi in southern Africa, in river canyons in China or in the rainforest on the Río Alseseca in Mexico: As a photographer and influencer, he seeks out spots that few people know. The greater the risk, the more likely Nick Troutman is to get into the flow, "because that's when I stop thinking and go into auto-pilot mode." This incomparable feeling is familiar on land too - when he is on his eMTB.

Liv Sansoz

Alpine mountaineer, France



Aiming high is what drives Liv Sansoz. She is a 2x world champion in lead climbing, a discipline that involves getting as far up a steep route as possible. Mountains are her passion, whether by rope, skis or paraglider. She recently discovered something new to spark her passion: "The eMTB has opened up the mountains to me in a new way. I can get up higher and therefore into the snow earlier and later in the season," says the 44-year-old multi-discipline athlete from Chamonix at the foot of Mont Blanc, a place she calls her "playground". Her biggest goal is always to

beat her own personal best: in 2022 her aim is to climb to 8,000 metres in the Himalayas without oxygen. After being the first woman to stand on the summits of all 82 four-thousand-metre peaks in the Alps in just 18 months, this year she is focusing on training as a high-altitude guide. The alpine mountaineer will then be able to pass on what her mountain sport has taught her: the ability to constantly adapt to new circumstances and make the right decisions quickly.

Featured products

Performance Line CX

A drive system for limitless riding enjoyment. Off-road and on summit tours. Performance is always guaranteed.



bosch-ebike.co.uk/performance-cx

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Kiox

The smart display provides information on power, cadence and heart rate.

bosch-ebike.co.uk/kiox

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PowerTube 625

The battery provides a boost even on long distances.

bosch-ebike.co.uk/powertube

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A love of heights: Frenchwoman Liv Sansoz not only loves climbing and mountain biking – she also enjoys touring on skis – as she is here in the Portes du Soleil on the Swiss border.

TOO GOOD TO WASTE

An initiative in the English town of Milton Keynes, 90 kilometres north-west of London, saves edible food that is no longer saleable from being thrown away and redistributes it to those who need it most. Bosch eBike Systems supports this social project.



New towns have a lot of advantages – provided they are well planned. Milton Keynes, just under 90 kilometres north-west of London, is one such town: it is just 54 years old, has many roundabouts, lots of parkland, 22 million trees and a dense network of cycle paths.

When Ritchie Dixon rides his electric-powered cargo bike around Milton Keynes to deliver surplus food from supermarkets to community fridges, he sees a lot of green spaces around him. "I listen to the birds, the rustling of the trees, I smell the flowers and sometimes stop to tell curious people what I'm up to," he says.

Ritchie Dixon is a rider for Hubbub's Food Connect pilot project, and he loves his job. A former social worker, the 53-year-old family man is delighted to be able to do something for the people of Milton Keynes. He's thrilled with how easy his eCargo bike is to ride, even when it's fully loaded. eCargo bikes can carry up to 250 kilos, and on average Ritchie carries around 100 kilos. To stay on the right route and to ensure the food reaches the right people, he follows the navigation instructions on his Nyon display on the handlebar. "It's never let me down," he says. "People can count on me finding them."



Rescue mission: rider Ritchie Dixon on his rounds by the cargo bike to deliver food to those in need.

He works for Food Connect, a food rescue and redistribution initiative set up by London-based charity Hubbub. Supported by Bosch eBike Systems, Food Connect uses three Bosch-powered eCargo bikes and an electric delivery van to collect and redistribute food in Milton Keynes in an environmentally-friendly way.

The fight against food waste

Save instead of waste – initiatives following this principle have emerged all over the world in recent years to combat a global problem: 1.6 billion



Delivery to the front door: People who can't leave home get food brought to them by Food Connect.

tonnes – about one third of all food produced for human consumption worldwide – ends up as refuse every year,

**Around one third
of the world's
food ends up as
waste each year**

responsible for eight percent of emissions worldwide.

The pandemic has exacerbated the problem, including in Milton Keynes. During the national lockdown in summer 2020, Food Connect saved more than 21 tonnes of food from being thrown away. For the most part, these are

according to United Nations estimates. This has dramatic consequences for land use, water resources and carbon dioxide emissions. According to the UN, food waste is

products that are no longer saleable but are in perfect condition, with expired best-before dates, or fruit and vegetables with minor blemishes.

In many UK cities, this food is stored in community fridges, known as 'food hubs', which are part of Hubbub's network of community fridges from which any member of the public can help themselves. Volunteers help in providing the food. They all work just as conscientiously and safely as the supermarkets where the goods originate. Anyone who goes to the community fridge is allowed to take up to ten products per person per day and share them with friends or acquaintances.



Sustainability pro:

Helen Innes, Food Connect project manager.



Climate-friendly course:

the Nyon on-board computer navigates the eCargo bike effectively to its destination.



More on Food Connect:

bosch-ebike.co.uk/food-connect

Fast and effective

"Since Food Connect started delivering food to community fridges, people can be sure there's always something available when they come," says Helen Innes, who is leading the pilot project in Milton Keynes on behalf of Hubbub. "This is a very good model for the quickest way to share a lot of food that would otherwise have been disposed of." 77,500 people have been helped in this way so far, many of them regular users. Food Connect handles the logistics behind collecting expired food and immediately distributing it to stakeholders through its network of community refrigerators. "We don't have much time," says Helen Innes. "The eCargo bikes help us get from A to B quickly, so the food stays fresh and the cold chain isn't broken."

The eBike has not only proven itself to be the fastest means of transport for distances of up to ten kilometres, but also helps to reduce the impact on the environment. For example, an eCargo bike with DualBattery produces just 30 g CO₂ for a journey of ten kilometres. The average emissions from a car for the same distance are 1130 g CO₂.

Good and green - this is the principle on which the project is to be expanded after a successful pilot phase. Riders are paid a salary, and the service is expected to develop into an income-generating business – with the goal of creating environmentally-friendly jobs.

Helen Innes is confident that Food Connect has a future in the city: "The bridges we've built recently with many businesses in the city are sustainable and we can use that to develop Food Connect even more." This is a promising prospect – and a model not just for cities in the UK.

Featured products

Cargo Line

With a capacity of up to 250 kg, eCargo bikes can transport almost anything. The Cargo Line drive unit offers the rider up to 400 % assistance.



bosch-ebike.co.uk/cargoline

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Nyon

Easy navigation via touchscreen with the connected on-board computer. bosch-ebike.co.uk/nyon

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DualBattery

Full power: the ideal battery for cargo bikes. bosch-ebike.co.uk/dual-battery

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SUSTAINABILITY THAT AIDS PROGRESS

Sustainability is a community concern. We can all help to protect resources and emissions – out of respect for nature and future generations. Especially in traffic: Our mobility is responsible for more than a fifth of all CO₂ emissions worldwide. Riding an eBike helps to lower this figure. It enables us to reduce traffic and relieve the environment.

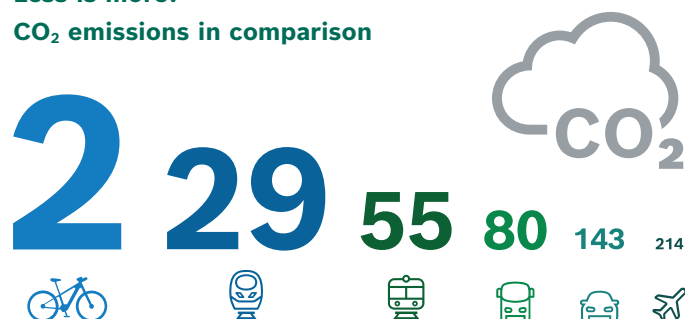
Mobility & CO₂ balance

The eBike is the next evolutionary step in cycling, allowing the rider to keep going for longer, covering greater distances and overcoming greater differences in altitude. Overall, eBikes significantly extend the possibilities for

use without significantly changing the sustainability of the vehicle when compared to a conventional bicycle. This is the case even though more energy is required for the battery and drive system than for the bicycle, especially in production: eBikers use their electric bikes twice to three times more often in everyday life, often as an alternative to cars and other means of transport. In addition, eBikers cover significantly longer distances on their electric bikes. In addition, the required energy consumption is very low, averaging around 7 Wh of electricity per kilometre travelled. CO₂ emissions are likewise minimal. An eBike only produces 2 g of CO₂ per kilometre.

Less is more:

CO₂ emissions in comparison



Sources: CO₂ emissions from an eBike in use, basis: internal calculation with TÜV Rheinland Energy GmbH; all other means of transport: CO₂ equivalents of emissions in g/Pkm (passenger kilometres), Federal Environment Agency

Batteries & Recycling

Correct recycling of rechargeable batteries conserves resources. Every eBiker can hand in their old or defective battery free of charge to the bicycle retailer, who will recycle it in an environmentally-friendly way. Bosch eBike Systems is in contact with many recycling companies and supports new and sustainable recycling methods. In the recycling processes used by the German GRS industry solution, over 80% of many valuable raw materials are recovered and can be reused for new products.

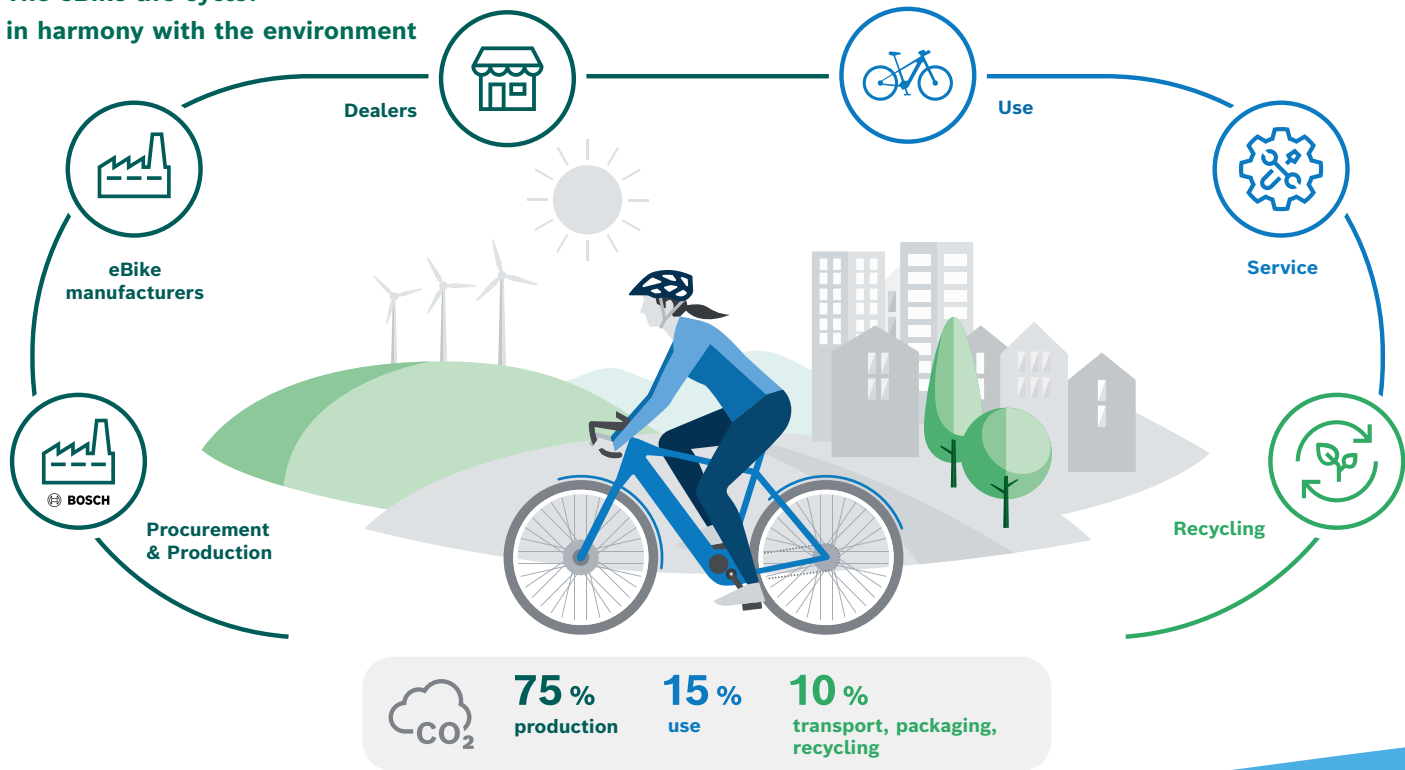
With the aim of: Design for Environment

Sustainability plays a central role at Bosch eBike Systems and is part of corporate strategy. Even during the development of a product, everything revolves around the question of how it can improve people's quality of life, minimise environmental impact and how to reduce the consumption of resources even further in our work. Design for environment is an integral part of the product development process: Already in the concept phase, we work out how a new product can be designed to be as sustainable as possible. Even at this early stage the

criteria considered covers the entire value chain, such as the choice of environmentally-friendly raw materials, the use of recycled materials, manufacturing steps that are as energy-efficient as possible and packaging design that favours sustainable alternatives. This approach is completely in line with Bosch's sustainability strategy. It aims to minimise the environmental impact of products, ensure transparency and responsibility in the supply chain and establish a recycling economy.

The eBike life cycle:

in harmony with the environment



More info on sustainability with eBikes:

bosch-ebike.co.uk/sustainability



TRANSPORT FOR TOMORROW

The United Nations estimates that two-thirds of the world's population will live in cities by 2050. How will this affect traffic? And what needs to be done to ensure that the growing metropolitan areas are liveable for people? We asked three experts about how mobility is set to change in 10 to 15 years.





G

Gregor Dasbach, Vice President of Digital Business for Bosch eBike Systems

sees the eBike as the driving force behind new mobility. For the future, he foresees new digital services that will enrich the riding experience.

Mr. Dasbach, how do you see mobility developing over the next 10 years?

It is likely that the space currently dedicated to cars will be freed up more for other road users. Cities are increasingly realigning themselves according to environmentally friendly principles. This includes more sharing services and electric vehicles, which, together with public transport, offer greater scope for intermodal travel. The bicycle in particular is taking a more central role.

What makes you so sure of this?

During the pandemic, it became obvious that work and private life are increasingly merging. The increasing trend of working from home means that long commutes are no longer necessary. As a consequence, people increasingly associate travel with leisure time. You might take your bike to a meeting first thing and then head into the woods to clear your mind. Mobility is not just a means to an end, but increasingly part of an individual lifestyle.

What role does the eBike play in this?

It is relevant because it combines both: In the city, it is often the faster mode of transport, and it enhances your quality of life. A few years ago, the eBike was primarily a kind of mobility aid for people who didn't want the effort of riding a bike or who believed that they were too old to do so. But the truth is, everyone is familiar with situations where you don't use your bike because it's stressful or inconvenient in some way. eBikes increase people's motivation to ride a bike. The eCargo bike reinforces this trend. More and more people are beginning to wonder: do I really need a car in the city?

Couldn't I drop my two children to daycare with a cargo bike? What else is possible? Shopping at the farmer's market, a trip to the hardware store? This is where opportunities arise that will get a huge boost from electrification.

As a manufacturer of eBike components, how are you preparing for future developments?

We are constantly asking ourselves about the challenges that cyclists face. We provide innovative answers to these questions. For example, we have introduced Help Connect, a service that calls for help if an eBiker has an accident. We were the first to introduce an assistance system for eBikes with the ABS anti-lock braking system. Another focus is on products for theft protection and other digital functions. Connecting the eBike with digital services is an elementary stepping stone on the way to future mobility. By introducing the smart system, we are expanding the ways to connect the cyclist and the environment with the eBike. For example, eBikers can regularly look forward to new functions that are conveniently transferred to the eBike via the app.

How digital will the eBike of the future be?

As soon as you combine the eBike and smartphone, you have a connected riding experience, so, for the most part, this is already possible right now. In the future, eBikers will not only be connected while cycling, but also when their eBike is parked. The rider might want to make sure that their bike is still there when they return to it. This can only work if the bike is connected to the internet to give the owner this information. Another advantage of a connected eBike is the ability to communicate with other road users.

What advantages do you mean?

We know from accident studies that many of the accidents involving bikes in the city are turning accidents where cyclists were overlooked. In future, by connecting road users, drivers and vehicles will be warned to avoid such accidents. I believe there is enormous potential to be tapped through communication with other road users.

How are digital services changing the eBiking experience?

Rather quite decisively. eBiking is becoming an increasingly individual experience. This begins right from the start. It doesn't really matter whether I unlock the eBike with a touch of the finger or by smartphone. The eBike will suggest a route that fits my riding profile. It handles gear shifting, making the most of my battery for the trip - and effortlessly making my favourite apps part of my eBike experience.

What products will be under development at Bosch eBike Systems in the coming years?

We are pursuing two strategies in developing new products and services. Our first concern is rider safety, from the further development of ABS to assistance in the event of an accident. The second major topic is digital services that will make eBiking an even more enjoyable and individual experience in the future. This requires seamless connectivity. After all, the many new functions are only truly fun if the hardware and digital components are perfectly matched. We will continue to expand our innovation leadership in this area.

**"DIGITAL SERVICES ARE SIGNIFICANTLY
ENHANCING THE eBIKE EXPERIENCE"**

Gregor Dasbach, Vice President of Bosch eBike Systems



Stephan Rammler is working on sustainable mobility at his institute in Braunschweig, Germany.

S

Stephan Rammler, sociologist and founder of the Institute for Transportation Design, predicts a fundamental transformation in cities that will only succeed with sustainable mobility.

Mr. Rammler, how will cities be different in the future?

As more and more people move to urban areas, the demand for living space, cultural and leisure facilities and mobility will also increase. The question is how to reconcile future expectations with the available urban space.

What's your solution?

The increasing density of the population in cities will give rise to a central demand for greater sustainability, as otherwise we will simply run out of air to breathe in cities due to climate change. This affects many areas, but first and foremost mobility. Individual ownership of the classic combustion engine car with its significant ecological footprint cannot continue. As is evident in younger generations, usage patterns are shifting towards sharing - from car and ride sharing to electric scooter and bike sharing services.

Will the city of the future be car-free?

I wouldn't quite go that far. In the future, however, there will certainly be more electrified vehicles on the road. Politicians will have to incentivise more sustainable mobility, for example by introducing a toll for motorists in the city. Because one thing is clear: The transformation can no longer be put on the long finger.



Researcher Ralph Buehler is the author of "City Cycling" (2012) and "Cycling for Sustainable Cities" (2021) – and commutes to work by bike himself.

R

alph Buehler, professor and transportation researcher at the Virginia Tech Research Center in the U.S., discusses ways to create a bike-friendly city and the Copenhagen model.

Mr. Buehler, Copenhagen is universally regarded as a model for bike-friendly traffic management – what can other cities learn from it?

Like many smaller cities in the Netherlands, the statistics for the Danish capital are the stuff of dreams. 49 percent of the population cycle to school, university or work. However, this did not happen overnight, as Copenhagen is a traditionally bike-friendly city that has stepped up its measures over the last 30 years. The reason why the city has become a model for the world at large can best be summed up with a formula for success: separate, protected cycle paths along the main traffic routes. These allow everyone to get around quickly and safely.

Do you see signs that other cities are following suit?

Yes, there is already a trend in many cities around the world to create protected bike lanes to allow cyclists to get from A to B safely and quickly - often in combination with more car-free zones in downtown areas and streets with speed limits. This is part of a transport policy that gives more space to pedestrians, cyclists and public transport, while restricting car traffic and making it less attractive. This can be seen in Montreal in

"IT IS IMPORTANT TO HAVE SEPARATE, FAST BIKE LANES FOR COMMUTERS"

Ralph Buehler, traffic researcher

Canada or Portland in the USA, as well as in the European cities of Paris, Vienna and Barcelona.

What is driving this development?

Municipal authorities around the world face the challenge of reducing CO₂ emissions, minimising traffic congestion and combating local air pollution. This is the only way to maintain quality of life. We're talking about values like health, safety and recreational opportunities. For this, the traffic space needs to be reallocated.

How important is the role of the bicycle in the mobility revolution?

Cycling will play a major role in sustainable transport. In cities in particular, it is the perfect means of transport for many people when it comes to distances of up to ten kilometres. The increased popularity of eBikes is giving this development a further boost. They allow longer distances to be covered and appeal to new target groups. For example, commuters who no longer get into a sweat, even on long and steep routes to the office. This requires an expansion of the cycle path network so that people from outlying areas can commute quickly to the city and back home again. Many cities still have some catching up to do here.

Featured products

The smart system

Longer riding enjoyment, 100 % connectivity: the smart system from Bosch regularly enhances the eBike with new functions.



bosch-ebike.co.uk/smartsystem

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ABS

For more control and stability when braking: Bosch eBike ABS prevents rear wheel lift and boosts the effectiveness of the front wheel brake.

bosch-ebike.co.uk/ebike-protect

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eBIKE SYSTEM AND PRODUCTS 2022

The eBike gains even more momentum in 2022 – with a new app, control unit, display, battery and motor that all work together to connect the bike and ensure even more riding fun and safety. Quality and a passion for innovation are the driving force behind new products and digital services with which Bosch is taking the eBike experience to the next level.



**Full speed ahead:**

The eBike offers the possibility to improve fitness and extends the radius – both in the city and on longer journeys.

RIDING ENJOYMENT

An eBike is much more than a bicycle and offers you numerous advantages. The electric drive gives you an extra boost when you need it. At the same time you are protecting the environment, improving your fitness and having fun. More and more people are discovering the eBike for themselves – whether for everyday use, in their leisure time or when traveling.

5 good reasons why it's worth switching to the eBike:

You enjoy the ride:

The drive provides support on challenging climbs and conserves energy on long rides. This way you can easily expand your own radius.

You're improving your health:

Regular exercise keeps you fit and puts you in a good mood. Studies have found that eBikers get on their bikes more often and cover much longer distances than conventional cyclists.

You're saving the environment:

With an eBike, traffic can be relieved just as much as the climate. It often makes the car redundant, takes up little space and causes neither noise pollution nor exhaust fumes.

You can all ride together:

The electric support compensates for differences in rider performance – and makes the ride a shared experience – even if people with different levels of fitness are on the road.

You save time:

On a distance of up to 10 kilometres, the eBike is the fastest means of transport in the city. The daily route to work can be covered in a relaxed manner on the eBike.



The components of the eBike system

① App

Enhance your eBike experience with a variety of digital features and services.

Find out more >> p. 76

② Display

Conveniently control your eBike with the on-board computer or smartphone solution and control unit.

Find out more >> p. 74

③ Battery

Together with the charger, optimally supply your eBike with power.

Find out more >> p. 78

④ Drive unit

Cover longer distances and more altitude thanks to electric assistance.

Find out more >> p. 70

WHICH eBIKE TYPE ARE YOU?

In which situation
do you want to use
your eBike? For
everyday use or in
your leisure time?



Every day

Do you often
drive short
distances from
A to B? Or do
you use the eBike
for commuting
to work or for
transportation?

From A to B

Commute
to work

Transport

Both

Would you like
to use your eBike
for short trips,
sporty day trips
or for longer
holiday trips?

Comfortable
short trips

Sporty
day trips

Multiday
trips

Leisure

Are you looking
for a sporty
challenge on
asphalt or are
you an off-roader
on trails?

Asphalt

Trails

Your bike should look stylish and be able to connect to your favourite apps on your smartphone.



Urban eBike: The stylish networker

Your products: Active Line Plus drive unit, SmartphoneHub, PowerTube 400, COBI.Bike app

Your eBike should be practical, easy to handle and offer you additional protection against theft.



City eBike: The practical city cruiser

Your products: Active Line drive unit, Kiox, PowerPack 400, eBike Connect app, Lock

You want to ride your eBike safely to work everyday. Longer distances should also not be a problem.



Speed Pedelec: The reliable company vehicle

Your products: Performance Line Speed drive unit, Nyon, DualBattery 1250, eBike Connect app, ABS

With your eBike you want to transport your shopping and take your kids to kindergarten.



eCargo bike: The sustainable second vehicle

Your products: Cargo Line drive unit, Nyon, DualBattery 1000, eBike Connect app

Your eBike should be comfortable and allow short trips on different surfaces.



SUV eBike: The comfortable all-rounder

Your products: Performance Line CX drive unit, Nyon, PowerTube 625, eBike Connect app

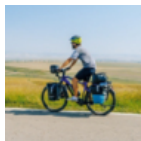
On your day trips you like to be sporty and minimalistic. A sleek design is important to you.



eGravel bike: The sporty all-rounder

Your products: Performance Line drive unit, Kiox, PowerTube 500, eBike Connect app

With your eBike, you want to be able to take longer trips with luggage as well as navigate and plan routes.



Trekking eBike: The optimal travel companion

Your products: Performance Line CX drive unit, Nyon, PowerTube 625, eBike Connect app

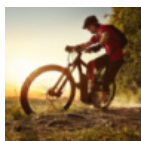
You often work out with friends. Your eBike should give you a tailwind and push your limits.



eRoad bike: The training partner with stamina

Your products: Active Line Plus drive unit, Kiox, PowerTube 500, eBike Connect app

You like to ride challenging trails. You want to have just as much fun with your eBike uphill as you do downhill.



eMountain bike (eMTB): The dynamic powerhouse

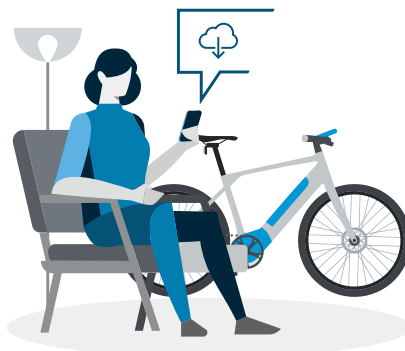
Your products: Performance Line CX drive unit, Kiox 300 & LED Remote, PowerTube 750, eBike Flow app

THE SMART SYSTEM



Fully connected: The smart system

The smart system by Bosch eBike Systems – consisting of eBike Flow app, control unit, display, battery and drive unit – ensures an individual eBike experience. The new system generation combines technologically high-quality eBike components with digital functions and thus raises your everyday and leisure riding pleasure to the next level.



Continuous development

Keep discovering new things:
With the smart system, your eBike continues to develop even after purchase. Your eBike experience is always enriched with new features – thanks to updates 'over the air', whenever and wherever you want. The smart system from Bosch eBike Systems brings the rider into the digital future.



Longer riding enjoyment

The smart system's new PowerTube 750 integrated battery offers the maximum range among PowerTubes. In addition to a sleek design and integration in the eBike, safety, easy handling and durability also have top priority.



[bosch-ebike.co.uk/
smartsystem](https://bosch-ebike.co.uk/smartsystem)



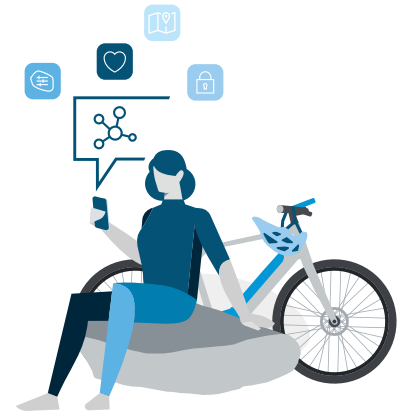
One hundred percent connectivity

The new eBike Flow app is the key to your Connected Biking experience. It connects you to your eBike – and your eBike to the Internet. Via Bluetooth, the eBike Flow app can be easily connected to the LED Remote. This way, you are always connected to your eBike – and thanks to smart, customisable functions, you are always ready for new adventures.



Beautifully formed design

The components of the smart system can be elegantly integrated into the bicycle frame and enable a modern and subtle design. The Kiox 300 display provides a clean eBike look on the handlebars and boasts optimal readability as well as animation effects. Stylish and organised at the same time.



Perfect teamwork

The smart system connects perfectly coordinated components with the digital world – and your eBike with your favourite apps. Your activities are recorded completely automatically and can not only be evaluated by you after the ride but also synchronised with fitness apps such as Apple Health.

DRIVE UNITS

The demands placed on drive units are as varied as their users. That's exactly why Bosch eBike Systems doesn't have a one-size-fits-all drive, but rather the drive that's right for you: Whether as an environmentally friendly alternative in the city, for transport, for a fun activity or for the challenge of mountainous terrain.



Active Line

The elegant companion for the city

- ▶ Quiet riding due to low-noise motor
- ▶ Up to 40 Nm assistance for harmonious acceleration
- ▶ Carefree cruising, thanks to light weight of approx. 2.9 kg
- ▶ Clean eBike look due to compact construction
- ▶ Natural ride feel thanks to smooth pedaling in off mode and over 25 km/h
- ▶ Comfortable braking with optional back-pedal function



bosch-ebike.co.uk/active



Active Line Plus

The drive unit for adventure, everyday and excursions

- ▶ Authentic riding experience through smooth pedaling in off-mode and over 25 km/h
- ▶ Comfortable riding experience in every situation due to up to 50 Nm torque
- ▶ Modern eBike look thanks to elegant integration into the bike's frame
- ▶ Comfortable braking with optional back-pedal function
- ▶ Excellent design thanks to flowing shapes and lines



bosch-ebike.co.uk/activeplus

The smart
system



Cargo Line

The powerful drive unit for transporting heavy loads

- Comfortable riding even with load, due to the special adaptation to eCargo bikes
- Easier starting and acceleration even at low cadences thanks to up to 85 Nm assistance
- Powerful uphill riding due to an assistance of up to 400 % over the entire speed range up to 25 km/h
- Maximum range thanks to efficient motor and DualBattery



[bosch-ebike.co.uk/
cargoline](https://bosch-ebike.co.uk/cargoline)



Performance Line

Versatile drive system for sporty riders and commuters

Performance Line

- Authentic riding experience through smooth pedaling in off-mode and over 25 km/h
- Sporty acceleration even at high cadences, thanks to maximum torque of 65 Nm

Performance Line Speed

- Dynamic riding experience thanks to 85 Nm maximum torque
- Fast riding with assistance up to 45 km/h



[bosch-ebike.co.uk/
performance](https://bosch-ebike.co.uk/performance)



Performance Line CX

The powerhouse for the ultimate Uphill Flow and more riding fun in challenging terrain

- Powerful starting and acceleration thanks to up to 85 Nm support, even at low cadences
- Natural riding dynamics due to particularly fast processing of the sensor signals
- Optimal control without switching riding modes with special eMTB mode
- Easily tackle roots, steps and rocks even when climbing, thanks to the Extended Boost function of the eMTB mode
- Continuously incremented support for a natural riding sensation and energy saving riding with Tour+ mode
- Maximum agility even on demanding trails, thanks to multi-sensor concept and Bosch power control
- Constant performance even under continuous load
- Individualisation of the riding experience by customising the riding modes within the given framework



[bosch-ebike.co.uk/
performance-cx](https://bosch-ebike.co.uk/performance-cx)



[bosch-ebike.co.uk/
smart-cx](https://bosch-ebike.co.uk/smart-cx)

RIDING MODES

With the Bosch eBike system you have different riding modes to choose from: Whether riding in the city, commuting to work or in leisure time – there is the optimal support for every riding situation and for every type of rider.



Riding modes at a glance

The Bosch eBike system offers a choice of different riding modes, providing ideal assistance depending on type of use and rider type.



▶ **Turbo:** Direct, maximum power assist up to the highest cadences for steep ascents



▶ **Sport*:** Powerful support for universal use – both sporty riding as well as fast commuting in city traffic



▶ **eMTB*:** Dynamic support for a natural riding feel and optimum control when eMountain biking



▶ **Tour+**:** Smooth incremental support for energy-saving riding and a natural riding sensation for sporty rides



▶ **Tour**:** Uniform support for long rides



▶ **Eco:** Low level support with maximum efficiency for maximum range



▶ **Off:** No support, all display functions can still be displayed

*Depending on the eBike type; in Performance Line and Performance Line CX, eMTB mode can replace Sport mode. In eMTB mode, support level varies between Tour and Turbo riding modes.

**In the Performance Line CX, Tour+ mode can replace Tour mode. In eMTB mode, the level of support varies between Tour and Turbo riding modes.



The eMTB mode perfectly adapts the support to you and the ground in every situation. This gives maximum riding enjoyment and a unique riding sensation. We call it Uphill Flow.



eMTB mode

The riding mode for eMountain biking on the trail

- ▶ Overcome obstacles such as rocks and roots easily with Extended Boost
- ▶ More control in all riding situations thanks to optimal power delivery by the motor
- ▶ Easier starting uphill on the mountain due to powerful assistance
- ▶ Mastering demanding trails through dynamic power delivery
- ▶ Extend the range by automatically reducing assistance on more relaxed sections



bosch-ebike.co.uk/emtb



Tour+ mode

The riding mode for sporty rides

- ▶ Full focus on the ride without manually switching between riding modes
- ▶ Natural riding sensation due to sensitive power delivery by the motor
- ▶ Enjoy longer rides with a higher power input by the rider
- ▶ Stepless assistance varies between the riding modes Eco and Turbo
- ▶ Available for the Performance Line CX drive unit as of model year 2020



bosch-ebike.co.uk/performance-cx

DISPLAYS

Bosch eBike displays offer a suitable companion for every requirement – from the purist control unit to the all-in-one on-board computer or the smartphone solution on the handlebars.



Purion

The compact purist

- ▶ Organised display of the most important riding data
- ▶ Optimum readability even in direct sunlight
- ▶ Safe operation with thumbs and a tidy handlebar
- ▶ Optional service interval display



bosch-ebike.co.uk/purion



Intuvia

The intuitive control centre

- ▶ Easy operation via the separate control unit
- ▶ Good readability in all light conditions
- ▶ Can be used as a charging station thanks to USB interface
- ▶ Shift recommendation for optimum range
- ▶ Optional service interval display



bosch-ebike.co.uk/intuvia



Kiox

The connected training partner

- ▶ Optimal training thanks to display of power, cadence and heart rate*
- ▶ Clear orientation with navigation function
- ▶ New functions via the eBike Connect app
- ▶ Tidy handlebar thanks to compact size
- ▶ Organised ride data evaluation in the eBike Connect app and in the portal

*When connecting a heart rate monitor via Bluetooth



bosch-ebike.co.uk/kiox

The smart
system



Nyon

The connected
all-rounder

- ▶ Intuitive operation of the colour display thanks to touch function
- ▶ New functions via the eBike Connect app
- ▶ Full concentration on the ride thanks to offline navigation
- ▶ Organised display of the range before and during the ride
- ▶ Connected to your favourite apps



 [bosch-ebike.co.uk/
nyon](https://bosch-ebike.co.uk/nyon)



COBI.Bike

The intelligent
smartphone cockpit

- ▶ Safe and easy control of your smartphone display using the control unit on the handlebars
- ▶ New functions via the COBI.Bike app
- ▶ Integrated smartphone charging function
- ▶ Connected to your favourite apps



 [bosch-ebike.co.uk/
cobi-bike](https://bosch-ebike.co.uk/cobi-bike)



SmartphoneHub

The flexible
smartphone display

- ▶ Use with smartphone or with integrated LCD display
- ▶ Navigate, track activities and experience new functions with the COBI.Bike app
- ▶ Easy charging of the smartphone thanks to USB port
- ▶ Connected to your favourite apps



 [bosch-ebike.co.uk/
smartphonehub](https://bosch-ebike.co.uk/smartphonehub)



LED Remote

The fully connected
control centre

- ▶ Comfortable thumb operation with ergonomic L-design
- ▶ Fast status information and more safety through intuitive detection of the colour LEDs
- ▶ New functions via the eBike Flow app
- ▶ Intuitive use of the smart walk assistance function
- ▶ Good readability even in changing light conditions



 [bosch-ebike.co.uk/
led-remote](https://bosch-ebike.co.uk/led-remote)



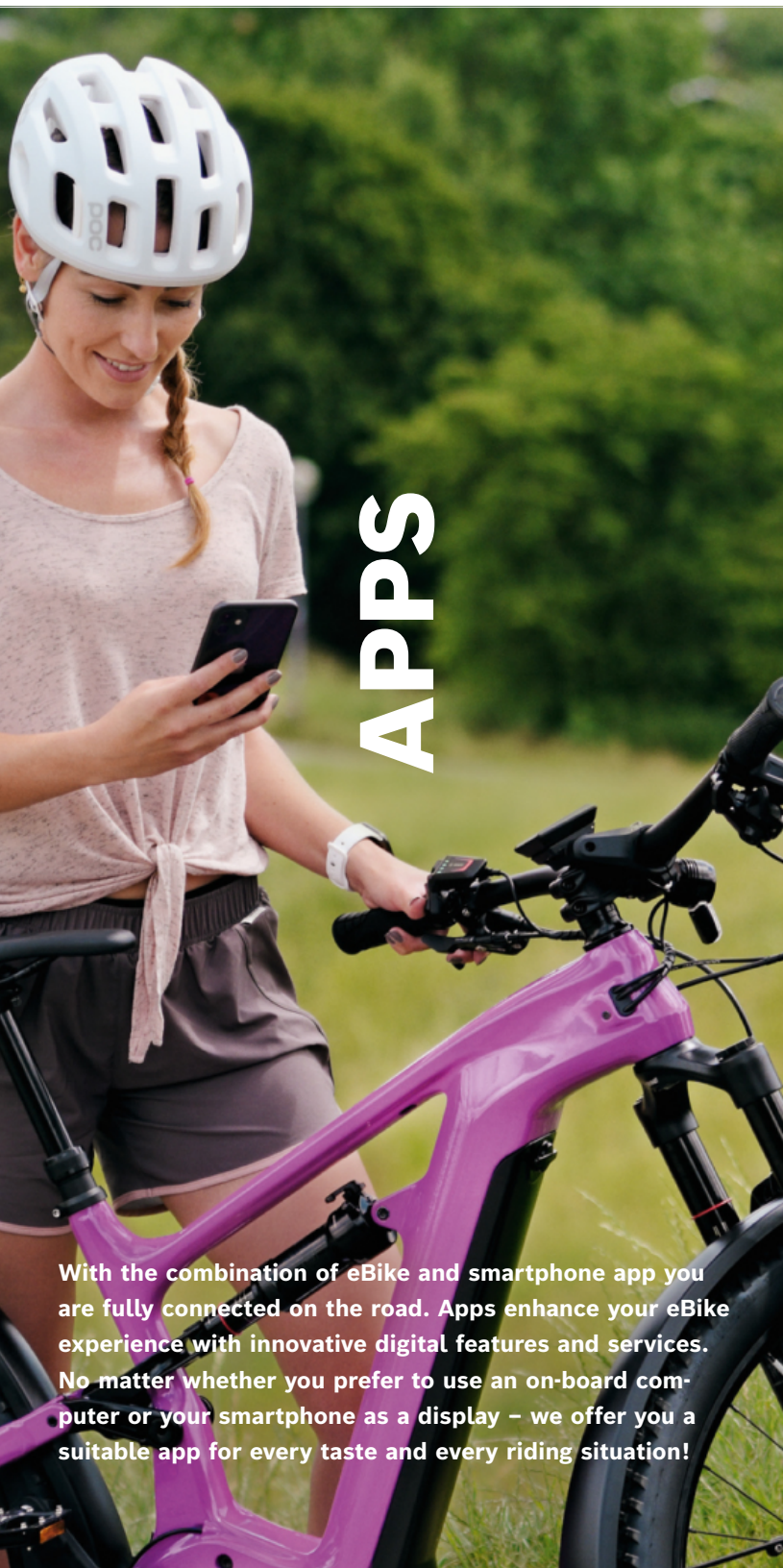
Kiox 300

The smart
sports friend

- ▶ Determines fitness data and optimises your training through a motivational display
- ▶ Improved route planning through mapping of remaining range
- ▶ New functions via the eBike Flow app
- ▶ Compact size, modern design and optimal readable colour display
- ▶ Individual positioning by means of flexible display holder



 [bosch-ebike.co.uk/
kiox300](https://bosch-ebike.co.uk/kiox300)



APPS

With the combination of eBike and smartphone app you are fully connected on the road. Apps enhance your eBike experience with innovative digital features and services. No matter whether you prefer to use an on-board computer or your smartphone as a display – we offer you a suitable app for every taste and every riding situation!



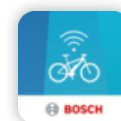
eBike Connect app

The right app
for your on-board computer

- ▶ Connects your smartphone via Bluetooth to the on-board computers Nyon and Kiox
- ▶ Allows you to plan your route and navigate through Nyon or Kiox
- ▶ Helps you integrate an active lifestyle into your daily routine by automatically recording your activities
- ▶ Helps you keep an eye on the most important information on your on-board computer through customisable user interfaces



[bosch-ebike.co.uk/
connect](https://bosch-ebike.co.uk/connect)



COBI.Bike app

The right app
for your smartphone solution

- ▶ Connects your smartphone to the SmartphoneHub or COBI.Bike – and turns your smartphone into an eBike display
- ▶ Lets you control your audio apps directly from your eBike
- ▶ Connect with your friends with the ability to make and receive calls
- ▶ Synchronises your fitness information with Apple Health or Google Fit – so you can easily share it with others



[bosch-ebike.co.uk/
cobi-bike](https://bosch-ebike.co.uk/cobi-bike)

The smart
system



eBike Flow app

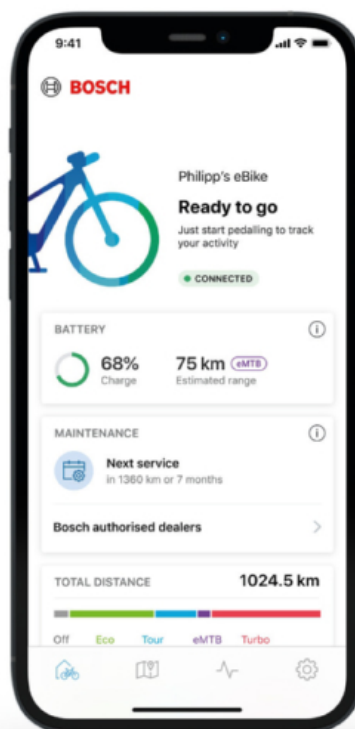
The right app for your eBike
with the smart system

Expanding the eBike

Develops your eBike continuously
through new functions and
updates 'over the air' – so your
eBike is always up to date

Recording activities

Records your ride and fitness data
completely automatically – just
put your smartphone in your
backpack, get on your eBike and
start pedaling



Customise riding modes

Provides the motor assistance
you need – and lets you customise
riding modes to perfectly match
your riding style

Everything at a glance

Bundles all important informa-
tion on the home screen – from
battery charge status to the next
service appointment to total
distance ridden



Connects to your favourite apps
like Apple Health and synchronises
your activity and fitness stats

Answers many of your questions in
the Help section about your eBike

Offers you all setting options for
your eBike centrally in one place



[bosch-ebike.com/
flow-app-magalog](https://bosch-ebike.com/flow-app-magalog)

BATTERIES & CHARGERS

The Bosch batteries are the energy suppliers of the eBikes and therefore one of the most important components. They combine impressive mileage performance, a long lifetime and low weight with an ergonomic design and simple handling. You can find more information about care, transport and recycling in our battery guide: bosch-ebike.co.uk/battery-guide



PowerPack

Versatile and always at hand:
A power supplier for every eBike experience

- ▶ Easy charging at the eBike or easy removal in a single action
- ▶ Long service life thanks to battery management system
- ▶ Easy handling due to ergonomic carrying handle
- ▶ High safety standards through product design and manufacturing
- ▶ Variety of choice thanks to different characteristics
- ▶ Frame battery: Available with 300 Wh, 400 Wh and 500 Wh
- ▶ Rack battery: Available with 300 Wh, 400 Wh and 500 Wh



[bosch-ebike.co.uk/
powerpack](https://bosch-ebike.co.uk/powerpack)



PowerTube

Convincing combination
of top performance and
appealing design

- ▶ Optimum integration into the downtube for a clean eBike look
- ▶ Long service life thanks to battery management system
- ▶ Secure even in challenging terrain thanks to locking mechanism
- ▶ Intuitive removal
- ▶ High safety standards through product design and manufacturing
- ▶ More variety in eBike design through horizontal or vertical variants
- ▶ Available with 400 Wh, 500 Wh and 625 Wh



[bosch-ebike.co.uk/
powertube](https://bosch-ebike.co.uk/powertube)

The smart
system



DualBattery

The perfect solution for long distances

- ▶ Double the range through the coupling of two batteries
- ▶ Flexibility through a wide range of battery combinations up to a maximum of 1250 Wh*
- ▶ Reliable charging through intelligent charging management
- ▶ Long service life thanks to battery management system
- ▶ High safety standards through product design and manufacturing

*PowerPack 300 and PowerTube 400 do not work in any combination with DualBattery



[bosch-ebike.co.uk/
dual-battery](https://bosch-ebike.co.uk/dual-battery)



Charger

Practical chargers for every situation

- ▶ Easily transported due to compact size and low weight
- ▶ Quiet charging without noise
- ▶ Easy handling due to ergonomically shaped charging plug
- ▶ Varied selection for every situation
- ▶ 2 A Compact Charger: Particularly light and small
- ▶ 4 A Standard Charger: The all-rounder for everyday
- ▶ 6 A Fast Charger**: Perfect for fast and frequent charging

**Charge current is limited to 4 A for PowerPack 300 and Classic+ Line batteries.



[bosch-ebike.co.uk/
charger](https://bosch-ebike.co.uk/charger)



PowerTube 750

The biggest capacity PowerTube for long and demanding tours

- ▶ Maximum range thanks to 750 Wh
- ▶ Shapely eBike design through frame integration
- ▶ Long service life thanks to battery management system
- ▶ Secure even in challenging terrain thanks to locking mechanism
- ▶ Intuitive removal
- ▶ High safety standards through product design and manufacturing
- ▶ More variety in eBike design through horizontal or vertical variant



[bosch-ebike.co.uk/
pt750](https://bosch-ebike.co.uk/pt750)



4A Charger

Lightweight charger for energy in an instant

- ▶ Fast charging supplies the PowerTube 750 with the necessary energy in the shortest possible time
- ▶ Full charge of the PowerTube 750 in approx. six hours, 50 % battery charge in just over two hours
- ▶ Easily transported due to compact size and low weight
- ▶ Ergonomic design of the charging plug for easy use



[bosch-ebike.co.uk/
smart-charger-4A](https://bosch-ebike.co.uk/smart-charger-4A)



Safety plays a central role in cycling. eBike Protect includes all innovative products and solutions from Bosch eBike Systems that make eBiking even safer.



Bosch eBike ABS*

The system for more safety and stability during braking

- More stability and improved steering due to optimised brake pressure control
- Reduced risk of front wheel skidding on loose surfaces when braking
- Reduced risk of an accident when braking on slippery surfaces due to rear wheel lift control

*Bosch eBike ABS is available in the countries of the European Union and the following countries: CH, NO



bosch-ebike.co.uk/ebike-protect



Help Connect**

The vigilant digital companion for more safety on every eBike ride

- Automatic accident detection thanks to the intelligent algorithm of the COBI.Bike app
- 24/7 emergency support by trained Bosch service team, which immediately sets the rescue chain in motion in the event of an emergency
- Automatic transmission of the accident location to the Help Connect assistant

**Help Connect is currently only available for users with German SIM cards and in German and English. It is available in eleven countries: DE, AT, CH, FR, BE, NL, LU, GB, IE, IT, ES



bosch-ebike.co.uk/HelpConnect



Lock

The electronic theft protection is an ideal supplement to a mechanical lock

- ▶ Deactivates the motor by disconnecting the on-board computer and thus makes the eBike less attractive to thieves
- ▶ Clear acoustic feedback similar to the central locking of a car
- ▶ Set up conveniently after purchase via the eBike Connect app
- ▶ Available for the Kiox on-board computer and, from model year 2021, also for the Nyon on-board computer



bosch-ebike.co.uk/lock



Just to be sure

At Bosch eBike Systems we create innovative mobility solutions and are committed to responsible eBiking. For people who want to get around in a relaxed, sustainable and above all, safe way.

29 %

The safety of eBike riders is a top priority for Bosch. The eBike ABS was developed using the already established motorcycle ABS from Bosch as a starting point. The active brake assistant enables more controlled, stable braking by combining front-wheel ABS and rear-wheel lift control. The pressure on the front brake is regulated during critical braking manoeuvres within milliseconds and thus stabilises the riding situation. In the event of an accident, Help Connect**, a

premium function of the COBI.Bike app, is available. In the event of a fall, Help Connect** makes an emergency call. This alerts a trained service team that is available around the clock and immediately notifies emergency services in the event of an emergency. Lock also provides electronic protection for the eBike itself – in addition to the mechanical lock: It deactivates the motor as soon as the rider disconnects the on-board computer.

of all eBike accidents could be prevented by ABS.

SERVICE IS MORE THAN A PROMISE

It's an attitude. Because Bosch eBike Systems knows that every product is only as good as its service. That's why specialist retailers and workshop staff receive extensive training to make them eBike specialists, thus guaranteeing the best possible service. Whether you need personal advice, regular software updates or comprehensive all-round checks: enjoy that special riding sensation – and leave the rest to us. If you wish to contact Bosch eBike Systems directly with a query, feel free to contact our service staff.

**Contact:**

bosch-ebike.co.uk/contact

Advice and support

More and more people are discovering a passion for eBiking. The choice of bike is becoming increasingly varied, raising the question: Which eBike is the right one for me? Even before visiting a specialist retailer, it can be helpful to consider what requirements the eBike should meet: What is the area of use and what distances do I expect to cover? Also, does the bike need to be connected? You can get initial guidance with our overview, starting on page 66.

When looking for a suitable eBike, it makes sense to visit a specialist retailer. This will enable you to get to know different eBike types and drive systems – and if you wish, also try them out on a test ride. This should reveal the advantages of the different models and which drive system is the right one.

After purchasing an eBike, you can enjoy the new riding sensation. Everything else will be handled by the specialist retailers. They will advise you on the care of the system, carry out regular inspections as well as professional repairs and help with individual settings, for example activating and deactivating Walk Assistance. The CapacityTester can also be used to check the capacity of the eBike battery.

Staying up to date: Specialist retailers can always keep your eBike up to date with software updates using the Bosch DiagnosticTool. This also enables

1,366

cities offer eBikers Bosch Service. They can be found in 17 countries in Europe and North America.

13,000

specialist retailers take part in Bosch training courses every year. And more courses are being added each year.



Is your eBike up to date?

Here you can see the current status of the software to enable your eBike to be updated by the specialist retailer: bosch-ebike.co.uk/software-updates



Pimp your eBike!

All retrofitting products and accessories can be found here: bosch-ebike.co.uk/accessories-retrofitting



Switching to an eBike?

Here you will find an overview of all brands that use Bosch drive systems: bosch-ebike.co.uk/brands

impressive increases in power. Example: The Performance Line CX, whose torque can be increased to 85 Nm since the 2021 model year. On-board computers such as Kiox, Nyon and SmartphoneHub can be upgraded with new smart functions and updated map material.

Get the best out of your eBike – Bosch offers numerous retrofitting and expansion options from specialist retailers. All on-board computers and smartphone solutions can be converted and retrofitted. The specialist retailer can also provide advice and assistance when the battery needs to be replaced with a more powerful one or when you need to choose the correct charger. You will find

an overview of which components can be combined on the following page:



bosch-ebike.co.uk/product-combinations

Your satisfaction is what drives us. That's why Bosch eBike Systems offers specialist retailers more than just a fast supply of spare parts. Regular training sessions and online tutorials provide retailers with comprehensive know-how on how to handle and care for new products. What counts is competent all-roundservice – from good accessibility and high reaction speed to customer loyalty through high level product competence. The rest is pure riding enjoyment.





Credits

Title, p. 74: Julian Mittelstaedt; Opener: Robb Thompson; p. 2: Futter-Fotodesign; pp. 4-5, 44-45: RiBLANC; pp. 6-11: Jeremie Carron; pp. 12-15, 67: Maximilian Semsch; pp. 16-17, 73: Nathan Hughes; pp. 16-17: iStock/Getty Images Plus; pp. 18-25, 62-63, 66: Philipp Schönauer; pp. 26-27, 54-55, 68-69: Illustrations: Studio Vaar; pp. 28-39: Greber/Skyshot; pp. 40-41, 49: Thomas Meï; p. 42: Peter Jamison; pp. 43, 84-85: Robb Thompson; p. 46: David Wilder; p. 48: Antipodes Zeb; pp. 50-53: Christopher Cox; p. 56: Ms.Yang Photography; p. 59: Amin Akhtar; p. 60: Elmer Lovrien; pp. 64-65, 67, 76, 83: Ralph Klohs; p. 67: Puria Ravahi; p. 67: Kittelberger; pp. 67, 70, 78, 80: Ronny Kiaulehn; pp. 68, 71, 74-75, 77, 79: Manuel Deutschle; pp. 70-71, 76, 78-79, 80-81: Bosch eBike Systems; pp. 73, 80: Bosch



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