

# E-BIKES EXPOSED

There is no doubt that cycling is an efficient and effective mode of transport. Not only can you travel three times as fast as walking for the same amount of energy, but twenty bikes can be parked in the same space as one car; and let's not forget the fact that they produce zero pollution. In city traffic you can quite easily outrun cars stuck in stand-still jams, and the benefits of bicycles in other areas are endless.

As far as technology goes, cycling is changing daily, and there are now a huge amount of options available in the electric bicycle market that can help you greatly, especially if you live in a hilly area or if you love mountain biking, but you're just not as keen on all that up-hill riding.

Riding electric bikes is also more important for the future of the environment in ways you might not have thought of before. The more we ride electric bikes, the more chance they will have of becoming a conventional part of our culture, and that will eventually take more cars off the road.

## So what are electric bikes?

To put it simply, electric bikes are a bike that has an electric motor that helps it move. You might be surprised to know that they aren't actually new phenomenon... In fact, they've actually been around since the 19th Century! Back then, experimenters started by attaching steam engines to tricycles; and in 1868, the first true motorised bike was created in France – the Michaux-Perreux steam velocipede.

Of course these days, there are no steam engines and technology has increased dramatically. eBikes now have rechargeable batteries and can travel up to 25-32 kilometres per hour. There are also higher powered bikes that exceed speeds of 45 kilometres per hour!

When it comes to eBikes, the Asia Pacific region is leading the world. According to research by Statista, in 2015 95% of electric bikes sold around the world were sold in the Asia Pacific region. Since the year 2000, China has been the largest market, with 30 million units sold in 2012! But they are also becoming more and more popular in Australia. The Australian government even announced in August 2016 that they were going to trial eBikes for public servants across the Australian Capital Territory!

eMountain Bikes in particular are increasingly popular among adventure seekers. Here are some of the best reasons we think you need to consider buying an electric bike – whether it's for use on the roads or a mountain bike:

1. If you love cycling and you love admiring amazing views, but hate the thought of having to get to the top of the mountain to enjoy them – an electric bike is ideal. You can cycle as much as you like on the flat roads: and then when you hit the mountain-side, click the on switch and away you go with minimal effort!

2. It's unfortunate that injury or health reasons might prevent you from riding a bike. If you don't want to have to give up cycling because your health is not the best, an e-bike is the perfect option. If you have a knee injury or suffer from blood pressure problems that might affect your heart rate, you can take it easy with the cycling while still enjoying the health benefits of a ride.

3. There's nothing worse than heading off to work of a morning, or home in the afternoon, and you're stuck in peak hour traffic. You can waste minutes – sometimes even hours – in traffic jams. But if you have an electric bicycle, you can avoid all of that and still get to work on time! They are faster than riding there yourself, you can go off-road when needed to avoid any traffic issues, and you will still arrive at work feeling and looking amazing (no sweat dripping everywhere!).

4. If you want to cycle to work but the threat of rain hangs overhead, you can ride knowing that with the help of the electrics, you are less likely to get wet! Enjoy the slow pace of a cycle until the weather takes a turn for the worse, then hit your ON switch and off you go.

5. You're helping to save the environment. According to the Environmental Protection Agency, the motor on an eBike emits 40 times LESS CO2 emissions than a car.

6. They help save money. Although you might have to pay a fair whack up front (though its nothing compared to the price of a new car!), you'll easily earn that money back by saving on petrol.

7. Contrary to what some people believe, eBikes are still great exercise. You still have to use the pedals, it just makes the trip a bit easier for you. You can cycle long distances, much further than you would on a regular bike, and you can turn off the motor at any time.

The only problem with eBikes is that people in Australia aren't really sure of what the laws are around the country. In 2012, the standards set by the Australian Design Rules was changed to bring eBikes in line with Europe, increasing the output to up to 250 watts, but keeping the maximum speed at 25 kilometres per hour.

So that we could help you make a more informed decision, we spoke with eBike experts from around the country to get an update on the different laws for each Australian state, and where eBikes and their popularity seems to be headed (into the future) for that region.

# QUEENSLAND



## The View – on E-Mountain Bikes in Queensland

The European standard EN15194 for 'pedelec' (pedal-assisted) electric bikes was introduced into Australia in 2013. This standard provided a 20% boost in power from the existing standard and gave Australia access to a much wider range of electric bike designs and models from European manufacturers. The adoption of the legislation across the various states in Australia, and subsequent regulation introduced in some states, has made it a bit confusing for riders.

## The law in Queensland – what's in, what's out

We are lucky in Queensland:

- Firstly because we have awesome weather which allows us to ride our trails all year round
- Secondly, because we adopted EN15194 when it was first introduced into Australia so there is a broader understanding of the ebikes themselves and how they work, and
- Thirdly, riding EN15194-compliant electric mountain bikes on public mountain bike trails and singletrack is perfectly ok, unlike some states which have banned them.

## So, what is 'EN15194-compliant'?

These are ebikes fitted with an electric motor that provides up to 250W assistance in addition to the riders own pedal power, and provides assistance up to 25 km/ hr. For weaker riders it means you ride at quite a good speed; for strong riders who are used to those speeds you accelerate much faster when you start and you can travel much faster up hills. What many people don't realise though is that you need to pedal for the motor to work, hence 'assisted pedalling'. The general rider will push out 150– 250W of power themselves so, if you want to know what it feels like to ride with the power of Cadel Evans who will produce 400-500W, ride an electric bike up a hill in the highest power setting! Not to be forgotten on the legal front though is that the earlier category of electric bikes, before EN15194 came in, still exists.

This legally allows bicycles with electric motors of up to 200W power. What's different about this standard is that these bikes can be fitted with throttles and are not restricted in speed on public roads. Bikes complying to this older standard are generally a lot cheaper and obviously aren't as powerful. While they still have a place as an alternative form of transport, especially from a mobility perspective, they are not suitably equipped or built for mountain biking.

## What is not legal?

What is not legal quite often gets misinterpreted. Basically, if your electric bike is not legal (see below), by law you should ride on private land, not 'offroad' as is often the interpretation.

Your ebike must be ridden on private land if it has:  
> a motor greater than 250W – so a lot of home-made ebikes with eg. 1,000W motors should not be riding on publicly accessible mountain bike trails;  
> a 250W motor that is not delimited to 25 km/hr – yes, there are ways around this limitation;  
> a motor greater than 200W that is being operated with a throttle.

Now all this sounds a bit overcomplicated and we agree. For how much longer the 200W category standard will remain is hard to tell but what we do know is that the compliant purpose-built electric mountain bikes that are being manufactured in Europe are simply superb.

Take the brand Haibike, for example. It's e-mountain bikes are designed specifically to cope with fast, technical downhills and to climb well. Turn off the power and you still have an excellent, albeit heavier, mountain bike. Turn on the power and you will have some of the most fun, exhilarating mountain biking riding ever! All the components are purpose built for singletrack mountain bike riding.

They are equipped with excellent shocks, brakes etc and there has been a huge investment made into the design and engineering of the frames and electrics. This means that the bikes ride and perform like a mountain bike should and can endure the wear and tear of faster speeds. What's more, choosing drive systems partners such as world-leader Bosch delivers superb pedal-assist performance that enhances your riding, not overrides it.

If you are a good rider already, be prepared to be challenged. Riding fast up technical singletrack requires skill! If you are an ok rider then be prepared to have a ball. The extra power levels the playing field more, for climbs in particular.

Like all new emerging technologies there those who are for and those who are against. In Queensland, while we have a small and rapidly growing community of e-mountain bikers, there are still some doubters. Nick and I have been involved in the sport of mountain biking for a long time; long enough to witness the resistance when suspension was first being introduced.

Funnily enough it is largely the same arguments against ebikes as there was against suspension!

Key concerns tend to be about excessive trail damage and rider behaviour. When we delve into what is driving this point of view though it is primarily because that person still relates an electric bike to the old standard where throttles are used, or they have had a poor experience with a rider on a bike with an oversized motor.

In these instances we totally agree! But these are not pedelecs.

We have, and continue to, put a lot of effort to providing people – including legislators – an opportunity to try an e-mountain bike on trail. The resounding conclusion each time is that they are fantastic fun and a great bicycling experience.

Concerns about trail damage fade away as there is a clearer understanding of what a pedelec is. After all, if we banned electric mountain bikes for concerns about trail damage then should we also ban Cadel Evans from mountain biking again?

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THIS ONE  
RUNS ON MONEY  
AND MAKES YOU FAT



## How far will a SEB take me?

Your range is dependent on a range of factors but an average of 30 to 40km's is a good figure to base your trip on. The battery size is the main factor, the bigger the battery, the more juice and further it will take you. Some of our bikes will take you 50km's or more. Your weight also plays a part and the type of terrain you are riding. Here is a quick trip guide based on battery Amp Hours.

9AH > 30 to 40km

10AH > 35 to 45km

12AH > 50 to 65km

14Ah > 65 to 85

17Ah > 85 to 115km

It is important to emphasise that these distances are based on pedal assistance, not sitting on your butt and letting the SEB do all the work. Obviously if you only used the SEB to assist you on hills, and you only had a few hills on your journey, you could ride many km.

## Isn't it lazy to ride an electric bike?

Most definitely not! Riding a SEB will get your heart rate up without a doubt. You will be able to travel about five times the distance of your average pedal powered ride so you will more than likely do the same if not more exercise on a SEB than a normal bike. You will get as hard a workout as you want, the pedal assistance is really just to take out the hardest parts of your journey, we don't suggest you let the motor do all the work. Think of it like using an exercise bike at the gym, with a constant exertion or cadence. You will get into shape without the need for gut wrenching exertion and all the associated wear and tear on your joints. Just start using a SEB bike for all, or at least some, of your commuting.

## What is throttle mode?

Electric Bicycles come in a few different flavours when it comes to controlling the power of the motor. The most simple is the Throttle only mode. Operating just like a motorcycle, a throttle can be found either on the left or right side of the handlebars and is spring loaded so when it is not used the default position is off. Some throttles are full grip twist ones, others use a half grip and our favourite is the discreet thumb throttle. Very easy position to activate. More often than not the throttle activates the motor whether or not you are pedalling. This style of riding is not possible in Europe as electric bicycles are defined always as "electric assist", you have to be pedalling at all times to get the benefit of power assistance. Currently in Australia we don't have that requirement so it's possible to have throttle bike that could be ridden without pedalling. We don't encourage that as the whole point of Ebikes in our mind is to get significant health benefits. Your range from your battery will also be reduced.

## What is pedal assist mode?

In this setup there is no throttle on the bike, the only way to get assistance is to pedal. Most bikes with this setup will have a controller on the handlebars that allows the rider to adjust how much power you receive. Either three levels of assistance, just like Low - Medium - High or up six levels. This way you can focus on riding and let the bike assist you automatically. It also saves considerable wrist strain as holding a throttle over a long period of time can be hard work on your hand. Some bikes like the eZee range can be used in Pedal Assist mode but the throttle is always on, irrespective of pedalling.

LAW - NEW SOUTH WALES- In New South Wales, motor assisted pedal cycles with electric engines do not need to be registered if the maximum engine output is less than 250 watts. If you do have a cycle that is exempt from registration, the law states that you must follow the same rules as for cycles without motors.

You don't need a licence or registration to ride a "pedelec e-bike". Any electric bike with a power source of 250 Watts or less is classified as a standard bicycle in NSW. So jumping on a SEB and heading off into the sunset is so easy. There is no need to deal with registration, parking or special licenses.



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# VICTORIA



## How fast do electric bikes go?

The speed of an electric bike will vary based upon several factors. Electric bikes in Australia are limited to 25 km/h under assistance. Most electric bikes are rated up to 25 km/h by the manufacturer, but the actual speed will vary depending on rider weight, terrain and road conditions. Smaller riders are likely to achieve higher top speeds than larger ones, and you're likely to go faster on flat terrain than uphill.

## How far can I go on a single charge?

The range of electric bikes can vary, but most riders are able to achieve 50-70 kilometres per charge on the average e-bike model. One of the main factors in determining how far you can travel on a single charge is how much assistance you provide. Rated by amp hours (AH), the typical e-bike battery has a capacity of 10-12AH. Another factor that can have a big impact is terrain. If you live in a hilly area or have lots of steep inclines - expect less range from your e-bike. Larger riders or people carrying heavy loads can also expect reduced output. Because weight is a factor, this also means higher quality NiMH or Li-Ion batteries are capable of slightly longer ranges due to their reduced weight. Other factors include: wind and road conditions. Battery charge times will vary between manufacturers, models and battery types. Typically, the initial charge will take 4-5 hours. For routine charging, higher quality batteries (such as Li-Ion and NiMH) will take less time - anywhere from 3-4 hours..

## How long will the battery last?

Battery life will vary depending on the type of battery you choose and how well you maintain it.

## Are electric bikes safe to operate?

Electric bikes are very safe! Intelligent functions are incorporated into every bike we sell and vary between manufacturers. Most include automatic power cut-off features, and all bikes use standard electrical safety components such as circuit breakers and fuses to protect riders.

## Ebikes are known as Pedalecs.

A Pedelec is a type of power assisted bicycle equipped with one or more auxiliary propulsion motors. It allows a maximum power of 250 watts, with a safeguard allowing for power assistance only when the bicycle is travelling at less than 25km/h and the rider is pedalling. This means that the rider must pedal to obtain help from the auxiliary motor(s) and cannot simply be propelled by the motor alone.

## THE LAW - VICTORIA ([www.vicroads.vic.gov.au](http://www.vicroads.vic.gov.au))

Power assisted bicycles are likely to have similar performance characteristics to pedal powered bicycles so the same road rules apply. These types of power assisted bicycles are not required to be registered nor the rider required to be licensed. Definition of a power assisted bicycle: A power assisted bicycle is identical to a pedal powered bicycle, except it has an auxiliary motor. Power assisted bicycles have two definitions in Victoria:

\* A pedal cycle with one or more auxiliary propulsion motors attached which has a combined maximum power output not exceeding 200 watts.

\* A bicycle certified as a Pedelec (compliant with European Committee for Standardization EN 15194:2009 or EN 15194:2009+A1:2011 Cycles - Electrically power assisted cycles - EPAC Bicycles).

This bicycle features an auxiliary power producing no more than 250 watts and specifies this as a continuous rating. It also restricts the top power assisted speed to 25 kilometres per hour and requires the rider to pedal to access the power.

A motorised bicycle is not classed as a bicycle if the motor is the primary source of power and the motor's power output exceeds 200 watts (whether or not the motor is operating). These are considered to be motorcycles. The rider will be required to hold a motorcycle licence and have the vehicle registered before it can be used on the road network.

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