

Australia's e-bike moment



About Bicycle Network

Bicycle Network is Australia's largest membership-based bike riding organisation, representing nearly 50,000 members nationwide.

We support our members with bike riding insurance (incl. medical coverage, income protection and third-party coverage) and legal support in the event of a crash.

We are a registered Australian health charity, and our mission is to help create liveable places where people are physically active. We aim to make it easier for everyone to ride a bike every day.

We campaign to build more places to ride, fight for riders' rights and make bike riding safer for all Australians.

We run world class events including Great Vic Bike Ride, Around the Bay, Peaks Challenge and the Great Outback Escape.

For more information
visit bicyclenetwork.com.au

Follow Bicycle Network on:



@bicycle_network



/BicycleNetwork



@bicycle_network

About Bicycle Queensland

Bicycle Queensland (BQ) is Queensland's premier force for positive change for all things involving bikes and micromobility.

Established 44 years ago, BQ has instigated many great events (such as the Brisbane to Gold Coast ride) and looks after the interests of those who like to ride.

Whether it's commuting to work, exploring local paths, or embarking on multi-day adventures, BQ provides: insurance, education, resources, and a sense of community to make every cycling experience more enjoyable.

As a member-based, non-profit organisation, BQ advocates for a future where cycling is safe, accessible, and embraced as a regular part of everyday life.

BQ advocates tirelessly to improve cycling infrastructure across the state, collaborating with government and stakeholders to develop bike paths, dedicated lanes, and facilities that empower cyclists of all levels.

If you're interested in finding out more about BQ,
please contact us at: bqinfo@bq.org.au

Or find us at:



/bicycle.qld



@bicycle_qld



A note from our CEOs

The battle for the future of our planet has moved into new territory.

The emergence of e-bikes has rapidly expanded the appeal of two-wheeled transport, tapping into new segments of the population and helping them over hills and home with groceries.

E-bikes allow workers to arrive relaxed at the office and they are reshaping the school run, as more Australian families swap cars for a healthier, cost-effective alternative.

This ingenious mode of transport is enabling more Australians to combat the risk of inactive lifestyles. It is empowering individuals to play a daily part in a cleaner future and make sustainable transport choices.

2023 was the first year that global warming exceeded average temperatures of 1.5 degrees, the limit underpinning the Paris Agreement, to which Australia is party.

While experts consider this the threshold for avoiding the worst impacts of climate disaster, they say there is still much we can do to control how much the planet warms.

Transport emissions are our fastest growing source of emissions, and climate experts have sounded the alarm.

E-bikes have given us a powerful tool to create change. They offer an easy solution for the replacement of car trips and an accessible opportunity to dramatically reduce fossil fuel demand around the globe.

We find ourselves at a critical point in the history of transportation. Considering the task in front of us, the e-bike may have arrived at just the right time.

Alison McCormack
Bicycle Network CEO



Alton Twine
Bicycle Queensland CEO



Contents

- 8 **Introduction**
- 9 **What is an e-bike**
- 10 **E-bikes are an investment for the planet**
- 12 **Healthy living made easy**
- 14 **Affordable transport, made easy**
- 16 **Carbon savings, made easy**
- 18 **References**

Acknowledgement of Country

We acknowledge the traditional custodians of the lands where we work and live and pay our respects to Aboriginal and Torres Strait Islander Elders past, present and emerging. We celebrate the diversity, stories and traditions of Aboriginal and Torres Strait Islander people and their ongoing cultures and connections to the lands and waters of Australia.



Introduction

Australia's transport emissions are on the rise and on track to become our biggest contributor to the climate emergency by 2030.

Federal and state governments have taken commendable steps to facilitate a shift to low-carbon transport, through the National Electric Vehicle Strategy, new regulations for fuel efficiency, purchase incentives and tax credits for electric vehicles.

Modelling shows we must do more than rely on electric cars to meet our climate obligations. We must move rapidly towards other sustainable modes of transport such as bike riding and walking. Expanding our low-carbon transport vision to encompass e-bikes will be instrumental in accelerating this shift, while inspiring an entirely new demographic of active transport users.

This will help us tackle not just the climate emergency, but the many risks that come with sedentary lifestyles. Obesity is projected to cost the Australian community \$87.7 billion by 2032,¹ and brings with it increased risk of heart disease, diabetes and cancer.

The concurrent crises of climate change and physical inactivity present a complex problem, and the e-bike is the tool that can help us solve both problems together.

Millions of car trips in Australia's capital cities each day are under 5km, and burning calories instead of fossil fuels to carry them out would bring substantial benefits to our health, and the outlook of the planet.

The emergence of e-bikes means this is within our grasp and, with small adjustments in policy and public sentiment, we can set Australia on a path for a healthier and more sustainable future.

This booklet provides an overview of the benefits of e-bikes as they relate to human health, transport affordability and climate action. It also contains evidence in support of financial incentives for e-bike purchases. But before we dive in...

What is an e-bike?

E-bikes are bikes with electric motors that assist riders as they pedal up to speeds of 25km/h. Known as pedelecs or EPACs, they have a continuous rated power output of 250 watts and can roughly double the amount of power your legs put out. They typically cover 80-100km on each good-quality battery charge, and the level of assistance can be dialled up and down as the rider desires.

Hundreds of thousands of Australians now get around by e-bike, receiving a nudge along as they push up hills, cover long distances, carry large loads home from the supermarket and drop their kids off at school.

E-bikes can come in all forms to suit all kinds of uses, and cargo models are proving especially popular. They can be fitted with mudguards, racks and lights for commuting, extra kid's seats and cargo holds for larger items (or pets!). Will you join the movement?



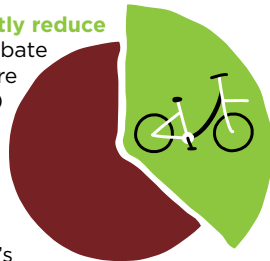
E-bikes are a smart investment for the planet

It's time to subsidise the purchase of the world's most climate-friendly vehicle. Big returns are there for the taking.

As the evidence builds around the many benefits of e-bike use, governments around the world are taking proactive steps to accelerate their uptake. E-bike rebate programs have been implemented in all corners of the globe and are proving highly effective at not just getting people to use e-bikes, but to use them instead of cars.

E-bike rebate programs can **directly reduce emissions**.

A study of Norway's rebate program found that emissions were reduced by between 440 and 720 grams of CO₂e (equivalent) per day for each participant, while a study on programs in California found emissions reductions of 12-44 kilograms of CO₂e per rebate participant per month.ⁱⁱ Colorado's rebate scheme for low-income earners encouraged owners to replace one third of their car trips with e-bikes.ⁱⁱⁱ



A \$1000 e-bike subsidy in Australia could stimulate 24,000 e-bike sales, avoid 13 million kilometres of car travel each year and **save 15,729 tonnes of greenhouse gas emissions** over five years. This shift from car use to e-bikes promises a cost-benefit ratio of more than \$2 per \$1 invested.^{iv}

15,729 tonnes

Purchasing incentives for e-bikes are widespread throughout North America and Europe and proving highly effective at **driving adoption**.

Australia has a history of guiding individual transport choices through financial incentives.

We've subsidised SUVs and made them the most popular cars on the road.

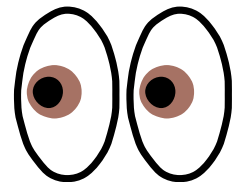
We've subsidised electric cars and sales have accelerated.

Let's subsidise e-bikes and watch them take off.



Cost is a barrier.

A survey of US residents found nearly half would switch to an e-bike with financial incentive.^v Similarly, surveys have found 41% of Europeans would be encouraged to buy an e-bike with financial incentives.^{vi}



Tasmania introduced Australia's first e-bike rebate scheme in November 2023 and it inspired a **rapid and noticeable** increase in interest and sales.^{vii}



Australia has a National Electric Vehicle Strategy. By broadening its scope to include financial incentives for e-bike purchases, the federal government could fast-track the nation's emissions reductions.

Like Tasmania, other governments can take bold steps of their own through **localised rebate programs** and lead the nation in sustainable transport.

Healthy living, made easy

The perception that e-bikes don't count as exercise is proving outdated, as scientific research demonstrates the many health benefits for regular users.

Don't be fooled. Just because e-bikes give riders a little assistance along the way doesn't mean the health benefits are negligible. In fact, research shows that e-bike users routinely ride further and more often than traditional bike riders and have a good time doing it. This helps them to meet physical activity guidelines and live longer, healthier lives.

Sedentary lifestyles are major risk factors for premature death from heart disease, obesity, cancer and diabetes. Making e-bikes a part of our daily lives could help build healthy habits and keep these health risks at bay.



It is recommended that Australians engage in at least **150 minutes of moderate-to-vigorous activity per week.**^{viii}

Riding an e-bike can be moderate exercise. Studies have found e-bike use can drive physiological responses that meet the parameters for **moderate intensity physical activity.**^{ix}



E-bikes **make longer trips more appealing.**

Research has shown e-bike riders routinely cover greater distances than conventional bike riders. One study on more than 10,000 adult e-bike users in seven European countries found that average daily travel distance was significantly higher at 8km compared to 5.3km.^x In a trial in Norway on parents of kindergarten children, e-bike users averaged 20.2km a week compared to 11.9km covered by conventional bike riders.^{xi}

E-bikes encourage **more frequent trips.**

Research shows that e-bike owners make healthier transport choices each day, even if they already have a bike. One study in Norway showed that after buying an e-bike, owners increased their share of total kilometres travelled by bike from 17% to 49%.^{xii}



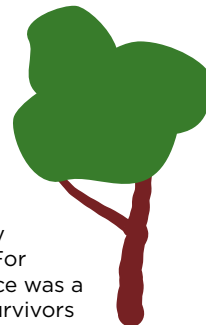
E-bikes **make exercise enjoyable.** Research has shown e-bikes offer a good workout, but the perceived effort can be low. Participants in one US study on e-bike commuting described it as "easier" and "fun." Another on 100 German workers found that while their perceived exertion was lower, they logged more time riding and expended more energy each week.^{xiv}



E-bike riding is **great for mental health.**

It is well established that outdoor exercise has big benefits for the brain, but a study directly comparing e-bike use to regular bike riding found greater improvements in reaction times and self-reported measures of mental health.^{xv}

E-bikes can **ease the path to recovery**, by helping patients rehabilitate after injury. For example, one trial found electric assistance was a positive factor in enabling some stroke survivors to ride outdoors.^{xvi}



Affordable transport, made easy

What would you do with \$9000?

The country is in the midst of a cost-of-living crisis and Australian households are feeling the pressure from all angles, from ballooning grocery bills and rising utility prices to rent hikes, and increasing interest rates. But the cost of car ownership, is vastly underestimated and growing even faster than household expenses.

The typical Australian household in 2023 had two cars and spent \$415 a week on transport, **90% of which went towards running cars.**

This is an increase on the \$381 per week in 2022, a jump that easily **exceeds the rising cost of living.**^{xvii}



Growing **costs of car ownership** are being driven by increasing purchase prices, fuel costs, interest rates on car loans and insurance premiums.

Electric cars are much cheaper to run and can save owners between \$1300 and \$3700 a year in running costs.^{xviii} But they are **expensive to buy**, starting at \$45,000.^{xix}



Australians are dedicating larger chunks of their household budget to car ownership.

But a viable and incredibly cost-effective alternative to the second vehicle has arrived. Say hello to the e-bike.

E-bikes range in price, but a good quality European-made e-bike with commuter accessories can be bought for around \$5000. At a depreciation rate of 15%, this costs \$750 annually.^{xx}

Commuting on an e-bike 20km a day, five days a week, costs about **\$20 a year in electricity.**^{xxi}

An e-bike will require regular servicing and replacement of tyres, brake pads and other parts at an estimated **\$300 a year.**

The battery will need replacement after roughly five years, adding around **\$200** to the annual running cost.



You may wish to insure your new ride, at \$340 a year for comprehensive insurance.

As a regular e-bike rider, you may want to take out a Bicycle Network membership, to cover you in the event of a crash, at around \$130 a year.

There are no road tolls, no parking fees, no registration.



Carbon savings, made easy

Say hello to Australia's most efficient EV.

Australia faces the significant challenge of decarbonising its transport sector to fulfil its obligations on climate change. Encouraging a shift to more active forms of travel is a key part of the solution and e-bikes are a welcome weapon in the battle.

E-bikes present us with an unprecedented opportunity to fast-track our climate ambitions and create more liveable communities.



E-bikes have huge potential to reduce emissions by replacing car trips. Globally, electric bikes are already **displacing four times as much oil** as electric cars.^{xxii}

International evidence shows access to an e-bike has a significant impact on reducing car trips.

Studies on a number of European countries show more than 50% of e-bike trips are replacements for car trips.^{xxiii}



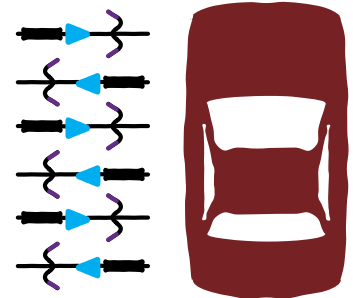
A 2022 study in the UK found that e-bikes have the capability to reduce car CO2 emissions by 24.4 million tonnes each year.^{xxiv}



In Australia, most car journeys in capital cities each day are **under 5km**.^{xxv}

In Victoria, half of all journeys under 2km each day are driven. That's **2.2 million car trips** that could be covered on an e-bike in **less than 10 minutes**.^{xxvi}

E-bikes produce **40 times less emissions** than a car and take up less than **one sixth of our public space**.^{xxvii}



E-bikes also **emit far less than electric cars**.
Grams of carbon emitted per person per km travelled:

Average Victorian car:



Tesla Model S charged on Victorian grid:



E-bike charged on Victorian grid:



Research has shown that when food consumption is factored in, e-bikes generate **even less carbon emissions than traditional bicycles**, due to the calories that go into each pedal stroke.^{xxviii}



References

- i. Australian Government Department of Health and Aged Care 2022, *National Obesity Strategy 2022-2032*.
- ii. Bicycle Network 'E-bike incentives key to cutting car use' November 2024. Available at <<https://bicyclenetwork.com.au/newsroom/2023/09/27/e-bike-incentives-key-to-cutting-car-use>> Viewed February 22, 2024
- iii. Kcicek C, Aemmer Z, Shankari K, Duvall D 'Freewheeling: What Six Locations, 61,000 Trips, and 242,000 Miles in Colorado Reveal About How E-Bikes Improve Mobility Options' June 2023. Available at <<https://www.nrel.gov/docs/fy23osti/86388.pdf>> Viewed February 22, 2024.
- iv. WeRide Australia, 'E-Bike Subsidy for Australians,' November 2021. Available at <https://www.weride.org.au/wp-content/uploads/2022/04/WeRide_e-Bike_Subsidy_Report_FINAL-lores.pdf> Viewed February 22, 2024.
- v. Dorr R, 'Perceptions of the E-BIKE Act Tax Credit' January 2024. Available at <<https://ebikes.org/general/perceptions-ebike-act-tax-credit/>> Viewed February 22, 2024.
- vi. Shimano, 'State of the Nation Report: Examining attitudes towards e-bike usage in 12 European countries' October 2021. Available at <https://lifestylebike.shimano.com/_assets/images/stories/2022/state-of-the-nation/shimano-state-of-the-nation-2022.pdf> Viewed February 22, 2024
- vii. Bicycle Network '100k in e-bike rebates still up for grabs' January 2024. Available at <<https://bicyclenetwork.com.au/newsroom/2024/01/30/100k-in-e-bike-rebates-still-up-for-grabs/>> Viewed February 22, 2024
- viii. Australian Institute of Health and Welfare, *Physical Activity*, viewed February 19 <<https://www.aihw.gov.au/reports/physical-activity/physical-activity>>
- ix. McVicar J, Keske M, Daryabeygi-Khotbehsara R, Betik A, Parker L and Maddison R, 2022, 'Systematic review and meta-analysis evaluating the effects electric bikes have on physiological parameters' *Scandinavian Journal of Medicine & Science in Sports* Jul;32(7)
- x. Castro A, Gaupp-Berghausen M, Dons E, Standaert A, Laeremans M, Clark A, Anaya-Boig E, Cole-Hunter T, Avila-Palencia I, Rojas-Rueda D, X Nieuwenhuijsen M, X Gerike R, Int Panis L, X de Nazelle A, X Brand C, X Raser E, Kahlmeier S, Götschi T, 'Physical activity of electric bicycle users compared to conventional bicycle users and non-cyclists: Insights based on health and transport data from an online survey in seven European cities,' *Transportation Research Interdisciplinary Perspectives*, Volume 1,2019,
- xi. Bourne J, Cooper A, Kelly P, Kinnear F, England C, Leary S, Page A, The impact of e-cycling on travel behaviour: A scoping review, *Journal of Transport & Health*, Volume 19, 2020.
- xii. Fyhri A, Sundfør H, 'Do people who buy e-bikes cycle more?' *Transportation Research Part D: Transport and Environment*, Volume 86, 2020,
- xiii. Alessio H, Reiman T, Kemper B, von Carlowitz W, Bailer J, Timmerman K, 'Metabolic and Cardiovascular Responses to a Simulated Commute on an E-Bike' *Translational Journal of the ACSM* 6(2) Spring 2021.
- xiv. Stenner HT, Boyen J, Hein M, Protte G, Kück M, Finkel A, Hanke AA, Tegtbur U. 'Everyday Pedelec Use and Its Effect on Meeting Physical Activity Guidelines'. *Int J Environ Res Public Health*. 2020 Jul 3;17
- xv. Leyland LA, Spencer B, Beale N, Jones T, van Reekum CM 'The effect of cycling on cognitive function and well-being in older' *PLOS ONE* 14(2):
- xvi. Boland P, Connell L, Thetford C, Janssen J. 'Exploring the factors influencing the use of electrically assisted bikes (e-bikes) by stroke survivors: a mixed methods multiple case study. *Disability and Rehabilitation* 2022 Apr;44.
- xvii. Australian Automobile Association, Transport Affordability Index, October, 2023.
- xviii. Butler G, 2023, 'Are electric cars cheaper to run than petrol or diesel cars?' Available at <<https://www.drive.com.au/caradvice/are-electric-cars-cheaper-to-run-than-petrol-or-diesel-cars/>> viewed February 15, 2024.
- xix. Corby S, 2023, 'How much does an electric car actually cost?' Available at <https://www.carsguide.com.au/ev/advice/how-much-does-an-electric-car-actually-cost-83863>, viewed February 15, 2024.
- xx. Depreciation costs for e-bikes have been included to match the car cost calculation.
- xxi. Uzair W, Rizwan Azhar M, 'The world's 280 million electric bikes and mopeds are cutting demand for oil far more than electric cars' Available at <<https://theconversation.com/the-worlds-280-million-electric-bikes-and-mopeds-are-cutting-demand-for-oil-far-more-than-electric-cars-213870>> viewed February 15, 2024.
- xxii. BloombergNEF 2023, *Electric Vehicle Outlook 2023*. Available at <https://about.bnef.com/electric-vehicle-outlook/> Viewed February 15, 2024.
- xxiii. Cairns S, Behrendt F, Raffo D, Beaumont C, Kiefer C, 'Electrically-assisted bikes: Potential impacts on travel behaviour,' *Transportation Research Part A: Policy and Practice*, Volume 103, 2017.
- xxiv. Philips I, Anable J,Chatterton T, 'E-bikes and their capability to reduce car CO2 emissions, *Transport Policy*, Volume 116, 2022,
- xxv. McLaughlin M, McCue P, 'Fewer of us are cycling – here's how we can reverse the decline' Available at <<https://www.unsw.edu.au/news/2023/09/fewer-of-us-are-cycling--heres-how-we-can-reverse-the-decline>> viewed February 22, 2024.
- xxvi. Victorian Integrated Survey of Travel & Activity, *Trips 2008 to 2020*. Available at <<https://public.tableau.com/app/profile/vista/viz/VISTA-TripsDraft/Trips-methodoftravel>> Viewed February 22, 2024
- xxvii. WeRide Australia, 'E-Bike Subsidy for Australians,' November 2021. Available at <https://www.weride.org.au/wp-content/uploads/2022/04/WeRide_e-Bike_Subsidy_Report_FINAL-lores.pdf> Viewed February 22, 2024.
- xxviii. Stott S, 'How green is cycling? Riding, walking, ebikes and driving ranked' October 2020 Available at <<https://www.bikeradar.com/features/long-reads/cycling-environmental-impact>> Viewed February 22, 2024.

