Changing Gears:

Exploring the Future of Battery Safety, Sustainability, and Electric Vehicle Repairs

NRMA INSURANCE | A Help Company

Ipsos

Contents

Foreword

As Australia strides toward an electric future, we are on the edge of a significant transformation in how we move, live, and interact with our environment. Electric vehicles (EVs) are at the heart of this change, offering new possibilities for sustainability and efficiency. But with this shift comes a responsibility to address the challenges around adoption, including the adequacy of Australia's repair workforce, the environmental impact of EVs and battery safety.

Since our last report, there has been huge growth in the availability of new EV models, including those at lower price points. This expansion has been beneficial for Australians, offering a broader range of options to suit different needs and budgets. However, despite the increased variety and more affordable prices, sales of EVs have plateaued. Reports of declining residual values of EVs, and uncertainty regarding future government subsidies have contributed to a climate of uncertainty for both consumers and the industry.

The CSIRO remains confident in its forecast that the majority of cars on the road by 2050 will be electric, which is an exciting prospect for a cleaner, greener future. However, it also highlights the need for forward-thinking strategies to ensure that the technology and infrastructure can evolve in tandem with demand. This report, Changing Gears: The Future of Battery Safety, Sustainability, and Electric Vehicle Repairs, expands on our first report, offering a deeper dive into the challenges and opportunities of the EV transition.

In this report, we explore the environmental concerns surrounding the lifecycle of EVs, as well as the questions many Australians still have about owning one. Our research reveals that while the appeal of EVs is growing, concerns persist around battery safety, repair costs, and long-term maintenance. These challenges cannot be overlooked. To build consumer trust and drive wider adoption, it will be important to address these challenges, while continuing to invest in EV infrastructure across the country.

As one of Australia's largest insurer of EVs, NRMA Insurance is dedicated to understanding how we can best support the transition to electric. EVs account for around 1.5% of the cars we insure, and we expect this to rise to 9% by 2030. However, a smooth transition will require more collaboration between industry, government, and consumers to ensure the infrastructure, skills, and policies are in place to support the transition.

This year marks a century of NRMA Insurance helping Australians protect what matters. We're using everything we've learnt over the last 100 years to help Australians for the next 100, including helping our customers and the industry as the world moves towards a future where electric mobility is the norm.

I'm proud to present this research and the valuable insights it offers. NRMA Insurance remains steadfast in our commitment to empowering our customers and supporting our communities.

Julie Batch
NRMA Insurance CEO

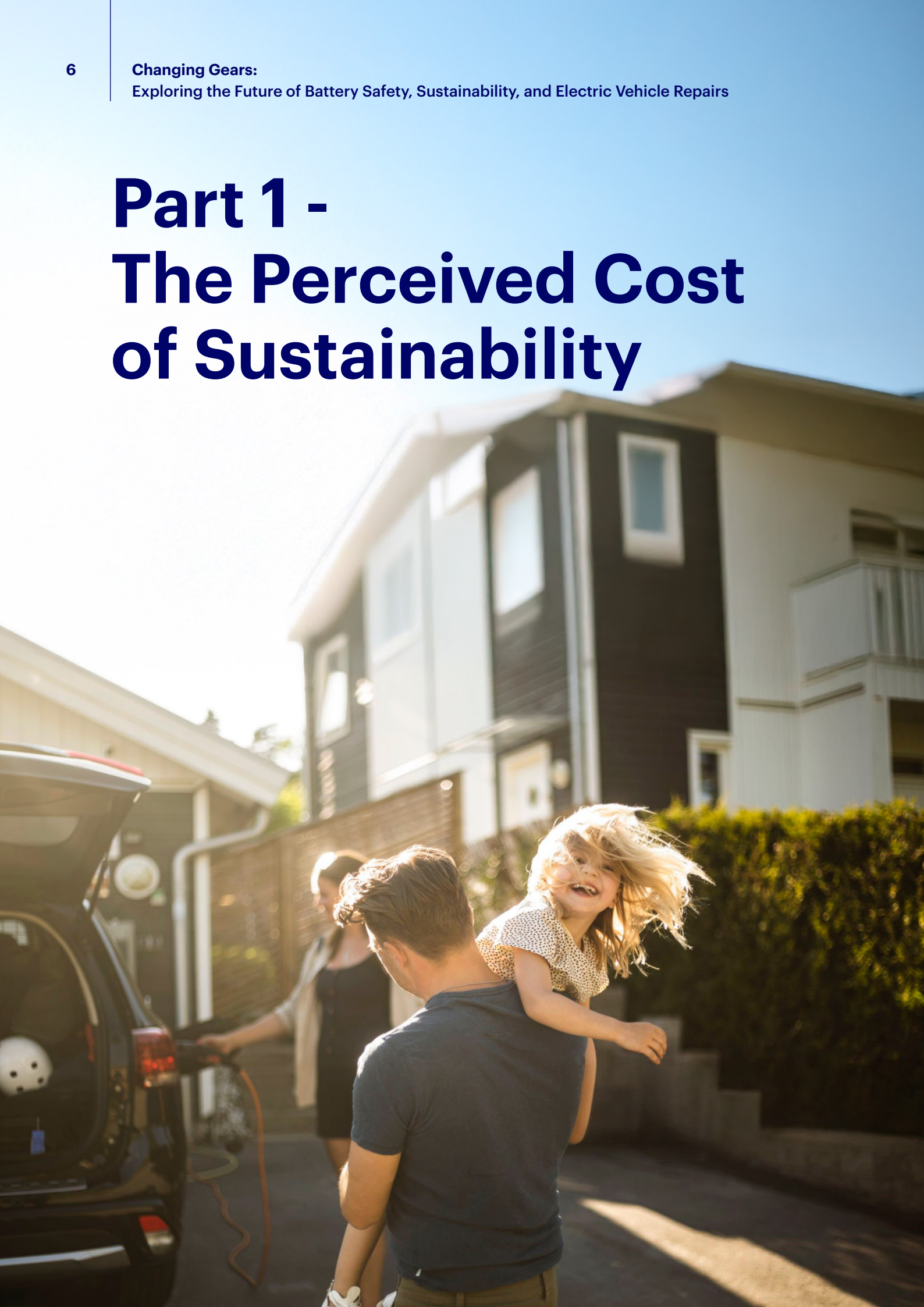
Introduction

As Australia accelerates towards an electric vehicle (EV) future, we find ourselves at a pivotal juncture in redefining our mobility landscape. CSIRO research forecasts that by 2050, the vast majority of cars will be electric,[1] with several manufacturers already planning to cease production of combustion engines beyond 2035.

While the growth and interest in the EV market signals a promising shift towards sustainability, it also brings to light critical areas that demand our attention, such as accurate information on battery safety, the environmental impact of the EV lifecycle, and the maintenance and repair infrastructure. Building on the momentum of the first 'Changing Gears' report, this follow-up edition delves into the complex landscape of the transition to EVs in Australia, and the opportunities and challenges that lie ahead.

[1] Under a rapid decarbonisation pathway, 97% of light passenger vehicles on Australian roads will be electric by 2050: https://www.csiro.au/en/research/environmental-impacts/decarbonisation/pathways-for-Australia-report

Part 1 - The Perceived Cost of Sustainability

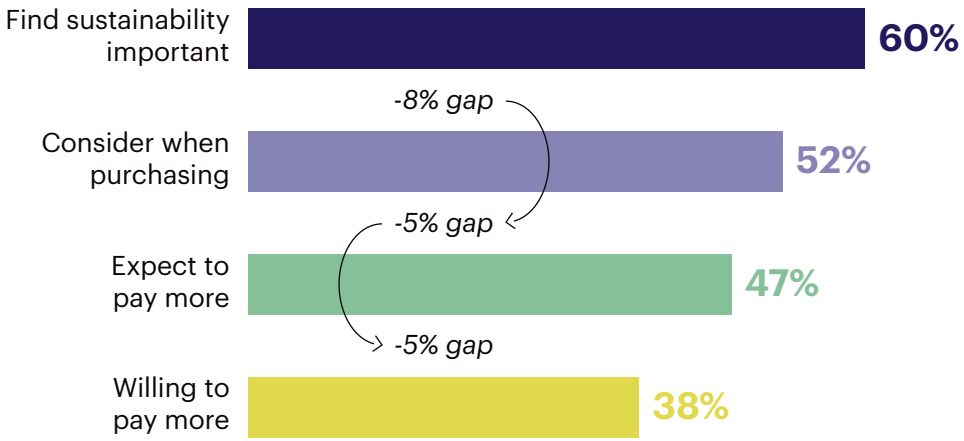


Australians are increasingly eco-conscious, with 60% valuing sustainability personally. However, many consumers remain hesitant to pay a premium for environmentally friendly options. Less than half (47%) expect to pay more for sustainable products and services, and even fewer (38%) are willing to do so. This cost-consciousness bleeds into the EV conversation, where uncertainty around the cost of running and repairing EVs presents a hurdle.

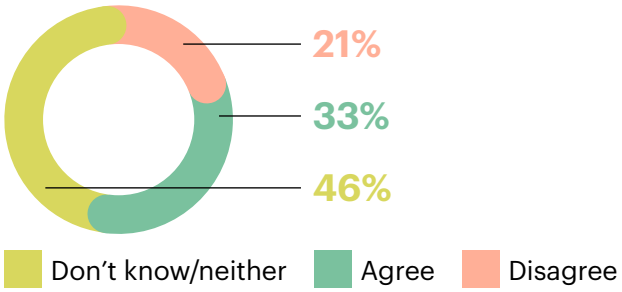
Many Australians are unsure whether EVs are truly more cost-effective than traditional vehicles. Less than a third (30%) believe EVs offer the cheapest running costs, and a significant portion (42%) of those not considering an EV cite higher overall ownership costs as a deterrent. This perception persists despite the fact that many consumers are simply unaware of the comparative servicing and maintenance costs of EVs versus petrol/diesel vehicles (46% say they "Don't know/neither").

The Sustainability Value-Action Gap

A decline from general interest to actual willingness to pay indicates a potential barrier in translating sustainability concerns into purchasing decisions.



Many Australians do not know whether it costs less to service and maintain an electric vehicle compared to traditional petrol/diesel vehicles



Key to overcoming these doubts about EV adoption is demonstrating the long-term benefits of EVs, not only in terms of reduced emissions, but also in cost savings from fuel efficiency and lower maintenance requirements.

According to Transport for NSW,[2] when comparing EVs to petrol cars, EVs are significantly cheaper to run, including maintenance savings of around 40%. By highlighting these advantages, consumers can better appreciate the value proposition of EVs beyond the initial purchase price.

[2] https://www.transport.nsw.gov.au/projects/electric-vehicles/why-buy-an-electric-vehicle

Part 2 - Navigating Repairs: The New Frontier

The transition to EVs brings with it the challenge of equipping the repair and maintenance sector. Unlike traditional internal combustion engine (ICE) vehicles, EVs come with unique complexities that require specialised skills and tools.

Consumer confidence in EV repairability is crucial for broader adoption. While most Australians recognise that EVs have different servicing or maintenance needs than petrol or diesel cars (82%), there is still some uncertainty about the costs of maintaining and servicing these vehicles.

In addition, over 60% of EV owners are concerned about the scarcity of trained mechanics in their area who can handle EV repairs (62%). This worry is coupled with a belief that having a specialised EV repairer network is crucial for their insurer, with 90% emphasising its importance.

These concerns are well-founded: while EVs typically need less servicing over their lifetime, their maintenance and repair require specific skills that traditional mechanics often lack. According to 2023 data, roughly one in ten repairers in Australia were certified to handle EV repairs,[3] leaving a significant portion of the market underserved. This can lead to increased wait times for repairs, vehicles needing to be transported long distances to appropriate repair facilities, and vehicles being written off more readily.

As the EV market continues to grow, addressing these gaps in expertise will be essential for building trust and confidence among consumers.

The New Frontier

A decline from general interest to actual willingness to pay indicates a potential barrier in translating sustainability concerns into purchasing decisions.

Recognition of different maintenance needs

82% of Australians recognise EVs require different servicing and maintenance compared to traditional vehicles

Concern on lack of local mechanics

62% of current EV owners express concern about the lack of qualified mechanics in their local area

Important of EV specialised insurer

90% of EV owners and prospective buyers consider a specialised EV repair network essential from their insurer

To address these concerns and help bridge the skills gap, it will be important to see investment in training programs that provide technicians with the necessary skills and equipment to safely service and repair EVs.

Industry collaboration and partnerships with educational institutions can play a key role in ensuring a pipeline of skilled technicians are ready to meet the demands of the evolving market. There are high levels of support among consumers for a national training package to upskill mechanics in service and repair of EV repair (66%).

Looking ahead, the integration of advanced diagnostic technologies and remote repair capabilities could further revolutionise the EV repair industry. As telematics and remote diagnostics become more sophisticated, technicians will be able to identify and address issues with greater precision and efficiency.

[3] Australian Automotive Service and Repair Authority Annual Report: https://aasra.com.au/wp-content/uploads/2024/02/AASRA-Annual-Report-2022-2023-v2.pdf

Uptooling a high-tech workforce for the EV era

"The shift to electric vehicles is driving a significant transformation in the skills needed across the automotive service industry. The sector is already facing a shortage, with over 38,000 unfilled automotive positions, and the transition to EVs is presenting new challenges. EVs are software-driven machines, and while hybrid technology has provided some exposure to high-voltage systems, there is an urgent need for more training to keep up with evolving technology.

As an industry, we must collaborate to attract more talent. We need to highlight the sector's focus on new technologies and demonstrate how repair work now revolves around diagnostics, software updates, and battery management. Without a commitment to modernisation, we risk falling behind in the EV era."

John Bright, General Manager, Bosch Automotive Service Solutions.
Bosch provides specialised training for auto repairers to service and repair electric vehicles.

Part 3 - Battery Safety: Addressing Consumer Concerns

Battery charging safety and potential fire risk remain top concerns for consumers, and securing confidence in battery safety is critical in the transition to EVs.

Over two thirds (69%) of Australians are concerned about safety when charging, or of EVs catching fire, despite there being only 10 battery fires in road registered EVs in Australia.[4]

The fact is that EV battery fires are very rare and are less common than ICE vehicle fires. When they do occur, they pose new challenges and risks for emergency responders, however, research, training and systems are being developed to better manage those risks.

The level of consumer concern about battery fires has been heightened by inaccurate reports that have exaggerated the frequency of fires without providing proper context or details about the specific circumstances involved. Additionally, there is confusion between high quality battery packs in road-registered EVs, which rarely catch fire, and lower-quality batteries in e-bikes and e-scooters, which are catching fire far more frequently, and have led to multiple property losses and at least five fatalities in Australia.

The complexity of EV batteries, combined with limited public understanding, necessitates a focus on safety protocols and education on the day-to-day maintenance and servicing needs of EVs. There is strong support among Australians for consumer education on how to safely charge and preserve EV battery life (65%).

To mitigate battery safety concerns, it is important that robust safety measures are implemented. This includes developing comprehensive battery 'state of health' checks, to determine battery degradation, which many dealerships and auction houses are now conducting.

There are high levels of support among consumers for this, with more than 3 in 4 Australians agreeing there should be a way to monitor and test EV battery health (79%).

EV Battery Concern when Charging

69% of Australians have safety concerns about EVs catching fire or safety when charging

65% support consumer education on how to safely charge and preserve EV battery life

79% of Australians agree there should be a way to monitor and test EV battery health

Additionally, establishing clear guidelines for safer charging sites and good charging practices is essential to prevent accidents and reassure users.

EV FireSafe, a company supported by the Australian Department of Defence, has been at the forefront of enhancing charging safety for emergency response teams, both globally and in collaboration with the Australian Building Code Board. The company recommends following the guidelines outlined in the ABCB Advisory Notice on Electric Vehicles in Buildings. You can view the guidelines here.

[4] EV FireSafe: https://www.evfiresafe.com/post/how-common-are-ev-fires

Reducing the risks of EV Battery Fires

Make Your EV Easy to Identify for Emergency Responders

Add a blue "EV" triangle sticker to your number plate to help emergency responders quickly identify your car as an EV, especially if there's a high-voltage battery involved.

Ensure Safe Charging Equipment

When setting up your charging equipment, make sure to follow safety standards like AS/NZS 3000 "Wiring Rules." This ensures both your charging unit and cables are up to code for safe use.

Install a Smoke or Heat Alarm

If you often park or charge your EV in your garage, it's a good idea to install a smoke or heat alarm. Fire and Rescue NSW recommend this to quickly detect any potential issues.

Use the Right Charging Equipment

Always use extension cords and power sockets made for EVs. Avoid using regular household items, especially in wet weather or during electrical storms, to ensure safety while charging.

Choose Certified Chargers

Only use chargers recommended by your EV's manufacturer or certified third-party options that match your vehicle's battery specs. Make sure any charger you use has the Regulatory Compliance Mark to guarantee safety.

What to Do in Case of an Emergency

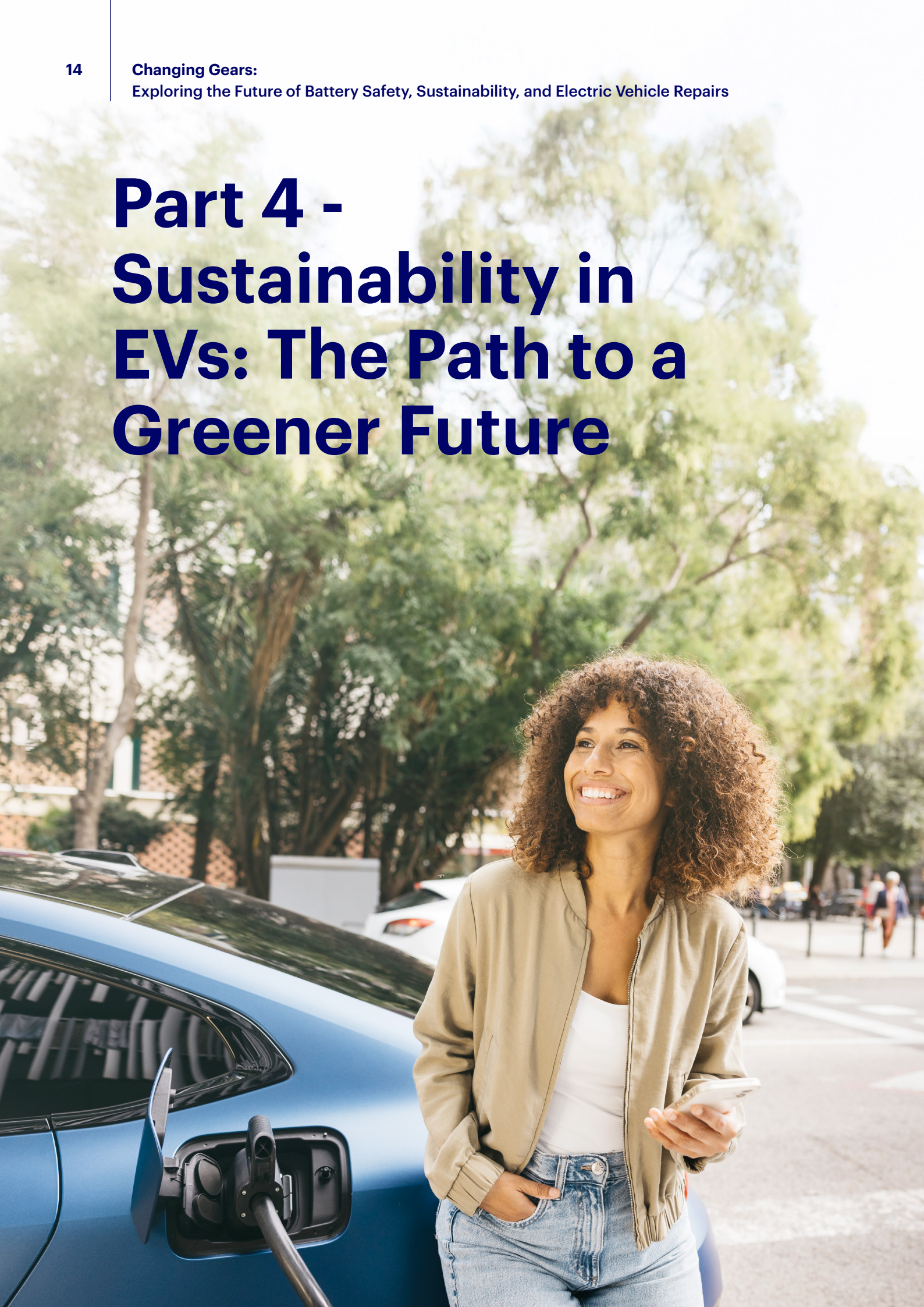
If something goes wrong, apply the parking brake, turn off the vehicle, evacuate everyone immediately, and call emergency services. Don't forget to mention that it's an EV so they're prepared.

For more driver awareness tips, visit https://www.evfiresafe.com/ev-charging-fire-risk

Global project to set lithium-ion battery safety guidelines.

Enhancing battery safety is a key priority for NRMA Insurance. Its parent company, IAG is leading a global research project to create a best practice guide for the safe use and storage of lithium-ion batteries. The research aims to debunk misconceptions about battery fires and establish clear, practical safety guidelines for everyday use. IAG is working with experts from Queensland University of Technology, EV FireSafe, Standards Australia, iMOVE Co-operative Research Centre, and other global specialists to explore how lithium-ion batteries are managed in EVs and micromobility devices such as e-scooters and e-bikes, both in Australia and around the world.

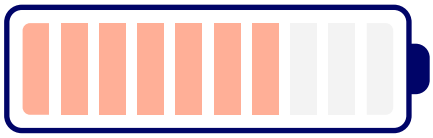
Part 4 - Sustainability in EVs: The Path to a Greener Future



Sustainability is at the heart of the EV revolution, offering the promise of reducing carbon emissions and creating a cleaner, healthier environment. But for EVs to truly become part of a fully sustainable future, we need to tackle key challenges—like how to manage the impact of batteries throughout their lifecycle, from recycling to disposal.

There is widespread concern among Australians about EV battery recycling and disposal (68%), and low levels of confidence in the feasibility of battery reuse and recycling (30%). This lack of trust translates into a reluctance to embrace recycled batteries, with less than a third expressing willingness to use one (31%). Consumers would overwhelming welcome the establishment of clear EV battery disposal and recycling processes (72%).

Recycling and EV batteries disposal



68% **Are worried about recycling and disposal of EV batteries**

30% **Are confident EV batteries can be reused and recycled**

72% support clear recycling processes

31% are willing to use recycled batteries

Efficient and safe recycling of batteries is crucial to minimizing the environmental impact of EVs. As the EV market grows, there are more opportunities to promote battery reuse and optimise supply chains to support battery repurposing and waste reduction. However, as the demand for lithium-ion batteries rises both globally and in Australia, concerns about the environmental and social impacts of battery production continue to grow. This highlights the urgent need for sustainable practices throughout the entire battery lifecycle.

The majority of Australians are concerned about battery recycling and disposal, and many remain unsure about which vehicle type is the most environmentally friendly—EVs (42%), PHEVs (35%), or traditional internal combustion engine vehicles (23%).

Establishing strong policy frameworks for battery management will be essential to give consumers the confidence they need to trust that the sector is adopting sustainable and safe battery recycling and disposal practices.

> NRMA Insurance recognises the importance of sustainability and is actively exploring innovative ways to contribute to battery reuse and recycling initiatives. In 2024, as part of its commitment to environmental responsibility, NRMA Insurance commenced the transition of its corporate fleet to electric and hybrid vehicles.

Part 5 - Future Directions

Trump's Tariffs: New Opportunities and Challenges for Australia's EV Market

Trump's trade policies, particularly the imposition of tariffs on Chinese imports and other international trade measures, have introduced uncertainty into the global EV supply chain. As a result, manufacturers are reassessing their export strategies, which may lead them to explore new markets, including Australia.

For Australia's EV market, this situation presents both challenges and opportunities. On one hand, it could increase competition as manufacturers look to expand their presence in Australia to compensate for losses in other markets.

With growing demand for EVs in the country, manufacturers from China and other regions may intensify their efforts to capture market share. This could provide Australian consumers with a wider range of options to choose from, but may also influence pricing dynamics within the market.

Lessons from Abroad

Australia can draw valuable lessons from international markets as it navigates the path ahead in EV adoption. Norway stands out as a leader, having achieved the remarkable milestone of EVs outnumbering petrol and diesel vehicles - the first country to do so, with 89% of new car sales in 2024 being fully electric[5] and plans to end new petrol/diesel car sales by 2026.

Norway's success is attributed to supportive government policies and incentives including tax breaks, combined with consumer demand to switch to more sustainable options.

Importantly, Norway has also developed a comprehensive charging network that effectively addresses the challenges posed by vast distances, remote populations, and harsh climates - factors highly relevant to Australia's own geography.

The three largest EV markets, (China, Europe, US) have also demonstrated the influence of government policies on EV adoption.

While policy changes have proven to be a pull factor in the US and China, with tax incentives making EVs more affordable, in Germany the removal of purchase subsidies has led to a decline in EV sales.[6]

Australians are receptive to solutions to overcome the challenges ahead, particularly measures that address cost concerns. Non-considerers of EVs point to lower electricity costs (45%) and cheaper EV models (40%) as key motivators, and current EV owners overwhelmingly (81%) support government incentives, such as tax breaks and manufacturer subsidies, to encourage EV uptake. Investment in charging infrastructure is also crucial, and 53% support the establishment of more charging facilities in their communities.

The appetite for reliable information is clear, with a need for accessible, and trustworthy information campaigns to address consumer concerns and dispel misinformation. When it comes to seeking information, Australians place most trust in motoring associations (58%) and mechanics (56%) for EV advice.

[5] In Norway, nearly all new cars sold in 2024 were fully electric | Reuters Fully electric vehicles accounted for 88.9% of new cars sold in 2024, up from 82.4% in 2023, data from the Norwegian Road Federation (OFV) showed.

[6] https://www.ipsos.com/en/how-keep-wheels-rolling

Current EV owners

81% believe some form of government incentives would encourage EV purchases

59% support incentives like lower taxes, benefits for end users if they have electric vehicles

43% support Government incentives to vehicle manufacturers to reduce electric vehicle prices

53% support the establishment of adequate electric vehicle charging infrastructure in each community and Local Government Area

Trusted sources of advice

Trusted sources of advice: Motoring association

58% trust motoring associations like NRMA/RACV for advice

Trusted sources of advice: Mechanic

56% trust mechanics for advice

Collaboration between government and industry is key, and Australians recognise this. A majority (67%) believe the government should lead on providing charging stations, while a substantial number (48%) see government as responsible for recycling EVs and their batteries. However, car manufacturers are also expected to play a crucial role, particularly in battery health monitoring (44%) and minimising the environmental impact of EVs throughout their lifecycle (40%).

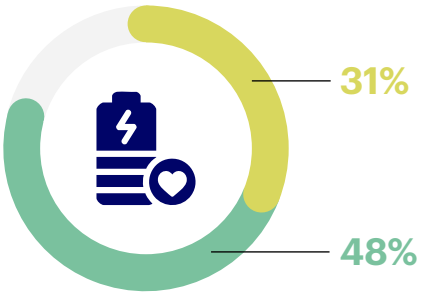
Government

67% believe government should lead on providing more charging stations

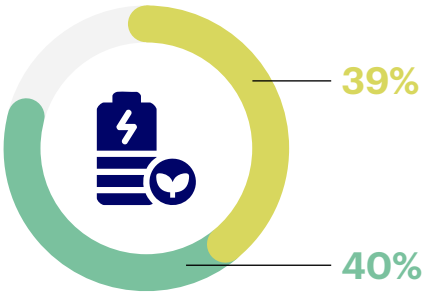
Manufacturer

44% believe car manufacturers should lead on monitoring and testing the battery life and health for electric vehicles

Both Government & Manufacturer



31%, 48%
Lead on battery recycling and end-of-life recycling of electric vehicles



39%, 40%
Lead on reducing the environmental and other impacts of electric vehicles throughout their product lifecycle

The road to an electric future in Australia is undoubtedly complex. Addressing consumer concerns, investing in infrastructure, and fostering collaboration between stakeholders will be crucial to unlocking the full potential of EVs and driving a sustainable transport revolution.

Conclusion and Recommendations

As the EV market continues to grow, so does the focus on key areas including the need for accurate information on batteries and battery safety, the environmental impact of the EV lifecycle, and the development of EV maintenance and repair infrastructure.

Building on the insights from the first Changing Gears report, this edition explores the evolving challenges of Australia's shift to EVs and presents a number of new recommendations.

Battery Health - The New Frontier in EV Maintenance and Regulation

While battery testing tools exist in Australia, their use is unregulated, and mandatory testing is not currently proposed. An annual battery health test for all EVs would build trust in the long-term viability of EVs among consumers and help boost the second-hand EV market.

Enhance EV Battery Recycling and Repurposing

The development of a robust battery supply chain that supports recycling and repurposing efforts will be important for growth of the EV market. Strengthening partnerships with recycling companies and investing in recycling technologies will help reduce waste and foster a circular economy. With the right focus, this initiative will help to reduce environmental concerns among consumers.

Expand Training Programs for Technicians and First Responders

Invest in specialised training for EV repair and safety for both technicians and first responders, including police, fire and ambulance officers and ensure they are equipped to manage EV-related incidents safely. With unique hazards including high-voltage batteries, tailored training is critical for handling these vehicles properly. Collaboration between industry and educational institutions will ensure these groups are equipped to manage EV-specific risks.

Advocate for Ongoing Government Support

To help accelerate EV adoption, push for continued government incentives, such as EV purchase subsidies and more investment in charging infrastructure.

Promote Collaboration Across Stakeholders

Encourage greater collaboration between policymakers, industry leaders, and consumers to overcome challenges and accelerate the EV transition.

Changing Gears

Changing Gears: Exploring the Future of Battery Safety, Sustainability, and Electric Vehicle Repairs is the second instalment of a two-part report produced by NRMA Insurance following on from Changing Gears: The road ahead for EV adoption in Australia. The first report included an analysis of the EV landscape in Australia, the drivers and barriers to EV consideration and recommendations for the path forward.

Methodology

This report draws upon a nationally representative survey of 2,079 Australian consumers conducted online in February 2024 by Ipsos on behalf of NRMA Insurance. The sample is weighted to reflect the latest ABS census data on key demographic variables. Additional analysis was performed drawing upon secondary data sources as referenced.

About NRMA Insurance: A Help Company

NRMA Insurance is Australia's most trusted insurance brand,[7] helping more than three million Australians protect what matters.

Help has been at the heart of NRMA Insurance since its beginnings in 1925 as a member-only company that provided motor insurance policies to the first drivers in NSW. NRMA Insurance has grown to become a national brand that helps people protect their cars, homes and businesses. It has a proud history of working with communities to build their resilience against extreme weather and keep people safer on the road. NRMA Insurance helps Australians understand their local risks and prepare for extreme weather through its Help Nation initiative.

NRMA Insurance is backed by IAG, Australia and New Zealand's largest general insurer.

About Ipsos

Ipsos is one of the largest market research and polling companies globally, operating in 90 markets and employing nearly 20,000 people.

Their passionately curious research professionals, analysts and scientists have built unique multi-specialist capabilities that provide true understanding and powerful insights into the actions, opinions and motivations of citizens, consumers, patients, customers or employees. Our 75 business solutions are based on primary data from our surveys, social media monitoring, and qualitative or observational techniques.

"Game Changers" – our tagline – summarises our ambition to help our 5,000 clients navigate with confidence our rapidly changing world.

[7] Roy Morgan Most Trusted Brands 2024

Disclaimer:

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