Australian Electric Vehicle Association
www.aeva.asn.au

ELECTRIC VEHICLE NEWS
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Issue 242: January – March 2024

50 years of supporting the rEVolution

Inside:

- **User experiences: off-grid with a Polestar 2**
- **AEVA/TOCA charging efforts in WA**
- **EV Mythbusting: are they cheaper to run than a petrol car??**
- **Newbies guide to going EV**
- **Branch contacts and how to join the AEVA**

Contents

Local media contacts

As a national body, we have members in each state and territory who are keen to field any questions for radio, television and print media.

NSW: Michael Day - 0419 986 801

ACT: Darryl Bourke - 0408 264 393

VIC: Rick Molloy - 0407 228 189

TAS: Clive Attwater - 0439 941 934

SA: Sally Knight - 0420 898 628

NT: Hunter Murray (Alice Springs) 08 89523411- Richard Smith (Darwin) - 0401 110 198

WA: Chris Jones - 0418 908 002 (Please note WA is GMT+8)

QLD: Leslie Smith - 0401 250 624

Who is AEVA?

The Australian Electric Vehicle Association (AEVA) LTD is a volunteer-run, not-for-profit organisation dedicated to the cause of switching Australia's transport networks to electric drive as quickly as possible. We all share a common interest in electromobility and climate-friendly transport. Formed after the oil price shocks of 1973, the AEVA is the longest continuously running EV society in the world.

We represent all EV users and enthusiasts, current and prospective, and are more than happy to offer jargon-free advice on which EV is right for you. We also make regular submissions to government and industry about policies which will help transition to electric drive, and away from imported fossil fuels for transport.

Our Mission

The AEVA's mission has not changed in 50 years - to accelerate the transition of our transport networks to electric drive as quickly as possible.

Our purpose is to provide a forum for social and technical communication in the EV field, create greater awareness of EVs and encourage their use, to foster further research and development in EV technology, and to be an official source of information on EVs in Australia.

Originally an incorporated association, the AEVA is now a not-for-profit company, limited by guarantee. A board consisting of 7 directors, one from each state or territory branch, oversees the strategic direction of the association as a national body. Our branches run events, host workshops and are the centre of action.

AEVA national board and executive

Board:

- Dr Chris Jones (WA) - President.
- Jude Burger (ACT) - Vice President
- Michael Day (NSW)- National Treasurer
- Riz Akhtar (VIC)
- Jon Ettershank (TAS)
- Michael Poll Jonker (SA)
- Les Smith (QLD)

Other national executive members:

- Warwick Cathro - National Secretary
- Rob Hills - Webmaster
- Christopher Walkden - Assistant webmaster
- Jamie Lovick - National Membership Secretary

EVNews is the quarterly national newsletter of the Australian Electric Vehicle Association.

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Contributions: EVNews@bigpond.com

Deadline for contributions:
March 15th, 2024 (For publication in April 2024)

From the editor

Bryce Gaton, EV writer/commentator for TheDriven.io and founder of EV Choice Consulting

Yes, having been editor of EV News from 2017 to 2020 (after which EV News went into hibernation) - am back for a one-off special edition to celebrate our 50th anniversary.

This edition takes a quick look back at some of AEVA's 50 year history (page 10) – plus provides examples of what AEVA does best: disseminate unbiased, EV information that is well researched, factually reliable and based on user experience.

Articles in this edition include a newbie's guide for getting into the EV market (page 13), a detailed comparison of EV charging costs versus an internal combustion engine (ICE) car using different charging options (page 22), user experiences of long distance travel combined with off-grid living (page 19: spoiler alert – with the right set-up, neither is hard to do!) and a report on the AEVA/TOCA efforts to expand the charging options across the Nullarbor. (Having personally done the Melbourne to Perth and back again trip in 2022, can attest to the need for more charging options there!)

If you like what you see here in EV News edition 242 and want more information and support in your own EV Transition (and are not already a member): page 28 lists each state's branch contacts and page 29 gives the (highly reasonable!) AEVA membership rates and how to join.

Now it's over to you: if you don't want EV News to return to deep sleep after this special edition, let us know – plus send contributions for articles, pictures and short descriptions from events, even questions that you want answered! (Details on where to send them on last page of this edition).

Yours in EV'ing
Bryce Gaton

From the president

Dr Chris Jones: National AEVA president and WA branch chair

Welcome back to EV News!

The AEVA turned 50 in late 2023, marking half a century of advocacy and agitation for electric transport in Australia. So, it seems wholly appropriate to fire up the EV News in 2024. This humble periodical charts the AEVA's 50-year history, although it is a bit patchy - A pandemic caused a hiatus in recent years, while very early editions are hard to find considering they were from the era of typewriters and postal services!

In the years since EV News edition 241 (2020) the AEVA has re-structured to become a not-for-profit company limited by guarantee – moving from an incorporated association. This called for a new constitution, a board and improved governance. Our board is introduced in this edition. Each director is elected by their respective state or territory branch and reports back on matters of significance around electric transport, policy, and governance.

We didn't hold a national conference in 2021 as much of the country was still dealing with pandemic restrictions, but in 2022 the ACT branch hosted the national conference and EV Expo at EPIC, Canberra. With over 12,000 visitors and plenty of vehicles on display, it was arguably a roaring success. The 2023 national conference and EV Expo was held in Perth on November 3rd-5th, which was also a massive success, particularly given the multitude of EV expos which took place around Australia in that year.

Of particular significance was a change of federal government in May 2022. Where the previous administration was famous for deriding EVs for not being able to tow a boat, the new government has made a raft of changes to federal regulations designed to encourage EV uptake. They have abolished fringe benefits tax on EVs, supported DC fast charging infrastructure rollouts, removed import duties on certain models and have committed to increasing the number of EVs in the commonwealth fleet. But a mandatory new vehicle emissions standard so far remains unrealised, with the transport minister taking her time to release draft legislation. The AEVA continues to push the government on this key piece of legislation, insisting they don't fall prey to opportunistic culture warriors or fossilised legacy car importers.

Perhaps the greatest development for the Association in the past few years has also been our collaboration with Norsk elbilforening, the Norwegian EV Association. As the world's most successful membership-based EV organisation (boasting 125,000 members!) Norsk elbilforening are sharing their experience with other EV associations around the world, including the AEVA. A workshop held in Perth as part of the 2023 national conference was enormously productive, with a renewed sense of vigour and motivation; you can read about it in this edition of EV News. The board agreed that the time was right for AEVA to focus on being Australia's primary EV consumer representative organisation. Our goal is to grow the membership, commit to advancing good EV policy, and continue to be the community's preferred source of unbiased EV knowledge.

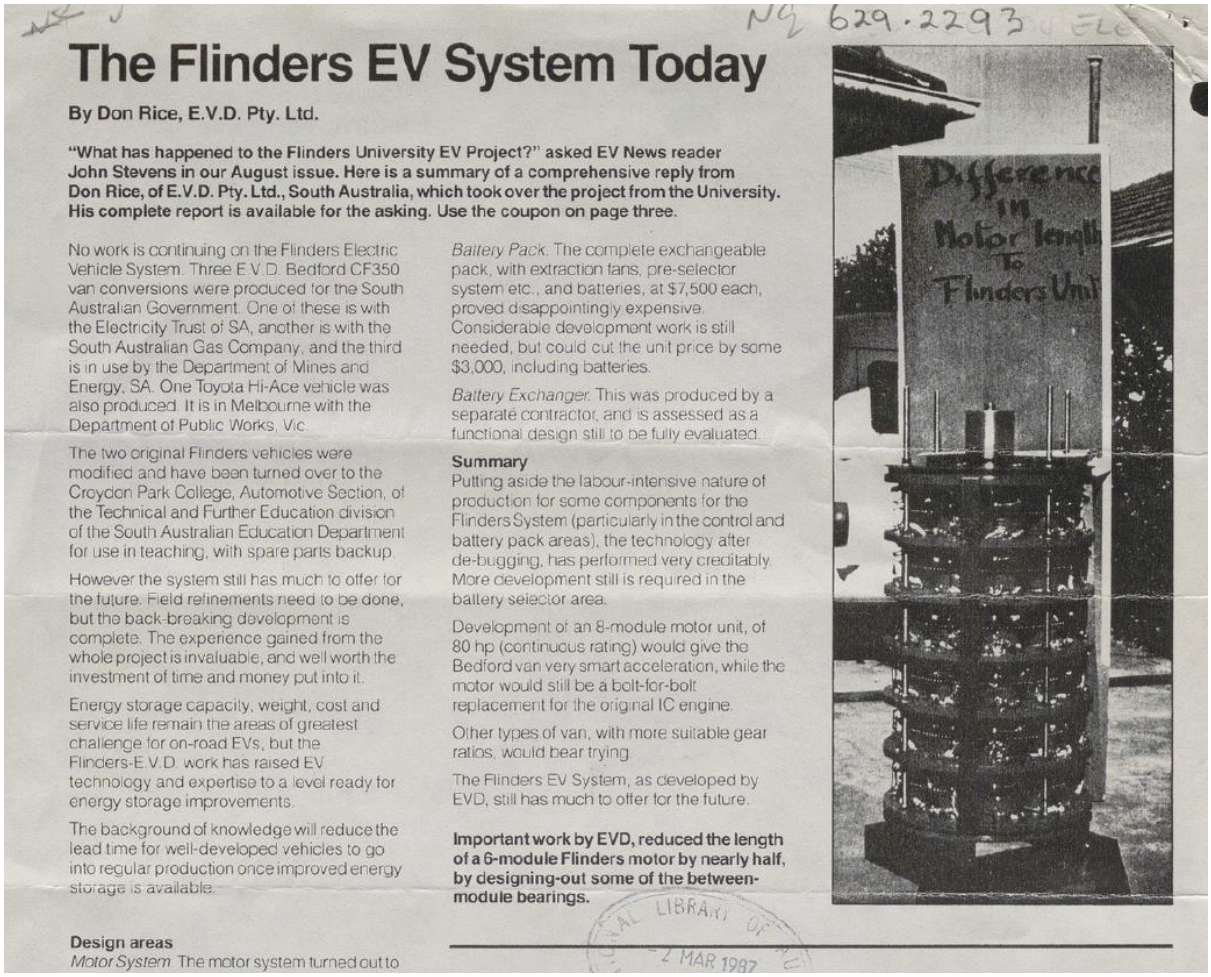
To this end the AEVA will be expanding the list of benefits that come with membership, including free access to seminars and webinars, unbiased reviews of EVs and associated equipment, and exclusive access to discounted products and services with partner businesses and organisations.

The AEVA continues to serve as a friendly public forum for the dissemination of information and advice on all matters of electric transport. Regular appearances in the media highlighting the needs of current and prospective EV drivers, along with frequent submissions to governments on matters of transport policy remain central to our existence. We even hope to establish a permanent Northern Territory branch this year!

Thank you for being a member of the world's oldest, continuously running electromobility organisation, and may we thrive into 2024.

Chris Jones, AEVA President.

From the archive: November 1984 of EV News:



The Flinders EV System Today

By Don Rice, E.V.D. Pty. Ltd.

"What has happened to the Flinders University EV Project?" asked EV News reader John Stevens in our August issue. Here is a summary of a comprehensive reply from Don Rice, of E.V.D. Pty. Ltd., South Australia, which took over the project from the University. His complete report is available for the asking. Use the coupon on page three.

No work is continuing on the Flinders Electric Vehicle System. Three E.V.D. Bedford CF350 van conversions were produced for the South Australian Government. One of these is with the Electricity Trust of SA, another is with the South Australian Gas Company, and the third is in use by the Department of Mines and Energy, SA. One Toyota Hi-Ace vehicle was also produced. It is in Melbourne with the Department of Public Works, Vic.

The two original Flinders vehicles were modified and have been turned over to the Croydon Park College, Automotive Section, of the Technical and Further Education division of the South Australian Education Department for use in teaching, with spare parts backup.

However the system still has much to offer for the future. Field refinements need to be done, but the back-breaking development is complete. The experience gained from the whole project is invaluable, and well worth the investment of time and money put into it.

Energy storage capacity, weight, cost and service life remain the areas of greatest challenge for on-road EVs, but the Flinders-E.V.D. work has raised EV technology and expertise to a level ready for energy storage improvements.

The background of knowledge will reduce the lead time for well-developed vehicles to go into regular production once improved energy storage is available.

Design areas

Motor System. The motor system turned out to

Battery Pack. The complete exchangeable pack, with extraction fans, pre-selector system etc., and batteries, at $7,500 each, proved disappointingly expensive. Considerable development work is still needed, but could cut the unit price by some $3,000, including batteries.

Battery Exchanger. This was produced by a separate contractor, and is assessed as a functional design still to be fully evaluated.

Summary

Putting aside the labour-intensive nature of production for some components for the Flinders System (particularly in the control and battery pack areas), the technology after de-bugging, has performed very creditably. More development still is required in the battery selector area.

Development of an 8-module motor unit, of 80 hp (continuous rating) would give the Bedford van very smart acceleration, while the motor would still be a bolt-for-bolt replacement for the original IC engine.

Other types of van, with more suitable gear ratios, would bear trying.

The Flinders EV System, as developed by EVD, still has much to offer for the future.

Important work by EVD, reduced the length of a 6-module Flinders motor by nearly half, by designing-out some of the between-module bearings.

EV Website links

Australian:
TheDriven https://thedriven.io/
EVTalk http://evtalk.com.au/
My Electric Car https://myelectriccar.com.au/
EV Festival https://evfestival.com.au

International:
NZ Gov. EV info site https://www.electricvehicles.govt.nz/
Green Car Reports https://www.greencarreports.com/
Inside EVs https://insideevs.com
Cleantechnica https://cleantechnica.com/
Electrek https://electrek.co/
Charged EVs http://chargedevs.com
US Drive Electric Week https://driveelectricweek.org/
Driving Electric (UK site) https://www.drivingelectric.com

Video sites:
Fully Charged ***https://fullycharged.show/***
Autogefuehl https://www.youtube.com/user/autogefuehl

International EV Association sites:
Plug In America https://pluginamerica.org/
Electric Auto Assoc (US) https://www.electricauto.org/
EVA Scotland: https://www.eva.scot/
Norwegian EVA: https://elbil.no/english/about-norwegian-ev-association/

Reminder: AEVA YouTube channel

Yes folks, we have our own dedicated YouTube channel! You will find it at: https://www.youtube.com/channel/UCnXUeRiI052r6piTRh46Qdw/videos

AEVA EV Fact Sheets

The AEVA website hosts downloadable two page ***EV Fact Sheets*** on each full battery electric vehicle (BEV) on the Australian market. Done to a standard format, they make comparing EVs easy! There are also double sided ***summary sheets*** (one of which is included in this edition on pages 8 and 9) listing the prices and major specifications of:
(a) all the passenger BEVs available here,
(b) Passenger BEVs soon to come here and
(c) A list of available/coming EV utes & vans.

Each BEV Fact Sheet is created and added when a model is officially released to the Australian market. They are also updated whenever there is major model change or upgrade. The summary pages listing the BEVs here, BEVs coming and e-LCVs here/coming are updated monthly. For the latest versions and individual BEV fact Sheets, go to: https://aeva.asn.au/info/

Available new BEV passenger vehicles in Australia

Current to January 1, 2024

For latest version, plus coming models and electric light commercial vehicle lists: go to aeva.asn/fact-sheets

make/model	WLTP range[3] km	V2L V2G[13]	Size class[11]	Battery: kWh	AC(DC)[7] charge rates in kW	Tow rating in kg unbraked/braked	Price[4]
Audi e-tron (update due)	***417***	N	L SUV	95	11(150)	750/1800	$160,000
Audi e-tron GT	***487***	N	L Pass	93	11(270)	X	$195,000
BMW i4 eDrive40	***520***	N	M Pass	81	11(200)	750/1600	$111,000
BMW i4 eDrive M50	***465***	N	M Pass	81	11(200)	750/1600	$137,500
BMW i5	***582***	TBC	L Pass	84	22(205)	750/2000	$168k
BMW i7 xDrive60	***625***	N	UL Pass	106	11(195)	750/2000	$240k TBC
BMW iX1 xDrive30 & 20	***440***	TBC	SUV	65	22(130)	750/1200	$92,000
BMW iX3	***460***	N	M SUV	80	11(155)	750	$129,000
BMW iX Drive40	***420***	N	L SUV	75	11(150)	750/2500	$150,000
BMW iX Drive50	***620***	N	L SUV	110	11(200)	750/2500	$186,000
BYD Atto 3	***345/420***	L	S SUV	50/60	7.4(70/80[15])	750/750	$47,000
BYD Dolphin	***340/427***	L	S Pass	*45/60.5*	11(60/80)	X	$41.5/47.5k
BYD Seal	***460/570***	L	M Pass	61/82	11(150[20])	X	$50k/59k+ORCs
Cupra Born	***511***	TBC	S Pass	82	11(170)	X	$65,000
Fiat 500e	***311***	N	Li Pass	42	11(85)	X	$58,000
Ford Mach-E	***470/600***	N	L SUV	72/91	11(150)	X	$80,000
Genesis GV60	***470***	L	M SUV	77.4	11(220)	750/1600	$120,000
Genesis GV70	***445***	L	L SUV	77.4	11(220)	750/2200	$141,000
Genesis G80	***520***	L	L Pass	77.4	11(220)	X	$160,000
Hyundai Ioniq 5	***384/507***	L	M SUV	58/77.4	11(233[19])	750/1600[9]	$72k/$78.5k
Hyundai Ioniq 5 N	***TBC***	L	M SUV	84	11(233)	X TBC	$118.5k
GWM Ora	***310/420***	TBC	S Pass	48/63	11(80)	X	$38.5/45k
Hyundai Ioniq 6	***429/614***	L	M Pass	**58/77.4**	11(233[19])	750/1500	$71k/77k
Hyundai Kona (New model due)	***305/484***	N	S SUV	39/64	7.2(44/70[15])	X	$60.5k/64k
Jaguar I-Pace	***470***	N	L SUV	90	11(100)	750/750	$150,000
Kia EV6 2WD	***528***	L	M SUV	77.4	11(233)	750/1600	$78,600
Kia EV6 4WD	***504***	L	M SUV	77.4	11(233)	750/1600	$95,700
Kia EV6 GT	***424***	L	M SUV	77.4	11(233)	750/1800	$100k+ORCs
Kia EV 9	***443/512***	L, G?	UL SUV	76/99.8	11(230)	750/2500	$107k/120k
Kia Niro EV	***460***	N	S SUV	65	11(85)	300/750	$72,300
LDV Mifa9	***435***	N	PM	90	11(120)	750/1000	$106k+ORCs
Lexus UX300e	***440***	X[14]	M SUV	72.8	6.6(50)	X	$89,000
Lexus RZ450e	***354***	N	L SUV	71.4	11(150)	750/750	$134,500
Mazda MX-30 E35 Astina	***200***	N	S SUV	35.5	6.6/50	X	$65,000
Mercedes EQA	***426***	N	S SUV	66.5	11(100)	X	$83,000
Mercedes EQB	***371***	N	M SUV	66.5	11(110)	X	$88k+ORCs
Mercedes EQE sedan	***508***	X	L Pass	89	11[17](170)	X	$140,000
Mercedes EQE SUV	***446***	N	L SUV	89	11[17](170)	750/750	$141,000
Mercedes EQC	***400***	N	M SUV	80	11(110)	X	$151,500
Mercedes EQS sedan	***587***	N	UL Pass	108	22(200)	X	$350,000
Mercedes EQS SUV	***592***	N	UL SUV	108	11[17](220)	X	$204,000
Mercedes EQV	***418***	N	PM	90	11(110)	X	$155k+ORCs
Mercedes eVito Tourer	***421***	N	PM	90	11(110)	X	$116k+ORCs
MG 4	***350/450/530***	L	S Pass	51/64/77	6.6[18](88/135)	500/500	$42/48/60k
MG4 XPower	***385***	L	S Pass	64	6.6(140)	500/500	$64,000
MG ZS EV	***320/440***	L	S SUV	51/72	11(75)	500/500	$44/53.5k
Mini Cooper SE	***232***	N	Li Pass	32.6	11(50)	X	$62,800
Nissan Leaf ZE1	***270***	X[14]	S Pass	40	6.6(50)	X	$57,000
Nissan Leaf ZE1 e+	***385***	X[14]	S Pass	62	6.6(100)	X	$65,000
Peugeot e-2008	***328***	N	S SUV	50	7.4(100)	X	$65,555
Polestar 2 std. range (2WD)	***546***	N	M Pass	69	11(130)	750/1500	$69,430
Polestar 2 long range (AWD)	***655***	N	M Pass	82	11[17](205)	750/1500	$79,451

Table continued on next page

make/model	WLTP range[3] km	V2L V2G[13]	Size class[11]	Battery: kWh	AC(DC)[7] charge rates in kW	Tow rating in kg unbraked/braked	Price[4]
make/model	**WLTP range[3] km**	**V2L[13]**	**Size class[11]**	**Battery: kWh**	**AC(DC)[7] charge rates in kW**	**Tow rating in kg unbraked/braked**	**Price[4]**
Porsche Taycan (RWD)	***403***	N	L Pass	**79**/93[6]	11(225)	X	$176,000
Porsche Taycan 4S (AWD)	***478***	N	L Pass	79/**93**[6]	11(270)	X	$218,224
Porsche Taycan Cross Turissmo	***425***	N	L SUV	93.4	11(270)	X	$196,000
Tesla[8] Model 3 Std Range 2WD	***491***	N	M Pass	62.3	11(170)	750/1000	$66,350
Tesla[8] Model 3 L. Range AWD	***602***	N	M Pass	75	11(250)	750/1000	79,900
Tesla[8] Model Y SR RWD	***491***	N	L SUV	62.3	11(170)	750/1600	$74,700
Tesla[8] Model Y LR AWD	***533***	N	L SUV	75	11(250)	750/1600	$88,200
Volvo C40 Recharge 2WD	***475***	N	M SUV	69	11(135)	750/1500	$87,300
Volvo C40 Recharge AWD	***530***	N	M SUV	82	11(200)	750/1800	$97,500
Volvo XC40 Recharge 2WD	***460***	N	M SUV	69	11(135)	750/1500	$85,250
Volvo XC40 Recharge AWD	***500***	N	M SUV	82	11(200)	750/1800	$95,000

Notes to table:

1. Quoted range from the Green Vehicle Guide: https://www.greenvehicleguide.gov.au.
2. Renault quoted real-world range.
3. **WLTP (Worldwide Harmonized Light vehicles Test Procedure) derived range in *Bold italic***. WLTP standardised cycle: 57% urban routes, 25% peri-urban routes, 18% motorway routes. WLTP range is approx. 30% lower than NEDC, but about 10% higher than US EPA. (For city through to outer suburban areas – WLTP is the likely range you will achieve. If your drive is more a mix of suburban to regional, for an estimate of your likely range - either source the US EPA figure, or subtract 10% from the WLTP figure).
4. Approximate base model price in Victoria, based on currently available vehicle sales listings. This price includes on-road costs (ORCs) but does NOT include any subsidies. Note that ORCs vary slightly between states and territories – more so now as some states have dropped Stamp Duty and other state based charges on some EV purchases and/or for a set number of EVs sold. Check your local situation when close to purchase to avoid disappointment.
5. ETA: Q=quarter. Q1=Jan-Mar; Q2=Apr-Jun; Q3=July-Sept; Q4=Oct-Dec. H1=Jan-Jun; H2=Jul-Dec.
6. Some EVs are now offered with optional (larger) battery sizes. If more than one size listed, price is for base version and if only one range estimate is listed, it is for the italicised battery size.
7. Maximum recharging rates. Note that AC rates over 7.4kW require three phase power. DC rates are for charging rates up to around 80% of full charge. DC charging rates reduce significantly after 80%.
8. Tesla models S and X no longer made in right-hand drive. RHD sales in Australia stopped in late 2020, but were only officially ended in May 2023.
9. Standard Range (SR) version has a 750 kg maximum tow rating.
10. Tow ratings: XX/YY = unbraked rating/braked rating
11. VFACTS (Australia) definitions.
    SUV = Sports Utility Vehicle. Sizes: S = small, M = medium, L = large, UL = upper large
    Pass = Passenger vehicle. Sizes: Li = light, S = small, M = medium, L = large, UL = upper large
    PM = people mover
    Sp = sports
12. NA.
13. Symbols: L = V2L. G = can do V2H and V2G. N = No V2X capabilities.
    V2X is the generic term covering the options of getting 230V AC power from the battery and supplying it as:
    - V2L: vehicle to load (230V power available from outlet in car).
    - V2H: vehicle to home (supply home via special connection) done using the DC section of the charge socket.
    - V2G: vehicle to grid (supply home or grid via spec. connection) done using the DC section of the charge socket.

    Note:
    V2L does not enable a vehicle to directly supply power to a home switchboard or to the grid. The CCS charging system is expected to offer both V2H and V2G capabilities by 2025.
14. These vehicles are the last remaining vehicles offered here with the CHAdeMO DC charging socket. Whilst the CHAdeMO charging system does incorporate V2L, V2H and V2G capabilities, currently only South Australia and the ACT allow trial installations of the necessary equipment to do V2H/V2G. In addition, no CHAdeMO V2L equipment has been approved for use or sale in Australia.
15. Larger battery has a higher DC maximum charge rate.
16. Extra-cost option for 11kW AC charging available.
17. Extra-cost option for 22kW AC charging available.
18. 11kW AC charging for MG4 Long Range only.
19. Ioniq 5 and 6 SR charge at 175kW DC.
20. Smaller BYD Seal battery charges at 110 kW.

Important notes:

1. **This Fact Sheet is prepared by Bryce Gaton and provided free to AEVA for personal, non-commercial uses only.**
2. **For commercial or public use approvals: contact bryce@EVchoice.com.au**
3. **Please check all specifications with the manufacturer prior to any purchase. No responsibility accepted by AEVA or Bryce Gaton (EV Choice) for errors factual or due to reproduction in this Fact Sheet. Whilst all efforts are made to ensure the accuracy of the material in this Fact Sheet, manufacturers regularly make changes (often unannounced) to their model ranges and specifications.**

Australian Electric Vehicle Association turns 50!

Reflections on AEVA's past, present and electric future by AEVA national President, Dr Chris Jones.

The old and the new: Detroit Electric next to Tesla banner at 2014 AEVA national Expo and conference

Formed after the oil price shocks of 1973, the Australian Electric Vehicle Association (AEVA) has turned 50 and, believe it or not, is now the longest continuously running EV society in the world.

From the inside though, progress has seemed so damn slow that it's easy to think we've not made a difference over the years. However, looking back on even the last 12 or so years I've been involved, AEVA has done plenty. In 2009 AEVA was a partner with the University of WA's Renewable Energy Vehicle (REV) Project, providing technical support and beta testers for the early days of the EV trials. AEVA also helped with the development of safety systems and engineering details during the conversion of 10 Ford Focus vehicles to electric (done locally at EV Works, Kewdale). This was even before it was possible to buy an EV in Australia!

In fact, that project precipitated the need for the development of NCOP14 (the code of practice for the safe construction of ICE to EV conversions). NCOP14 was largely developed by the AEVA in conjunction with state transport authorities. AEVA is also a partner organisation with the ANU Fenner School of Environment and Society. (The project lead, Dr Yuan Peng, will be sharing her results at the AEVA EV Conference and Expo on November 3rd).

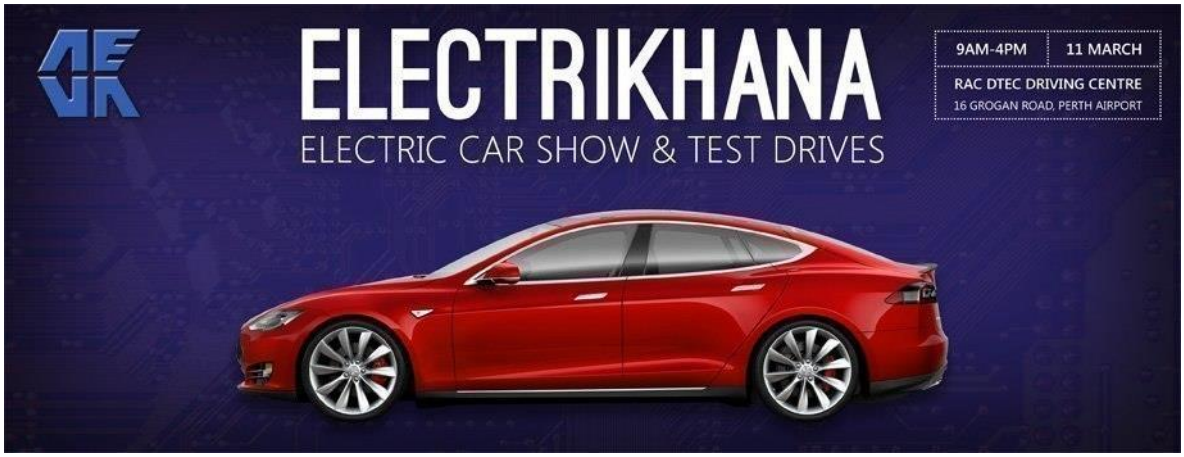
AEVA's WA branch prepared the first detailed plan for an 'Electric Highway' between Perth and Augusta in 2013, and was pitched at anyone who'd listen. Eventually the RAC of WA saw it and said *'actually, we'll build it!'*

The RAC Electric Highway was commissioned in 2015 and was Australia's first contiguous public DC charging network. This was also the moment I knew EVs were on an unstoppable trajectory here in Oz. AEVA continues to play a key advisory role with government charging infrastructure rollout, most recently with the WA EV network - one of the world's longest contiguous DC charging networks.

Image: Infinite Energy

AEVA also provided support and logistics for the first electric motorcycle racing series, the eFX Championship (2011 to 2016) as well as providing a technical forum for the development of faster, safer and more reliable racing machines. Some of these machines will no doubt be covered in great detail in a history book, recognising them for the ground-breaking prototypes they were. We knew major manufacturers were looking with keen interest as we proved our home-built e-motos were capable and competitive.

Even in the last few years, AEVA members have been rolling up their sleeves and doing the engineering and planning on a whole host of electromobility endeavours, including Electrikhana (a test-drive event for the public to experience the EV grin), biodiesel DC fast chargers on the Nullarbor, fundraising for essential charge points in the outback and remote reaches of western Queensland and the NT, even supporting EV endurance and tarmac rally race challengers, TOCEVA racing.



But our history of providing a forum for knowledge sharing goes even further back. Names such as Professor Brian Leary and Roy Leembruggen are often seen in dusty pages of EV News - AEVA's long-running (and hopefully soon to be resumed) newsletter. Professor Leary pioneered solid state switching research, developing reliable power electronic circuits capable of powering AC motors in the late 1970s, while Roy Leembruggen designed Sydney's first double-decker electric trains. He also designed and engineered Australia's first battery electric bus - the Townobile, in 1978.

The Annual AEVA Electrathon was a competitive challenge where members would build ever faster, more efficient light EVs from whatever parts they had lying around, and pit them against each other for engineering bragging rights. This was often done in conjunction with high schools and TAFE colleges, fostering young interest in science, technology, engineering and math (STEM).

It's not just engineering either - A lot of what AEVA does is representations to governments on matters concerning transport and energy policy. In the last 12 months, AEVA has made scores of submissions to various federal and state government committees and enquiries. Sadly it often feels like we're just updating the reference list on the same old submissions - but recent progress is heartening. Here's hoping we'll have an effective federal vehicle emissions standard by January 1st! *(**Editor's note**: notably, Chris forgot to specify which year …)*

For 50 years now, AEVA has kept the pressure on Australia to embrace electric mobility. If not for our efforts sharing knowledge freely with the public and allowing people to experience the benefits of electric vehicles first hand, EVs would be even further behind in Australia. We see our role of informing, educating and inspiring at the grass roots level as an extremely important part of the transition - fostering demand for change amongst the populace so that legislators cannot ignore their constituents.

New to the EV market? What do you need to know?

By Bryce Gaton. First published by TheDriven.io, January, 2024

Megane E-Tech at Australian Renault dealer. Image: B. Gaton

Your new year's goal is to buy an electric vehicle – but where do you begin? I suggest first starting with 'unlearning' a few of the things you've become habituated to through years of driving internal combustion engine (ICE) cars.

What do you need to 'unlearn'?

Number one of these is for local travel, you no longer have to make time for finding, stopping and refuelling at a petrol station. Your refuelling point moves to wherever your destination is: no extra time allowance needed. Arrive, plug-in and do your thing whilst your car does its thing.

Number two is related to the first: no more fuel price cycle. You choose when (and at what price) you 'refuel' at. Need a charge when you get home in the evening? Yes, you will pay peak electricity rates. Need it charged in the morning? Program the charging and pay off-peak rates. Have solar PV? Use it when you're home in daylight hours: that fuel costs you almost nothing!

Number three: instead of L/100 km (litres per hundred kilometres), think kWh/100 km (kilowatt-hours per hundred kilometres). That will ensure you can easily work out how a

recharge takes/how long you need to get a top-up charge when away from home. (Yes, you will very occasionally forget to charge at home before heading out for the day).

Number four: The days of the plug-in hybrid EV (PHEV) are numbered, so choose the full-battery EV (BEV), not PHEV. Overseas, the PHEV with its combination of ICE and EV drivetrains is on its way out as BEVs close in on driving range and price. In Norway (the leader in the EV Transition) 93% of new cars sold there in 2023 were PEVs (PEV = plug-in EVs, being the combination of BEV + PHEV). However, of that 93%, 87% were BEV and 6% were PHEV. PHEVs are also losing their favoured status under legislation in many countries due to their problematic 'green' status. Even here in Australia, after March 2025, PHEVs will no longer be included in the favourable Fringe Benefits Tax (FBT) treatment that BEVs and PHEVs currently receive.

Now for the new things to learn.

'Refuelling' methods are now chosen to suit your stay at a destination: If your car uses 15kWh/100km - then recharging for 8 hrs at work on a power point providing 2 kW gives 8 x 2 kWh = 16 kWh. That's just over 100 km replaced. At home, 15 hours overnight on a power point gives 200 km replaced. Using a 7 kW wall charger at work for 8 hours will give 370 km replaced. At work, 3 phase chargers are often easy to install and 8 x 11 = 88 kWh, which is more than a full charge for most BEVs. (See also charging times table below). An overnight charge at home on a 7 kW charger will also give you a full charge by morning. A general summary of these times and charge rates is shown in the table below:

Typical outlet example	Maximum kW supplied	Maximum km charged/hr[a]	Typical outlet example	Maximum kW supplied	Maximum km charged/hr[a,e] (100 km time in min)
AC charging			**DC charging**		
10A power point 	1.8[b] 2.4	12[b] 16		50	333 (20 min for 100km)
15A power point 	3.6	24		150	1000 (6 min for 100km)
Home charger 	7.4[c] 11[d] 22[d]	48 73 146		350	2333 (2.6 min for 100km)

Notes to table:

a. Assuming 15kWh/100km efficiency
b. Most common EV manufacturer supplied AC portable charger rate
c. Single phase
d. Three phase
e. Theoretical at maximum kW rate. kW rate varies with state of charge and other factors

If you are on the road – say travelling from Melbourne to Sydney (a trip I do several times a year by BEV) – this is when DC charging comes into play. DC chargers can charge up to 150 times or more faster than a power point (depending on charger size and BEV). This means with BEVs that have the latest DC charging speeds using the fastest chargers, a 10 to 20 minute stop is often all that needed. Given the 400 to 500 km driving range of the modern long-range BEV models – this adds up to a 10 to 20 minute stop every 2 to 3 hrs at most. Very little more than needed for an ICE vehicle – but it is exactly how long you need to stop to be safe on an extended trip.

By the way: for trips within the range of your BEV, you still don't need a DC charger as you can recharge at your overnight stay with no refuelling stop/time-out required.

To tie this all down to a specific car: below is a summary of the charging methods and times for a Hyundai Ioniq 5. The Ioniq 5 has a WLTP 17 kWh/100 km efficiency (2WD long-range version). It can charge at up to 7.4 kW at the typical home, 11 kW on three phase AC and up to 230 kW on a DC charger. If you want a similar table specific to your intended BEV – go to https://www.aeva.asn.au/info/ and scroll down to your chosen BEV model.

	AC: 0 – 100% time				DC: 0 – 80% time	
Model designation (Battery kWh)	10 A power point	15 A (1 phase) Caravan outlet	32 A (1 phase) Typical Home EVSE	16 or 32 A (3 phase) Typical public AC EVSE	DC Fast charge (50kW)	DC Fast charge (230+kW)
Standard-range (58 kWh)	24 hrs	15 hrs	7.5 hrs	5 hrs	55 min	15 min
Long-range (77 kWh)	37 hrs	20 hrs	10 hrs	6.75 hrs	90 min	18 min
Ioniq 5 100 km recharged time*	8.5 hrs	4.6 hrs	2.3 hrs	1.5 hrs	20 min	4.5 min

* Using 17kWh/100km WLTP figure for the 2WD, long-range Ioniq 5.

With this new knowledge, we can now debunk a few EV myths:

Myth 1: EV charging takes hours and slows you down compared to an ICE car.

Yes, charging from a power point can take many hours – but if you're asleep and you only want 100 to 200 km recharged, did it matter? You choose your charging solution to suit your needs. If you do find it difficult to work out your best home or workplace charger solution, electricians are now being schooled in how to help you.

Myth 2: EV charging is no cheaper than refuelling with petrol.

Even at the highest public DC charger fees and using the most expensive DC network for 100% of your charging, you'll be paying barely more than half the price of the 'average' petrol bill for 10,000 km. For more on this topic – see my article here.

Myth 3: You need all petrol stations replaced with DC chargers before BEVs will be viable.

Studies show 80% or more of BEV charging is done where you live, with less than 5% done at DC chargers. As a result, the EV Transition does not need a 1:1 swap of petrol stations to DC charge sites. (It's more likely that 95% of petrol stations had better look for a business model other than selling fossil fuels...)

Abandoned petrol station: Norseman, WA. Image: B Gaton

Roadhouses in regional areas and on major intercity routes will of course stay, with chargers eventually replacing fuel bowsers. Larger city ones on major routes will also stay for travellers … and for those people who forget to recharge. (As we occasionally do now with our mobile phones). But that latter group will always be small as DC chargers cost more than recharging at home. That's a big incentive for remembering to recharge at the cheapest price!

Summing up: charging an EV generally happens where you live. The small local servo is already in decline, and the rise of the BEV will only hasten that. (Unless of course they are well-placed to become a small coffee shop or convenience store with a few DC chargers as a point of difference to attract customers).

Choosing your BEV: what do you need/what is irrelevant?

So you are now armed with how to enjoy refuelling a BEV without possibly ever seeing a fuel station again – what do you need to know about EVs to choose between them?

First-up, EVs are still cars. You will still choose the size, type and configuration that best suits your needs. However, moving to BEV is a good time to re-evaluate these. There are way more 4WD dual-cab utes on our roads than can possibly be justified as tradies needing tool and materials carrying space. Same for big SUVs with oodles of cabin and huge tow ratings that could lug a big caravan to Cape York at the drop of a hat … that are instead carrying one passenger to work most of the time and NEVER travel to Cape York. Do you really need that??? If you commute around town, need space for a couple of kids and tow a 6x4 trailer occasionally: there are plenty of smaller BEVs that can do that. (See summary page at https://www.aeva.asn.au/info/ for, amongst other things, size category and tow rating of all BEVs on the Australian market). For simple two person commuting and day trips – perhaps a Fiat 500e is all you need.

Secondly: efficiency and range matter, but battery chemistry doesn't. This by the way will be regarded by some as my most controversial statement ever! It will certainly raise the ire of LFP battery devotees, but the facts are that all EV batteries are safe and last well. The

differences are marginal and analogous to choosing between an ICE car that uses premium or standard petrol. LFP chemistry batteries are said to be best charged to 100% most of the time, NMC chemistry batteries are said to prefer 90%, but are fine to charge to 100% when leaving for a long trip the next day. On the other hand, LFP batteries on DC chargers charge slightly more slowly than NMC. Summing up this point: choose a battery type if you want to, but don't avoid buying an EV simply because it doesn't have the battery chemistry you'd like.

On the other hand, like checking the litres/100 km rating on a new car window sticker, BEV electrical efficiency figures are important. These are generally shown in Wh/km. (If you want, you can divide that number by 10 to get the kWh/100 km number). Also, make sure you use the same rating system when comparing them. WLTP is used in Europe and gives a good all-round figure. The US EPA number is closer if you travel a lot in 80 km/hr outer suburban and regional 100 km/hr roads. The NEDC number (still used here under our outdated fuel efficiency/fuel quality standards) is best described as **N**ot **E**ven **D**arn **C**lose. Still useful for comparing cars using the same system, NEDC provides unachievable driving range figures. (For more on the main vehicle rating systems – see article here). To easily find the NEDC, WLTP and US EPA range and efficiency figures for a chosen BEV model, they are included in the individual model Fact Sheets at https://www.aeva.asn.au/info/ .

For example, a car that uses 20 kWh/100 km will need twice the battery size to go the same distance as one that uses 10 kWh/100 km … or go half the distance on the same size battery. Why pay for a bigger battery if a more efficient BEV does it better with a smaller battery? A smaller battery means cheaper too. Manufacturers are also working hard to improve their efficiencies – for example, Volvo/Polestar have recently done some hard-yards improving theirs.

Thirdly: choose wisely for battery size. If unsure, I recommend picking the medium to long-range versions over the shortest range options. Mind-you, that doesn't apply if you only ever do short trips. In that case, the shortest range one will be the ideal choice without wasting money on a battery bigger than you will never need. If pressed, short-range BEVs will do the longer runs too now, given that DC chargers are getting to be all over the place. You will need to stop more often though.

The reasons I recommend longer range versions rather choosing a short-range one that 'just' meets you needs are:

(a) they are likely to hold their value slightly better;
(b) they give you a buffer as the battery ages.

To explain point (b): BEV batteries lose capacity at around 1% a year and are generally guaranteed for around 70% or 80% remaining after 8 years. This is worst-case and covers batteries that are failing due to a manufacturing fault – they don't lose that much normally.

So, unlike what some people will try to tell you: BEV batteries don't fall-over at eight years old. (Just like petrol motors don't fail the day after the warranty runs out). For the average BEV battery, a 500 km range BEV losing 1% a year will after ten years still have a 450 km

range left. That's perhaps five to ten extra minutes at a DC charger stop on a Melbourne to Sydney trip … and you would never notice the difference around town. This basically means that modern batteries will last the life of the car, even if it's 20 years. (The average Australian car age is by the way 10.6 years). On the other hand, if you bought the 320 km short-range version based on a regular trip of 300 km – after 5 or 6 years, your battery might have reduced in capacity just enough to need a quick DC charge on the way there or back. As an example here: the MG4 offers three battery sizes. These are 51 kWh, 64 kWh and 77 kWh for WLTP ranges of 350, 450 and 530 km. Pricing for each is $42k, $48k and $60k (on-the-road in Victoria). In the above scenario, the middle battery option might be the better choice over the budget one.

Fourth: if you're waiting for a sub-$40k BEV – this is your year! The first few to break that barrier happened in 2023 – and more will follow this year. However, as manufacturers make more money selling bigger, more luxurious cars: sadly they won't be hurrying to release too many. The Chinese manufacturers are going to have a say here as they will continue to exploit that segment this year. As this will start to cannibalise sales from elsewhere, it will force the hand of the European, US and other Asian manufacturers. Therefore, whilst 2024 will see an influx of cheaper Chinese models, 2025 will be the year the others start to release theirs. As examples, VW and Renault - to name a couple - have already announced plans to release smaller, cheaper BEV models for 2025.

Fifth: don't forget the FBT changes brought in by the Federal government last year. If you currently lease a car – the changes have tilted the playing field heavily towards making your next leased vehicle an EV. And remember: from April 1 2025, those changes will also only apply to BEVs, not PHEVs.

So that's about it: if a BEV meets your price and specification needs now, there is by the way no need to wait for another technology 'breakthrough'. BEV tech is maturing and the changes happening now are better described as incremental rather than step-changes. In fact, BEVs from 5 years ago still match it against many new ones. (Like my 2019 Kona electric). Unlike the period from 2008 to 2018, BEVs are now improving at much the same pace that ICE cars have done over the last 100 plus years.

However, there is one new technology on the horizon – and that's Vehicle to Home (V2H) and the associated Vehicle to Grid (V2G). These provide power out of the battery to the home and/or grid. If you want V2H/G, you may need to wait another 12 – 18 months to see what tech wins there, plus be able to buy a BEV that can do it.

The user experience: can you be off-grid and own an EV?

By: Will Pyke

Polestar 2 owner's report on two oft-touted 'hurdles' to EV ownership: long distance travel and an off-grid home.

Charging off-the-grid. Image: Will Pyke.

My wife and I recently drove 2000 km from our home in Western Vic to the central Queensland coast, averaging 500 to 600 km per day. Energy use went from 18.5 kWh/100 km in the cold and wet south to about 15.7 kW/h/100km in the warmer north. Rain, cold and some night driving lead to this higher power use. Cabin temp was kept at 22 degrees.

An interesting observation is comparing our previous economic diesel hatch with the EV using MJ/100 km: an energy efficiency unit not always quoted in comparing the two types of vehicle. The diesel hatch averaged 5L/100 km or less on a long trip. Taking the diesel energy value at 39 MJ/litre, the ICE car used about 195 MJ/100 km, whilst the energy use in the EV varied between 67 to 57 MJ/100 km.

In comparison to the diesel hatch, we were slightly inconvenienced by charging compared with filling the fuel tank which in the past could give us 1000 to 1100 km per tank. Never-the-less, the electricity cost in travelling to Qld was less than the equivalent amount of diesel, at about $120 for electricity versus about $180 for diesel. (Based on observed average at the time of $1.80/L).

On the other hand, charging took longer and often had to take place at a spot we would not have chosen to stop. In general though we were able to leave the car and have a walk or a cup of coffee. We probably walked further than we would have if we were filling with diesel.

We also rarely had to wait to charge, but an increased uptake of EVs without an equal increase in charging stations will become a problem for long distance travellers. On the other hand, commuters with home or work site chargers won't face this problem. Experience so far suggests travelling from the Wimmera to Melbourne also won't pose a problem in either summer or winter.

Running an EV off-grid.

Our property is totally off grid. The solar system consists of 14.25 kW of panels charging a 15 kWh lithium titanate battery system. The EV charger is a 7 kW single phase Ocular EVSE. The solar batteries need to be charged to float before power is made available for the car charger.

Charging at home is generally fine, although doing so in mid-winter has not always been successful. Before the days shortened to mid-winter and the cloud cover became almost constant, the car (which is not used on a daily basis) could easily be charged by the system.

In that particularly cloudy period, even though these batteries take up charge rapidly, by the time the batteries get charged there was not enough solar energy to divert to the car. However, there was never a difficulty in driving the 45 km to town to charge during this overcast winter. Longer, clearer days mean that we will keep the charge up purely by solar power for all local use.

Overall, we find the Polestar is great to drive, and the rough and corrugated dirt roads we have to drive on are not creating the problem that may occur on an EV with less ground clearance. The two main criticisms are:

(a) the radio in the Polestar only gets DAB and FM – DAB is no good outside the capital cities, and the FM reception is limited- obviously meant to be offset by the internet and Google and
(b) The lack of a spare wheel. For country driving, that can lead to an anxiety greater than range anxiety.

10 years ago: EV News 218, November to February edition 2013/14

IS THE TIDE TURNING FOR COMMERCIAL EV?

In the last few months it seems that announcements of new EV and Plugin Hybrid models from manufacturers have been coming in thick and fast, from Tesla's Model X, Mitsubishi's Outlander PHEV to the Golf GTE and BMW i3, it looks like every major car manufacturer has at least one model of EV or at least Plugin Hybrid on the way. In the last year the success of the Tesla Model S – which has been the biggest success story of 2013 has been phenomenal and Tesla are projecting sales of 35000 cars in 2014 or 55% growth on 2013.

Online surveys have indicated that 8.1% of Americans are very interested in purchasing or leasing an EV as their next car purchase so there is a fertile market both in the USA and overseas – with Tesla eyeing China as their next big market.

In countries like Norway, the best-selling make and model of car in 2013 was the Tesla Model S while the most sales per capita of the Model S is also in that country. It remains to be seen if this phenomenal global sales growth can be translated to EV uptake here in Australia. Although there are very few incentives to speak of locally, they are certainly gaining much more attention than before and there is a lot more talk around office water coolers about EVs than ever before.

Current Australian incentives, as listed on the Tesla Australia website are a Luxury Car Tax threshold for a fuel efficient vehicle of AU$75,375 compared to AU$57,466 for conventional vehicle. That would save over AU$5,000 with a Tesla Roadster relative to a similarly priced petrol vehicle, while Electric Vehicles registered in the Australian Capital Territory are exempt from vehicle stamp duty.
Electric Vehicles registered in Victoria receive a $100 reduction in registration fee per annum.
Let's hope that federal and state governments hear the call for better EV facilities and incentives and catch the EV wave before it swamps them.

EV mythbusting: Does EV charging cost more than running a petrol car?

By Bryce Gaton.

First published by TheDriven.io, January 2024. (Updated with recent Evie network kWh price rises)

DC charging at Jugiong, NSW. Image: B. Gaton

The recent cost of living price rises have included significant electricity price rises. As a result, I've recently been asked *'does this mean EVs are getting close to petrol car running costs?'*

Well, back in late 2022 I did a comparison for TheDriven of the 'refuelling' costs of a battery electric vehicle (BEV) over a petrol driven car and found then no matter how you charged your BEV, the 'refuelling' costs were always significantly cheaper than for a petrol car[a].

Given the cost of living issues, I thought this would make a good excuse to recheck the figures in case things had changed. After all, price rises have hit all of petrol, electricity and DC fast-charging … plus Tesla has entered the DC fast-charger market by allowing non-Teslas to charge at many of their Supercharger sites. (Albeit at a premium price of 82c/kWh).

In that earlier article I noted that studies show home charging makes up somewhere between 70% and 95% of all recharging events. (The rest being made up of mainly AC destination charging plus a lesser percentage of DC fast-charging). From that, I came up with an approximate (if slightly arbitrary) choice to use 90% AC charging and 10% DC in the analysis, which I am sticking to for this article.

On the other hand, for this article I have worked to better define some of the other parameters and data. These include:

Using the average of all the Victorian government mandated default offer prices for peak and off-peak electricity (by the way, these are perhaps some of the more expensive in the country).

Adding a comparison cheaper kWh tariff. This is the WA super off-peak tariff of 8.2c, which is available from 9am to 3pm daily.

Improving the average kWh/100km figure for BEVs by creating a (non-weighted) average of the WLTP ratings for the top ten selling BEVs in Australia for 2023. This is my simplified version attempting to match the Australian new car fleet L/100km average for all new car sales. Given the ABS gave up calculating that number in 2021: for the moment this is the best I can come up with for a BEV equivalent!

Putting this all together, my revised and updated review of the costs of running an EV on different chargers and tariffs are shown in table 1. (By the way, these are not directly comparable to the table in the 2022 article as I have more formally defined the peak and off-peak electricity tariff kWh price and changed the way I calculate the average kWh/100km number).

Table 1: costs for running a BEV using different charging sources and electricity tariffs (Article updated to include recent Evie network price increases)

Charging Network	cents/kWh	Annual 'fuel' cost[1,2]		
		100%	10% DC, 90% AC[4]	10% DC, 90% AC[8]
Chargefox network				
- Fast (to 50kW)	45c	**$698**	**$446**	**$184**
- Ultrafast (over 50kW)	60c	$930	$470	$207
Evie network				
- 22 kW (AC)	50c	$783	$458	$194
- Fast DC (to 50kW)	58c	$908	$471	$206
- Superfast DC (over 50kW to 150 kW)	68c	$1065	$487	$222
- Ultrafast DC (over 150kW to 350 kW)	73c	$1143	$495	$230
Tesla Supercharger				
For Teslas:				
- Pre 2017 Teslas	Free	$0	$377	$114
- Post 2017 Teslas	69c	$1070	$484	$221
- Non-Teslas:	82c	**$1271**	$504	$241
Ampol – AmpCharge	69c	$1070	$484	$221
BP Pulse[5]	55c[5]	$853	$462	$200
Home (AC): peak[3]	42c	$651	N/A	N/A
Home (AC): off peak[4]	27c	$418	N/A	N/A
Home (AC): WA super off-peak[8]	8.2c	$127	N/A	N/A
Petrol[6,7]:	$2.15/litre	**$2,386[3]**	N/A	N/A

Assumptions:

1. 15.5 kWh/100 km BEV usage. This is an average (non-weighted) value of WLTP consumption of the top ten best-selling BEV in Australia for 2023.
2. 10,000km per year (Equates to 1,566 kWh of electricity or 1,110 litres of fuel per 10,000 km).
3. Using a peak electricity tariff of 42c/kWh. (Average of default offer prices in Victoria)
4. Using an off-peak electricity tariff of 27c/kWh. (Average of default offer prices in Victoria)
5. BP Pulse are rolling out variable pricing of 60c/kWh 7am to 10pm, 50c for 10pm to 7am.
6. Using 11.1 litres/100km (2020 ABS average fuel consumption of new passenger vehicles sold in Australia. Note: this is the latest figure. The ABS discontinued collection of this data after 2020).
7. Using a current average Australian petrol price of $2.15/litre
8. When using WA super off-peak electricity rate of 8.2c/kWh.

Reviewing the data: the point I made back in late 2022 – and which is further brought home by the addition this time of the West Australian super off-peak tariff – is that EV running costs are principally controlled by the kWh electricity price you pay at home. Back in 2019 I wrote that home charging would add around 30% to the usage component of an electricity bill. Since then, electricity rates (and petrol prices) have gone up – but that relativity still holds true.

Looking at Table 1, we can see there that running a BEV still costs considerably less than running a petrol car. This applies even if you chose to use the most expensive DC charging system for 100% of your charging needs. Table 2 summarises this:

Table 2: summary of cost and percentage savings of BEV over petrol vehicles.

Charging type and pricing mix:	Text colour in table 1	Electricity 'fuel' cost	Electricity versus petrol cost saving/percent saving
90/10 mix: Cheapest AC, cheapest DC	Green	$184	$2200/92% saving
90/10 mix: Vic default off-peak price, Cheapest DC	Blue	$446	$1754/81% saving
90/10 mix: Vic default peak price, Most expensive DC	NA#	$713#	$1684/70% saving
100%: cheapest DC (ChargeFox 50kW chargers)	Orange	$698	$1700/70% saving
100%: most expensive DC (Tesla Superchargers)	Red	$1271	$1135/46% saving

Note to table: # Not in Table 1, but is calculated in the spreadsheet created to write this article.

By the way – just as I was finishing off this article, I realised I haven't included running an EV off your own solar. (Something I can perhaps detail in a future update ☺). In brief: an approximate kWh cost for self-consumed solar is around 6c/kWh. This would provide savings even greater that the WA super-off peak rate comparison shown in table 1.

Also – both a better defined weighted average kWh/100km figure for BEVs sold and finding average Australia prices for peak/off peak kWh costs would likely change the savings further in favour of a BEV. (Given Victoria's tariffs are relatively high in comparison to other states and the most numerous BEVs by far sold here are the highly efficient Tesla Model 3 and Y pair, plus the rest of the top 10 are mostly quite efficient too. For instance, my first efforts to create a weighted average resulted in a value of 13.8kWh/100km – but it needs far more work and checking before I am prepared to use it).

Summing up:

Yes, like petrol, electricity costs have increased. However, if cost-of-living increases are worrying you: this analysis shows that rather than reconsidering buying a BEV, it could be well worth reviewing your electricity retailer and tariffs as there could be plenty of savings to be had there. (That is assuming you live in a state/territory with more than one electricity retailer).

However, if you are currently running a BEV on any form of charging system and pricing, rest assured you are still making significant savings over running a similar sized fossil fuelled car.

On the other hand, if you are thinking of swapping to a BEV: rather than avoiding buying one, the recent cost of living rises are just one more reason to make that switch to lock in the fuel, service and climate damaging emissions savings that a BEV offers.

* As petrol cars make up over 70% of the national fleet (ABS data), I didn't include diesel cars in the initial analysis. Given the size of the savings, I decided there was no point in adding the additional column and data as it did not materially affect the conclusions.

More crowdfunded EV chargers rolling out to fill gaps on Nullarbor route

By Chris Johnson.

First published on TheDriven.io, November 2023

The Balladonia Delta charger out in the weather.

West Australians have always been a bit tetchy about the only major national route connecting WA's capital Perth with the eastern states. It didn't help when the WA government sealed the road to the WA/SA border in the mid-1970s, but South Australia took several more years to finally seal the 200km gravel section on their side the border.
The crowdfunded Biofil DC charger at Caiguna and Delta DC chargers at Balladonia and Madura were key elements in persuading the then reluctant state government to fund an extension of the WA Electric Highway out to the border.
The rollout of these four sites by Horizon Power is running to schedule, but is still up to seven months away. The chargers will be 50kW, shared between two outlets.
I attempted to contact the relevant people in both NRMA and RAA (SA) to ask about rough timelines for the NRMA chargers planned for Eucla Border Village (SA) and Nullarbor roadhouse, and the RAA and NRMA DC chargers planned for Ceduna but haven't received a reply.
It is quite possible that this route is seen as a low priority because of low traffic.
Given this uncertainty, when a number of Delta 22kW DC chargers became available at a very favourable price it was Jon Edwards' idea to purchase them to fill the current DC charging gap between Madura in WA and Ceduna in SA.
The units will be purchased through the NFP TOCEVA established by Jon, and each of the three EV associations operating in WA (AEVA, TOCA and TOCWA) have agreed to put money in, with private donations making up the balance.
Donations to the project can be made to: TOCEVA, PayID 97978818134. It will be interesting to see if yet another crowdfunded venture from WA influences the decision makers.

These units are robust and reliable (Balladonia's is mounted under a loading ramp out in the weather) and can be plugged into the existing AEVA/TOCA 32A 3 phase outlets at roadhouses on the route. They will generate no extra work for the generally understaffed roadhouses apart from handing out the key and reading the customer's phone pic of kW used for billing.

Once DC chargers from all organisations are in place on the route, the amount of use these Delta chargers get will be monitored.

I believe Rob Dean is correct that the new DC charger networks between Perth and the WA border, and Adelaide to Ceduna will result in a significant increase in EV traffic exploring one of Australia's greatest road trips. If use tapers off, the chargers will be redeployed in areas of most need in WA, in consultation with the EV associations.

Based on Plugshare check-ins, the EV traffic volume on the Nullarbor route has roughly doubled in the last six months compared with the previous six months, so there is an immediate need for these chargers, backed up by anecdotal reports of queuing.

The extra chargers will also offer greater choice around charging and accommodation stops, especially as one roadhouse is now charging $2/kWh (the equivalent of $7/litre for diesel) even when staying and paying for overnight accommodation.

Having CCS2 plugs on the route will also reduce the practice that has resulted in one roadhouse banning EV charging: using a 32A plug wired to only one phase in a 32A 3 phase outlet, causing phase imbalance and potentially shutting the whole system down. Fine for home, but not for remote power sources.

The project demonstrates yet again that when EV organisations, drivers and leaders like Jon work together it is possible to come up with practical and effective solutions to charging, even on the Nullarbor.

From the archive: oldest (known) EV News still in existence: August 1984

(Do you have earlier editions? If so, contact the National Secretary to organise a scan and upload!)

Electric Vehicle News

Australian Electric Vehicle Association 126 Russell Street Melbourne Victoria Australia 3000 Number 27 August 1984

AEVA President looks at 1984/5

OUR AIMS STILL RIGHT FOR TODAY'S CONDITIONS

By DON RICE,
President, Australian Electric Vehicle Association.

With the Australian Electric Vehicle Association having completed 1983/84 and begun the 1984/85 fiscal year, it is important to reflect on our past achievements (and disappointments), and to review the lessons we've learnt, and to consolidate plans and strategies to best serve the AEVA community for the next period.

Your Council has been reviewing and planning during the past year, to meet these future needs.

We accept that battery-electric vehicles and their wide development and use (especially on the road), did not develop to the expectations we began with in 1973. Never-the-less a tremendous amount of expansion has been achieved, and expertise gained through the pioneering work of our Association.

Hardware and vehicle systems were developed in this country in a time of considerable financial and resource limitations, but we hung in there, and today we should be proud of the results achieved with the budgets we had.

I feel confident in saying: Nowhere else in the World did EV research and development results represent better value for money.

In considering our past and our future, I suggest you read again the words of our Immediate Past President Colin Bain in the AEVA 10th Annual Report, 1983, under the headings "The First 10 Years", and "Our Next Decade".

Colin ended that assessment, his look into the future, with these words:

"Whether 1984 provides the conditions or the hardware for viable mass production of EVs for the road, or whether we have to wait until 1985 or later before all the factors come together, our Australian Electric Vehicle Association must be in place, fully prepared and fully capable of working in the interests of members, suppliers, users, servicers and energy suppliers."

That message certainly bears repitition as 1984/85 begins.

Strategic plan

At our Council meeting late in July, we intend to complete our Association's new strategic plan, one which will be both interesting and challenging to us all.

It has been our aim for some time, to have the AEVA formally Incorporated, and new legislation makes this possible now at very nominal cost to us. We are now moving to Incorporation.

AEVA Aims

As we enter 1984/85, I suggest you read again the Aims of the AEVA. These are:

1. To provide a forum for technical and social communication between persons and organizations interested in electric vehicles.

2. To create a greater awareness of electric vehicles, and encourage their wider use.

3. To encourage electric vehicle research and development and to establish standards of quality and performance.

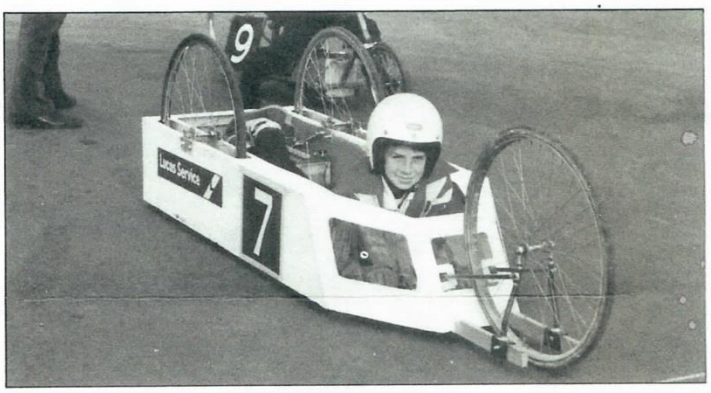
4. To be the authoritative source of information on electric vehicles in Australia.

Don Rice, AEVA President.

I'm sure you'll agree that our Aims are still as relevant today as they were when the AEVA was formed in the early 70s.

We continue to have a very important role to play in supporting and guiding electric vehicle equipment into all appropriate fields, especially for materials handling, for personnel carriers and other in-plant duties.

I look forward to continuing my work as President of the AEVA, with your support.



Novel entry at Melbourne AEVA event

When the Melbourne AEVA Branch held its annual EV Endurance Competition on 24 June, John Stevens, of Lucas, entered this "flying coffin", with his son David aboard (plus 20 kg of ballast). Copied from a design used in UK Lucas Events, the vehicle lost 25 min. for battery case repairs, but then lapped steadily. It has friction drive from two modified Lucas permag 12V motors in series on 24V from two 12V batteries; on-off solenoid control, and steering by fore and aft movement of the front vertical uprights. The Competition was won for the second time by the Bruno Angelico/Ian Robinson entry (a record 73 Km in two hours). First Interstate entry was John Bodnar, placed fifth. Second place was taken by John Hill's entry (David Hill up) and Third by John Bodnar's entry (T. Sharman up

Branch contact info:

ACT:

Meeting day:
Third Monday of each month from 7pm
(Except January)
Venue:
Harmonie German Club.
Contact:
Secretary – Darryl Bourke
secretary@act.aeva.asn.au

New South Wales:

Meeting day:
Second Wednesday, every 2nd month
(Date and venue change for Dec. meeting).
Venue:
Baulkham Hills Sports Club
11 Renown Rd, Baulkham Hills
Note: venue can vary: check website
Contact:
Secretary – Jamie Lovick
secretary@nsw.aeva.asn.au

Queensland:

Meeting day:
Third Wednesday of each month
Venue:
The Albion Peace Centre
102 McDonald Rd, Albion
Contact:
Secretary – Wayne Moore
waynemoore@gmail.com

West Australia:

Meeting day:
Second Tuesday of the month
(Except January).
Venue:
The Park Business Centre,
45 Ventnor Avenue, West Perth.
Contact:
Secretary – Antony Day
secretary@wa.aeva.asn.au

South Australia and Northern Territory:

Meeting day:
Third Wednesday of each month - 7:30pm
(Except December)
Venue:
Vogue Theatre, 25 Belair Rd, Kingswood SA 5062
(Northern Function Room).
Website:
https://aevasa.kestar.com.au/
Contact:
Secretary – Eric Rodda
www.sa.aeva.asn.au
E: See SA AEVA website for contact link
NT (Alice Springs): Hunter Murray - (08) 8952 3411
NT (Darwin): Richard Smith – 0401 110 198

Tasmania:

Meeting day:
Fourth Wednesday of every second month.
(Odd numbered months).
Venue:
Varies – Mostly Hobart, but at least one meeting in each of Launceston and the North West per year.
See AEVA website for locations.
Contact:
Secretary – Christopher Walkden
secretary@tas.aeva.asn.au

Victoria:

Melbourne branch:
Meeting day:
Second Wednesday of the month.
Venue:
5a Hartnett Cl, Mulgrave VIC 3170
Contact:
Secretary – Rick Molloy
secretary@vic.aeva.asn.au

Geelong branch:
Meeting day:
First Friday of the month
(Except January).
Venue:
South Barwon Community Centre.
33 Mt. Pleasant Rd, Belmont VIC, plus Zoom
Contact:
geelongev@gmail.com

Becoming a member:

Thank you for your interest in the Australian Electric Vehicle Association.

The strength of the AEVA is in its numbers - this allows us to host meetings and workshops, run expos, conferences and social events. Critically, we represent you - the current or prospective end user of electromobility technology. We frequently make submissions and offer policy guidance to business and government.

Please keep the momentum strong by becoming a member of the AEVA!

BENEFITS OF AEVA MEMBERSHIP

Access to a wealth of engineering knowledge, technical skills and lived experience with all forms of electric transport, including charging information

- Learn about EV models
- Access to AEVA Forums with over 15 years of information and answers
- Join in policy submissions and campaigns
- Discounted or free attendance for AEVA-led and other major events
- Discounts from business members
- Enjoy diverse social events
- Participate in AEVA governance and operations
- Access to EV racing / motorsports through affiliate membership with Motorsports Australia

Membership rates*:

Individual Member - $50.00

Individual Member - Concession - $25.00

Business/Organisation Member - $125.00

*** All prices plus 10% GST, applied at point of payment**.

To join, go to https://www.aeva.asn.au/memberships/applications/aeva-membership/

Or use the QR code below:

WANTED

Your EV experiences in writing and pictures

REWARD

The pleasure of sharing your EV knowledge, experiences and thoughts to help the wider EV community gain their very own 'EV Grin'.

Contact:

EVNews@bigpond.com for assistance and/or submission requirements