INFRASTRUCTURE PARTNERSHIPS AUSTRALIA

2 December 2019

Mr Peter Achterstraat AM
Productivity Commissioner
NSW Productivity Commission
GPO Box 5469, Sydney NSW 2001

Via email: productivityfeedback@treasury.nsw.gov.au

Dear Mr Achterstraat AM

RE: NSW Productivity Commission's *Kickstarting the productivity conversation* Discussion Paper

Infrastructure Partnerships Australia is pleased to provide this submission in response to the NSW Productivity Commission's Discussion Paper titled *Kickstarting the productivity conversation*. Infrastructure Partnerships Australia is an independent think tank and an executive member network, providing research focused on excellence in social and economic infrastructure.

In response to the Discussion Paper, our submission outlines the below potential reform options to improve productivity in the state:

- introducing a road user charge for electric vehicles
- taking a customer-focused approach to social infrastructure, and
- working with the Federal Government to pursue a national energy policy.

Introducing a road user charge for electric vehicles

In response to the issue raised by the Discussion Paper of improving motor vehicle taxation arrangements, we submit that NSW should initiate road funding reform through the introduction of a road user charge on electric vehicles.

Our recent report *Road user charging for electric vehicles* is submitted as an attachment to this submission. The paper proposes a model for implementing a simple, distance-based charge for electric vehicles that will make road funding fairer and more sustainable.

Electric vehicle uptake could bring enormous potential benefits for the state, enhancing transport outcomes, boosting productivity through more efficient road networks, and supporting better environmental outcomes. But time is running out for these benefits to extend to road reform. Reform is only possible while electric vehicles make up a minor proportion of the fleet.

Initiating road reform through the uptake of electric vehicles is a no-regrets reform that could create a new ongoing revenue stream for the NSW Government. This revenue would be resilient to changes in

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the economy, inflation and developments in technology. By ensuring funds are earmarked for use on transport and kept in the state they are raised, this reform would also provide NSW with greater capacity to manage its own transport network.

Taking a customer-focused approach to social infrastructure

The Discussion Paper notes the importance of social infrastructure as a key enabler of productivity that provides access to markets and services and promotes competitiveness. As such, there is a need to better understand the contribution of social infrastructure to our society and economy in order to better harness potential productivity gains. Valuing both the social and economic benefits of social infrastructure will improve our understanding of how it can contribute to economic productivity and enable governments to better prioritise funding and resource allocation.

The Discussion Paper identifies the link between improving productivity and customer outcomes. We submit that in delivering social infrastructure, governments should consider the benefits of the associated services and the intended outcomes for the community. This requires a customer-centric approach whereby the needs of end users influence decisions and procurement processes relating to social infrastructure. We acknowledge that this approach already underpins the NSW Government's strategy in delivering social infrastructure, particularly through the recent application of outcome-based budgeting.

Social infrastructure is inextricably tied to social outcomes. To this end, the PC should recommend the NSW Government extend its customer-focused strategy across all social infrastructure services to maximise the benefits of this approach. This will be increasingly important as place-based solutions to infrastructure delivery and city-planning are more widely adopted by governments. We submit that governments should also maintain a focus on boosting competition where appropriate and procuring social infrastructure in line with an outcome-based approach.

Working with the Federal Government to pursue a national energy policy

The Discussion Paper highlights the risks of policy uncertainty and government intervention in the energy market. Australia's energy sector is experiencing a period of considerable disruption, in terms of technological change and new business models. Within this context, ongoing policy uncertainty has exacerbated challenges in attracting investment in the electricity market.

We suggest that a key priority for the NSW Government should be to ensure that policy and regulatory reform within the energy sector does not undermine the National Electricity Objective, which is:

> "to promote efficient investment in, and efficient operation and use of, electricity services for the long-term interests of consumers of electricity with respect to:
>
> - price, quality, safety and reliability and security of supply of electricity
> - the reliability, safety and security of the national electricity system."

Government intervention in energy markets, particularly through uncoordinated regulatory amendments, is likely to distort incentives for investment. We submit that the long-term interests of consumers would be better served by progressing a national energy policy, rather than further direct market interventions. To this end, the NSW Government should work with the Federal Government and other state and territory governments in order to reach agreement on a broader national energy policy.

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In response to the issue raised in the Discussion Paper of improving the NSW energy regulatory framework, we support streamlining energy market regulatory arrangements given regulatory activities are currently dispersed across several agencies. Ensuring robust and stable regulatory frameworks will encourage investment where it is most needed, while avoiding over-investment.

We acknowledge the NSW Government's recently released *NSW Electricity Strategy*, which sets out a sensible plan for the state, bringing together key reform documents including the *Integrated System Plan*, the *NSW Transmission Infrastructure Strategy* and the Energy Security Board's work on post-2025 market design.

2019 Australian Infrastructure Investment Report

To further inform the consultation process, we have also attached our recently released *2019 Australian Infrastructure Investment Report* as additional evidence for consideration. The report provides a comprehensive overview of investor appetite and sentiment. It reveals insights into the drivers and challenges for foreign and domestic infrastructure investors.

The Discussion Paper notes that:

> "business investment has fallen as a share of the economy and annual productivity growth in NSW has slowed from more than two per cent throughout most of the 1990s to less than one per cent in the past decade."

Our report contains a section focused on the key challenges and opportunities for investors in the infrastructure sector, and as such provides timely and relevant evidence, which may help inform the Productivity Commission's work into strengthening infrastructure investment governance and transparency. Specifically, the report offers insights into the key factors limiting investment, which should provide useful input into your assessment of the current investment environment.

We would be happy to provide further evidence in support of our submission. Should you require further information, please contact [redacted]

Yours sincerely,

[redacted]

Attachments

Infrastructure Partnerships Australia's reports:

- *Road user charging for electric vehicles*
- *2019 Australian Infrastructure Investment Report*

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INFRASTRUCTURE PARTNERSHIPS AUSTRALIA

ROAD USER CHARGING FOR ELECTRIC VEHICLES

INFRASTRUCTURE PARTNERSHIPS AUSTRALIA

Infrastructure Partnerships Australia

Infrastructure Partnerships Australia is an industry think tank and an executive member network, providing research focused on excellence in social and economic infrastructure. We exist to shape public debate and drive reform for the national interest.

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CEO'S INTRODUCTION

Over recent years, reform has become the hardest word. Productivity-boosting reforms of the 1980s, 1990s and early 2000s have driven 28 years of uninterrupted economic growth. Governments are investing in infrastructure at record levels – particularly in NSW and Victoria – but productivity growth has largely stalled. Technologies and markets are moving faster than regulators, placing Australians at risk of missing out on the opportunities these advances bring.

Transport in particular faces a strong imperative for change. We are in the midst of a transport revolution, driven by electrification, the spectre of automation, and on-demand travel options. Without reform, Australia will be soon driving with the handbrake on.

It does not have to be this way. One transport reform can place Australia at the front of the pack, support further innovation and technological development, unlock productivity benefits through more efficient road networks, and ensure we can pay for transport services for generations to come.

Introducing a road user charge for electric vehicles is a home run reform. It represents a win-win for infrastructure users and taxpayers. But there is a catch – reform must be delivered soon.

Fortunately, the timing is perfect. We've made it through a cluster of elections over the past 12 months – including those of the Federal Government and our two largest states. This means governments have a unique window to engage communities on the need for reform, and to get it done.

Fuel excise is in terminal decline, while the total number of vehicle kilometers traveled is only growing. This trend started many years ago as vehicles became more fuel-efficient and is set to fall off a cliff as a wave of electrification hits. What has emerged gradually as an increasingly unsustainable tax – and one that is unfair for many users – will very quickly become untenable as those who cannot afford an electric vehicle must foot a growing road bill for those who can.

We are also at the perfect moment in the technology cycle. While electric vehicles still only represent a small fraction of new car sales, the future of our light vehicle fleet is electric. Once there is an electric car in every street, the opportunity will be lost.

While fuel excise is a federal charge, and there are benefits to nationally led-reform, states and territories have an opportunity to jump ahead. There is a large first mover advantage in claiming an ongoing revenue stream that is stable, reliable, and immune to inflation or economic downturns. In an environment of tightening fiscal settings, a new and sustainable source of revenue is an attractive proposition.

All governments have a clear imperative for change. This paper provides a pathway for that change. We look forward to working closely with governments, industry and the community to make it work.

EXECUTIVE SUMMARY

The need to change how Australian motorists pay for roads is well-established. Since at least the early 1990s, policy leaders including the Industry Commission[1] (and in its later incarnation) the Productivity Commission,[2] Infrastructure Partnerships Australia,[3] the Harper Review,[4] Infrastructure Australia[5] and Infrastructure Victoria[6] have argued that road pricing is a crucial, productivity-enhancing reform. The Federal Government even agreed to advance reform in 2016,[7] but no progress has eventuated.

Over the past few years, the need for reform has become more acute. While our population and the total distance travelled on our roads have grown substantially, improvements in the fuel efficiency of vehicles has eroded the revenue collected through fuel excise. The result has been mounting congestion in cities, worsening road quality in many regions, and a lack of certainty about how we will meet Australia's future transport needs.

The arrival of electric vehicles has made the need for reform even more urgent. Although electric vehicles form only a small part of the vehicle fleet today, this is likely to shift rapidly as the price of new vehicles falls and eventually reaches price parity with internal combustion engine vehicles. This point may come within the next five years.

The arrival of electric vehicles brings enormous potential benefits for Australia:

- More vehicles with zero tailpipe emissions will dramatically improve air quality in our cities and bring substantial health benefits.
- Deployed effectively, the storage capacity of electric vehicles could help to stabilise the electricity grid during peak periods.
- The capacity to power electric vehicles by renewable energy – whether sourced from home solar and storage systems or large-scale generators – can help Australia to substantially reduce its carbon emissions and achieve its international targets.
- Reduced reliance on international supplies of petroleum and oil can reduce living costs for Australian households, improve national fuel security and insulate our economy from disruptions to supply.

But electric cars don't float. They will still use roads, so we need to keep paying for them. And all motorists should pay their fair share. Without reform, fewer road users – particularly those who cannot afford a new vehicle or motorists in regional areas who drive vast distances – will increasingly subsidise electric vehicle motorists. Road funding will also have to be drawn from the broader tax base, taking away resources from critical services such as health and education.

While rapid uptake of electric vehicles comes with its challenges, it also presents a unique opportunity for reform that will provide lasting benefits without short-term pain. The timing for reform is perfect – governments should implement a road user charge on electric vehicles now while there are few on the roads.

To be clear, this reform is not about deterring uptake of electric vehicles. On the contrary, this reform would provide certainty to potential electric vehicle owners about their future costs, and how the roads they rely on will be paid for. It would also bring clarity for businesses and investors – both in transport technologies and the economy more broadly – about Australia's future transport direction, providing much-needed confidence and policy stability.

Governments can and should ensure that electric vehicle owners will pay no more than other motorists. Some governments may wish to ensure electric vehicle owners pay less than their internal combustion engine counterparts to encourage uptake and unlock the widespread personal and societal benefits that electric vehicles bring sooner. This is rightly a call for governments based on their policy agenda. What is most important is getting a system in place that enables some level of charge for road use and enables governments to manage their networks and sustainably fund their maintenance and upgrades over time.

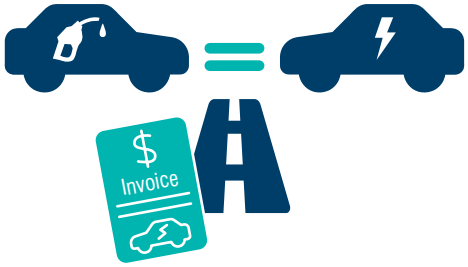
Conversely, this reform would not penalise those who wish to continue driving internal combustion engine vehicles. The existing road charging arrangement for petrol and diesel-powered vehicles can and should remain the same. In this way, fuel excise can be allowed to decline over time as more of the fleet becomes electric-powered, but road user charging will remain an 'opt-in' decision for motorists, tied to their choice of new vehicle. In this way, our proposed approach is resilient to any uptake scenario and is fair for all road users. All motorists should pay for the roads they use, and none should pay both excise and a road user charge.

A road user charge for electric vehicles does not need to be complex. In fact, this reform will be most easily implementable and understandable for communities if it is simple, transparent and effective. Figure 1 outlines a simple model of a road user charge that could be implemented today.

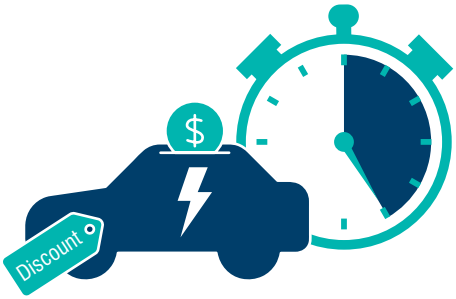
1. Industry Commission, 1994, *Urban transport* **2.** Productivity Commission, 2014, Public infrastructure, and 2017, *Shifting the dial* **3.** Infrastructure Partnerships Australia, 2014, *Road pricing and transport infrastructure funding: Reform pathways for Australia* **4.** Prof Ian Harper, 2015, *Competition Policy Review* **5.** Infrastructure Australia, 2016, *Australian Infrastructure Plan* **6.** Infrastructure Victoria, 2016, *The road ahead* **7.** Australian Government, 2016, *The Australian Government's response to Infrastructure Australia's Australian infrastructure plan*.

Figure 1: What a road user charge for electric vehicles should look like

The charge should be simple, distance-based and cover the whole of the road network

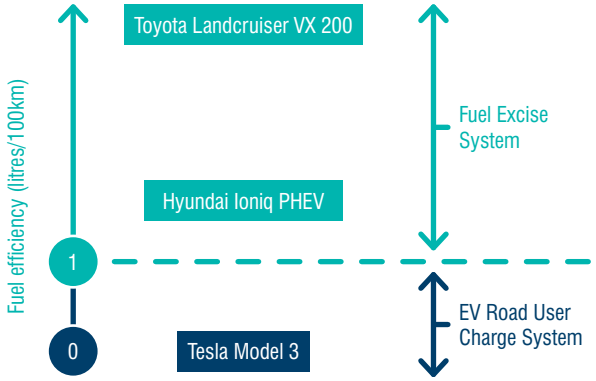


A per-kilometre charge should be set or capped to ensure electric vehicle motorists pay no more than those paying fuel excise

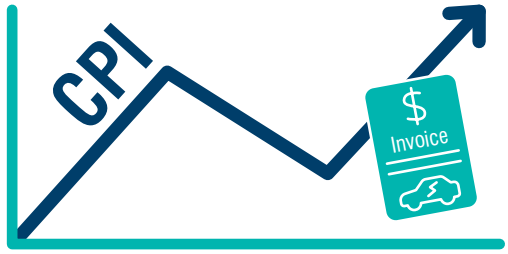


Governments may wish to provide a time-limited discount period to encourage uptake and provide certainty for prospective electric vehicle buyers

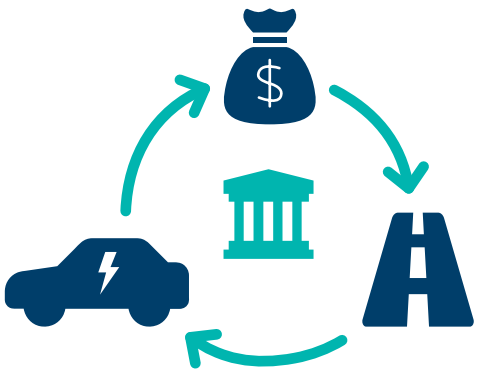
Charges could be the same or different across states and territories, but should be based on the same methodology and a compatible approach



The charge should capture all vehicles with manufacturer-rated fuel use below 1 litre per 100 kilometres



The charge should be indexed in line with inflation



Funds raised should be retained in the jurisdiction they are raised and reinvested in maintenance and new transport capacity

Motorists should submit (or vehicles transmit) odometer readings every six or 12 months

Over time, governments may wish to make a road user charge more sophisticated by moving from a distance-based charge to a location, time and mass-based charge. This would enable a road user charge to help address congestion or support broader policy objectives. In some cases, this will require the use of technologies to measure where and when users travel. It is important that governments should have time to engage communities on and install appropriate safeguards for users' information. In the meantime, it is important that today's governments do not rule out any future options until this engagement has occurred.

A government that implements a distance-based charge in the near term does not make the implementation of a location, time and mass-based charge inevitable over time. Nor does the implementation of a distance-based charge preclude governments from introducing a more sophisticated system at a later date.

This reform could be initiated by the Federal Government, by state and territory governments in collaboration, or by any of the state and territories individually. Each of these options has potential advantages and challenges. There may be some constitutional limitations to the Federal Government implementing a charge on state-owned roads, or in varying charges across jurisdictions, placing state and territory governments in the box seat to initiate reform in the short term.

With the state-led reform pathway, it is essential that jurisdictions work together to ensure compatibility – if not consistency – of approaches to road user charging across jurisdictions. Without this collaboration, we risk creating 'Rail Gauge 2.0,' repeating the mistakes of early Australian governments in establishing incompatible railway lines across state borders.

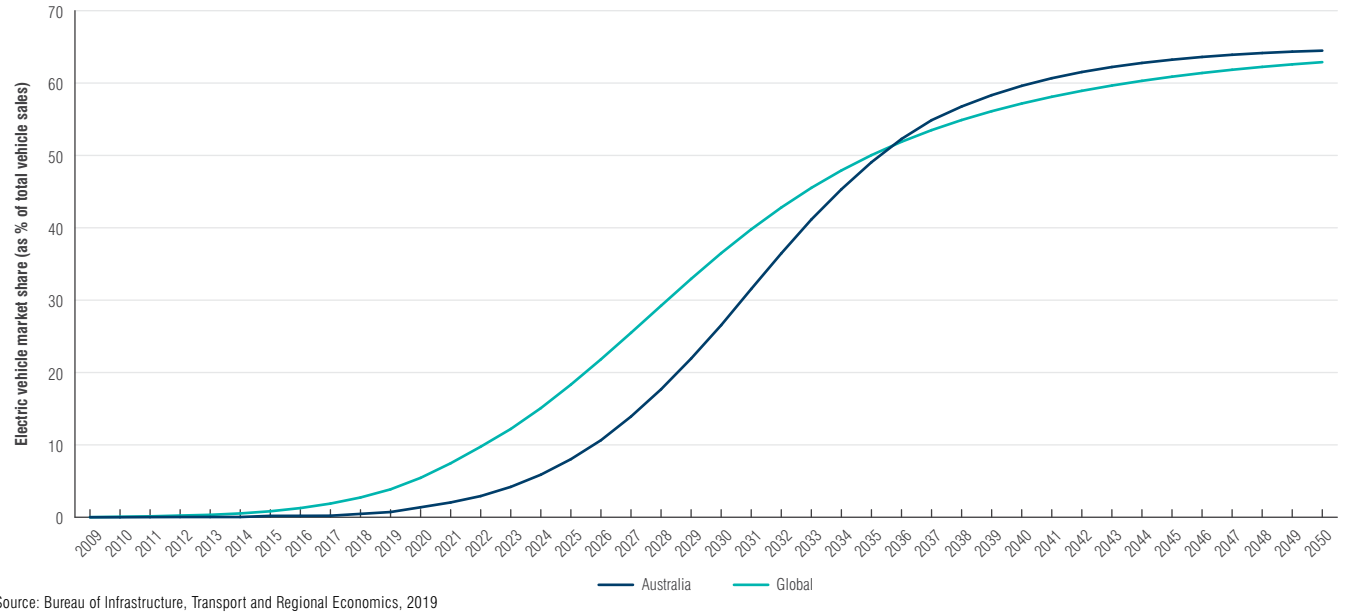
Whichever reform pathway Australia's governments adopt, they will have the full backing of Infrastructure Partnerships Australia. Reform of Australia's transport networks can be a major catalyst for improvements in productivity and quality of life in the twenty-first century. But unless we act now to update our road funding system, Australia is going to be stuck in the slow lane.

ELECTRIC VEHICLES ARE COMING, AND THAT'S A GOOD THING

Australian electric vehicle uptake is rising

Over the coming decades, electric vehicles are expected to dominate the new car sales market. While there are a range of forecasts of the rate of electric vehicle uptake, even conservative estimates indicate that by 2046, at least 60 per cent of new car sales are likely to be electric-powered (Figure 2).[7]

Figure 2: Projected electric vehicle uptake in Australia vs globally



Source: Bureau of Infrastructure, Transport and Regional Economics, 2019

The proportion of Australia's light vehicle fleet that is electric – approximately 0.076 per cent[8,9] – is lower than in many other developed countries. In the near term, internal combustion engine vehicles will continue to make up the majority of the fleet.

However, the declining cost, increasing efficiency, ease of maintenance and reliability of electric vehicles over the next decade is likely to result in a growing proportion of electric vehicle sales. A major cost driver of electric vehicles – the battery – is becoming cheaper.[10] With the price per kilowatt hour falling, the variety of reasonably priced electric vehicles is growing.

An increasing number of manufacturers are offering low- and medium-priced electric vehicles. Several vehicle manufacturers offer electric vehicles in Australia for less than a $50,000 sticker price, including Hyundai, Nissan and Renault. There are more expensive options such as from BMW, Jaguar and Tesla. At least five more manufacturers will introduce electric vehicles to Australia over the next two to three years.

Every year, the proportion of Australian motorists in the market for electric vehicles grows. More than a third of Australians considered buying an electric vehicle in 2018, compared to 28 per cent in 2017.[11] It is likely that, once price parity between electric and internal combustion engine vehicles is reached, electric vehicle uptake in Australia will grow rapidly. Price parity in Australia is expected to be reached by 2024.[12]

This paper uses the term 'electric vehicles' as short-hand for a range of different electric vehicle and low-emissions vehicle technologies. Box 1 outlines how this paper defines electric vehicles and outlines the different forms of electric vehicle technologies.

8. Bureau of Infrastructure, Transport and Regional Economics, 2019, *Electric vehicle uptake: Modelling a global phenomenon* **9.** International Energy Agency, 2019, *Global EV Outlook 2019* **10.** Australian Bureau of Statistics, 2019, *Motor Vehicle Census, Australia, 31 Jan 2019* **11.** Bloomberg New Energy Finance, 2019, *Lithium-ion battery pack price outlook* **12.** EY analysis for Infrastructure Partnerships Australia, 2019 **13.** Energeia for ARENA and the CEFC, 2018, *Australian electric vehicle market study*

MYTH BUSTED

Myth 1: Electric vehicle uptake relies on government investment in charging

The charging network is also expanding with more sites across urban and regional areas. As this network grows, coupled with improving battery technology, 'range anxiety' among prospective electric vehicle buyers will diminish.

Governments have made some investments in charging infrastructure. The most significant of these is the Queensland Government's 'Electric Super Highway', which provides over 30 charging stations from Cairns to Coolangatta and inland to Toowoomba.

However, there is no clear market failure in the delivery of charging infrastructure. Nor is there a need for government subsidies to charging providers. As the number of electric vehicles grows, so too will the commercial case for expanding the charging network. Government investment in charging only risks distorting the market and creating perverse incentives for delayed investment by charging providers.

Charging infrastructure will follow uptake in a commercially responsible and efficient way, meaning taxpayers aren't on the hook for infrastructure that could be redundant within a matter of years.

Box 1: What do we mean by electric vehicles?

This paper considers electric vehicles to be cars and other light vehicles powered by an electric motor, whether the fuel is electricity from a battery, hydrogen fuel cell, or any other source. This includes all vehicles that are not powered by petrol, diesel, or LPG – since each of these currently pays excise duties on the fuel consumed.

There are currently three main types of electric vehicles: Battery electric vehicles (BEVs), Plug-in hybrid electric vehicles (PHEVs) & fuel cell electric vehicles (FCEVs).

Battery electric vehicles

These use an electric motor powered by electricity stored in an internal battery. The battery is re-charged via plug-in to an external electricity source.

Plug-in hybrid electric vehicles

These contain both electric and combustion engines. They are powered by battery stored electricity but have additional range-extending petrol or diesel fuel tanks. The vehicle can be run using either fuel source however it is expected the battery will be primarily used given the lower cost of electricity relative to fossil fuels.

Fuel cell electric vehicles

These use an electric motor powered by electricity generated from an electrochemical 'fuel cell' within the car. The fuel cell utilises a chemical reaction, typically hydrogen and oxygen, to create electricity. Unlike a battery, which is plugged into a power source when flat, the fuel cell is refilled with hydrogen in a similar manner to petrol or diesel cars.

Other vehicles

Beyond these electric vehicles is a fourth category – the non-plug-in hybrid electric vehicle (HEV). HEVs use a combustion engine assisted by a battery and an electric motor to dramatically increase fuel efficiency. The battery is recharged using excess power from the engine and through regenerative braking.

For hybrid vehicles, the existing fleet can be considered as regular petrol or diesel vehicles. Over time, however, hybrids will become more fuel efficient and rely more on their electric motors. As such, future 'ultra hybrids' – those that are more fuel-efficient than vehicles currently on the market – should also be considered as electric vehicles for the purposes of a road user charge.

The world is transitioning to electric vehicles

Globally, the transition to electric vehicles is well underway. Over two million electric vehicles were sold in 2018, and this is projected to rise to 10 million in 2025 and 28 million in 2030.[14]

Uptake has been driven by a range of government interventions, including incentives to reduce purchase and operation costs, preferential parking for electric vehicles, and access to bus and transit lanes. Some governments have introduced a number of taxes on new internal combustion engine vehicles to make electric vehicles more cost-competitive. In Norway, these taxes have helped to make electric vehicles more affordable than their petrol or diesel alternative.

As Table 1 shows,[15] a Volkswagen e-Golf is cheaper than the petrol Golf for Norwegian retail customers despite a 50 per cent differential in import price, and even before the electric vehicle's cheaper lifetime running costs are taken into account.

Table 1: Illustrative comparison of Volkswagen retail prices in Norway

	Volkswagen Golf	Volkswagen e-Golf
Import price	€22,046	€33,037
CO2 tax (113 g/km)	€4,348	-
NOx tax	€206	-
Weight tax	€1,715	-
Scrapping tax	€249	€249
25% VAT	€5,512	-
Retail price	**€34,076 (AU$54,777)**	**€33,286 (AU$53,507)**

Source: Norsk Elbilforening, 2019

A growing list of nations have also announced plans to ban sales of some or all passenger vehicles powered by fossil fuels over the coming decades. The world's largest car market, China, is also developing a timeline for phasing out petrol vehicle sales, while several states in the USA, the second largest market, have announced future bans. In another approach several countries are placing targets on electric vehicle sales, including Japan and India.[16]

Manufacturers are also committing to a future dominated by electric vehicles. Car manufacturer Volvo will phase out combustion engines from 2019,[17] while Volkswagen is planning almost 70 new electric models by 2028,[18] and General Motors 20 by 2023.[19] One of the world's largest car-parts manufacturers, Continental, has also announced investment cuts to conventional engine parts because of a faster-than-expected fall in demand.[20]

Electric vehicles can improve environmental and health outcomes

Transport is the second largest contributor to total greenhouse gas emissions after energy. It is also the fastest growing, increasing from 11 per cent in 1990 to 21 per cent in 2016. Light vehicles are responsible for roughly half (46 per cent) of transport emissions.[21]

Electric vehicles could help to substantially reduce greenhouse emissions when they are powered by clean energy. This remains a significant hurdle in unlocking the environmental benefits of electric vehicles. Although investment in renewable energy generation capacity in Australia has grown rapidly over recent years, with one of the world's highest per-capita renewable installation rates,[22] fossil fuels still dominate the energy mix. Black and brown coal accounted for 71 per cent of total output in the National Electricity Market in FY2018-19, with gas contributing a further 8 per cent of the energy mix.[23]

Until renewables comprise more of the generation mix, electric vehicles will remain primarily fossil-fuel powered, and Australia will miss out on the emissions reduction benefits of electric vehicle uptake.

Noxious tailpipe emissions from internal combustion engines – in the form of oxides of nitrogen and sulphur, particulate matter, hydrocarbons, and carbon monoxide – worsen air quality and have adverse health impacts. These emissions have been shown to contribute to cardiovascular disease, respiratory illness and cancer.[24]

Uptake of electric vehicles will help to improve air quality – particularly in dense urban areas – and lessen the health costs of noxious emissions. The estimated health benefits gained through greater electric vehicle adoption and improved air quality are estimated to be $28 billion by 2050.[25]

Electric vehicles could reduce living costs and bring wider benefits

Prospective electric vehicle buyers currently face a cost premium for electric vehicles at the dealership. However, this difference in costs is declining, and the whole-of-life costs of an electric vehicle are likely to become far lower than for regular internal combustion engine vehicles.

Electric vehicles have fewer moving parts than internal combustion engine vehicles and require fewer consumables (such as oil and spark plugs), resulting in lower maintenance costs. Fuel is also vastly cheaper.

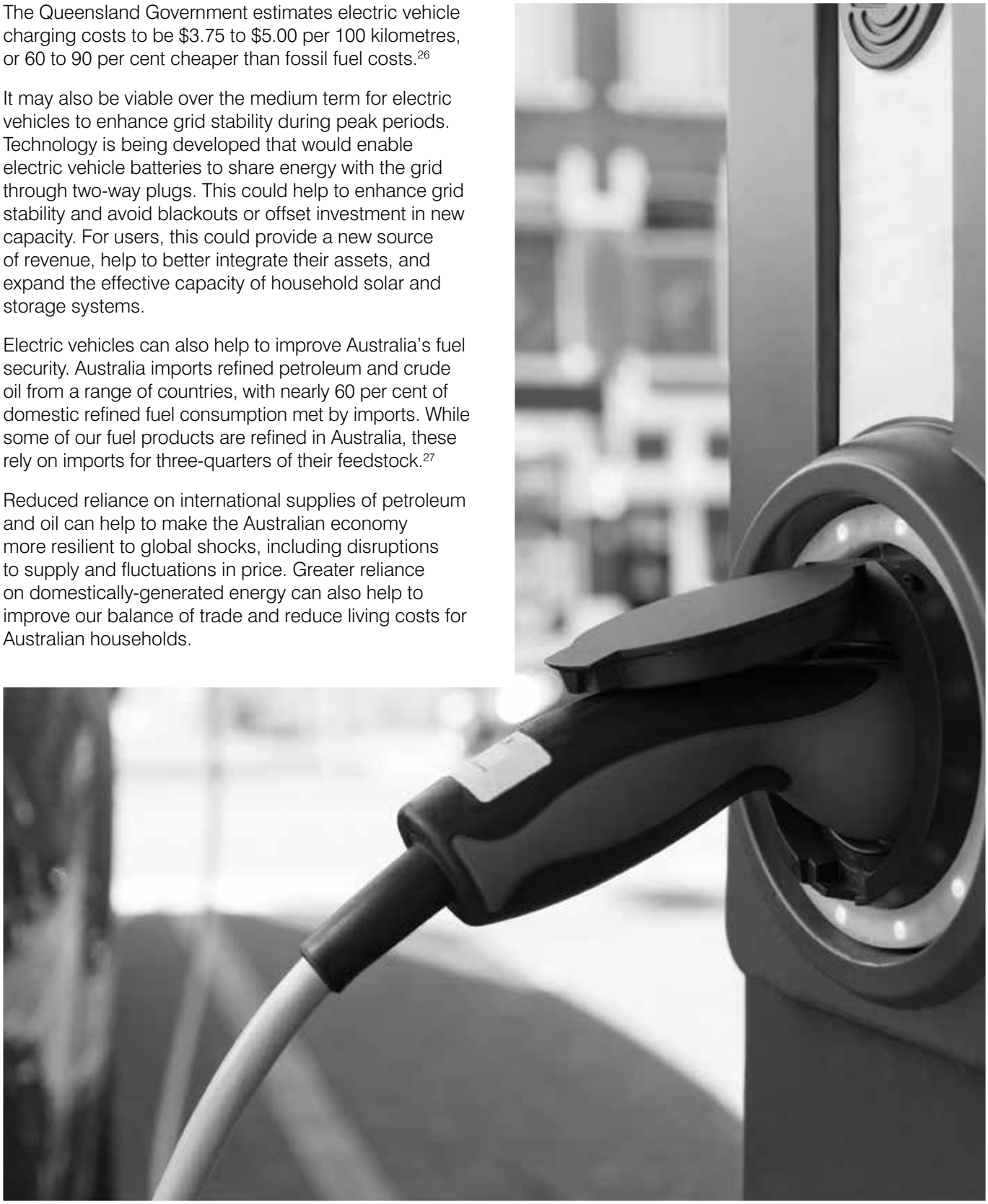
14. Bloomberg New Energy Finance, 2019, *Electric vehicle outlook 2019* **15.** Norsk Elbilforening, 2019, *Norwegian EV policy* **16.** International Energy Agency, 2019, Global EV Outlook 2019; *EY analysis for Infrastructure Partnerships Australia*; and Oliver Wyman, 2019, *Embracing an electric future* **17.** Volvo, 2019, *Volvo Cars to go all electric* **18.** Volkswagen, 2019, *Volkswagen plans 22 million electric vehicles in ten years* **19.** General Motors, 2017, *We believe the future is all-electric* **20.** Continental, 2019, *Powertrain business to change course and focus on the electric future and clean air* **21.** EY analysis for Infrastructure Partnerships Australia, 2019 **22.** Blakers et al, 2019, *Australia: the renewable energy superstar* **23.** Australian Energy Regulator, 2019, *State of the energy market – Data update November 2019* **24.** Australian Government Department of the Environment and Energy, 2018, *submission to the Senate Select Committee on Electric Vehicles: Inquiry into the use and manufacture of electric vehicles in Australia* **25.** EY analysis for Infrastructure Partnerships Australia, 2019

The Queensland Government estimates electric vehicle charging costs to be $3.75 to $5.00 per 100 kilometres, or 60 to 90 per cent cheaper than fossil fuel costs.[26]

It may also be viable over the medium term for electric vehicles to enhance grid stability during peak periods. Technology is being developed that would enable electric vehicle batteries to share energy with the grid through two-way plugs. This could help to enhance grid stability and avoid blackouts or offset investment in new capacity. For users, this could provide a new source of revenue, help to better integrate their assets, and expand the effective capacity of household solar and storage systems.

Electric vehicles can also help to improve Australia's fuel security. Australia imports refined petroleum and crude oil from a range of countries, with nearly 60 per cent of domestic refined fuel consumption met by imports. While some of our fuel products are refined in Australia, these rely on imports for three-quarters of their feedstock.[27]

Reduced reliance on international supplies of petroleum and oil can help to make the Australian economy more resilient to global shocks, including disruptions to supply and fluctuations in price. Greater reliance on domestically-generated energy can also help to improve our balance of trade and reduce living costs for Australian households.



26. Queensland Government, 2019, *Compare electric vehicles costs* **27.** Australian Government Department of Environment and Energy, 2019, *Australian energy update 2019*

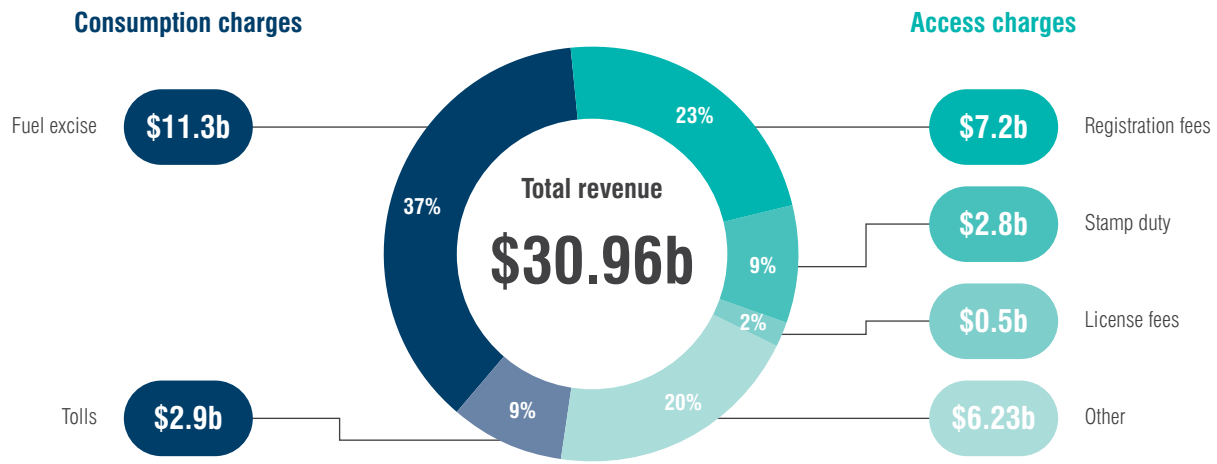
HOW WE PAY FOR ROADS NEEDS TO CHANGE

Fuel excise is in decline, making road funding unsustainable

Fuel excise has for many decades provided a relatively simple and fair way of charging for road use, and of raising revenue for road upgrades and maintenance. Levied by the Federal Government and collected from fuel retailers, fuel excise has provided a stable and consistent revenue stream that has been easy to raise and hard for users to avoid.

As shown in Figure 3, revenue is raised from a range of road-related sources. Fuel excise, levied by the Federal Government as a set rate on sales of fuel for on-road use, represents by far the largest single source of road-related revenue, contributing $11.3 billion, or 37 per cent of the total funds raised from road users in FY2017-18. This fuel excise figure represents the net revenue raised after rebates on diesel use for heavy vehicles. Beyond fuel excise, major sources of road revenue, such as stamp duty on vehicle sales, registration and licence fees, are levied by state and territory governments. Other charges include GST on road-related purchases and fringe benefits tax on vehicles.

Figure 3: Road revenue was raised from a range of sources in FY2017-18



Source: EY analysis for Infrastructure Partnerships Australia, 2019

Government investment in roads, underpinned by fuel excise, has proven to be an adequate means of ensuring most Australians have access to jobs and services for most of the twentieth century. While road revenue is not directly hypothecated to funding road construction and maintenance, the total road revenue is historically comparable to what is spent on roads every year.

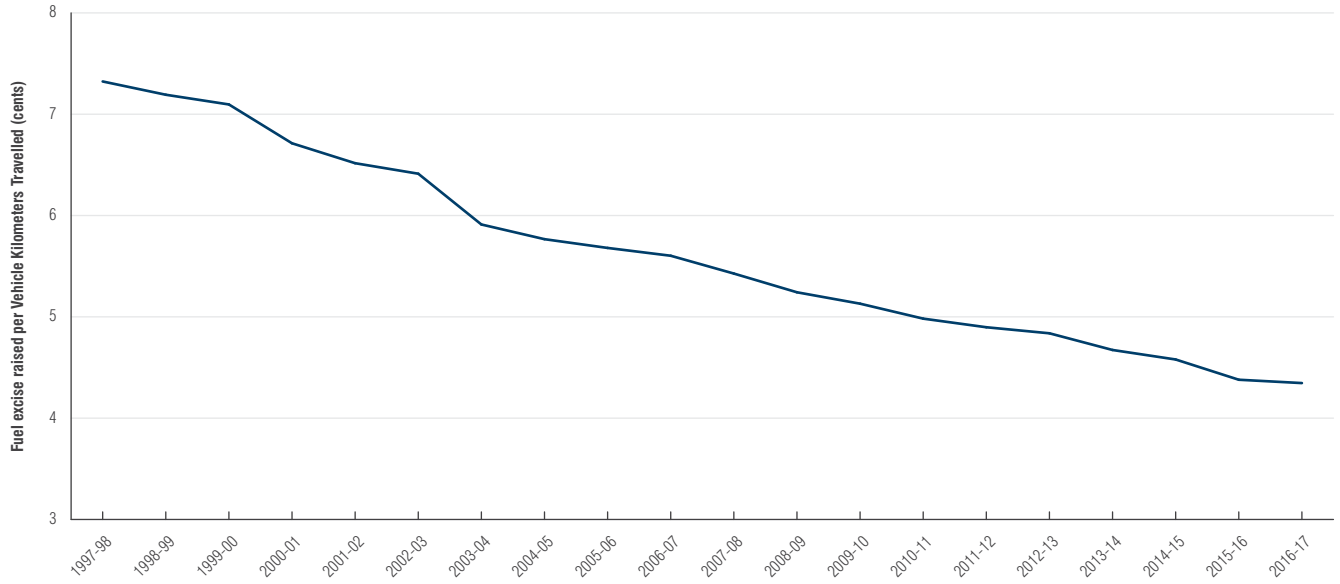
However, over recent decades, increasingly fuel-efficient vehicles have led to a decline in fuel excise. This means that the balance between funding and spending no longer holds true.

The decline in fuel excise is occurring despite a rise in vehicle kilometres travelled across the country. While the re-introduction of indexation on fuel excise in 2014 has helped to stem the decline somewhat, the key relationship between demand and supply is fundamentally broken.

This is shown by Figure 4,[28] which demonstrates that fuel excise is recovering far less from each kilometre travelled on Australia's roads than 20 years ago. Declining funding from road users is being stretched further to cover a steep increase in demand for roads. While electric vehicles can bring substantial benefits for Australia, mass market uptake will only accelerate and exacerbate the funding shortfall.

28. Bureau of Infrastructure, Transport and Regional Economics, 2018, *Yearbook 2018 – Australian Infrastructure Statistics*

Figure 4: Funding raised for each kilometre travelled is in freefall



Source: Bureau of Infrastructure, Transport and Regional Economics, 2018

How we pay for roads is also inequitable

Over time, fuel excise has also become increasingly unfair. Since fuel excise is paid per litre of fuel consumed, it penalises those who:

- require their vehicles for work and therefore consume more fuel, such as tradespeople
- cannot afford newer, more fuel-efficient vehicles, and
- live in areas with poor transport options, such as regional and outer suburban areas, and have little choice but to drive to access jobs and services.

By contrast, electric vehicle motorists pay nothing at the pump, and only contribute to the road network through state-based road access charges such as registration and licence fees. Under the current system, more electric vehicles will mean less funding for roads. Over time, this could result in growing congestion, poorer quality transport networks and rising costs for goods and services for all Australians. Road funding will need to be drawn from the broader tax base, taking away resources from critical services such as health and education.

Increasingly, those who drive internal combustion engine vehicles – particularly those in older, less fuel-efficient vehicles – will subsidise electric vehicle owners. This is not fair or equitable and will have a regressive impact on households by charging the most fuel excise to those who can afford it least.

Broader changes in transport increase the imperative for reform

Occurring in parallel with the electrification of the fleet, emerging trends in the light vehicle market will exacerbate the decline in road revenues and amplify the need for reform.

Growth in shared fleets

The current model of private car ownership, with at least one car in every driveway, may be unrecognisable in a generation's time. Many Australians have already opted for car-sharing programs or ridesharing for some or all of their trips. This trend is likely to become more widespread as parking becomes harder to find, and more people seek to avoid the costs and hassles of car ownership. Approximately half of all vehicle sales in Australia already are to fleet buyers – though many of these are still leased by individuals.[29]

By using shared vehicles, users pay no direct fee for road use – with fees flowing to third-party operators. Shared vehicles are typically used more often than private vehicles, so reduced individual car ownership will also undermine the second-largest source of road-related revenues, vehicle registration, which is levied by state and territory governments.

Shared fleet owners and ride-share operators also have a greater incentive to move to electric vehicles sooner, especially if they pay no charge for road use. Growth in shared fleets could therefore accelerate electric vehicle uptake beyond current projections, and lead to even more rapid decline in road revenues.

Rollout of autonomous vehicles

Estimates for the mass market arrival of autonomous vehicles vary widely. While the specific timeline for rollout of the technology is unclear, 'level five automation' – where fully self-driving cars require no driver or steering wheel – may arrive at some point over the coming decades.

These autonomous vehicles will almost certainly be electric, and – given the level of technology required – it is unlikely they will be within the price range of average motorists. Fleets of electric, autonomous vehicles owned by a few major companies without a price signal for road use would leave taxpayers with the full burden of paying for roads.

Both ride-sharing and autonomous vehicles are also susceptible to 'empty running', where vehicles carrying no passengers take up vital road space. Without a road user charge in place, this phenomenon will only exacerbate congestion, and the increasing demand for road space will mean operators will be able to charge a premium to travel. This would benefit those who can afford to pay more, and penalise those with fewer transport options, while leaving governments with little control over transport service delivery on publicly-funded roads.

Clearly, a road user charge is required before these developments eventuate, and the approach recommended by this paper is robust under each of these scenarios. The sooner a road user charge is in place, the better the outcomes will be for future road users and taxpayers.

29. Fleetcare, 2017, *Fleet buyers dominant in record vehicle sales*

WE NEED A ROAD USER CHARGE FOR ELECTRIC VEHICLES

Mounting challenges bring a clear opportunity for reform

The rise of electric vehicles presents a clear need for reform. It is unsustainable for a growing subset of Australia's motorists to pay no charge to reflect their use of roads. It is not fair that other motorists – among them, those who cannot afford an electric vehicle – will shoulder a growing funding burden. In addition, the effectively free use of roads for electric vehicles can only lead to growing congestion on many urban roads.

Clearly, how we pay for roads needs to change. Electric vehicles present a unique opportunity to attach reform to the rise of an emerging technology. A road user charge for electric vehicles is a no-regrets reform that would benefit Australians for generations to come. By aligning reform to the rise of electric vehicles, Australia has an opportunity to deliver a future-proof, fairer way to pay for transport infrastructure that is the first of its kind in the world.

Done well, reform can also accelerate many of the benefits that electrification of the fleet brings. Cleaner air in our cities and a reduction in greenhouse gas emissions could help Australia to meet its international emissions reduction targets, and to create healthier and more sustainable places.

This chapter outlines Infrastructure Partnerships Australia's recommended approach to introducing a road user charge for electric vehicles. This approach should be a simple, distance-based charge that covers the whole of the road network. This would ensure all road users contribute their fair share of funding for roads, and provide a fairer and more sustainable of paying for maintenance and upgrades of the transport networks we all rely on.

The need for road reform is well-established

Successive inquiries, reviews and reports have pointed to the need to reform our road funding and user charging system. Each of these have drawn the same conclusion that the current system for funding and investing in our roads is inefficient, unfair and unsustainable. These include:

- The Productivity Commission's *Public infrastructure* (2014)
- Professor Ian Harper's *Competition policy review* (2015)
- Infrastructure Australia's *Australian infrastructure plan* (2016)
- Infrastructure Victoria's *The road ahead* (2016)
- Productivity Commission's *Shifting the dial* (2017), and
- Infrastructure Australia's *Australian infrastructure audit* (2019).

The Federal Government, in response the 2016 Australian Infrastructure Plan, even committed to an inquiry into road reform. However, three years later, this inquiry has failed to materialise.

Infrastructure Partnerships Australia has consistently argued for national road reform and implementation of a user charging system for the past decade. This includes publishing *Road Pricing and Transport Infrastructure Funding* in 2014 and advocating for change through a variety of inquiry processes, formal submissions, public forums and news publications.

A road user charge on electric vehicles would bring wide-ranging benefits

A road user charge would benefit all Australians by providing a sustainable funding base for transport maintenance and investment, as well as improving transport outcomes for users and encouraging electric vehicle uptake.

Reform would also bring clear benefits for a broad cross-section of the community. A road user charge for electric vehicles:

- **is better for non-electric vehicle motorists** as it ensures all road users pay for their road use, regardless of the type of vehicle they drive
- **is better for other transport users** because it ensures that all transport users pay their fair share for the transport services they use, and
- **is better for taxpayers** as all revenue generated by a road user charge can and should be directed to transport upgrades.

This is a fairer, more efficient and sustainable system of paying for roads, and allows flexibility to address further policy challenges such as congestion and productivity.

Those who continue to use an internal combustion engine vehicle will pay nothing extra, since the road user charge is only applied to electric vehicles. Therefore, regional users and lower income earners who continue to use an internal combustion engine vehicle will not be worse off. They will continue to pay what they currently do and nothing more.

MYTH BUSTED

Myth 2: A road user charge on electric vehicles will discourage electric vehicle uptake

While this paper recommends introducing a simple, distance-based charge road user charge on electric vehicles, this need not deter sales or use of electric vehicles. On the contrary, a road user charge could provide the catalyst for strong growth in the electrified fleet by providing potential electric vehicle buyers with certainty about the future road funding arrangements. This allows potential buyers to purchase vehicles with confidence, while providing surety that governments will retain sufficient funding to pay for maintenance and upgrades of the roads they will use over the life of their electric vehicle.

Also, a road user charge provides governments with a simple, powerful tool to manage electric vehicle uptake. Governments can provide guarantees to electric vehicle motorists that revenue raised through a road user charge will not exceed what they would have otherwise paid in fuel excise, and that revenue will go directly to transport investment.

Depending on their policy agenda, a government may also choose to provide a discount on a road user charge or registration fees for a number of years, ensuring electric vehicles will pay less than their petrol or diesel equivalents, in recognition of the wider environmental and economic benefits electric vehicles can bring.

These factors, combined with the declining gap in whole-of-life costs for electric vehicles can provide strong incentives for motorists to move to electric vehicles.

Box 2: Electric vehicle owners will still benefit under a well-structured road user charge

Electric vehicle uptake is likely to be driven by individual consumer choice. To explore the choices potential electric vehicle buyers face, and the impact of a road user charge on that choice, Infrastructure Partnerships Australia commissioned EY to analyse the whole-of-life cost of equivalent electric vehicle and internal combustion engine vehicles.

The analysis found that:

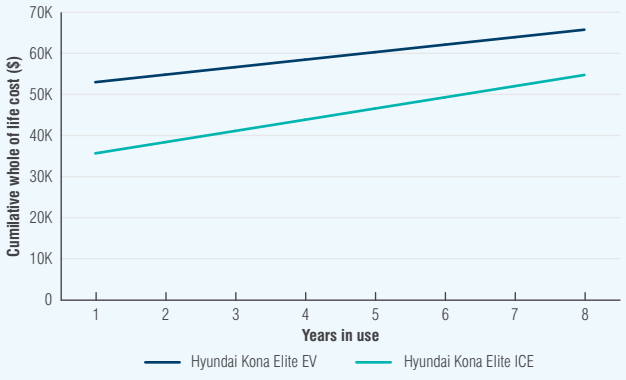
- while electric vehicles are more expensive now, their sticker prices are falling
- the cheaper ongoing costs of electric vehicles mean they will be cheaper to own over their lives
- a road user charge can be applied at a rate that equalises the tax contributions of electric vehicles and internal combustion engines, and
- with a road user charge applied, electric vehicles will still be cheaper to own and run than internal combustion engine vehicles.

Three scenarios were considered for the analysis: current prices, sticker price parity, and sticker price parity with a road user charge implemented.

Scenario 1: Current prices

Currently, electric vehicles are more expensive than internal combustion engine vehicles because of the higher upfront sticker price, which outweighs any maintenance or fuel savings over the life of the vehicle. For example, a Hyundai Kona Elite is $15,500 or 53 per cent more expensive as an electric vehicle rather than as the petrol equivalent.[30] However, as Figure 5 shows, cheaper running costs of an electric vehicle mean the difference in cumulative costs narrow over time.

Figure 5: An electric vehicle is more expensive than a petrol equivalent at current prices

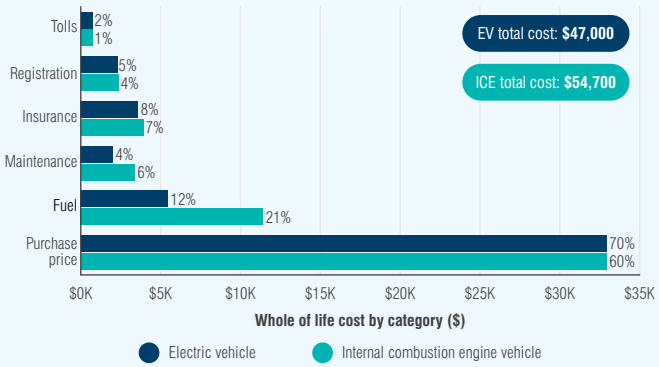


Source: EY analysis for Infrastructure Partnerships Australia, 2019

Scenario 2: Price Parity

Once electric vehicles cost the same as internal combustion engine vehicles at the dealership, lower running costs make them cheaper over the life of the vehicle. As demonstrated in Figure 6, fuel and maintenance will only comprise 16 per cent of an electric vehicle's whole-of-life cost, compared to 27 per cent for an internal combustion engine. This represents a $7,700 reduction over the life of the vehicle.

Figure 6: Once price parity is reached, electric vehicles will provide savings to owners[31]



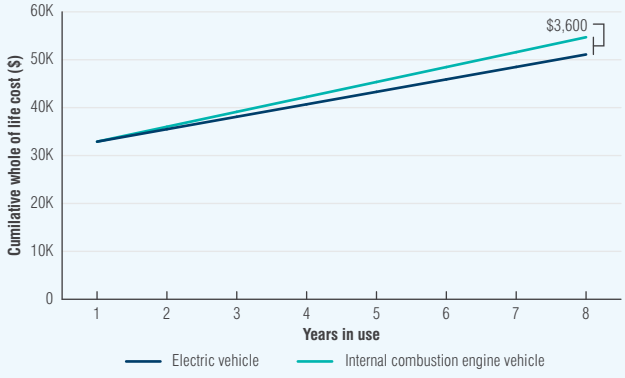
Source: EY analysis for Infrastructure Partnerships Australia, 2019

Scenario 3: Road user charge applied

Electric vehicles remain cheaper even when a road user charge is applied. With a charge of up to four cents per kilometre, an electric vehicle will save at least $3,600 over an eight-year lifespan (see Figure 7). Four cents per kilometre was used, as it reflects a similar charge to fuel excise. A road user charge at this level is required to equalise tax contributions of electric vehicles and internal combustion engines.

If a road user charge was applied today, the operating costs of an electric vehicle would still be cheaper than an internal combustion engine. As sticker prices continue to fall, this will further level the whole-of-life costs. On this basis, a road user charge need not hinder uptake.

Figure 7: Even with a road user charge, electric vehicles would be cheaper over their lives



Source: EY analysis for Infrastructure Partnerships Australia, 2019

30. Prices accurate at the time of analysis **31.** Figure 5 depicts the whole-of-life costs of an electric vehicle and a comparable, moderately-priced internal combustion engine vehicle

A road user charge should be a whole-of-network charge

It is important that implementation of a road user charge is network-wide and not isolated to specific area or type of road. It should not be confused with a congestion charge or subscription style transport services.

A road user charge allows the pricing of road use on the entire network. Previous work by Infrastructure Partnerships Australia and Infrastructure Australia has shown a network-wide charge is the most effective and fairest approach to funding road and wider transport network maintenance and investment.

This road user charge should charge each motorist for the roads they use. While transport markets may evolve to provide subscription-style packages, where users pay a third-party provider for access to transport services, this does not alleviate the need for a road user charge. Under this approach – often labelled as mobility-as-a-service – the roads would need to be funded separately to the transport services provided on those roads.

The same is true for Netflix in the telecommunications sector. Third-party 'over-the-top' service providers do not pay for the infrastructure that carries the goods users receive. Netflix is delivered to users via data packets over a mobile or fixed network that is paid for by an internet subscription.

For roads that are provided by private operators, such as toll roads, the same approach as today could be maintained. There is no need to apply a separate treatment for private or tolled roads. Users currently pay fuel excise for use of these roads, so a distance-based road user charge would mirror the existing approach.

MYTH BUSTED

Myth 3: A congestion charge would be more effective than a whole-of-network charge

Some commentators have proposed that a congestion charge, whereby motorists would be charged a price to drive into designated zones around major city CBDs, would be a better solution than a whole-of-network charge. However, a congestion charge is the wrong tool for the job.

A congestion charge does little to counter the most pressing challenge for the future of Australia's transport networks – the imminent sharp decline in fuel excise caused by the arrival of electric vehicles. It would leave the vast majority of roads with an effective price of zero. This would leave no way to manage demand outside of the major cities, and would leave regional roads with an ever-growing funding backlog.

A congestion charge alone would also be a poor way of managing demand. While it may help to lessen congestion in some parts of the city, at least two-thirds of people commute to areas outside the CBD and surrounding regions of Sydney, Melbourne and Brisbane.[32] As a result, a CBD-based cordon charge would have limited impact on users' travel patterns, while incentivising 'rat-running' on local streets outside the congestion charge zone.

This form of charging would also be regressive and unfair, penalising those who have no option but to drive, and cannot afford to live closer to jobs and services. Conversely, it would reward those who can afford to pay the most, and who live in inner areas serviced by good public transport, by reducing congestion for their commute. This has proved to be the case in London.

Furthermore, a congestion charge would be difficult to implement. Australian cities are vastly different to London, Stockholm and others that have implemented congestion charges. Our major cities lack a natural inner-city ring and are far less densely populated. For example, Greater London could fit inside Sydney seven times.

32. Australian Bureau of Statistics, 2018, *Census of population and housing: Commuting to work*

A road user charge can be simple to design, implement and operate

The technology to implement a simple and effective road user charge already exists. This means that a road user charge can be implemented in the short-term, and be in place well before electric vehicle sales take off.

For a simple distance-based charge, no new hardware is required. Odometer readings could be taken every six or twelve months and could be implemented alongside existing registration processes. For vehicles with the capacity to transmit readings, owners may choose to submit this way, or simply take a photograph of their odometer as evidence. Enforcement could be undertaken using software to detect fraudulent submissions and manually at random – similar to the way tax returns are checked.

There would be no need for authorities to know when or where a vehicle has been. Governments would require no more information about a vehicle than what could be gathered by a glance at its odometer.

This proposed approach would impact a limited number of motorists – only those who already own electric vehicles or are actively considering buying one. Governments could set rates on charges to ensure electric vehicles pay no more than the equivalent internal combustion engine vehicle.

Those who drive vehicles powered by petrol, diesel or LPG currently pay excise on the fuel they consume. This system could be allowed to continue, with no change to current arrangements This would mean that no driver is worse-off, whether they move to a road user charge for electric vehicles or not.

This would also mean that the road user charge system is opt-in, as motorists choose to move to the new model when they choose to purchase an electric vehicle. Regional or outer urban motorists would therefore not be unduly affected. No motorist is compelled to move to the new system or buy a certain type of vehicle.

The broad approach Infrastructure Partnerships Australia proposes can be found in Box 3.

Myth 4: A road user charge will require access to detailed personal data

A simple distance-based road user charge, as this paper recommends, does not require any more information than is already provided to transport agencies. It does not require personal data collection such as where motorists have travelled. Governments do not need to know where you have been, when you travelled or how fast you travelled.

As shown in New Zealand (Box 4), a road user charge does not require GPS tracking and can accommodate private road use exemptions.

Even under a more sophisticated road user charge, the data collected would be less detailed than is already collected from most modern cars:

- Almost all vehicles sold today include GPS-tracking as a standard feature. Most are operated by third parties such as vehicle manufacturers, which provide navigation information and accumulate vast volumes of data about when and where motorists travel.
- Many transmissions of data between vehicles and operators are two-directional, with limited or no regulatory oversight.
- Almost all vehicles, regardless of when they were made, have a cheap and effective radio transponder for reading by toll gantries.
- Number plate recognition is already used in many car parks across the country, as well as by police for traffic rule enforcement and identifying stolen vehicles.
- Indeed, the technology most Australians carry with them – smartphones – already collect data to a far greater extent than would be required to enable GPS-based road user charging.

Although these technologies are already widely in use and accepted by motorists, governments should be aware that a minority of users may hold reservations about the use of these technologies for road user charging. These privacy concerns can be easily mitigated through effective and proven safeguards. The experience of introducing public transport cards, such as Myki in Victoria, Opal in NSW and go card in Queensland, shows that users are quick to embrace these technologies, and any privacy concerns soon subside.

Box 3: What a road user charge for electric vehicles should look like

- The charge should be simple, distance-based and cover the whole of the road network.
- A per-kilometre charge should be set no higher than fuel excise for regular petrol or diesel vehicles to ensure electric vehicle motorists pay no more than the equivalent vehicle would in fuel excise.
- Governments may wish to provide a time-limited discount period to encourage uptake and provide certainty for prospective electric vehicle buyers. However, there is a limited policy case for this approach.
- Charges may be the same or different across states and territories, but should be based on the same methodology, a compatible charging approach and interoperable legislation.
- The charge should capture all vehicles with manufacturer-rated fuel use below 1 litre per 100 kilometres, meaning existing hybrids will be excluded and future 'ultra-hybrid' vehicles cannot be developed to avoid road user charges.
- The charge should be indexed in line with inflation.
- Funds raised should remain in the jurisdiction in which they are raised, providing more autonomy to the states and territories to manage their transport networks.
- Funds should be reinvested in new transport capacity. This investment should be 'modally agnostic' and flow to the projects that will provide the greatest improvements to transport outcomes over time.
- Motorists would submit or vehicles transmit odometer readings every six or 12 months.

A road user charge can be made more efficient and fairer over time

A whole-of-network charge by kilometre will be effective in ensuring all road users pay their fair share, and we can continue to fund roads into the future. However, this approach treats all kilometres travelled equally and does not reflect a road user's impact on the broader network. Over time, governments may wish to consider moving to a location, time, and mass-based charge:

- A location-based charge that is higher on inner urban roads could help to manage congestion and provide discounts for travel in outer urban and regional areas, where users may need to travel further to access jobs and services, and where public transport options are limited.
- A time-based charge could help to spread peak travel periods, resulting in lower levels of congestion. This would also help to defer or avoid additional investment in new transport capacity.
- A mass-based charge would allow motorists to pay for the impact of their vehicles on roads. A number of jurisdictions already use a proxy of this charge through different rates of annual registration charges. Australian toll roads operators also apply a higher toll for heavy vehicles.

Introducing the time, location and mass dimensions of road user charging would likely require the use of technologies. These already exist today, and their use is widespread. However, building community acceptance around a more efficient form of road user charging is important. Governments may need to undertake pilots to provide proof-of-concept, and public education campaigns can help to build understanding.

That is why Infrastructure Partnerships Australia recommends that governments introduce a simple, whole-of-network, distance-based charge on electric vehicles in the short term to ensure it is in place before mass uptake occurs. Introducing the new dimensions of time, location and mass can be considered over the coming years and implemented if and when governments have secured the support of communities for this approach.

A government that implements a distance-based charge in the near term does not make the implementation of a location, time and mass-based charge inevitable over time. Nor does the implementation of a distance-based charge preclude governments from introducing a more sophisticated system at a later date.

Box 4: The Kiwi experience of road user charging

New Zealand has had a variable mass- and distance-based charging regime in place since 1987. A road user charge applies to all vehicles over 3.5 tonnes gross-vehicle-mass and all light vehicles powered by diesel and other fuels which are not taxed when sold.[33] This includes electric vehicles, however they are currently exempt from the charge until they reach two per cent of the vehicle fleet.[34]

The Kiwi experience with operating a road user charge is a valuable case study. Vehicles under the scheme are required to pre-purchase a distance (in 1000-kilometre intervals) with their licence and install a distance recorder to track the distance travelled. Once the licenced distance is reached, a new licence must be purchased. Distances travelled on non-public roads can be claimed back, so vehicle owners do not pay for use on private property.[35]

Originally only sold over the counter, today the licence can be purchased online on the New Zealand Transport agency website. There are four distance recorders approved by the government for light vehicles, all developed by private entities.

The fact that this road user charge was implemented before the advent of smartphones or widespread personal use of GPS means a road user charge need not be complicated.

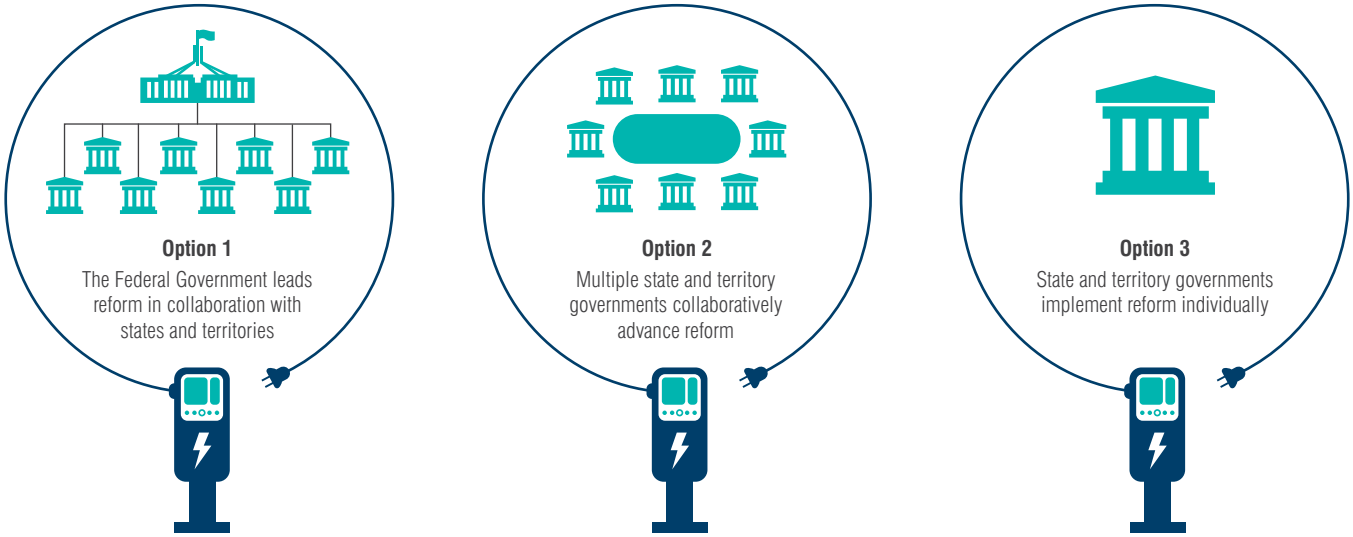
33. Infrastructure Partnerships Australia, 2014, *Road pricing and transport infrastructure funding: Reform Pathways for Australia* **34.** New Zealand Government, 2016, *Road user charges exemption for electric vehicles extended*
35. New Zealand Transport Agency, 2019, *Road user charges handbook*

THE ROADS TO REFORM ARE CLEAR

We are at a fork on the pathway to reform

Unusually for a potential reform, change could be initiated by the Federal Government, or by any of the state and territory governments. While each of these options has potential advantages and challenges, each is a viable way of advancing reform.

Figure 8: There are three options for advancing reform



Across all cases, there are important outcomes that governments considering a road user charge for electric vehicles should seek to deliver:

- **National compatibility** is essential for users, investors and operators of transport services. We need to avoid 'Rail Gauge 2.0'[36] with eight separate and potentially competing mechanisms that carry different risks and costs and are not interoperable.
- **Transparency** is important for building public support for road user charging and communicating the rationale for its introduction.
- **Fairness** is important to ensure the road user charge doesn't repeat the unfairness of the current fuel excise system. Certain users, such as regional, lower-socioeconomic or those who require the roads for work (for example, taxi drivers and tradespeople) must be considered.
- **Flexibility and scalability** should be embedded through policy design. Infrastructure Partnerships Australia recommends a simple distance-based charge be implemented in the short term. However, governments should ensure the system can evolve to meet changing needs.

36. This refers to the evolution of Australia's rail network from the colonial era, where each state chose a different rail gauge width. The standardisation of our interstate network began in the 1930s and was only completed in 1995.


Sunshine
Coast

Option 1: Federal leadership

Historic calls for reform have centred on the Federal Government taking the lead. This is because fuel excise is currently collected by the Federal Government, so they have a clear incentive to implement reform to ensure the road revenues they collect are sustainable in the face of electric vehicle uptake. A federally-led road user charge would also allow national policy objectives, such as productivity gains and emission reductions, to be managed consistently across the nation.

However, despite persistent signals to implement reform from Infrastructure Partnerships Australia, the Productivity Commission, Infrastructure Australia, and others, this reform process has not been initiated by the Federal Government.

There are Constitutional challenges with a road user charge being levied by the Federal Government. While fuel excise has been levied by the Federal Government on petrol since Federation, and on diesel since 1929,[37] a road user charge would constitute a Commonwealth charge on roads, which are state property. Section 114 of the Constitution expressly prevents the Federal Government from levying a charge on state property – which includes the majority of Australia's road network.

A workaround could theoretically be achieved by allowing the transfer of state assets to the Federal Government or by levying a road user charge as a form of excise (for example, a charge on electricity for motor vehicle use). However, this would introduce complexity that may detract from the transparency and effectiveness of a road user charge and would most likely require the agreement of states and territories.

Also, while the national consistency of a federally-led charge could have benefits, it may also be a limitation. If the charge was to be levied federally, Sections 99 and 51(ii) of the Constitution require that duties be levied uniformly. This introduces challenges for applying a location-based charge, where congested inner urban roads could be charged more per kilometre than other parts of road networks. This limitation may also be worked through the use of separate location-based charges by states and territories, but this kind of measure would also introduce another layer of administrative complexity and reduced transparency.

Option 2: States and territories collaborate

The pathway to reform that appears to present the fewest hurdles to implementation is for state and territory governments to work together to introduce a compatible – if not consistent – road user charge for electric vehicles. Given that road networks are largely state-owned, there do not appear to be Constitutional barriers for the states and territories to introduce a charge for road use.

There is a substantial carrot for states and territories that embrace this reform – the opportunity to tap into a new source of revenue. This would enhance the autonomy of jurisdictions to manage both the supply and demand of their road networks, including directing investment to transport networks with less reliance on, or intervention from, the Federal Government.

While the revenue raised is unlikely to be substantial in the short term, it could rise rapidly as electric vehicle uptake grows – into the hundreds of millions each year for a large state by the mid-2020s and the billions by 2030. Such opportunities for new state-sourced revenue are rare, especially for a recurrent and growing source of funds.

Another advantage of this approach would be the autonomy of states and territories to apply a road user charge to support their policy objectives. For a distance-based charge, jurisdictions may wish to set the per-kilometre charge at varying rates, and may wish to provide incentives such as discounts on registration or concessional rates for a set period to encourage electric vehicle uptake. Under a more sophisticated location, time and mass-based road user charge, the states and territories could use this measure to manage demand, spread peak periods or incentivise behaviours that benefit other transport users.

This approach would also enable states and territories to retain the road revenue raised on their roads. This would support greater autonomy by jurisdictions on how and when to invest in new capacity, or to invest in longer term maintenance programs with greater certainty over future road funding. As a new, ongoing revenue stream it would be stable, reliable, and immune to inflation or economic downturns – a highly attractive proposition at a time of tightening fiscal settings across most governments.

37. Parliamentary Library of Australia, 2000, *Petrol and diesel excises*

A major challenge of state-led reform would be ensuring compatibility across borders. Without this compatibility, road reform risks introducing inconsistencies in regulation and technology that would deter investment and cloud broader policy objectives.

There is, however, no need to design a policy to account for road use by light vehicles outside their registered state or territory. Cross-border travel forms a relatively small proportion of total road use by light vehicles, and an even lower proportion of road use by electric vehicles. Levying the charge through vehicle registration also helps to avoid motorists travelling across borders to avoid a road user charge.

These issues can be mitigated by sourcing agreement to a common approach through national forums such as the Council of Australian Governments or the Board of Treasurers – the group of eight state and territory government Treasurers established in 2017.

Jurisdictions would also need to consider how a road user charge would affect existing streams of funding from the Federal Government, including GST distributions. Similarly, the impact of state-led road user charge on current Commonwealth Grant and horizontal fiscal equalisation processes (such as GST allocations) will need to be addressed through these forums.

Option 3: States and territories go it alone

If the Federal Government or the states & territories cannot establish a consistent approach to a road user charge, individual jurisdictions implementing the reform individually remains a viable option – and one that is vastly preferable to the status quo.

In this reform pathway, the first state or territory to implement a road user charge will have the advantage of selecting the design and technology that best meets their policy objectives. Contrary to other types of reform, an early mover on a road user charge is also most likely to encounter the least public resistance to change. That is because those who will be immediately impacted – electric vehicle owners – will be at their lowest ebb. Reform can only become more difficult over time as more motorists embrace the technology.

The benefits of this pathway mirror those of Option 2, however there is one additional risk – a lack of cross-jurisdiction agreement leading to multiple incompatible charging methods. While the first movers carry a high degree of autonomy in system design, subsequent jurisdictions will face the challenge of either being tied to the approach and technology implemented by others, or introducing a new system that will bring cost and complexity.

Under this scenario, sharing experiences of reform and seeking agreement to a nationally compatible system of road user charging through COAG or other appropriate bodies will be important.

The window of opportunity for change is closing

Whichever reform pathway eventuates, the best time for implementing a road user charge on electric vehicles is now, when these vehicles only form approximately 0.076 per cent of the light vehicle fleet.[38,39] We know that electric uptake is an inevitable wave, just over the horizon. Once price parity is reached, and electric vehicles become the default choice for households across the country, the window of opportunity for reform will have closed, and mass market uptake will have made this sensible reform electorally unachievable.

Action is required now to ensure there is a road user charge on electric vehicles before this coming wave. The potential rapid growth of electric vehicles through shared and autonomous fleets raises the stakes.

Putting a price on roads for electric vehicles in the short term will avoid significant pain for all transport users and taxpayers over the long term. Crucially, a road user charge would provide certainty for existing or prospective electric vehicle owners about future transport costs to inform their decisions.

Delays in implementing a road user charge on electric vehicles will erode the funding available to invest in transport infrastructure, due to continued decline in fuel excise. The further this revenue falls, the harder it will be to restore to levels that can sustainably fund the investments in new infrastructure our cities and regions require, and to overcome a mounting transport maintenance backlog.

Reform of Australia's transport networks can be a major catalyst for improvements in productivity and quality of life in the twenty-first century. But unless we act now to update our road funding system, Australia is going to be stuck in the slow lane.

38. International Energy Agency, 2019, *Global EV Outlook 2019* **39.** Australian Bureau of Statistics, 2019, *Motor Vehicle Census, Australia, 31 Jan 2019*

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AUSTRALIAN INFRASTRUCTURE INVESTMENT REPORT 2019

INFRASTRUCTURE PARTNERSHIPS AUSTRALIA

Allens › ‹ Linklaters

Perpetual

Infrastructure Partnerships Australia is an industry think tank and an executive member network, providing research focused on excellence in social and economic infrastructure. We exist to shape public debate and drive reform for the national interest.

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Perpetual is a diversified financial services group providing specialised investment management, wealth advice and corporate trustee services to individuals, families, financial advisers and institutions.

Our origin as a trustee company, together with our outstanding track record in investment management, has built our reputation as one of the most respected brands in financial services in Australia.

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CONTENTS

About the 2019 Infrastructure Investment Report

Infrastructure Partnerships Australia, Allens, and Perpetual Corporate Trust are pleased to jointly present the 2019 edition of the *Australian Infrastructure Investment Report*.

This year's survey captures the views of international and Australian investors who together collectively own or manage around AU$490 billion of infrastructure assets across the globe.

Our report provides a comprehensive annual view of investor appetite and sentiment. It reveals insights into the drivers and challenges for infrastructure investors, which include sovereign wealth funds, pension funds, fund managers, banks and other infrastructure professionals.

Special thanks to Robert Montgomery for his valuable stewardship of this project.

EXECUTIVE MESSAGE

The 2019 *Australian Infrastructure Investment Report* marks the fifth anniversary of the study. The last five years has seen the global economy enter a period of heightened uncertainty. A low interest rate environment has intensified the hunt for yield and has changed the risk/reward calculation for investors. After examining this year's results against several years of historical data it's clear investors in Australian infrastructure have not been immune to this changing risk environment. Investors understand well the balance of risk and reward, and are adapting their risk appetite to seek new opportunities in an Australian infrastructure market, which remains highly competitive and active. However, this year's report shows that in some areas the necessary risk/reward balance has been disrupted, and we are seeing growing risks without rewards.

Australian infrastructure is highly attractive, but also highly competitive

Investor appetite for Australian infrastructure remains strong, with 90 per cent of participants 'highly likely' to invest in Australia in the next two to three years (equal to the 2018 result). The attractiveness of the Australian market is primarily driven by our strong track record for infrastructure delivery and the sophistication of local market participants and partners.

The strength of the Australian market also creates challenges for investors. Forty-five per cent of participants reported that competition for assets and a lack of opportunities are creating challenges in finding new investments. This has led to some investors moving up the risk curve or expanding their investment mandate to pursue opportunities in core-plus infrastructure assets such as data centres or land-titles registries. Termed 'core-plus' assets for their similar characteristics to core infrastructure assets, they may also exhibit shorter contracts, higher volatility and potential earnings. In fact, 64 per cent of participants showed a preference for core-plus assets, making them just as popular as passenger rail or water infrastructure from an investor's perspective.

Some risks are symptoms of a flourishing market

A competitive market is a healthy market, and it would be anticipated for investors to move up the risk curve into assets such as core-plus infrastructure. In recent years, Australia's strong infrastructure market has made it a destination of choice for international investors. Australian governments and infrastructure developers have harnessed private capital and expertise to accelerate the pipeline of infrastructure projects across the country.

However, Australia is somewhat a victim of its own success, with the sector feeling the pressure of a high volume of projects simultaneously entering the delivery phase. This increased market pressure is seeing risk allocation on complex projects, and capacity constraints in the construction market, begin to impact the cost of infrastructure delivery. Ninety per cent of participants agreed that the Australian infrastructure market is facing capacity constraints, with these constraints felt to a high degree in civil and tunnelling projects. While challenging, many of these risks can be traced to a flourishing market and are typically priced to match risk and reward.

Policy and regulatory risks are without reward

Not all risks in the Australian infrastructure market are matched by commensurate reward. Eighty-three per cent of participants agreed that uncertainty in Australia's policy and regulatory settings is limiting their willingness to invest. Many investors have long investment horizons and their memories are just as long. A flurry of government interventions, tax changes and regulatory reviews in recent years has caused concern for many investors. While some risks are symptoms of a busy market, or offer rewards proportionate to the risks being taken, policy and regulatory uncertainty have little upside for investors, taxpayers or customers. Instead, policy and regulatory uncertainty dampen incentives and drive poorer outcomes for infrastructure users.

Over recent decades, Australia's reputation as a leading infrastructure investment market has been built on stable market frameworks and rules, with ongoing uncertainty in energy policy and regulation being the notable exception. This year's report confirms that new challenges have arrived, with the risk environment changing on several fronts. As we navigate this new environment, policymakers and regulators must work to reduce those risks which offer few rewards.

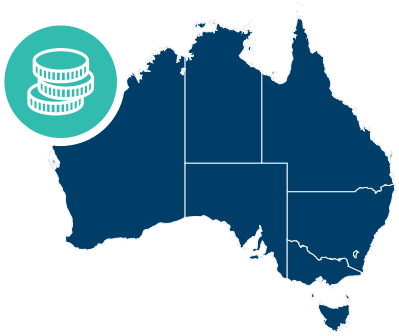
We thank each participant for their contribution to the fifth *Australian Infrastructure Investment Report*.

Adrian Dwyer
Chief Executive Officer – Infrastructure Partnerships Australia

David Donnelly
Partner – Allens

Richard McCarthy
Group Executive – Perpetual Corporate Trust

KEY FINDINGS



Investor appetite for Australian infrastructure remains strong and steady

90 per cent are 'highly likely' to invest in Australia, the same level as in 2018

But investors are struggling to find enough investment opportunities in the competitive Australian market

79 per cent
of investors say North America provides compelling investment opportunities

whereas only
49 per cent
of investors say the same about Australia

45 per cent
said competition for assets and a lack of opportunities are significant challenges for investment

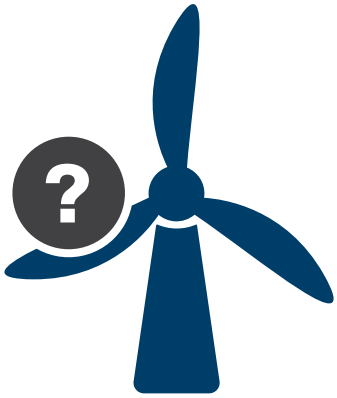
So, investors are moving up the risk curve to pursue opportunities in core-plus assets

64 per cent showed a preference for core-plus infrastructure, meaning it ranks the same as passenger rail or water infrastructure

Risk allocation and capacity constraints in the construction market are beginning to impact the delivery of infrastructure

90 per cent
agree the Australian infrastructure market is facing capacity constraints.

Constraints are most severe for civil and tunnelling projects, with social infrastructure less affected by skills shortages and cost increases.



Interest in renewable energy generation is high, but policy uncertainty is creating risk

67 per cent
are considering near-term investments in renewable energy

whereas just
21 per cent
are considering non-renewable energy investments

74 per cent
agree that policy and regulatory uncertainty limit their willingness to invest in the energy sector

Across all sectors, investors remain concerned about policy and regulatory uncertainty

83 per cent agreed uncertainty in Australia's policy and regulatory settings is limiting their willingness to invest

When it comes to the attractiveness of the Australian market, emerging challenges are outweighed by our strong track record on infrastructure and our experienced local market participants

85 per cent say our track record of infrastructure business draws them to Australian investment opportunities, up from 70 per cent in 2018

70 per cent agree that the knowledge and experience of partners and market participants make Australia an attractive investment destination

METHODOLOGY & PARTICIPANT PROFILE

Methodology

This report provides a unique insight into the preferences, intentions and sentiments of major market participants considering investments in Australian infrastructure.

In September 2019, we conducted a quantitative survey of 49 senior market participants about investing in Australian infrastructure.

We followed this with detailed qualitative discussions with six of the participants to gain a deeper understanding of the issues.

The report draws on both the quantitative and qualitative research to provide insights into the perceptions of investors about Australian infrastructure and the factors that influence their decisions.

As the fifth edition in this series, the report also identifies investment trends over time and investigates the underlying causes of observed trends.

Participant Profile

The market participants surveyed are senior representatives of major infrastructure organisations including banks, fund managers, domestic superannuation funds, foreign pension funds, investors, as well as infrastructure constructors and operators.

Over half of the participants had their head office located in Australia, with the remainder spread evenly across Europe, Asia, and North America. Almost all the individuals surveyed are based in Australia, reflecting the importance of local presence to effectively participate in the Australian infrastructure market.

Survey participants included Chief Executives, Chief Investment Officers, Fund Managers, General Managers, as well as Transaction and M&A Managers.

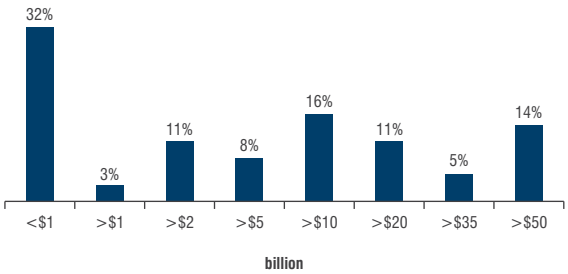
PARTICIPANTS' INVESTMENTS

PARTICIPANT STATISTICS

- Participants have over AU$490 billion in infrastructure investments globally
- Over half of the participants manage more than AU$5 billion of investments
- Over 70 per cent of participants hold road, social infrastructure and renewable energy assets

Each year, the *Australian Infrastructure Investment Report* continues to grow in terms of number of participants and the value of assets under management. In 2019, the report surveyed 49 participants managing more than $490 billion in infrastructure investments worldwide, up from the original 21 participants and less than $100 billion in 2015. This year, 14 per cent of participants have over AU$50 billion invested in infrastructure, as shown in Figure 1.

Figure 1: Profile of survey participants' global infrastructure investments (AU$)



In the 2019 report, 86 per cent of participants are already invested in Australian infrastructure, with a further 12 per cent identifying as market participants, but not investors. Only two per cent of participants are not currently active in Australia (see Figure 2). Fifty-five per cent of participants had more than half of their investments in Australia, as shown in Figure 3.

Figure 2: Current investment in Australian infrastructure

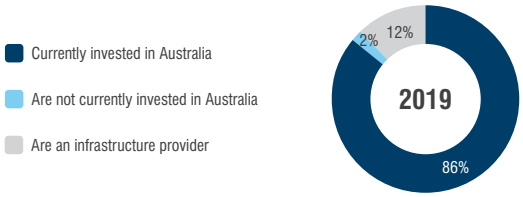
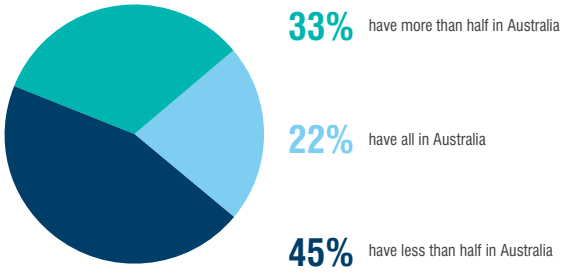
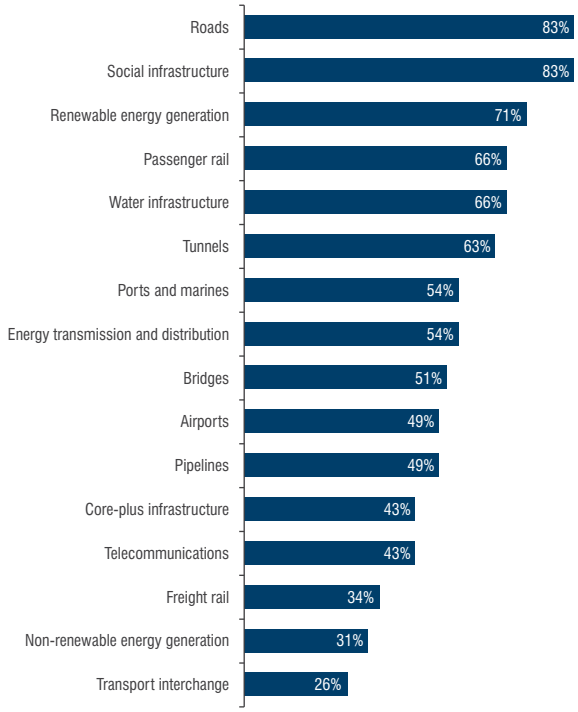


Figure 3: Proportion of total investments in Australia versus anywhere else



The participants had existing investment stakes in a broad range of asset types, however some asset types are more prevalent than others. Like previous years, road and social infrastructure are the most common types of assets in which participants hold investments, followed by renewable energy generation, passenger rail and water infrastructure, as shown in Figure 4.

Figure 4: Global profile of participants with an investment in each asset type



INVESTMENT INTENTIONS

KEY FINDINGS

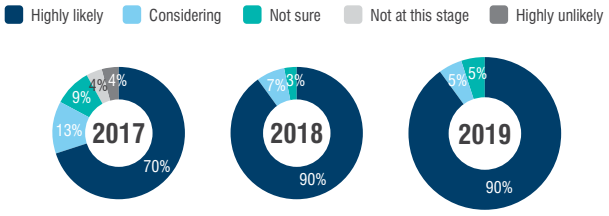
- 90 per cent of participants are highly likely to invest in the Australian infrastructure market, and a further five per cent are considering investing over the next two to three years
- Preference for renewable energy assets has increased by 15 per cent from last year
- 64 per cent of investors are interested in core-plus infrastructure
- Interest in unregulated assets has grown in line with regulatory uncertainty

Participants were asked about their investment intentions for Australia. The questions ranged from likelihood of investing to the particular asset class and type preferred. While general investment appetite remains strong, investment methods and asset preferences are responding to the current environment.

Appetite for investing in the Australian infrastructure market remains strong

As shown in Figure 5, 90 per cent of participants are 'highly likely' to invest in Australian infrastructure in the next two to three years. A further five per cent are 'considering' investing. The figures are largely unchanged from the 2018 results, confirming a consistently strong appetite for Australian infrastructure. None of the participants said they are 'unlikely' to invest in Australia.

Figure 5: Likelihood to invest in Australian infrastructure



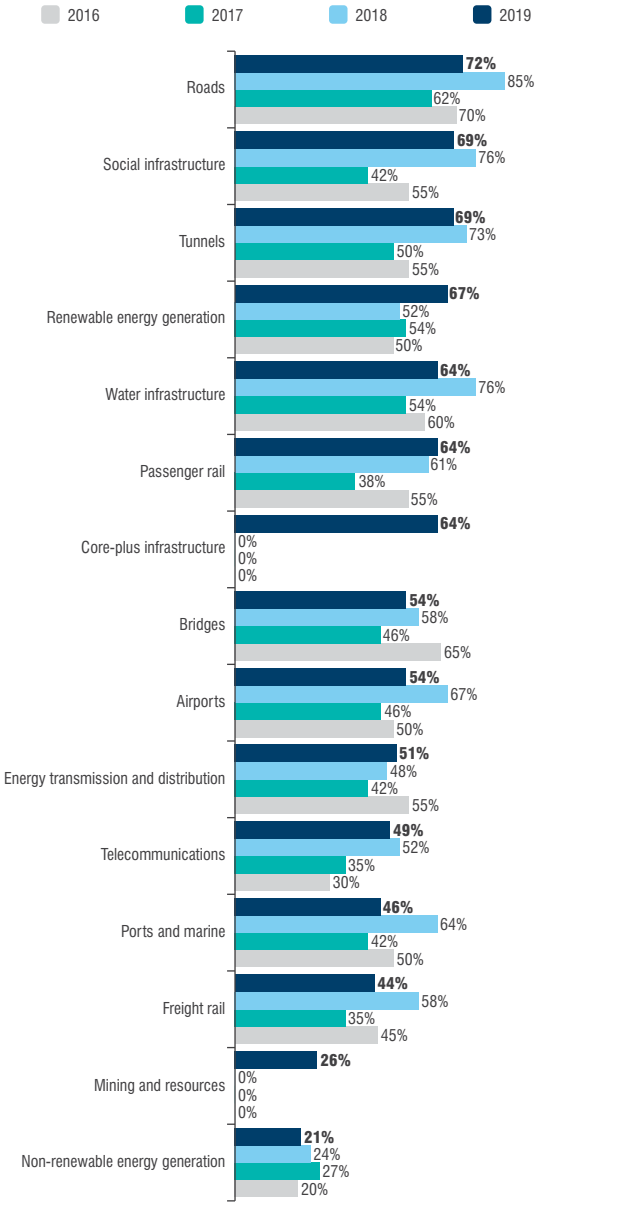
"Every major investor in the world would like to be in Australia. We've got lots of domestic capital and certainly most of the big overseas players… we're forever having people knock on the door, whether they are from Canada, Asia, or the Middle East."

Infrastructure investor & developer

High growth in preference for renewable energy generation, while interest in other assets has fallen

Relative investor preference fell for most asset types, except for renewable energy, passenger rail, and energy transmission and distribution (see Figure 6). Participants explained the fall in preference across asset classes was due to a lack of available opportunities rather than specific issues deterring investment.

Figure 6: Preferred Australian asset type to invest in



In contrast, the growth in renewables interest corresponds with perceived greater opportunities in the sector, due to lower barriers to entry for investment. Renewable energy generation assets experienced an increase of 15 percentage points on the 2018 results, which corresponds with heightened investment activity in the sector. This increase in interest has occurred despite uncertainty over the Federal Government's energy policy beyond the 2020 Large-scale Renewable Energy Target.

"Renewable energy is a huge area of focus right now. There are pressures there as well. Regulation is a challenge but there's a lot of willingness to invest, there's lots of money and valuations are pretty high right now."

Global investment adviser

"I think on renewables, there's a lot of money there. There's more money than there are opportunities."

Investment banker

"The barriers to entry into renewables in Australia, certainly in the last two years, have been extremely low."

Institutional investor

The infrastructure categories of 'freight rail' and 'ports and marine' experienced the largest declines in interest, falling 14 and 18 percentage points respectively compared to the 2018 results. This is consistent with the fact that there are no significant asset divestments in the pipeline.

Strong interest for core-plus asset class

This year's report included two new asset categories, 'core-plus' and 'mining and resources'. Core-plus assets are those that would not be defined as traditional, 'core' infrastructure assets, yet retain similar characteristics such as high barriers to entry, long lifespans and stable revenues; examples include data centres or land titles registries. Core-plus is as popular as passenger rail and water infrastructure, with 64 per cent of participants stating a preference for investing in these asset classes. The lack of new traditional infrastructure investments and the pursuit of higher yields in a low interest rate environment, is driving the search for new asset types.

"I think the rise in interest for core-plus assets is symptomatic of the shortage of core infrastructure assets, so investors are looking beyond the core definition"

Institutional investor

Interest in unregulated assets has grown in line with regulatory risks

Investors continue to demonstrate a preference for unregulated assets over regulated assets (see Figure 7). In some cases, this is driven by the desire to seek the higher returns offered by unregulated assets. In other cases, it is underpinned by a desire to avoid the regulators themselves.

"I much prefer to negotiate with my customers than go cap in hand to a regulator every five years to find out what my revenue is going to be."

Global investor

"The shift away from regulated assets was primarily due to trying to get higher returns in the non-regulated environment combined with the level of policy and government intervention."

Institutional investor

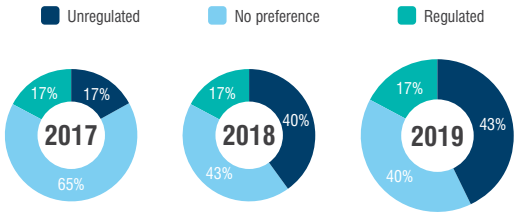
"Unregulated offers a better risk adjusted return but it also offers greater volatility in those returns."

Institutional investor

"At the moment regulated assets are an acquired taste in Australia given the amount of intervention from regulators and from politicians, but over the medium term, I don't see a big shift away from it."

Institutional investor

Figure 7: Preferred regulatory model for investments



Experienced investors are chasing both Brownfield and Greenfield opportunities

When asked about Greenfield (new developments) or Brownfield (asset divestments) intentions, 43 per cent of participants had no preference (Figure 8). This year's report adds further granularity to the data on investor preferences for Brownfield or Greenfield assets by adding an expansion (or Khaki) category. Expansions are considered investments in Brownfield

assets which involve a significant planned capital upgrade as part of the transaction. Participant comments reflected mixed sentiments around the two main asset classes, with pros and cons acknowledged for each. Investors are increasingly willing to take either option due to a lack of opportunities.

"Absolutely prefer Brownfields. You really don't want construction risks as an infrastructure investor if you can avoid it."

Global investor

"There are more Greenfield assets out there, there are hardly any assets being privatised, or Brownfield assets being recirculated through secondary sales. Much more common is the PPP style development which is Greenfield."

Global investor

While Greenfield investments carry additional risks due to the construction element, there is a perception that investors are increasingly capable of taking on the construction risks. Australia has a long history of Public Private Partnerships (PPPs) with many local investors well experienced in Greenfield construction.

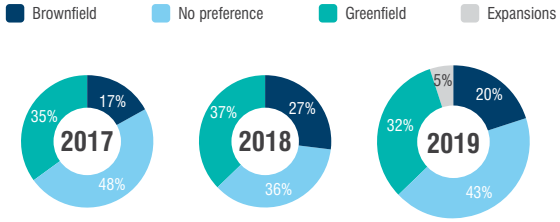
"I think there's a longer track record on Greenfield where people are more confident they can price the risk. Back in the day, not many people had done Greenfield, now more people have done it and more people are comfortable doing it, therefore there's more interest in it."

Investment banker

"We are seeing an increase in risk appetite for Greenfield projects from traditionally more conservative investors who've tended to want to shy away from construction and development risk. It's a sign of the increasing sophistication of equity investors, particularly local equity investors."

Infrastructure investor & developer

Figure 8: Brownfield or Greenfield



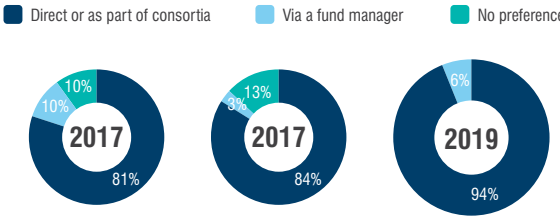
Direct investment via in-house teams preferred over fund manager

The trend towards direct investment continues in 2019, with 94 per cent of participants preferring to invest directly or via consortia (see Figure 9). The trend is explained by the growth of in-house capability, particularly among the large super funds, which negates the need for intermediary managers.

"The preference for going direct is an ongoing trend. I think it will just keep increasing as the Australian super funds get bigger and more sophisticated. Increasingly people have in-house teams and therefore want to invest directly."

Infrastructure investor

Figure 9: Preferred method for investing in Australia



Greater interest for higher value assets

Participants continue to prefer higher value assets, as shown in Figures 10 and 11. Participant portfolio sizes are growing, as is the corresponding pressure to deploy larger amounts of capital.

"The larger funds have gone up the asset size curve mainly because of a desire not to deploy capital into a whole host of middle assets which create some management difficulties."

Global investor

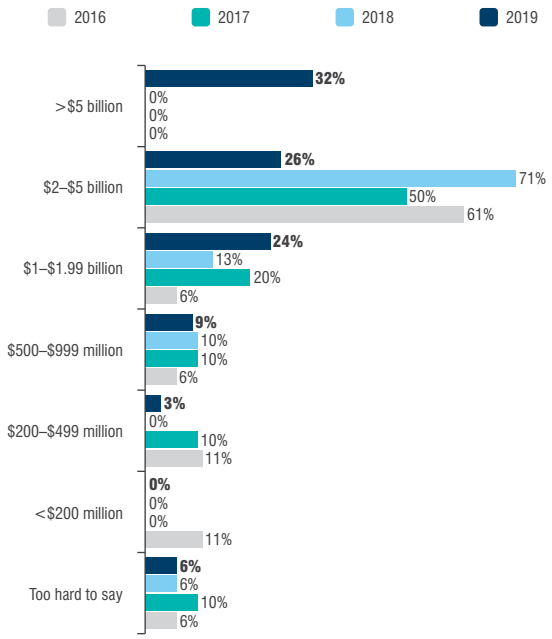
"The amount of work that goes into doing that $2 billion project is not that different from a $500 million project."

Super fund manager

"We would be keen to commit $2 billion plus in capital to a single project, primarily because of the fund the capital's sourced from, it's a very substantial fund and to move the dial, you need to be investing at least $500 million to $750 million."

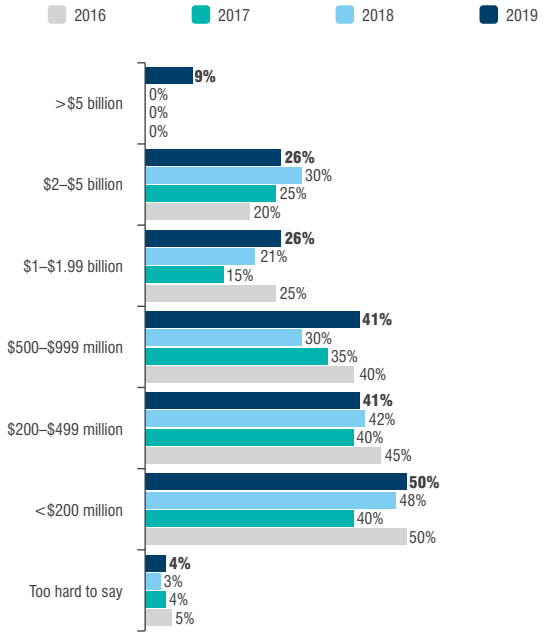
Institutional investor

Figure 10: Total amount comfortable investing in Australia



Note: The $2-$5 billion category and >$5 billion category were represented as >$2 billion from 2016 - 2018

Figure 11: Single investment sizes considered by participants



Note: The $2-$5 billion category and >$5 billion category were represented as >$2 billion from 2016 - 2018

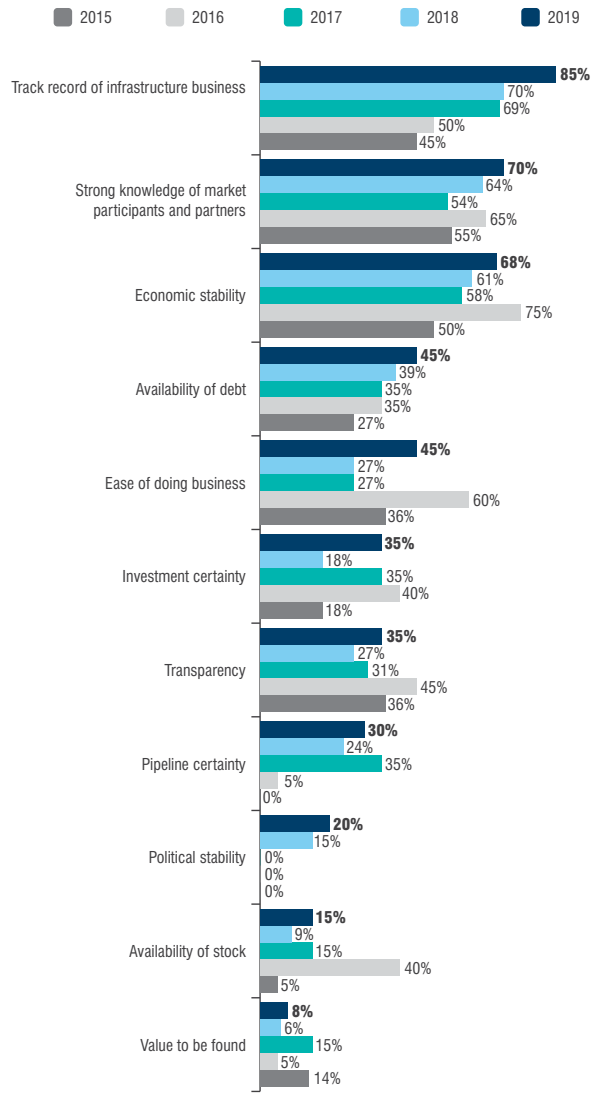
WHY AUSTRALIA FOR INFRASTRUCTURE?

KEY FINDINGS

- The big three attractions for investment in Australian infrastructure continues to be track record for infrastructure, knowledgeable market participants and economic stability
- Ease of doing business is up 18 percentage points due to increased public service capability
- Investors accept that lower returns are a by-product of Australia's stable, mature market

While participants expressed an improvement in attractiveness for infrastructure investment across all measures in 2019, three core indicators continue to outperform the rest - track record, knowledgeable market participants and economic stability. Over the past five years, these indicators have ranked consistently high and centre on a perception of Australia as a stable, capable and proven infrastructure market. Interestingly, participants have low expectations of value for the same reasons.

Figure 12: What makes Australia attractive for infrastructure investment?



Australia's track record continues to attract infrastructure investment

The leading attraction for investment in Australia continues to be the country's track record for infrastructure business (Figure 12). This indicator encompasses Australia's history of infrastructure investment, delivery and operation, and was nominated by 85 per cent of participants. The fact that this has remained the leading indicator for the past three years underscores the importance of Australia's established reputation for attracting investment.

Knowledgeable market participants and a stable economy continue to underpin interest

Australia's long history of infrastructure delivery and use of sophisticated procurement techniques, including being a pioneer of Public Private Partnerships (PPPs), have given rise to a strong pool of experienced and capable firms and individuals. This is underscored by a continued appetite for PPPs, and the increasingly sophisticated relationship between governments and private partners across procurement, investment and construction.

"If you look back 10-15 years ago, infrastructure was a very young asset class. You had a whole lot of fledgling managers coming into the market. Through the post-GFC period they have weeded themselves down into a smaller number of very strong survivors."

Global infrastructure investor

Market participants value Australia's economic stability as a key attraction for infrastructure investment, which requires stable revenue over long time horizons. This stability has underpinned an increasing appetite for large asset investments, as reflected in Figure 10 (Investment Intentions section).

Ease of doing business had the largest increase from last year

Ease of doing business has increased by 18 percentage points since the 2018 results. Participants said this is closely tied to the improvements in the skill and expertise of personnel in market-facing government departments that oversee infrastructure procurement and management. Some participants indicated that this has recently improved through targeted recruitment to key positions.

"Governments have stocked the key departments with very talented people from the private sector."

Global investment adviser

Only eight per cent of participants see value in Australia's market as a key drawcard

Australia's success as an infrastructure market is a double-edged sword for investors seeking value. While only eight per cent of participants rated value as an attraction for investment, they acknowledged that the low returns are a by-product of a stable, sophisticated, competitive and mature market.

"The returns are pretty low because the assets are good, the environment is good, the rule of law is great. Everything works so it's hard to find real value."

Infrastructure investor & developer

"Value is hard to find because it's an expensive country, we've got good assets and good innovation and the product is good, it just costs a lot of money."

Investment banker

EMERGING MARKET CONDITIONS

KEY FINDINGS

- Open-ended, direct investment is rising, with 31 per cent of participants intending to hold assets for more than 20 years
- Limited opportunity and a competitive market are driving investment in core-plus assets
- Interest in renewables has grown 31 per cent over five years, but investors are wary of policy uncertainty

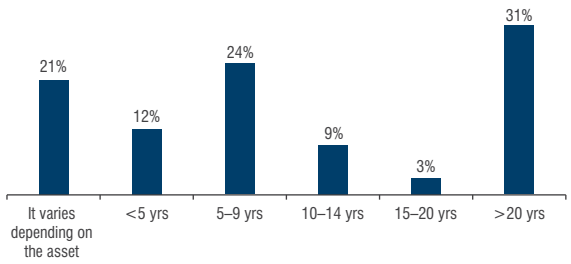
As in previous years, participants expressed a series of views on emerging market conditions. Commonly cited themes included evolving investment methods in the form of open-ended, direct investment; limited opportunities and a search for new assets; as well as a wariness of the strong renewables market.

Rise of open-ended, direct investment

In 2019, participants were asked about their intentions in terms of investment tenure. Responses showed that 31 per cent of infrastructure investors are looking to buy and hold assets, with less focus on divestment strategy. Participants noted that the intention to hold assets for longer is a result of increasingly sophisticated super funds and pension funds, looking for assets with long-term returns that will match their ongoing liabilities.

Macroeconomic conditions are also contributing to this trend. A low interest rate environment across the globe has encouraged long-term investors to increasingly look to asset classes such as infrastructure for stable returns. This has seen many superannuation funds and other institutional investors increase their focus and expertise in infrastructure, leading to a greater incidence of open-ended investments, which are made directly by experienced in-house teams.

Figure 13: How long are infrastructure assets typically held?



"You're seeing the closed-end fund investors diminishing and the real money investors starting to take their place; pension and super fund investors who are very focused on asset liability matching. Whilst they've got an asset that's matching liabilities, they can't see themselves exiting at all."

Infrastructure investor & developer

"Both of our investment funds are open-ended, so we don't factor in a divestment strategy at the outset and given the time and effort challenges of actually securing good quality investments, we like to hold on to them."

Institutional investor

"Debt markets continue to be really favourable, so there's lots of refinancing and stretching tenure, which is very sensible in this current environment"

Global investment adviser

Although almost a third of participants look to hold assets for more than 20 years, 12 per cent intend to hold assets for less than five years, with 24 per cent declaring a typical investment intention of five to nine years. Explaining the differing investment strategies, some participants challenged the value-add of open-ended investment, arguing that closed-ended investment incentivises improvements to the asset.

Limited opportunity is driving core-plus investment

Infrastructure investors are turning to core-plus assets because of greater competition and a lack of opportunities in core assets and increasing pressure to chase higher returns in a low-yield environment. Investors view core-plus assets as those that are 'adjacent' to traditional infrastructure assets, but with shorter contracts, bringing higher volatility and potential earnings. Recent transactions have seen infrastructure players invest in assets such as shipping lines, bus and ferry operators, storage terminals and motor vehicle registries. The NSW Government's possible privatisation of the NSW Forestry Corporation's Softwood Plantation Division is an example of a potential upcoming investment opportunity that would be categorised as core-plus.

"Investors are looking beyond the core definition for infrastructure-like businesses that are adjacent to the sector in some way. You find them within businesses such as airports, ports, etc. They have separate characteristics but they wouldn't have the same barriers to entry, they'd have shorter contracts, they'd offer up more volatility and earnings."

Institutional investor

"Core-plus are infrastructure-like assets that are monopolistic or have high barriers to entry. It's telecom towers, data centres, land titles registry."

Global investment adviser

"Core assets are firmly single digit returns now and therefore if you want mid-teens returns, or anything above 10 per cent internal rate of return, then you're really looking at core-plus exposure."

Global infrastructure investor

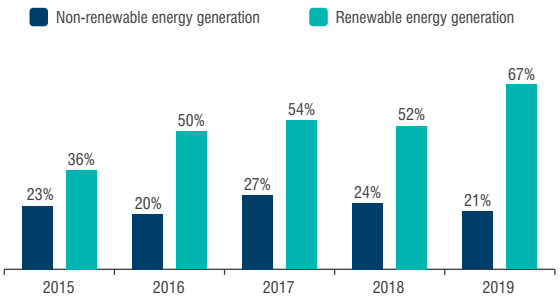
"The people buying higher risk infrastructure are more your private equity style investor, or funds looking to generate larger returns, and the way they do that is buy it, develop it and flip it."

Super fund manager

Despite a flood of investment, participants are wary of the lack of policy frameworks in the renewables sector

Investment intentions for renewable and non-renewable energy generation have clearly diverged over the five years of data recorded by the Australian Infrastructure Investment Report, as shown in Figure 14. Desire to invest in non-renewable energy generation has remained stagnant, whereas interest in renewable investments has grown by more than 30 percentage points over the five years since the report began. Although market participants acknowledged the popularity of investing in renewable energy generation, they are sceptical of the certainty of expected returns given the lack of a stable policy framework.

Figure 14: Energy generation investments considered over the next two to three years



"I think interest in renewables will continue, but I don't think renewables will deliver in terms of the way people expect them to."

Global investor

"We simply are not prepared for bringing such a large volume of renewables into the system in the last two to three years. We don't have a clear road map ahead of us as to what the energy mix is or how the system will cope in the next six months, never mind the next six years."

Institutional investor

"Chopping and changing the policy framework around renewables is not conducive to investment."

Investment bank

"Australia is not somewhere we're looking at, and I think it's a deadly place to invest [in renewables]. Environmental policy is very volatile. It changes quite a bit, and currently there is a lack of policy."

Super fund manager

AUSTRALIA VERSUS OTHER MARKETS

KEY FINDINGS

- Close to 80 per cent of investors see North America as providing the greatest investment opportunities globally, up from 38 per cent in 2016
- Perceptions of Australian investment opportunities have remained stable in recent years, whereas Europe dropped from first place in 2018, to third in this year's report
- Changes to stapled structures have seen the tax pendulum swing against foreign investors, making Australian opportunities less attractive globally

In 2019, market participants believe the most compelling investment opportunities are to be found in North America, where the privatisation pipeline is growing. Participants preferred Australia to Europe because of our track record for infrastructure, strong knowledge of market participants, and stable economy. However, taxation benefits and political stability in Australia are viewed unfavourably by investors.

North America provides the greatest investment opportunities

Interest in North America has grown steadily over recent years, with investor preference for the region more than doubling since 2016. In 2019, North America leads the world as the most attractive investment destination, with 79 per cent of participants saying it has the most compelling opportunities. Participants explained that growth in investment opportunities has been particularly strong in the United States, where state and local governments are successfully engaging private capital through asset recycling and in the development of new assets. This contrasts with the Australian market, which has seen the privatisation pipeline all but dry up and a slowdown in procurement of infrastructure through Public Private Partnerships.

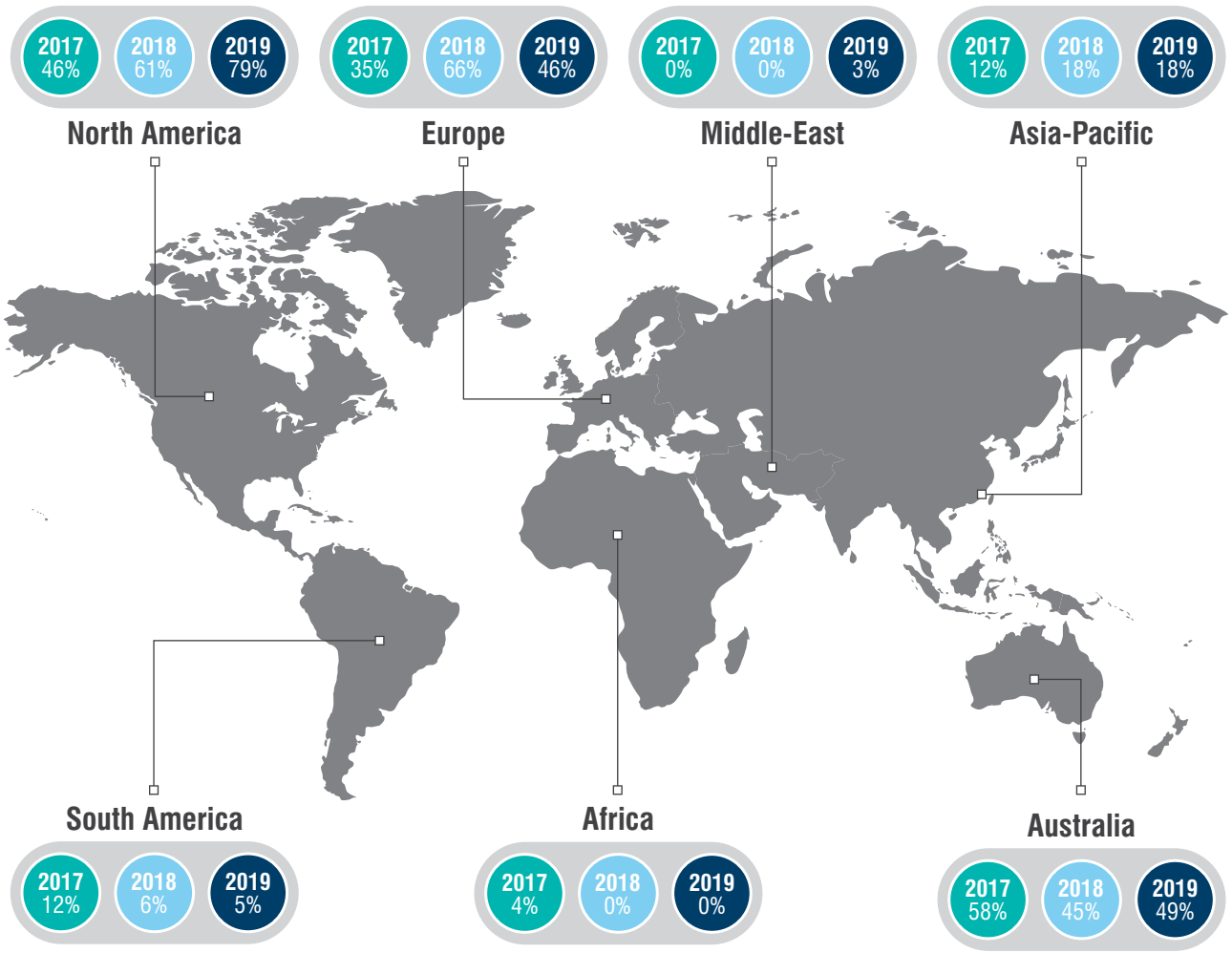
"The increase in opportunity in the United States is Trump-irrelevant. What's happening is; at the state/city/county level governments are latching onto private capital as a really useful tool to help them procure infrastructure and to recycle assets."

Infrastructure investor & developer

"There is interest in North America because it's a deeper market, there's more to do, returns are higher, and you can deploy bigger equity cheques. The U.S. is where everyone is starting to look."

Global investment adviser

Figure 15: Regions with the most compelling opportunities



Australia is preferred to Europe

Perspectives on opportunity in the Australian infrastructure market have remained relatively stable since this report started tracking sentiment. Conversely investor impressions of opportunity in Europe have been more volatile with Europe falling from first place globally in the 2018 report to third place behind North America and Australia. These results demonstrate that despite perceptions of political instability in Australia, when compared to other regions, Australia enjoys relative stability in a political and economic sense.

"Returns are higher here for the same sort of asset than they are in the European market, so from that perspective there's value in Australia."

Global investment adviser

"Because we are still in population growth mode, there'll be follow-on investment, I think people can see potential for more."

Global investment adviser

The tax pendulum has swung against foreign investors

When considering Australia's competitiveness with other infrastructure investment destinations, the taxation environment plays a major role. Australia is a net importer of capital and as such tax arrangements for foreign investors play a significant role in encouraging investment into the local market.

This year, participants reflected on recent changes to taxation conditions for foreign investors, noting that the taxation environment has become significantly less attractive within the global market. The Federal Government's recent package of changes to the tax treatment of stapled structures has greatly reduced benefits for foreign investors, who often use these investment vehicles when entering into Public Private Partnerships and privatisation transactions in Australia.

The changes have increased the Managed Investment Trust (MIT) withholding tax rate from 15 per cent to 30 per cent and have limited the availability of concessions for these investors.

These changes have reduced the attractiveness of Australian infrastructure opportunities for foreign investors, as rising taxes increase their cost of capital and put them at a competitive disadvantage when competing with domestic investors. For domestic investors, the changes reduce the field of potential partners for consortia. For governments procuring infrastructure or divesting assets, the amount of competition in the investment market could potentially shrink.

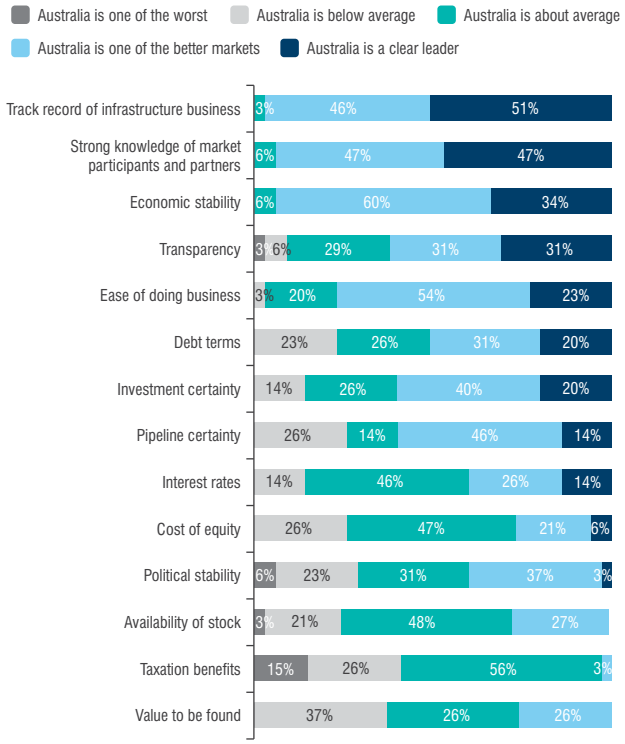
"Tax is a significant issue for overseas investors, local super funds had felt that overseas investors had a tax advantage…The pendulum has swung too far now and there is a disadvantage and a disincentive for foreign investment."

Global investment adviser

"Aussie investors are holding for longer and are less likely to sell, the foreigners are a little bit different. A big part of it is the changes in tax law have made it less attractive and there's less regulatory certainty for them and so we're seeing quite a few of them look to sell assets, even though they're long-term investors."

Investment Bank

Figure 16: How does the Australian market compare to other infrastructure markets?



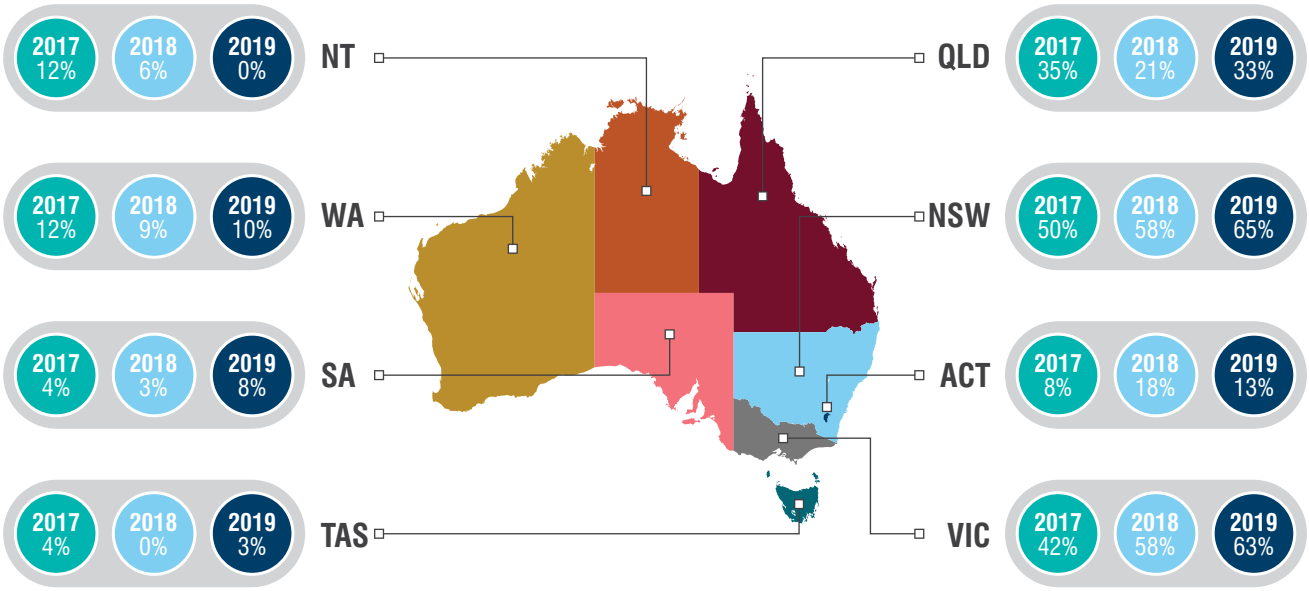
STATE VERSUS STATE

KEY FINDINGS

- NSW (65 per cent) and Victoria (63 per cent) are Australia's most preferred infrastructure investment destinations
- Preference for Queensland has rebounded strongly since last year but remains relatively low
- When deciding which state to invest in, 89 per cent of investors say track record for infrastructure is the most significant factor
- This year, participants reported that availability of stock is emerging as a key factor in determining which state to invest in

New South Wales and Victoria continue to be preferred by investors – matching the significant infrastructure build taking place in both states. Queensland has rebounded after a sharp decline in 2018, with the proportion of participants expressing a preference to invest there rising from 21 per cent to 33 per cent. Interest has increased in Western Australia, South Australia and Tasmania. However, interest in the Australian Capital Territory and the Northern Territory has declined.

Figure 17: Preference to invest on a state-by-state basis



Investors' preference for Australia's two largest states continues to grow in 2019, increasing to 65 per cent in NSW and 63 per cent in Victoria. These figures reinforce the two-speed economy divide in the Australian infrastructure market. NSW and Victoria have had significantly larger infrastructure funding capacity in recent years, much of it as a result of successful asset recycling undertaken by both states. While NSW ranked slightly higher than Victoria, participant comments suggest Victoria has the strongest pipeline of investment opportunities.

Investor preference for NSW and Victoria is directly linked to the large government infrastructure funding programs which are creating investment opportunities in these two states. Combined, the NSW and Victorian governments have committed $125 billion[1] to infrastructure over the next four years, which represents 68 per cent of Australia's total general government infrastructure funding[2] over the period.

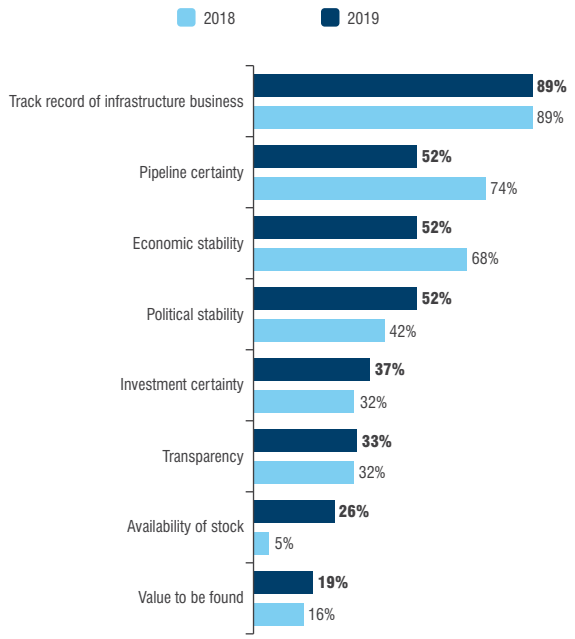
1. Infrastructure Partnerships Australia, *2019-20 Australian Infrastructure Budget Monitor*.
2. General government infrastructure funding does not include funding for government-owned enterprises as these businesses fund their own capital expenditure through user charges.

The largest movement on 2018 results was in Queensland, which rebounded 12 percentage points. This movement can be partly explained by the recent signing of contracts for Queensland's flagship infrastructure project, the Cross-River Rail Public Private Partnership (PPP). SA, Tasmania and WA also increased on the 2018 results, while the ACT and NT declined.

Digging deeper into what drives preference for particular states, Figure 18 shows that track record for infrastructure business remains the most important factor for infrastructure investors. In comparison to the 2018 findings, participants reported that economic stability and pipeline certainty were less important to them this year.

Interestingly, availability of stock is emerging as a more significant determinant of investors' preferences for particular states. This finding supports insights at the market-wide level that there is a lack of opportunities and a high degree of competition for assets.

Figure 18: What drives preference for particular states?



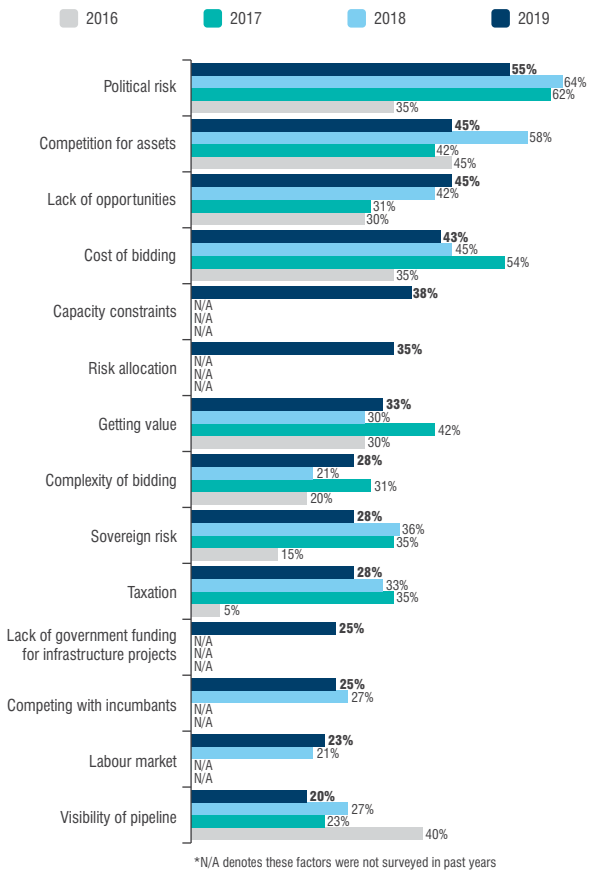
CHALLENGES FOR AUSTRALIAN INFRASTRUCTURE

KEY FINDINGS

- Political risk and regulatory uncertainty have dampened investor appetite
- Competition for assets and lack of opportunities continue to challenge investors
- Cost of bidding is high and risk allocation concerns investors
- Capacity constraints are beginning to impact infrastructure delivery

Participants were asked what they perceived to be the most significant challenges to investing in Australia. Political risk remains the biggest challenge, though it has moderated since last year. While competition for assets and lack of opportunities are challenging investors, these could also be considered signs of a healthy market. The bidding pool is narrowing due to current risk allocation and high cost of bidding for the private sector. Investors are also noticing capacity constraints, particularly for the civil contractors.

Figure 19: Most significant challenges to investing in Australian infrastructure



*N/A denotes these factors were not surveyed in past years

Australia continues to suffer from policy and regulatory uncertainty

Political risks remain the single largest challenge for investors in Australia (Figure 19), this is despite the Federal, NSW and Victorian governments all being returned at their respective elections in the last 12 months. While concern over political risks has declined by nine percentage points since the 2018 survey, suggesting an improvement in the situation, participants have not forgotten past interference and are wary of governments' susceptibility to electorate pressure. In 2019, both the NSW and Federal election campaigns featured threats of cancelling projects.

"People go 'oh yeah, the Government's just cancelled a project, or changed their views, or they're going to take you to court'. Investors have long memories, and so once you do one of those things, it's not like she'll be right next year or we'll just forget about it, I don't think people forget that quickly."

Super fund manager

"When you're dealing with government administrations that don't have large majorities, then they're very sensitive to the mood of the electorate and do have a propensity to make decisions that we would argue are short-sighted and to the detriment of long-term investing."

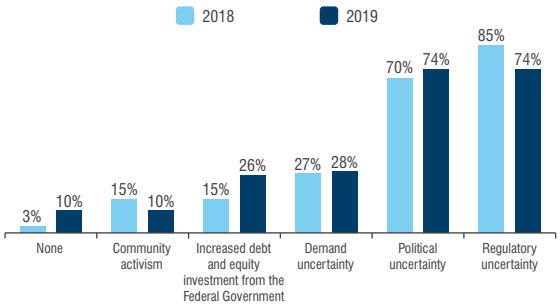
Institutional investor

Participants see political and regulatory uncertainty as a significant problem for the energy sector, where government intervention has been commonplace in recent years. This year, the Federal Government introduced a Default Market Offer for retail electricity prices and is currently seeking to legislate divestment powers. When asked what factors limit investing interest in the energy sector, participants rated political risk and regulatory uncertainty as the most limiting factors (see Figure 20).

"Whether it's the energy regulator, the ACCC, FIRB, or the Government, every one of them is making life more difficult for infrastructure investors, but not in a productive way."

Super fund manager

Figure 20: Factors limiting investor interest in the energy sector



Participants have noted an increase in regulatory reviews and suggest they are detrimentally affecting the value of Australian infrastructure assets. Events contributing to the current atmosphere of uncertainty include delays on the WestConnex transaction caused by the Australian Competition and Consumer Commission failing to complete its competition assessment in a timely fashion, and the Federal Government's proposed 'Big Stick' legislation in the energy sector, which would include divestment powers.

"You don't want to have too much concentration in Australia within your portfolio and to be perfectly honest, Australia is not as safe a place to invest in infrastructure as it was five or 10 years ago."

Super fund manager

"There are two general risks you take. One is you take risk on the GDP or the macro state of the world and the other is you take risk on the regulation that's imposed on an asset. The funny thing is, you look at the impact of Trump or Brexit or what's going on in China, or the Australian economy and just the fact that interest rates are getting so low. But people are still more willing to take the GDP bet, than a bet over regulators, which should spell how concerned people are about the regulators."

Super fund manager

Competition for assets and lack of opportunity continue to challenge investors

Participants rated 'competition for assets' and 'lack of opportunities' equally as the next most significant investing challenges behind political risk (Figure 19). Participants perceive competition in the market to be less of a challenge than last year, (declining from 58 per cent to 45 per cent) and acknowledge competition is also a sign of a healthy market.

"People are becoming more accepting of the fact that competition is everywhere. You have to accept that our market is driven by competitiveness and that's what makes it efficient."

Infrastructure investor & developer

The strong competition for assets is being fuelled by a lack of opportunities for investment and explains participant perception of a lack of value in the market. The high availability of capital in the current environment puts further pressure on investors to find infrastructure assets to deploy it on.

"For mature infrastructure assets, which really requires a privatisation pipeline, there's nothing coming into the market."

Global infrastructure investor

"Certainly, portfolios are getting larger and so equity cheques are getting larger, but I think the limit is just fundamentally, the number of projects."

Investment bank

While Australia is punching above its weight in terms of the number of and size of infrastructure projects being delivered, it remains a smaller market by global standards. Strong competition for assets will help ensure taxpayers and end users receive value in terms of both quality and price when the Government engages private capital in the delivery of public infrastructure. However, opportunities must continue coming to market to keep the major players interested in Australia.

"There's just not many opportunities in Australia at the moment. Governments are delivering stuff but they're delivering it on their own balance sheet."

Super fund manager

Cost of bidding and concerns over risk allocation

Cost of bidding is less of a problem than in recent years, though it is still considered a significant challenge.

Bidding in Australia for public infrastructure projects is a costly and lengthy process. The current influx of civil infrastructure projects in the east coast market has reduced the capacity of bid teams to source suitable personnel, yet also provided them the luxury of picking and choosing which projects to bid for.

Participants noted that some government tender processes are suffering from a lack of bidders. The most notable example of this is WestConnex Stage 3B, or the 'Rozelle Interchange,' which attracted a single bid through an expression of interest process – a bid the government then rejected. To encourage a second bidder to enter the tender process, the NSW Government offered a compensation package of $20 million to cover the bid costs of the unsuccessful bidder.

"We have seen issues in getting engineering advice where there just haven't been enough engineers to go around multiple bidders. It's also an issue for government when they're trying to get competitive tension by getting that third and fourth bidder into the process. It is hard to get additional bidders when all the engineers get snapped up by bidder one and bidder two."

Investment bank

Participants spoke about the risk allocation on major infrastructure projects and its implication for bidding processes. Risk-averse governments have tended to contract out many risks to the private sector, but as the complexity of risk has increased, the pool of capable and willing design and construction bidders has narrowed. Participants are particularly wary of risk allocation within the PPP delivery model, and its effect on partner dynamics and the ultimate profitability of the venture.

"Risk allocation between the public and private sector in PPPs is certainly an issue for contractors in the civil space."

Infrastructure investor & developer

"PPPs are trading at seven per cent internal rates of return. So, everything's got to go your way to make sure that doesn't become a three per cent internal rate of return. That's why a lot of investors won't invest in a PPP style structure, particularly if it carries construction risk."

Global infrastructure investor

A more collaborative approach from government towards risk allocation may help widen the bidding pool and ensure value for money. Last year the NSW Government took initial steps to meet this need for collaboration by releasing an action plan, the Ten Point Commitment to the Construction Sector, which sought to address some of the perceived challenges being faced by the construction market, including risk allocation. Some participants saw the emerging challenge of risk allocation as a sign of a sophisticated market, whereby government and the private sector are learning by testing the ability for the market to price risk on increasingly large and complex projects.

"One of the critical issues right now is governments want competition from different contractors but to encourage it they need to be sensible about the risk allocation. There's no point encouraging everyone then slapping on a contract which is completely one-sided in terms of the risk allocations."

Global investment adviser

"One of the things that's probably not well understood is that it's not always challenges in risk allocation between government and the private sector or government and the contractors, sometimes government takes on too much risk as well."

Infrastructure investor & developer

"I think the market is readjusting, both in terms of the risks contractors are willing to take, but also in that governments are starting to understand that although they need to share the risk, they also need to do the work upfront to take the risk out of projects."

Infrastructure investor developer

"I think government does have a role to play in terms of delivery and being more of a partner with the private sector as opposed to 'them' and 'us' and I think they're getting there on that."

Global investment adviser

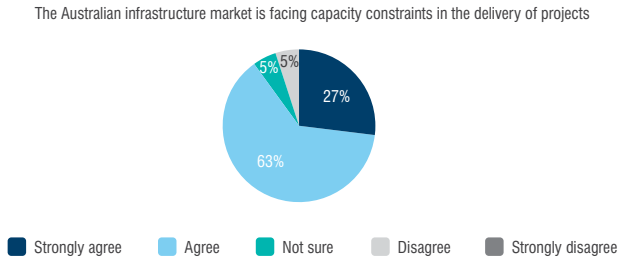
"I differentiate civil transport style PPPs, from social infrastructure PPPs. While the risk allocation looks the same, the way the risks manifest is quite different. Building a 40-kilometre road is very different to building a 40-storey building."

Infrastructure investor & developer

Capacity constraints are impacting the delivery of infrastructure projects and in turn the pipeline

Confirming a very visible market challenge, 90 per cent of participants agreed there are capacity constraints on the delivery of infrastructure projects (Figure 21). Participants have noticed an increase in prices, with respondents seeing this as a symptom of a stretched civil construction sector. Participants have warned that the cyclical nature of rising prices will put pressure on the pipeline by restricting what can be delivered within a government's budget. Some participants noted changes to immigration policy around visas for skilled workers as a factor that has compounded the skills shortages and capacity constraints on major projects.

Figure 21: Is the Australian infrastructure market facing capacity constraints in project delivery?



"There certainly is concern on the capacity of the construction sector to take on major projects. We're starting to see construction prices increase which is a product of supply."

Institutional investor

"Price increases are putting pressure on government budgets which means the pipeline is affected. In NSW it's a direct consequence of having so many of these mega civil style projects going on. Costs are going up on road, rail and tunnelling projects and that's putting pressure on the whole budget and pipeline."

Infrastructure investor & developer

"We're starting to see construction prices increase, which is a product of supply, but also the economics of how projects are bid three, four, or five years ago. Back then the market was quieter, so margins are pretty skinny. Now we're seeing a situation where the pipeline has expanded significantly and contractors are facing pressure on projects which are bid a few years ago, so they are looking to recoup those margins on new projects."

Institutional investor

Participants believe better pipeline visibility and coordination will help to ease the strain, and importantly encourage global participants who require long lead times to enter a new market.

"It's really basic stuff like flagging to the market early what projects are happening and when so people can plan. There's arguably a skills shortage in Australia and there are lots of global companies who want to compete in this country. So it needs to be well telegraphed in advance, when things are coming."

Global investment adviser

"Whether it's a federal project like Snowy 2.0 or whether it's in Queensland, Victoria, or New South Wales, governments need to be a little bit more coordinated in terms of when things are going to happen as opposed to competing. Obviously, everyone wants their projects at the same time though."

Global investment adviser

Interestingly, participants commented that social infrastructure is not experiencing capacity constraints to the same degree as civil and tunnelling projects. Social infrastructure projects draw upon resources from the vertical building sector, which has generally experienced a slowdown due the housing market downturn. This may provide impetus for further funding of social infrastructure projects, from governments that are increasingly reliant on infrastructure spending as an economic lever.

"The skills are different in social infrastructure. The sense I get is that we're not seeing massive constraints in the housing and the vertical buildings market, the constraints seem to be in the civil and tunnelling projects."

Infrastructure investor & developer

CONCLUSION

The 2019 *Australian infrastructure Investment Report* explores a changing risk environment for infrastructure investors. In some ways Australia is a victim of its own success – the market is attractive, so competition for assets has led to a shortage of investment opportunities. On other fronts, policy and regulatory uncertainty are creating unnecessary risks for existing asset owners, as well as those looking at upcoming projects and transactions.

Successive government interventions, tax changes and regulatory reviews in recent years have left many investors unsure of the rules of the game, or the process by which those rules are changed. The risks for investors and the broader infrastructure sector created by this uncertainty offer little reward in exchange and serve to dampen investment into new and existing Australian assets.

At the same time, investors are coming to terms with emerging market dynamics such as a broadening of the definition of infrastructure to include investment opportunities in core-plus assets. This trend sees investors assessing new asset types which offer higher payoffs but with greater risk and volatility.

In traditional infrastructure, investors are concerned by risk allocation and capacity constraints in the delivery of projects. These challenges are symptoms of a flourishing market in which governments have successfully engaged private capital to accelerate Australia's infrastructure pipeline, and as such, these factors will require careful management by all parts of the sector.

As in previous years the *Australian Infrastructure Investment Report* confirms investor interest in the Australian market and offers valuable insight into how we can continue to maintain our status as one of the world's leading infrastructure investment destinations.

For more information on the projects mentioned in this report please visit infrastructurepipeline.org

The Australia & New Zealand Infrastructure Pipeline (infrastructurepipeline.org) provides a detailed and informed picture of upcoming greenfield and brownfield infrastructure investment and major construction opportunities, across the two countries. It is a joint initiative between the Australian & New Zealand Governments and Infrastructure Partnerships Australia.

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