

Australia's infrastructure policy and the COAG National Reform Agenda

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In the last 15 years, Australian governments' infrastructure policy has shifted systematically from directly providing virtually all infrastructure to creating competitive markets where competing public and private suppliers can provide infrastructure efficiently. Wide ranging competition and structural reforms, particularly under National Competition Policy, have underpinned this policy shift. The Productivity Commission (2005) estimated these reforms added about 2.5 per cent to GDP, or about \$7,000 to household income each year.

However, significant opportunities remain to enhance infrastructure markets' performance and hence raise national productivity and wellbeing. Outstanding policy reforms broadly involve making markets more fully competitive where competitive supply is possible and resolving regulatory and planning failings where natural monopolies remain. All governments took an important step forward to address some of these issues, when in February 2006, the Council of Australian Governments agreed to a wide ranging National Reform Agenda (NRA) to build on National Competition Policy. The competition stream of the NRA focuses on reform initiatives in energy, transport and infrastructure regulation and planning; it tackles many, but not all, of these outstanding infrastructure policy issues. Fully implemented, the NRA and other reforms canvassed in this paper would make a significant contribution to ensuring Australian households and businesses receive the most efficient and cost effective infrastructure services possible.

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Introduction

After 15 years of continuous growth, in the midst of a resources boom and a major drought, some Australian infrastructure sectors are showing signs of strain. Communities are suffering water shortages, bulk commodity ships are queuing off some ports, on hot summer days electricity capacity reserves can be quite low in several States and the cost of urban traffic congestion is rising in major cities. While the Fisher Taskforce's report, *Australia's Export Infrastructure* (2005), concluded Australia did not have an infrastructure crisis, it found some parts of the nation's export infrastructure faced immediate capacity constraints and, if not dealt with, some underlying weaknesses in the infrastructure investment environment threatened to make these problems more widespread, compromising Australia's export potential in the next five to ten years. The OECD (2006) and International Monetary Fund (2006) outlined similar concerns about infrastructure market constraints in their recent reviews of the Australian economy. This paper examines best practice policy for infrastructure, analyses many of the major challenges facing Australia's infrastructure sectors and suggests potential policy solutions. It then examines the contribution the Council of Australian Governments' (COAG's) new National Reform Agenda (NRA) should make to resolve a number of these problems when fully implemented.

Because infrastructure is an essential input to virtually all economic activities and contributes directly to people's wellbeing, economically efficient infrastructure policy is crucial to Australia's economic performance. State governments retain constitutional responsibility for most energy and transport infrastructure policies while the Commonwealth Government is responsible for telecommunications policy and some economic regulation of infrastructure through the Trade Practices Act. The basic objective of Australian governments' infrastructure policy is to ensure households and businesses can access high quality, competitively priced infrastructure services in an efficient and sustainable way. However, ensuring infrastructure policies maximise community wellbeing is a challenging task. This is because most infrastructure activities including electricity, gas, water, telecommunications and land, air and sea transport have distinctive public good, externality and/or natural monopoly characteristics. However, if public policy ensures infrastructure markets function effectively, governments usually can allow competing suppliers to provide infrastructure services. Where competition is not possible, governments often need to regulate to ensure monopoly power is not abused or may decide to provide such services themselves. (See Appendix for more discussion of monopoly power issues.)

Over the past 15 years, Australian governments, like many others in the OECD, have reformed their infrastructure policies. As part of their broader microeconomic reform agenda to boost productivity and growth, governments have shifted systematically from directly providing virtually all infrastructure to creating markets where competing public and private suppliers can efficiently provide infrastructure services.

Indeed, as shown in the article 'Trends in Infrastructure' in this edition of the Treasury *Economic Roundup*, the share of private sector investment in infrastructure has markedly increased since the mid-1990s, to more than off-set a moderate decline in total public sector infrastructure investment during this period. As a result of rising private investment, the ratio of total Australian infrastructure investment to GDP rose from an average of around 3 per cent from 1987 to 2000 to almost 4.5 per cent by 2006 (Coombs and Roberts 2007).

However, Australia's infrastructure policy reforms are incomplete. This paper examines a range of factors constraining complete infrastructure markets and efficient infrastructure regulation. These policy issues can contribute to uncertainty that may discourage timely new investment and can generate actual or potential infrastructure bottlenecks and raise infrastructure prices for users.

Pressures to provide infrastructure in the most efficient way are increasing. Lower barriers to international trade and foreign investment, along with financial sector and other microeconomic reforms have increased the trade intensity of the economy. Technological advances also increase the importance of innovation in infrastructure provision and provide opportunities to recover costs through user charges.

Best practice infrastructure policies

Understanding why, when and how governments and the private sector can participate effectively in infrastructure provision is essential to delivering an efficient policy environment and maximising community gains from infrastructure policy. Given that most infrastructure sectors exhibit special characteristics, government infrastructure policy needs to:

- understand the monopoly nature of much infrastructure;
- prevent exploitation of monopoly power by, wherever possible, introducing competition in and for infrastructure service markets, or, if competition is not possible, appropriately regulating these markets; and
- recognise and allow for public good characteristics and externalities of some infrastructure services.²

² This section of the paper draws on the 'Principles of Infrastructure Provision' chapter of an East Asian Analytical Unit (1998) report led by Frances Perkins.

Public or private ownership?

The ownership of infrastructure assets is a sensitive community issue in many countries and Australia is no exception. This is due primarily to public sector employees' concerns about job losses and consumers' fears of reduced service levels and higher prices from privatised suppliers, particularly where public utilities' prices have been held artificially low or are used to subsidise certain groups. However, in all but a few centrally planned economies, privately owned businesses operating in competitive markets supply most goods and services. Because private firms' profits and management incomes typically are more closely linked to their performance, they generally respond better to customer demands and price signals.³ Hence, most consumers accept that, at least in sectors without significant public good, externality or natural monopoly characteristics, competing providers are more likely to supply high quality and competitively priced goods and services, compared to public sector monopolies using non-market resource allocation mechanisms. The economic efficiency losses from underpricing infrastructure services and the significant fiscal burden and risks imposed on taxpayers from developing new infrastructure create further incentives for governments to recoup fully the cost of infrastructure services and seek private involvement where appropriate.

One argument advanced for government ownership is that infrastructure supplies essential services, or merit goods, with benefits extending beyond direct users to the community more broadly. However, while water supply, sewage treatment, transport, energy and telecommunications certainly are essential services, this does not in itself justify public sector provision.⁴ Food is at least as essential as these services, but given the agricultural failures of centrally planned economies, few would argue that public sector provision increases food security.

Without public ownership, governments can ensure healthy competition in infrastructure industries and monitor reliability and safety standards as they do in

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- 3 They also are more likely to minimise costs and innovate in technology and service provision than are state owned entities. Effective public sector managers are less likely to be rewarded than their private sector counterparts for cutting costs or increasing revenue because public enterprises do not keep their profits. As a consequence, public managers often can invest in excessively secure systems or 'gold plated' investments to ensure they never fail, rather than implementing more cost-effective risk management strategies. The very negative public and political reaction to public infrastructure failures such as Auckland's power supply breakdown in 1998 and the failure of Sydney's water treatment plants and possible outer-catchments containment in 1998 show why public authorities often adopt such risk averse strategies.
 - 4 While minimum quantities of water and acceptable levels of sanitation prevent the outbreak of disease, generating considerable community benefits, direct government provision is not the only, or necessarily the most efficient way, to ensure even these most essential services are supplied.

other industries such as food and hospitality. In fact, governments arguably can regulate standards more effectively when they do not own and operate firms in the regulated industry; remaining an impartial umpire is difficult when you are also playing in the game.

While public ownership may reduce efficiency, it also can generate benefits. As discussed in the following sections, public ownership of infrastructure assets, regulatory control or government subsidies are more likely to deliver net benefits for the community if infrastructure exhibits significant public good, externality or natural monopoly characteristics. Other motivations for government ownership include providing a source of information for regulators, thereby making regulation easier and cheaper, and achieving social objectives that cannot be secured readily by other means.⁵ To determine whether the public sector should invest in infrastructure assets decision makers need to assess competing projects using robust and transparent cost benefit analysis.⁶

Alternatively, governments can recognise some infrastructure's public good and externality characteristics or achieve social objectives by offering subsidies to private operators, preferably in the form of contestable community service obligations.⁷ For example, rather than owning airlines that operate financially unviable services to isolated areas as they did in the past, Australian governments now provide contestable subsidies to private airlines to operate such services.

Public goods and externalities

Public ownership is likely to be necessary if the infrastructure is a pure public good. (See Appendix for a discussion of the characteristics of public goods.) For example, governments around the world typically supply public roads and urban infrastructure like footpaths and street lighting, which have strong public good characteristics.

5 Sometimes governments decide that maintaining public ownership is the best way to provide subsidies to targeted groups in the community. The relative costs of public ownership may be low when production processes are simple, the asset has substantial monopoly power and the information costs of regulating a private monopoly are high.

6 If private operation of an infrastructure service is not financially viable but the service is expected to generate positive net economic benefits for the community, due to externality or public good characteristics, the government could justify providing the service itself. The net economic benefits of selected projects should have the highest present value among all alternative uses of public funds.

7 Transparent, on-budget subsidies to competing suppliers to meet specified community service obligations should not exceed the net economic benefits (including positive externalities) derived from the infrastructure. If a government offers subsidies, the best approach is to ask market participants to bid to provide the service through a competitive tender process, with the bidder requiring the lowest subsidy to provide the service winning the contract.

Without subsidies, private sector providers cannot provide such pure public goods because they cannot efficiently charge people for using them.⁸ However, even public ownership of infrastructure services does not preclude private sector participation as the construction of infrastructure can involve private contractors, leaving the operation and ownership of the assets in public hands.

Governments also often play an important role in funding and providing infrastructure that generates significant externality, or spillover, benefits to the community. For example road, rail and public transport networks typically generate benefits beyond those immediately enjoyed by direct users that can increase land values in surrounding areas. Infrastructure generating significant positive externalities may be underprovided if governments do not subsidise it in some way.⁹ Hence, governments may decide to install such infrastructure itself and tax those, like landowners, receiving external benefits from it.

Similarly, infrastructure assets and services which produce negative externalities, such as noise, traffic accidents or pollution, may be overprovided if governments do not tax or regulate their provision. Congestion charges in urban areas, regulations requiring trucks to install quieter braking systems and prohibitions on heavy vehicles entering certain urban areas are some methods of discouraging activities or technologies which create negative externalities.

Monopoly networks and market power

The most critical difference between most infrastructure sectors and other industries is that many infrastructure industries have at their core networks that are natural monopolies (monopoly networks are discussed more in the Appendix). These include high voltage electricity transmission wires, fixed telephone lines, water and gas pipe networks, road and railway networks or regulated connections between transport nodes such as air routes. Inter-modal facilities like ports, rail hubs and airports also can possess monopoly power if suitable sites are not available to reproduce facilities or the current market is only large enough to justify one efficient facility in a particular location. As new entrants usually cannot threaten owners of such electricity, water or gas networks the owners could exploit their monopoly power without regulatory

8 Public provision of most roads is likely to remain unless it is technically feasible to charge for access. However, in many markets overseas, on toll roads and in some cities, telematic and related technologies now often charge vehicles directly for their actual use of roads.

9 This is because potential private sector investors will only value the revenue they can generate from charging the infrastructure's direct users, not any external benefits it may generate for the community. Thus if externalities are sufficiently large, a commercially unviable project still could have positive net economic benefits for the community.

oversight.¹⁰ Unregulated monopolies can earn excessive profits in the long term by constraining their output below, and pushing their prices above, levels that normally would hold in fully competitive markets.

However, not all infrastructure assets are pure natural monopolies and some can be duplicated efficiently and compete with each other even when they possess a level of market power. Such assets include ports, airports or rail hub inter-modal facilities in reasonable proximity to each other.¹¹ Road, rail, sea and air transport networks also can compete with each other to provide many but not all services. Similarly, mobile phone services, cable and Voice-over Internet Protocol now compete with fixed line telephony, reducing the monopoly power of telecom incumbents and allowing new players to enter these markets.

Governments also can play an important role in facilitating competition between infrastructure assets that are not pure monopolies but have some market power, thereby expanding service levels and/or reducing prices for users. Where it is economically viable to do so, governments can help reduce the monopoly power of incumbents by providing opportunities for investors to establish competing infrastructure assets and services. They also can prevent dominant incumbent infrastructure owners from bidding for limited sites or market niches for potentially competing facilities. For example, if an entity owns the main inter-modal (rail head) facility or airport in a city and the government decides to release land suitable for a competing facility, the inter-modal facility or airport owner incumbent could be proscribed from bidding to establish the new facility.¹² The two separately owned rail heads or airports could then create competitive pressures on each other, potentially reducing user charges and improving service quality. Similarly, if a port has a dominant position in a particular region and the government decides to open up a new port site, the private or public owners of the existing port or facility preferably should not be permitted to bid for the new potentially competing site.¹³

In the past, many governments addressed infrastructure networks' market power by publicly owning and operating integrated utilities that included these networks.

10 Replicating electricity transmission lines, water pipe networks and reticulated gas pipelines typically is not efficient as these networks are a major component of industry costs.

11 Typically infrastructure service providers like air, sea, road or rail transport service providers, loading facilities or stevedoring services within such transport hubs do not have any natural monopoly power and can compete in open entry markets.

12 In the case of rail heads, to remove incentives to restrict access to the new facility, such inter-modal facilities would be better developed by unbundled track owners or third parties, rather than integrated track and rail service providers.

13 Finally, if a port has only two stevedores and the government decides to develop a third berth which could compete with incumbents, the existing players should not be permitted to bid to provide this service.

However, they now increasingly recognise that competing suppliers often can provide lower cost and higher quality services than public utilities. Hence governments have sought alternative ways of addressing monopoly network power issues to reap the benefits of competing operators delivering infrastructure services.

Unbundle or integrate?

The most important first step in this process is for governments to consider vertically and horizontally separating, or 'unbundling', integrated infrastructure monopolies into their competitive and natural monopoly elements. While most integrated infrastructure utilities have natural monopoly network components at the centre of their operations they also include activities that smaller competing firms could supply more efficiently. Examples of unbundled infrastructure facilities and activities that can be supplied competitively include electricity generating plants, electricity retailing, water and sewage treatment plants, telephone exchanges and telephony retailing, rail passenger and freight services and gas wells, treatment plants, compressors and retailing. Unbundling is particularly important if the infrastructure is going to be privatised. Owners of vertically integrated networks and service activities have a commercial incentive to restrict access to their network to advantage their service supplying activities over other suppliers.

Benefits and costs of unbundling

Once competitive business segments are unbundled from monopoly networks, the competitive elements of the industry can be fully privatised without needing significant regulation. So long as they operate in a competitive market environment, privatisation will help pass on the gains from commercial efficiencies to customers, without government intervening with 'heavy handed' pricing or rate of return regulation. Infrastructure networks also can be privatised after unbundling, but typically will require ongoing access and price regulation.¹⁴

If an infrastructure network is separated from the industry's competitive components, and network access is assured by legislation, potential new entrants need not duplicate expensive network investments to compete. Instead, as in normal industries, new competitors can enter merely by investing in production capacity. Even major investments like power stations will not deter new entrants so long as they are guaranteed access to the network at economically efficient prices. The costs and decision delays associated with managing and operating large firms often provide

¹⁴ Owners of vertically separated infrastructure networks will have an incentive to provide competing suppliers access to their network, but if they have market power, may seek to charge excessive tariffs for such access.

opportunities for nimble competitors to exploit new technologies and gain market footholds.

The main potential cost of vertically separating infrastructure and regulating to mandate access to monopoly networks is that network owners who also provide services in competition with other access seekers may be unwilling to invest in new networks if they cannot have exclusive access.¹⁵ Even if potential network investors are not also competing with service providers, mandatory access and regulated prices may cap the upside of returns from new investments while network investors carry the risk of losses from the investment. Hence, some investors seek 'access holidays' for new network investments so they can capture more of the up-side from their investment.¹⁶

When to unbundle?

A government that owns an integrated infrastructure monopoly can significantly influence the future structure and performance of the industry by allocating its competing and monopoly activities to different companies before privatising it. Unbundling can produce a more efficient and fairer outcome for consumers by increasing competition and allowing a more transparent and stable regulatory regime. In 1995, the COAG adopted National Competition Policy (NCP), committing governments that were considering privatising public monopolies to undertake reviews to determine, inter alia, the merits of separating the natural monopoly elements from potentially competitive elements.¹⁷ If a public monopoly is privatised as a monopoly, or a private firm invests in integrated monopoly infrastructure, subsequent sectoral restructuring options are limited.

Monopoly network access regulation

Governments play a crucial role in regulating access to monopoly networks such as electricity transmission lines, fixed telecommunication lines and rail networks. Monopoly networks can either be retained in public hands, as is the standard gauge

15 Certain industry characteristics also can generate benefits from vertical integration. For example, vertical integration of track and rail services can reduce the risk of higher maintenance costs because poor track and train wheel maintenance can increase costs for rail service and rail network operators, respectively. Integration of electricity generators and retailers can also save some financial risk hedging expenses. However, such types of integration, if widespread, may discourage new entrants into these activities.

16 For example, Australia's gas access regime now allows proposed international gas pipelines to apply for a 15 year price regulation exemption. Under the exemption, pipelines are not subject to price regulation but may be subject to other forms of economic regulation such as ring fencing arrangements.

17 Paragraph 4(3)(b) of the Competition Policy Agreement.

interstate rail network operated by Australian Rail Track Corporation (ARTC)¹⁸, or sold or leased to private sector operators, as were the Victorian and South Australian electricity transmission networks and the Victorian, South Australian, Tasmanian and Western Australian rail networks. Both publicly and privately owned monopoly networks typically are placed under national or state based access regimes to prevent network owners from exploiting their monopoly power. These regimes require infrastructure owners to provide third parties with access to their networks under commercially negotiated or independently arbitrated terms and conditions, including access fees and tariffs.

Motivation and conditions for successful privatisation

Privatising monopoly assets should aim to benefit consumers through lower prices and improved services. However, this will only occur if the market and regulatory environment maintains appropriate competitive and regulatory pressures on private operators and ensures they meet necessary safety and quality standards. A low market value for public assets can indicate the government has not established transparent or stable regulatory process, exposing buyers to sovereign risk. Alternatively, a very high sale price for privatised assets can indicate that the new private owners expect to reap monopoly profits at the expense of consumers, because the market structure of the industry into which it is privatised does not encourage competition or regulation is ineffective in controlling monopoly power.

Private Public Partnerships

Private Public Partnerships (PPPs) is a term used rather imprecisely in public debates to cover a wide range of quite different infrastructure provision arrangements involving public and private participants. At one end of the spectrum are conventional private sector infrastructure investments in which the private investor carries all the commercial, operational, foreign exchange and sovereign risk of the investment. At the other end are contractual arrangements under which private sector participants may install and operate infrastructure in return for guaranteed revenue flows and taxation benefits while governments carry most or all of the project's risk. Sometimes, governments' desire to take major investments off their balance sheets to improve their apparent debt position may motivate the latter arrangements.

¹⁸ The ARTC was created in 1997 to operate and manage Australian, State and Territory government-owned rail tracks. As part of its establishment, the ARTC was required to submit an undertaking to the ACCC under Part IIIA of the *Trade Practices Act 1974* that would facilitate access to its rail network by third party rail operators. The ARTC is wholly owned by the Australian Government and in addition to ARTC's own capital investment program it also receives investment funding from the Australian Government's AusLink program.

Private infrastructure investment in well regulated competitive markets can boost the productivity of infrastructure investment and relieve taxpayers of commercial risks they are not well suited to bear. Many NCP reforms aim to increase such private participation. However, artificial infrastructure investment arrangements leave governments carrying most of the risks while guaranteeing private participants often inflated, non-transparent and non-contestable profits will not achieve these important objectives and could reduce community wellbeing.¹⁹

The role of National Competition Policy and the Trade Practices Act

Since 1995, NCP has played a crucial role in Australia's infrastructure policy reforms. In the Competition Policy Agreement, one of the key underpinning agreements of NCP, Australian governments agreed to implement competitive neutrality principles, ensuring public and private companies operated on a level regulatory playing field, and to structurally reform public monopolies. The CPA committed governments, where appropriate, to corporatise and consider unbundling integrated publicly owned infrastructure monopolies into natural monopoly networks and competing infrastructure facilities and service providers prior to privatisation. Government business enterprises also became subject to the competition provisions of the *Trade Practices Act 1974*. These reforms allowed private firms to compete in many previously government dominated infrastructure markets like electricity, rail and telecommunications. The independent National Competition Council (NCC), created to oversee the NCP, monitor reforms across jurisdictions, advise on competition payments and transparently report on its progress is considered a key factor in the NCP's success (Productivity Commission 2005).

Part IIIA of the Trade Practices Act and State-based access regimes also play an important role in Australia's infrastructure policy. The intention of Part IIIA is to ensure significant infrastructure with natural monopoly characteristics does not create a barrier to competition in related markets. Under these regimes, businesses can seek access to nationally important infrastructure services on reasonable terms where duplicating monopoly infrastructure would not be feasible economically, access would facilitate competition in upstream and downstream markets and commercial negotiations with the infrastructure owner or operator have failed. If requested by a third party access seeker, the Treasurer or relevant state minister, with advice from the

19 The Public Sector Comparator is a tool developed by the Australian Department of Finance and Administration to assist in assessing the value of private sector involvement in infrastructure investments (DOFA 2002). The Public Sector Comparator acts as a neutral benchmark to value the outputs and costs of privately financed project proposals, including the transfer of project risks from the government to a private proponent to help determine whether a project is best financed by the private or public sector.

National Competition Council (NCC) can 'declare' significant private or government-owned infrastructure. Declaration of a service gives any access seeker the right to apply for a binding arbitration before the ACCC if access terms and conditions cannot be agreed through commercial negotiations with the service provider. Part IIIA also allows firms to provide to the ACCC voluntary access undertakings that set out terms and conditions of third party access to their infrastructure.

After one and a half decades of reforms, most Australian infrastructure services including mobile and fixed line phone services, broadcasting, electricity generation and retailing, gas production and retailing and air, road, rail and sea freight and passenger services are provided successfully in competitive markets. In addition, many infrastructure facilities including fixed and mobile phone networks, electricity transmission and distribution lines, reticulated gas networks, railway networks, toll roads, ports and some water supply facilities are owned and operated successfully by competing firms. The Coombs and Roberts (2007) article in this issue of the Treasury *Economic Roundup* shows private sector investment's contribution to total Australian infrastructure investment doubled from the mid-1990s to mid-2006. Over this period, private infrastructure investment increased from under 1 per cent to about 2.8 per cent of GDP, while total infrastructure investment rose from 3 to 4.5 of GDP.

Benefits of NCP infrastructure policy reforms

Infrastructure policy reform has been central to NCP's success in boosting national productivity and growth. The Productivity Commission's *Review of National Competition Policy Reforms* (2005) found productivity gains in the six major infrastructure sectors which underwent most reform permanently added at least 2.5 per cent to gross domestic product over the period 1990 to 2003, raising average income in all but one of 57 regions studied across Australia and in all income groups. Output per worker in electricity, gas, urban water, telecommunications and rail freight sectors more than doubled over the 1990s. The Productivity Commission also found NCP and related structural reforms significantly reduced the cost of infrastructure services, particularly for business users of telecoms, electricity and land transport services.

While Australia has made major advances in its infrastructure provision policy in the last two decades, several major areas could benefit from further reforms. For example, in many infrastructure sectors prices do not reflect the full cost of provision. Several sectors without significant public good aspects still operate an inefficient mix of direct government provider and competing public and private supplier approaches to infrastructure provision. Some regulatory regimes and planning processes cause delays and uncertainty for investors. Together, these issues reduce potential productivity gains from infrastructure reforms, undermine investor confidence,

increase the risk of supply disruptions in vital sectors like electricity and contribute to congestion in ports and land transport.

The National Reform Agenda

In February 2006, COAG announced the NRA, a broad ranging 10 year microeconomic reform program aimed at raising economic productivity and workforce participation to help underpin Australia's future prosperity. The NRA seeks to build on the successes and lessons of the National Competition Policy reforms that commenced in 1995.

The NRA encompasses competition and regulation reforms in energy, transport, infrastructure regulation and best practice regulation as well as initiatives to enhance the capability and contribution of the Australian people – the nation's human capital (see Box 1).

Box 1: A snapshot of the NRA

The NRA's three streams aim to improve competitive markets in key infrastructure sectors, promote better regulation and enhance the nation's human capital.

Competition	Regulation	Human capital
<p>Energy — Strengthen the national electricity market, encourage more efficient energy use and investment.</p> <p>Transport — Increase the efficiency of land freight pricing, planning and regulation; reduce urban congestion.</p> <p>Infrastructure regulation and planning — Promote a simpler and more consistent national approach to regulation of significant infrastructure.</p>	<p>Promote best-practice regulation by strengthening gate-keeping for new regulation and reviewing regulation stock.</p> <p>Reduce regulatory burden focusing initially on ten identified 'hot spots'.</p>	<p>Early Childhood — Improving childhood development outcomes in the first five years of a child's life, up to and including school entry.</p> <p>Diabetes — Improving health outcomes and building on the national Chronic Disease Strategy and the Australian Better Health Initiative.</p> <p>Literacy and numeracy — improving student outcomes on literacy and numeracy.</p> <p>Child care — Encouraging and supporting workforce participation of parents with dependent children.</p>

Note: COAG's NRA is outlined at <http://www.coag.gov.au>

The infrastructure reform elements of the NRA are designed to address many, but certainly not all, of the infrastructure policy issues discussed in the following section of this paper, drawing on approaches outlined in the policy best practice sections above. When fully implemented, these NRA reforms should deliver electricity and land transport charges that better reflect their financial and economic cost of provision and

Australia's infrastructure policy

other structural reforms to ensure more competitive energy and land transport markets.

The NRA also aims to streamline and harmonise infrastructure regulation, with all heads of governments signing the Competition and Infrastructure Regulation Agreement (CIRA) at the 10 February COAG meeting as part of the NRA. The CIRA commits all governments to ensuring infrastructure service suppliers can access significant monopoly infrastructure facilities in a more timely and nationally consistent way.

However, NRA does not include facilities for water reform, which is covered by the National Water Initiative, or telecommunication sector reforms, which the Australian Government has progressed separately.

To help inform the detail of infrastructure reforms to be progressed under the NRA, COAG initiated three reviews to report by the end of 2006. These are the Productivity Commission's inquiry into road and rail pricing, the Energy Reform Implementation Group's inquiry into national energy markets and a joint Commonwealth, state and territory review of urban congestion.

Major issues confronting Australian infrastructure policy

While most Australian infrastructure sectors are operating reasonably effectively, several are confronting current or future capacity constraints, service quality or congestion problems, inefficient pricing or other regulatory and efficiency issues. These issues can be grouped under two broad headings: an absence of competitive markets in sectors where competitive supply is possible; and regulatory and planning shortcomings, particularly of monopoly infrastructure that cannot be supplied competitively.

As discussed below, reform being progressed under the NRA will go some way to address a number of (although not all) of the issues confronting Australian infrastructure policy.

Difficulties in creating competitive markets

Governments have an important role in encouraging competitive markets for infrastructure services and assets which are not pure monopolies. As discussed above, this is because competitive, functioning markets usually provide consumers with the best long term guarantee of efficient service supply. Inefficient infrastructure asset and service pricing sends distorted signals to users and investors and can cause inefficient use and investment, particularly in the electricity, water and road sectors. Insufficient competitive neutrality between publicly and privately owned infrastructure operators

also can undermine efficient markets. Inadequate treatment of externalities, including those generated by greenhouse gas emissions and congestion, also can compromise the efficient operation of competitive markets.

Inefficient infrastructure service pricing — electricity, water, road and rail

When governments price infrastructure services below the full cost of provision to achieve social or political objectives it inhibits the operation of competitive markets and distorts price and investment signals received by consumers and investors. Despite reforms over the last decade, inefficient pricing remains a feature of many government provided or price controlled infrastructure services in Australia.

Electricity

Most jurisdictions continue to cap the tariffs households pay for electricity; such caps concern retailers as they may fall below the full economic cost of supply. Some submissions to the Productivity Commission's Review of National Competition Policy (2005) and to COAG's Energy Reform Implementation Group (2006a) indicated private infrastructure investors are unwilling to commit to new base load power stations in part because of significant sovereign risk that price caps and government investment in the sector can suppress profits below commercial levels.²⁰ Transparent subsidies to specific disadvantaged consumers, progressive taxation and/or targeted income support payments to such groups are likely to be more efficient methods of achieving social equity objectives than utility price caps for all consumers. This is because the latter provide the largest subsidies to the heaviest users of the service, who typically are high income consumers.²¹ Furthermore, price caps inhibit consumers receiving efficient price signals, encouraging excessive electricity use. The Ministerial Council on Energy (MCE) has agreed a process which will see price caps removed when electricity markets are considered sufficiently competitive. COAG recommitted to this MCE reform program under the NRA.²²

20 The Business Council of Australia (2005) contends that electricity price restrictions depress supply-side investment signals for new generating capacity. This claim must be assessed seriously when most National Electricity Market states now need new base load capacity investment.

21 Transparent community service obligations could represent an effective instrument to address consumer welfare concerns relating to access to essential infrastructure services. Such a mechanism could allow social policy objectives to be met while not artificially suppressing prices.

22 The NRA's energy reform package committed governments to work collectively to strengthen the national energy market by recommitting to the ongoing MCE reform programme and a series of new reforms. The MCE's existing reform package includes phasing out household electricity price caps once retail electricity markets are fully competitive.

The increasing 'peakiness' of power demand, mainly due to the rapid uptake of air conditioners, is raising the proportion of generation capacity that operates for only a small proportion of the time. This trend reduces the overall capital efficiency of generating equipment, raising the average cost of generation. However, most households do not have electricity meters that can measure their electricity use throughout the day. This makes it impossible for retailers to introduce time-of-day pricing to account for the considerably higher cost of supplying peak time electricity. Interval pricing may allow consumers to moderate or spread their peak electricity demand and reduce their overall energy costs.²³ A range of other market regulations and structures also inhibit consumers and businesses from better tailoring their electricity demand to the actual cost of supplying them throughout the day or week.

In February 2006, under the NRA, COAG committed to the progressive national roll out of 'smart' electricity meters from 2007 to allow the introduction of time of day pricing and to allow users to better manage their demand for peak power, only where benefits outweigh costs for residential users and in accordance with an implementation plan that has regard to costs and benefits and takes account of different market circumstances in each State and Territory. The MCE was tasked with agreeing common technical standards for such meters and a timetable for their roll out from 2007. COAG also asked the MCE to develop a range of other demand side management policies to increase electricity markets' demand responsiveness.

Water

Efficient pricing arrangements which enable full cost recovery are also essential to creating functioning water markets to manage Australia's scarce water resources better. Such arrangements are necessary to encourage private investors to invest in the water sector and to ensure current assets can be replaced and expanded in an efficient and sustainable manner. Notwithstanding a decade of NCP reforms and the subsequent introduction of the National Water Initiative (NWI) in 2004, few water users pay the full cost associated with supplying them water and the scarcity value of this water.²⁴ Central to the NWI is the establishment of functioning water markets to allow the scarcity value of water to be priced, promoting its allocation to the highest value uses. To date, about 4 per cent of permanent water entitlements is traded (Australian Bureau of Statistics 2006) though a much larger volume of water is traded temporarily. Progress has been slow, lagging behind COAG's agreed implementation

23 Preliminary trials of smart meters in Queanbeyan, NSW, in 2006 tentatively indicate that consumers on average reduce their overall power bills

24 Nevertheless, legitimate debate exists regarding whether the full pricing of the scarcity value of water is the appropriate way to allocate essential water requirements to households. For example, the ACT has a two tier tariff which prices basic water allocations to households at a very low tariff and higher volumes at a more market orientated tariff.

timetable with many factors impeding rural water market development (Productivity Commission 2006b).

Progress in implementing cost reflective pricing has been faster in urban Australia than in rural areas. Under the NWI, COAG agreed that urban water business tariffs would move toward 'upper bound' pricing, recovering all operating costs in storing and delivering water and the cost of their capital assets, by 2008.²⁵ Considerable progress had already been made in this area under the NCP. However, urban water users generally will not be required to pay for the scarcity value of water under NWI. Governments typically prefer to ration scarce water via demand management strategies such as water restrictions. The NWI committed rural irrigation and water supply authorities to covering their 'lower bound' prices and moving towards 'upper bound' prices where practicable, but did not put a deadline on achieving these objectives.²⁶

Roads

Under the PAYGO (pay as you go) system, Australian heavy vehicles pay a combination of road user charges in the form of a fuel tax and registration fees to recoup estimated annual expenditure on roads attributable to their road use. The amount paid varies very approximately with the distance travelled and mass of heavy vehicles but not with their location.²⁷ Probably more importantly, the current road

25 COAG committed to implementing upper bound pricing in urban areas and lower bound pricing in rural and regional systems (with a movement towards upper bound where practicable). Lower bound pricing are water charges sufficient to recover the operational, maintenance and administrative costs associated with storing and delivering water, externalities (the environmental and natural resources management costs attributable to and incurred by the water business), taxes and tax equivalents (not including income tax), the interest cost on debt, dividends and provision for future asset refurbishment/replacement. Upper bound pricing includes lower bound pricing plus provision for the cost of asset consumption and cost of capital.

26 As defined in previous footnote.

27 Currently, fuel taxes for heavy vehicles provide a rough proxy for distance travelled; the further a vehicle travels, the more fuel tax its owner pays. Registration charges provide an even rougher proxy for mass carried, but in general the largest heavy vehicles pay more registration than lighter trucks. However, the current charging system cannot capture the location of vehicles and so users do not receive price signals that reflect the marginal damage they impose on different types of road surface or by being on congested or uncongested routes at different times of the day, week or year.

transport charging, revenue allocation and investment system does not provide credible price or profit signals to potential public or private land transport investors.²⁸

Several European countries now directly charge heavy vehicles for their road use. Direct charging of heavy vehicles based on their mass, distance travelled and location has the potential to provide more accurate price signals to operators, encouraging them to choose the most efficient routes, vehicles and travel times. Rail, air, and sea freight users already pay tariffs based on weight, distance travelled, time and location of services. Direct charging also could reform road investment approaches, allowing road investment to target areas of growing demand better. NSW is trialling a permit system allowing access to its roads for vehicles above the previous legal weight limit, enforcing route compliance using the Intelligent Access Program.²⁹

While passenger vehicles also pay for their overall road use through fuel taxes and registration fees, Australian cities typically do not employ road user charging with location or time of day elements.³⁰ Instead they mostly rely on queuing to ration congested urban roads. In 2000, the Bureau of Transport and Regional Economics (BTRE) estimated the total cost of traffic congestion in Australia's major cities was around \$13 billion a year, predicting if nothing were done to address this problem the cost could rise to almost \$30 billion a year by 2015 (BTRE 2000). The BTRE plans to release updated data in April 2007. Under-pricing access to congested roads also is likely to reduce the viability of public transport services, aggravating traffic congestion. The Greater London Authority currently levies road use charges to ration congested road space and employs the revenue to improve public transport,

28 While the PAYGO system may require heavy vehicles to repay their estimated share of additional spending on roads averaged over the last three years, it does not provide any indication of where new demand pressures are emerging or provide incentives for efficient and timely new investment going forward.

29 Transport Certification Australia expects to introduce the Intelligent Access Program (IAP) on behalf of the Australian Transport Council by mid 2007. IAP is a voluntary scheme that remotely monitors heavy vehicles using telematics services using the global Navigation Satellite System and other sensors to monitor parameters such as vehicle identification, route, temporal and speed compliance (Transport Certification Australia 2006). NSW high mass limit permit holders are required to join IAP when it comes on line.

30 Toll roads have been used to address congestion but typically do not use time of day charging. Experience has found they are best to be introduced within a coherently planned network and charging regimes to avoid inefficient diversion to non-toll roads and welfare losses by road users and taxpayers.

expanding alternative travel options. Sydney and Melbourne use parking levies in the CBD to discourage the use of private transport.³¹

Under the transport stream of the NRA, COAG asked the Productivity Commission to review the full financial, and if feasible economic and social costs of road and rail freight infrastructure to recommend options to COAG for transitioning to a consistent and competitively neutral pricing regime. Its final report was delivered to the Government and COAG in January 2007. In its discussion draft released in October 2006, the Commission found no compelling evidence that road freight is subsidised relative to rail, even accounting for externalities. It maintained that even if road charges were greatly increased rail would not derive much benefit because road and rail services only compete directly for about 10 to 15 per cent of the freight market. The Commission believed a more serious efficiency issue was the lack of connection between road charging and investment decisions. It noted developments in road pricing technology create the opportunity for location-based charges and anticipated that if an independent jurisdictional road fund created a link between such road charges and efficient investment it could generate significant potential efficiency gains (Productivity Commission 2006a).

In all these sectors, prices which do not reflect the full cost of supplying infrastructure services could be expected to create excessive consumer demand and undermine incentives for new investment. Electricity price caps on household bills, with other problems in this sector discussed in this paper, increase the possibility State governments will have to step in to fund new base load power stations in future, even though their stated preference is for private suppliers to make such new investments. Inappropriate water and road pricing also contributes to water shortages, inefficient road investment and growing urban congestion.

Government ownership of assets — electricity and ports

Another aspect of Australia's infrastructure policy is that several State and Territory governments continue to own and operate key infrastructure including electricity, ports and rail assets, while in other jurisdictions such assets are privately owned and operated. Where governments continue to regulate their own and competing private or public assets, a perceived conflict of interest may arise for governments between their roles as infrastructure regulators and owners. As governments may have an incentive to use their regulatory and planning powers to protect returns on their

31 Since 1992 Sydney has imposed parking levies in some areas of the city and used the proceeds to develop infrastructure which encourages public transport use. A recent study by the NSW Government found a higher proportion of passenger trips to these levied areas is by public transport. Melbourne imposed a levy of \$400 per annum on long stay car parks in the CBD in 2006 and will raise this to \$800 in 2007.

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assets, private sector operators may be unwilling to compete with government-owned enterprises in such circumstances.

While decisions on the ownership of assets is a matter for individual governments, as part of the NRA's CIRA all governments have committed to enhance the application of competitive neutrality principles to government business enterprises engaged in significant business activities in competition with the private sector.

Electricity

The Productivity Commission's 2005 review of NCP and the draft discussion paper of the COAG Energy Reform Implementation Group (ERIG) (2006a) found some jurisdictions' continued ownership of electricity generation assets may hinder effective competition between generators within the National Electricity Market (NEM) and create a conflict of interest for their owners. In particular, industry participants' submissions to these reviews raised concerns that publicly owned utilities' investment and dividend decisions may not be fully commercial in all circumstances and claimed excessive government investment in electricity generation assets in some States has lowered rates of return to sub-commercial levels, discouraging new private investment in base load power (Productivity Commission 2005, Energy Reform Implementation Group 2006a).

In examining such issues, COAG's 2002 review of national energy markets (the Parer Review) also found insufficient competition among generators prevented the NEM from operating as intended, with generators in some jurisdictions able to exert market power at certain times, thereby contributing to heightened price volatility. These reports recommended government-owned generation businesses be further disaggregated and subsequently divested to encourage more effective competition and strengthen the confidence of private generators in the market's integrity. The Productivity Commission (2005) made similar recommendations. ERIG's draft discussion paper canvassed a range of measures to address this issue, including strengthening competitive neutrality between public and private electricity businesses.

Ports

Virtually all multi-user Australian ports are owned by State governments, with the only significant exceptions being the Dalrymple Bay Coal Terminal in Queensland, the Port Waratah Coal Loader in Newcastle and the South Australian ports.³² While most ports appear to operate quite well, some submissions to the Fisher Taskforce (2005) maintained State and Territory governments' dual role as port regulators and owners of port and bulk loading facilities may create a conflict of interest. This is because

32 Several privately owned ports handle bulk commodities exclusively for their owners.

public owners may have an incentive to block authorisation of new private ports, berths or loading facilities which would compete with state owned facilities. The Fisher Report (2005) also expressed concern that, through their control of port authorities and planning processes, state governments may inhibit new stevedores from entering ports to compete with the current stevedoring duopoly. While the high cost of developing new berths and availability of suitable sites may be constraints, in the correct policy environment many private operators such as the former P&O Ports successfully develop ports and berths overseas.

Promoting competition via sales, unbundling and development processes

In Australia and internationally, government-owned monopoly infrastructure sometimes is privatised to maximise sales revenue rather than to maximise long-term service quality and minimise long-term prices to consumers.³³ Naturally, once a successful bidder has paid the highest price for infrastructure with market power in an open auction involving its competitors, it has a strong incentive, in fact an obligation to its shareholders, to maximise its profits by exploiting the asset's monopoly power. To prevent this, governments typically place such assets under access regimes and determine third party access conditions by arbitration. For example, Dalrymple Bay Coal Terminal in Queensland, which has some local market power, was privatised to the highest bidder and then placed under a state-based access regime to determine its coal loading charges.

A more efficient approach may be to canvass the market to determine the tariff at which potential owners would be willing to provide services using the monopoly asset, as well as repay the replacement cost of the asset and undertake any specified expansions. The successful bidder then would be the one willing to supply infrastructure services at the lowest long-term tariff. Many governments around the world use this approach to privatising infrastructure assets with monopoly power. Under the NRA's CIRA all jurisdictions have agreed to consider the use of competitive tendering to establish the terms and conditions for the supply of significant new services provided by government-owned monopoly infrastructure. If used, this should improve sales bid criteria, encourage competition for the market to promote efficient service delivery and reduce the need for 'heavy handed' regulation.

On occasions, governments have privatised infrastructure with significant market power without unbundling it into competitive activities or seeking competition for the

³³ However, assets without monopoly power that operate in competitive markets can be sold to the highest bidder. The competitive market will discipline the new private owner to offer prices that return only normal profits and provide service quality at least as good as competing suppliers.

market.³⁴ Most Australian governments have unbundled integrated infrastructure monopolies before privatising them, as recommended by the Hilmer Report (1994). For example, Victoria and South Australia unbundled their integrated electricity monopolies before privatising them and Victoria legislated to prevent cross ownership of the competitive and monopoly components. As part of energy reform under the NRA, COAG agreed in February 2006 to amend the National Electricity Law to prevent cross ownership of electricity generation and transmission assets to ensure transmission system owners cannot use their control of these assets to favour energy deliveries from their own generators.

Managing externalities — greenhouse gases and traffic related

Another common problem is that externalities generated by infrastructure may not be internalised appropriately into their market prices. If market prices then are used to appraise projects, this failure can result in under or over investment in such infrastructure.³⁵ With respect to greenhouse gases, some countries and regions have established carbon trading schemes to internalise the negative externalities in consumer prices. The Australian Government recently announced a Prime Ministerial Task Group on emissions trading. The Task Group will advise on the nature and design of a workable global emissions trading system in which Australia would be able to participate and on additional steps that might be taken, in Australia, consistent with the goal of establishing such a system.³⁶

Negative externalities generated by road use include traffic accidents, air pollution and noise imposed on other road users and adjacent residential areas. While some road accident costs are internalised in insurance premiums other externalities may not be internalised in charges motorists pay. Instead, governments typically try to mitigate the worst effects of these externalities by regulatory responses, limiting speeds,

34 For example, the NSW Auditor General reported that bids for the right to develop Sydney's Cross City Tunnel were decided at least in part on the basis of who would pay the NSW Government the most for the right to build the tunnel, rather than who would charge motorists the lowest tariff, plus pay for all required road connections. While this asset arguably does not have significant monopoly characteristics, the NSW Government agreed to increase its market power by offering, as part of the deal, to close off many above ground roads to funnel traffic into the tunnel.

35 To appraise alternative projects, private sector investors typically use financial or market prices but public sector investors should use economic or shadow prices, which include the impact of positive or negative externalities.

36 Australian governments currently attempt to deal with greenhouse gas emissions through a range of initiatives that require electricity generators to use different 'clean' fuel sources including wind, solar, hydro or natural gas to generate specified proportions of their output. However, recent reports have found that this response creates investment uncertainty and have questioned its effectiveness (Productivity Commission 2005, Energy Reform Implementation Group 2006a).

banning certain vehicles from particular areas and mandating the use of specific truck technologies (Productivity Commission 2006). If road use generates more of these externalities than alternative modes like rail or sea, a failure to internalise these externalities or adequately value their economic and social costs in project appraisals may result in over investment in road networks. COAG asked the Productivity Commission's road and rail freight pricing study to examine the feasibility of valuing and including externalities in road and rail charging regimes.

As part of the NRA's transport reform stream, COAG committed to reduce current and projected urban transport congestion, within current jurisdictional responsibilities, informed by a joint Commonwealth-state review into the main causes, trends, impacts and options for managing congestion focusing on national freight corridors, including an analysis of congestion charging approaches used around the world and their applicability to Australia. The urban transport congestion study was completed in early December 2006 and its findings will be considered by COAG at its first meeting in 2007.

Barriers to new service providers

While competitive new suppliers now can enter many previously closed, typically government dominated infrastructure markets, this is not the case in all sectors. For example, Queensland has just announced full retail contestability for its electricity sector several years after most states and most urban water suppliers still operate as government-owned monopolies.³⁷ As mentioned above, the Fisher Report (2005) also flagged concerns that government ownership and planning of ports may be restricting the entry of competing loading facilities and services. By introducing more free-to-air television services, the Government's recent media reforms should increase broadcasting investment, expand choice for consumers and promote innovation and growth in Australia's television content providing industry. Technological developments such as mobile technology and high speed broadband also are increasing competition in this sector.

The NRA's CIRA contains initiatives aimed at improving competition and efficiency at nationally significant ports. Jurisdictions agreed to undertake public and transparent reviews of their significant ports, port authorities and handling facility operations to ensure they permit entry by competing supplies of port and related infrastructure service providers.

³⁷ The Australian Competition Tribunal's 2006 decision to declare Sydney Water's supply system so water recycling company Services Sydney can supply recycled water to industrial customers should help promote competition in this sector. The NSW Government has now issued a draft undertaking covering these services.

Regulatory and planning problems

Even when governments do everything possible to create competition in infrastructure markets, some pure monopoly network assets will remain; these assets usually must be regulated to prevent abuse of monopoly power and may require planning to ensure rational network development. Protracted and uncertain regulatory processes and weak infrastructure project appraisal and network planning can reduce infrastructure service productivity and overall community wellbeing.

Under the NRA COAG has agreed to a range of initiatives to streamline national infrastructure regulation and reduce the fragmentation of regulatory systems. A key outcome at the February 2006 COAG meeting was the commitment from all governments to move to a simpler and consistent national approach to the economic regulation of significant infrastructure. These commitments were set out in the CIRA. The CIRA promotes a light handed approach to regulation, encouraging the use of market mechanisms and commercial negotiations to resolve infrastructure access terms and conditions in the first instance. Where regulation is required for nationally significant infrastructure, including major ports, railways and other export-related infrastructure, the CIRA aims to provide a simpler and more consistent national approach.

Tardy decision-making and lack of national consistency

Onerous regulatory frameworks and slow decision-making can distort investment decisions by unnecessarily increasing compliance costs and uncertainty for industry participants. Queues of ships at the Dalrymple Bay Coal Terminal in 2004-05 and long delays in some electricity transmission link investments, inter alia, resulted in criticism of Australia's third party access regulation regimes and their administration.³⁸ The length of time regulators take to make decisions, particularly when they know they are subject to administrative review, gaming of the regulatory process and the broad scope of merits review appear to be the main reasons for these delays.

The lack of national consistency in infrastructure regulation also can increase costs for industry participants and reduce efficiency. Many users of infrastructure networks including railways and road networks cross jurisdictional borders but regulations relating to their use are state-based and often are inconsistent. Despite some progress, after decades of efforts to harmonise road regulations between jurisdictions, many differences still persist.

³⁸ The Queensland Competition Authority took 22 months to decide on an appropriate price for coal loading at Dalrymple Bay Coal Terminal. National Access Regime institutions and the courts took about five years to decide on a planned augmentation of transmission capacity between South Australia and NSW, ultimately deterring this investment.

In the CIRA, States and Territories agreed that all their third-party access regimes will include consistent objects clauses and pricing principles and six month binding time limits on regulatory decision-making. Merits review, where available, essentially will be limited to the information originally submitted to the regulator. The CIRA also commits jurisdictions to submitting state and territory infrastructure access regimes for certification as 'effective' under the National Access Regime (Part IIIA of the Trade Practices Act) by 2010 and submit all new access regimes as soon as practicable.

Under the CIRA, COAG also agreed to implement a national system of rail access regulation, based on the Australian Rail Track Corporation (ARTC) undertaking, for all track from Perth to Brisbane (subject to commercial negotiations). It also agreed to implement this approach to other identified major rail freight corridors, if cost benefit analysis indicated this was worth doing. The standard gauge line from Kalgoorlie to the Queensland-NSW border already is operating under an undertaking issued by the ARTC which owns or leases all lines on this route. The Australian Competition and Consumer Commission (ACCC) oversees the ARTC undertaking. Jurisdictions' commitment to submit state-based access regimes governing other significant export related rail facilities for certification under the National Access Regime also should help harmonise rail access regimes.

Under the transport reforms of the NRA, COAG also asked the Australian Transport Council (ATC) to oversee a five year programme to harmonise and reform rail and road regulation. This includes harmonising road safety regulation and implementing performance-based standards to facilitate road access by innovative vehicles that may impose less road damage. Under the best practice regulation reform stream, COAG asked the ATC to recommend measures to achieve a national approach to rail safety regulation.

The NRA also endorsed the MCE's existing commitment to transfer energy distribution and retailing regulation functions to the newly established Australian Energy Regulator and Australian Energy Market Commission on an agreed timetable, to make energy sector regulation more nationally consistent.

Strengthening network infrastructure planning — electricity transmission, road and rail corridors

Historically, Australia has not had a strong record regarding planning and implementing national infrastructure networks. Jurisdictions' failure to coordinate railway gauges in the nineteenth century is probably our most spectacular failure; the standard gauge line still mainly links capital cities. Jurisdictions only recently

commenced work on coherent national transport corridor planning under AusLink.³⁹ Under the transport reforms of the NRA, COAG endorse the ATC's commitment to plan AusLink corridor strategies cooperatively by agreeing to complete corridor strategies by June 2007.

State-based electricity transmission grid owners and planners are not tasked with ensuring the most rational and cost efficient development of the overall National Electricity Market grid (Energy Reform Implementation Group 2006b). This almost certainly reduces the productivity of generation and transmission investment. Under the NRA, COAG agreed to strengthen the national character of the electricity transmission system and established ERIG to recommend, by the end of 2006, methods of achieving this. In November 2006, ERIG released a transmission discussion paper that canvassed establishing a national planning body to optimise transmission network investment in the National Electricity Market.⁴⁰

Stronger project appraisal for publicly provided infrastructure

Another challenge for governments investing in infrastructure is to ensure economic and social appraisal criteria dominate in prioritising projects. Weak and non-transparent public infrastructure appraisal can reduce potential productivity gains from infrastructure investment. In 2005, the ATC agreed to adopt more robust appraisal guidelines to assess alternative land transport projects and COAG endorsed this commitment under the NRA, and all governments agreed to adopt these guidelines for evaluating new public road and rail infrastructure projects. Cox (1994) estimated that investing in public road infrastructure on the basis of transparent and thorough economic analyses could raise GDP by 2.5 per cent over ten years. The recent Productivity Commission discussion draft *Road and Rail Freight Infrastructure Pricing* (2006) also stressed the importance of more transparent and robust investment appraisals of road projects.

Implementing the National Reform Agenda

The Productivity Commission review of National Competition Policy (2005) and various international reviews of Australia highlight the success of Australia's recent microeconomic reform but stress the need for ongoing reform and its effective

39 Commencing in 2004, AusLink, the Australian Government's long-term strategic plan for land transport infrastructure, is a cooperative approach to transport planning and funding by the Australian, State and Territory governments. The Australian Government's role focuses on inter-state connectivity with funding directed to road and rail infrastructure projects of national significance in a defined, integrated national network.

40 The National Electricity Market includes all States and Territories except Western Australia and the Northern Territory.

implementation and governance, including monitoring of reform progress (Productivity Commission 2006c).⁴¹ In February 2006, COAG agreed in principle to establish an independent body, the COAG Reform Council (CRC) to report to COAG annually on progress in implementing the NRA. In July 2006, COAG further agreed that the CRC would have six members; the Chair appointed by the Australia, a deputy chair appointed by the states and territories and four members agreed by COAG (COAG July 2006).

In July 2006, COAG also agreed that specific reform proposals in the areas of transport, energy, and infrastructure regulation, reflecting the reform commitments agreed by COAG in February 2006 would be available for COAG's consideration in early 2007. At the July 2006 COAG meeting, the Commonwealth confirmed that it will provide funding to the States and Territories on a case-by-case basis once specific implementation plans have been developed, if funding is needed to ensure a fair sharing of the costs and benefits of reform. Payments to the States and Territories and, where appropriate, to local government, would be linked to achieving agreed actions or progress measures and to demonstrable economic benefits, and would take into account the relative costs and proportional financial benefits to the Commonwealth, States, Territories and local government of specific reform proposals. Any Commonwealth funding:

- could take the form of Commonwealth and/or shared funding for specific initiatives, and/or payments from the Commonwealth linked to results;
- would be in addition to other Commonwealth funding; and
- would be decided on by the Commonwealth.

COAG also agreed that funding implications, where appropriate, will be considered by all jurisdictions once each specific reform proposal has been substantively developed.

41 'The challenge is to steadfastly implement action plans to achieve these goals. Australia has an admirable track record of implementing wide-ranging structural reforms over the past two decades even though its federal structure presents challenges of political coordination. Nonetheless, there is a concern that the commodity price boom could dampen the appetite for implementing reform going forward. To realise the large potential benefits from these reforms, the mission encouraged sustained and determined leadership from the Commonwealth government, arguing that this is an auspicious time to accelerate reforms by using some of the recent surge in revenues to spur action' (IMF 2006).
'Australia has a strong track-record in pushing ahead with sensible reforms. Further reform is needed to underpin vigorous growth and sustainable prosperity in the face of population ageing' (OECD 2006).

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COAG agreed that each specific reform proposal will include, as a package, the actions that will be done jointly and the actions that will be done by individual jurisdictions.

COAG agreed that specific reform proposals will include information on the direct costs to jurisdictions for proposed actions, including any costs to address any significant economic adjustment costs.

COAG also agreed that once specific reform proposals have been considered by COAG on a case-by-case basis there will be an independent assessment of the relative costs and benefits of each of the reform proposals. Assessments would give due regard to economic, demographic, geographic and other differences between jurisdictions. The assessment would be undertaken by the CRC for jurisdictional consideration. Each jurisdiction would retain full discretion as to how they act upon the assessment from the CRC. The CRC would draw on the work of the Productivity Commission on assessing the potential benefits of the NRA.

Expected impact of the National Reform Agenda

If fully implemented, the NRA should help address many of the pressing infrastructure market competition and regulation issues outlined above. The COAG National Reform Agenda aims to deliver significant economic and social rewards.

The Productivity Commission estimated that NCP yielded substantial benefits to the Australian economy, including a 2.5 per cent boost to GDP, a surge in productivity growth and strong growth in household incomes. In 2006, COAG asked the Productivity Commission to model the benefits of the NRA; the Productivity Commission will provide these results to COAG in early 2007. As they build on significant NCP reforms, NRA energy and transport reforms are likely to yield somewhat lower productivity benefits than NCP. However, when combined with wide ranging infrastructure and other regulatory reforms, the competition and regulation streams of the NRA could be expected to generate somewhat comparable gains to GDP.

Conclusion

Most of Australia's present infrastructure policy problems are not caused by inadequate public investment; they mainly reflect the need for further reform to ensure competitive and efficient infrastructure markets, where competition is possible, and more efficient regulation of monopoly infrastructure. In the last 15 years, Australian governments' infrastructure policy has shifted systematically from directly providing virtually all infrastructure to creating competitive market and regulatory environments that allow competing suppliers to provide infrastructure efficiently. In creating this

environment it is essential governments appropriately deal with the monopoly power, public good characteristics and externalities associated with many infrastructure assets and services.

Australia's infrastructure reform currently is incomplete, with many sectors operating an inefficient half-way house between the direct provider and competitive supplier models. Government-owned infrastructure competing with private operators, prices which do not reflect the full cost of provision, uncompetitive market structures and artificial restrictions on new suppliers entering markets all undermine the operation of efficient, competitive infrastructure markets, including in water, electricity and possibly ports. This can inhibit timely and efficient investment. Regulatory processes also can be slow and economic and safety regulation varies between jurisdictions creating uncertainty and potentially delaying investment. In land transport and electricity, inadequate network planning and investment appraisal probably reduce their contribution to national productivity growth.

Over the past two decades, major infrastructure market reforms have delivered substantial benefits to the Australian economy; the NRA builds significantly on these initiatives to increase the efficiency of infrastructure service delivery going forward. It targets significant policy-related impediments to well-functioning infrastructure markets, particularly in the energy and transport sectors and infrastructure regulation. If the NRA is fully implemented it should make an important contribution to removing infrastructure supply constraints in the Australian economy and to increasing productivity growth and the wellbeing of the Australian population. The experience of the NCP indicates robust institutional arrangements are necessary to ensure this occurs.

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APPENDIX

Public goods and monopoly networks

Why governments often provide pure public goods

While most goods or services consumed in an economy, such as water, electricity and food, are 'rival' or private goods, that can be consumed by only one person, the services provided by uncongested road networks and TV spectrums are non-rival or **public goods**, as many people can consume them without preventing others from doing so. An extra car travelling along an uncongested highway does not reduce the availability of the highway to others; turning on the television does not prevent someone else receiving the signal. The other characteristic of public goods is that it is difficult or impossible to exclude people from their use. For example, with current technology it is virtually impossible to prevent people from or directly charge them for using footpaths, street lighting, non-arterial roads or TV spectrum.

Infrastructure services with strong public good characteristics usually are unattractive for private providers, as it is not possible to exclude the public from their use or levy charges on consumers. Hence, unless the government subsidises private providers in some way, private ownership is likely to result in under-provision of pure public goods. However, in the case with TV spectrum, private broadcasters can obtain a return from advertising.

Hence, while competing providers can supply electricity, gas, railways and telecommunications, governments have retained a dominant role in providing roads. Toll roads are not pure public goods because operators can exclude users who do not pay. Australia has seen a trend towards more private sector road projects in capital cities including CityLink and EastLink in Melbourne and Westlink M7 and the Cross City Tunnel in Sydney. At present for the great majority of local and arterial roads directly charging for access is not yet feasible so continued public provision is necessary. However, new electronic tolling technologies have the potential to turn formerly public good roads into private roads on which charges can be levied more broadly.

Managing natural monopoly networks

Infrastructure networks are often natural monopolies because:

- they usually supply products that cannot be traded beyond a limited geographical region, so networks in other regions or countries cannot provide competition;

- the most efficient scale of producing the service often equals or exceeds total market demand, so the market has room for only one efficient producer. Although many large-scale industries, like petrochemicals, oil refining and steel, demand lumpy, mostly sunk investments and may have declining marginal costs of production over a certain output range, their products are tradeable. Imports can compete with domestic producers and producers can export production in excess of market demand;
- they usually involve very high initial investment costs but very low costs for extra connections to an existing network. Hence networks' marginal cost of supplying new connections will fall steeply, giving networks owners an overwhelming commercial advantage over potential new competitors. Infrastructure networks are a classic example of increasing returns to scale, with the average cost of providing the infrastructure service falling as the number of customers expands, providing increasing profits since prices charged to consumers are kept constant.

Investments in networks like water pipes, railways, cable networks and highways are typically 'sunk costs' with little or no re-sale value or alternative use, reducing the threat from 'hit-and-run' competition providing a credible threat to incumbent providers. On the other hand, satellite dishes, microwave towers, switching stations, passenger aircraft, locomotives and rolling stock can be sold if new entrants to the business subsequently want to leave the market.

