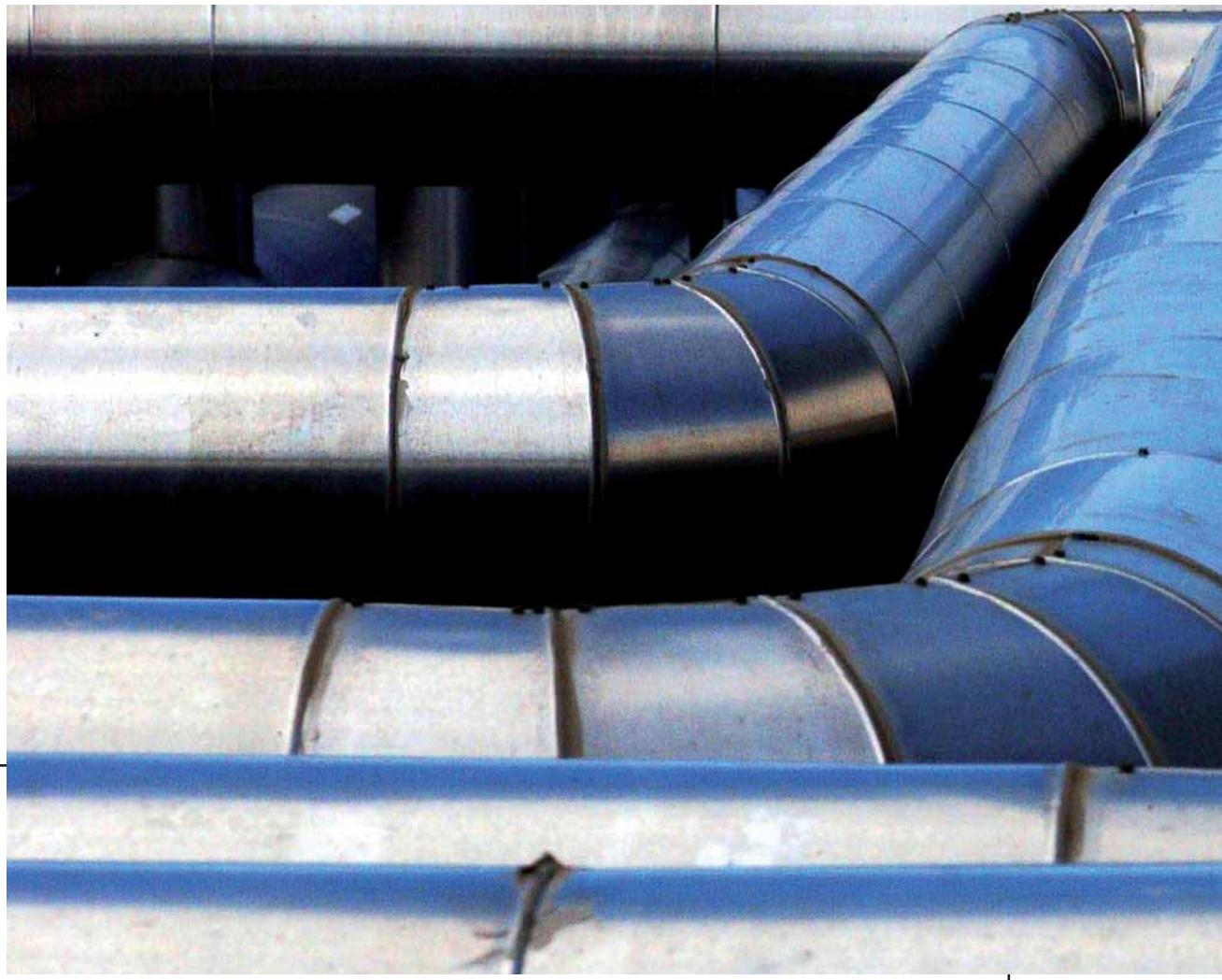


9 GAS TRANSMISSION

Vichub. James Davies (Fairfax Images)

In Australia high-pressure transmission pipelines provide long haul bulk gas transport services from production fields to cities and towns and to large customers located along the route of the pipeline.

9 GAS TRANSMISSION

This chapter considers:

- the role of the gas transmission sector
- the structure of the sector, including industry participants and ownership changes over time
- the economic regulation of the gas transmission sector
- new investment in transmission pipelines and related infrastructure.

9.1 The role of the gas transmission pipeline sector

A gas transmission pipeline system typically consists of large diameter high-pressure pipelines and metering, compression, regulating and monitoring equipment. The pipelines are operated under high pressure to maximise transport volumes and efficiency of operation. They are mainly placed underground, which promotes visual amenity and helps to prevent damage that could interrupt gas services.

Expansion and interconnection of transmission pipeline systems can strengthen the performance of the gas industry by:

- giving customers a choice of gas sources
- encouraging competition among gas producers, pipeline operators and gas retailers.

9.2 Australia's gas transmission pipelines

Prior to the early 1990s natural gas services were operated under separate state-based systems. Legislative and regulatory barriers restricted interconnection of pipeline systems across state borders and thereby restricted interstate trade in natural gas. Government reforms in the gas industry began in 1991 and were rolled into the National Competition Policy program agreed in 1995.

The gas reforms have been accompanied by increased activity in the development of new gas fields and existing and new gas transmission infrastructure. Australia's natural gas consumption has almost doubled from 655 petajoules in 1991 to over 1172 petajoules in 2006. Over the same period Australia's natural gas transmission pipeline networks have expanded significantly. In 2006 the pipeline system extended to just over 21 000 kilometres. A significant element of this expansion has been associated with construction of interstate pipelines—the Eastern Gas pipeline (Longford to Sydney), the NSW–Vic Interconnect (Wagga Wagga to Wodonga), the SEA Gas Pipeline (Port Campbell to Adelaide) and the Tasmanian Gas Pipeline (Longford to Bell Bay).

Transmission pipelines deliver gas in all states and territories and to most major cities and regional centres. Table 9.1 sets out summary details of a selection of major transmission pipelines. Figure 9.1 shows pipeline routes.[1] There is now an interconnected transmission pipeline network in New South Wales, the Australian Capital Territory, Victoria, South Australia and Tasmania. This network provides access to gas from the Cooper–Eromanga, Gippsland, Otway and Bass natural gas basins and, potentially, coal seam methane from the Sydney Basin. However, relatively high transport costs mean that gas from a particular basin is most likely to be sold into the markets in closest proximity. Gas from the Gippsland Basin, for example, is mainly marketed in Victoria.

In Queensland, gas is sourced from the Cooper–Eromanga and Bowen–Surat basins through pipelines connected at Ballera and the Wallumbilla hub. A raw gas pipeline from Ballera to Moomba also connects the Queensland and South Australian pipeline systems.

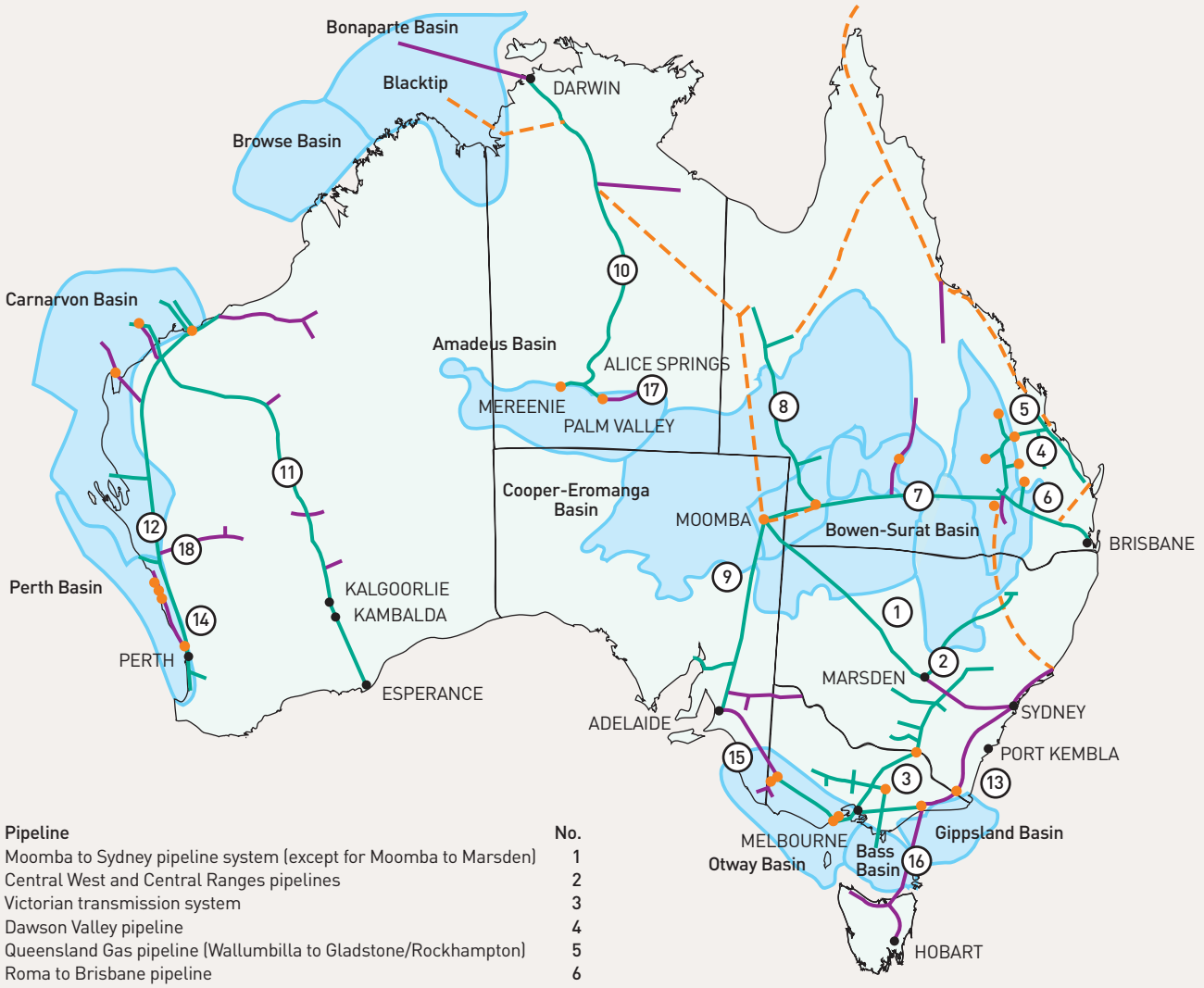
Western Australia is serviced by three main pipelines—Dampier to Bunbury, Parmelia and Goldfields. The Dampier to Bunbury and Goldfields pipelines deliver gas from the Carnarvon Basin. Gas from the Perth Basin is transported on the Parmelia Pipeline. The Parmelia pipeline also transports gas from the Carnarvon Basin via an off-take from the Dampier to Bunbury Natural Gas Pipeline (DBNGP).

The Amadeus Basin to Darwin Pipeline provides transmission services from the Mereenie and Palm Valley gas fields for the Darwin corridor, including McArthur River Mine and Mount Todd.

1 See appendix C for a more comprehensive listing of onshore transmission pipelines in Australia.

Figure 9.1

Major gas transmission pipelines and proposed pipelines in Australia



Pipeline	No.
Moomba to Sydney pipeline system (except for Moomba to Marsden)	1
Central West and Central Ranges pipelines	2
Victorian transmission system	3
Dawson Valley pipeline	4
Queensland Gas pipeline (Wallumbilla to Gladstone/Rockhampton)	5
Roma to Brisbane pipeline	6
South West Queensland pipeline (Ballera to Wallumbilla)	7
Carpentaria pipeline (Ballera to Mt Isa)	8
Moomba to Adelaide pipeline system	9
Amadeus Basin to Darwin pipeline	10
Goldfields Gas pipeline	11
Dampier to Bunbury Natural Gas pipeline	12
Eastern Gas pipeline (Longford to Horsley Park)	13
Dongara to Perth/Pinjarra (Parmelia)	14
SEA Gas pipeline	15
Tasmanian Gas pipeline	16
Palm Valley to Alice Springs	17
Midwest pipeline	18

Source: The map is based on K Donaldson, *Energy in Australia 2006*, ABARE report, Prepared for the Australian Government Department of Industry, Tourism and Resources, Canberra, 2007; supplemented with additional information.

Table 9.1 Major transmission pipelines (as at May 2007)

ROUTE AND/OR PIPELINE	LOCATION	LENGTH KM	APPROXIMATE THROUGHPUT TJ A YEAR	OWNER[1]
Moomba–Sydney	SA–NSW	2013	80000	APA Group
Longford–Sydney (Eastern Gas Pipeline)	Vic–NSW	795	36000	Alinta
Victorian transmission system	Vic	1935	213900	APA Group
Wallumbilla to Gladstone	Qld	532	21000	Alinta
Gladstone to Rockhampton	Qld	97	6000	Alinta
Roma to Brisbane	Qld	440	28000	APA Group
Ballera to Wallumbilla (South West Queensland Pipeline)	Qld	756	49200	Hastings Diversified Utilities Fund
Ballera to Mount Isa (Carpentaria)	Qld	840	30000	APA Group
Moomba to Adelaide	SA	1185	52000	Hastings Diversified Utilities Fund
Port Campbell to Adelaide (SEA Gas Pipeline)	Vic–SA	680	na	Origin Energy, International Power, China Light & Power
Longford to Bell Bay (Hobart) (Tasmanian Gas Pipeline)	Vic–Tas	576	na	Alinta
Dampier to Bunbury	WA	1845	260000	Diversified Utility and Energy Trusts (60%), Alcoa (20%) & Alinta (20%)
Goldfields Gas Pipeline	WA	1427	39000	APA Group (88.2 %) & Alinta (11.8 %)
Parmelia Pipeline	WA	445	26000	APA Group
Amadeus Basin to Darwin	NT	1656	21000	Amadeus Pipeline Trust[2] (96% APA Group)
Palm Valley to Alice Springs	NT	147	3000	Envestra

na not available. 1. Most of the pipelines listed are licensed to a subsidiary or associated entity. For example, GasNet Australia, which is the licensed entity responsible for the VTS is a wholly owned subsidiary of the Australian Pipeline Trust, which is part of the APA Group. 2. The Amadeus Pipeline Trust leases the Amadeus Basin to Darwin Pipeline from a consortium of financial institutions.

Source: Access arrangements for covered pipelines; EnergyQuest, *Energy quarterly production report*, February and May 2007; Productivity Commission, *Review of the gas access regime*, Inquiry report, no. 31, 2004, Canberra.

9.3 Ownership of transmission pipelines

During the 1990s governments restructured their vertically integrated gas transport utilities into separate transmission and distribution businesses. Except for the North Queensland Gas Pipeline, gas transmission assets are now privately owned. Figure 9.2 shows the significant changes in the ownership of major transmission pipelines since 1994.

The Moomba to Sydney Pipeline (MSP), which supplies Cooper Basin gas into New South Wales, was the first pipeline to be privatised in Australia. In 1994 the Australian Government sold the pipeline to the East Australian Pipeline Limited (EAPL) consortium, which was formed by AGL (51 per cent) and a foreign-owned venture called Gasinvest (49 per cent). In 2000 AGL increased its interest in EAPL to 76.48 per cent and the consortium's interest in the pipeline was transferred to the Australian Pipeline Trust, which is now part of the APA Group.[2] AGL retained a 30 per cent cornerstone investment in the trust. AGL also transferred its other pipeline interests into the trust.[3] This included the Roma to Brisbane (Queensland) and Carpentaria (northern Queensland) pipelines and interests in the Amadeus Gas Trust (which leases the Amadeus Basin to Darwin Pipeline (Northern Territory) and Goldfields Gas Pipeline (Western Australia).[4] The trust has further expanded by increasing its interest in the Goldfields Gas Pipeline.

2 As at November 2006 the Australian Pipeline Trust began trading as part of the APA Group, which comprises the Australian Pipeline Ltd, Australian Pipeline Trust and APT Investment Trust.

3 On 25 October 2006 AGL's interest in the Australian Pipeline Trust transferred to Alinta.

4 AGL had an interest in the Goldfields Gas Pipeline via its 45 per cent interest in the Southern Cross Pipelines Australia consortium.

Victoria, Queensland and Western Australia privatised their government-owned transmission pipeline infrastructure in the mid to late 1990s. Key new entrants into the transmission sector resulting from these sales included US-based energy utilities, PG&E (Pacific Gas and Electric Company), GPU GasNet (a subsidiary of GPU Inc)[5], Duke Energy and Epic Energy (formed from the sale of Tenneco). Queensland is the only government to retain an ownership interest in gas transmission assets. Through its wholly-owned company Enertrade, the Queensland Government operates the North Queensland Gas Pipeline, which transports coal seam gas from Moranbah to Townsville to supply the Mt Stuart industrial hub.[6]

In South Australia, Tenneco Gas Australia acquired the Moomba to Adelaide Pipeline System (MAPS) on 30 June 1995 through its purchase of the operations and assets of the Pipeline Authority of South Australia. The pipeline transferred to Epic Energy under an ownership restructuring of Tenneco.[7] In June 2004 Hastings Funds Management acquired full ownership of Epic Energy's assets other than the DBNGP. The assets owned by Epic Energy (including the MAPS), were rolled into the Hastings Diversified Utilities Fund.[8]

There has been considerable consolidation of ownership in the transmission sector. For example:

- In 2000 Envestra (a major Australian gas distributor that is part-owned by Origin Energy and Cheung Kong Infrastructure) acquired the Palm Valley to Alice Springs, Riverland and Berri to Mildura pipelines.
- In 2004 Alinta, along with DUET[9] and Alcoa, acquired the DBNGP after its owner Epic Energy went into receivership in 2004. Alinta also purchased Duke Energy's other pipeline and electricity interests, which included the Eastern Gas Pipeline (EGP), the Tasmanian Gas Pipeline and a minority interest in the Goldfields Gas Pipeline.
- In 2005 Alinta restructured its Duke Energy gas pipeline and electricity generation assets to form Alinta Infrastructure Holdings. Alinta retained a 20 per cent interest in the holding company and during 2006 steadily increased its shareholdings in the company. In January 2007 the holding company became a wholly-owned subsidiary of Alinta.
- In 2006 Alinta and AGL agreed to merge and restructure the assets of the two companies. On 25 October 2006, as part of the agreement, Alinta gained AGL's pipeline interests, including its stake in the APA Group. Alinta now owns 35.3 per cent of APA Group. On 27 November 2006 Alinta made an undertaking to divest its APA Group and related management contracts for the MSP and the Parmelia Pipeline. Should APA Group divest its interests in the Moomba to Sydney Pipeline, Parmelia Pipeline and GasNet, Alinta is not required to divest its interest in APA Group. The divestment obligation on Alinta is subject to legal appeal. The divestment obligation on Alinta is subject to legal appeal. Should the sale of Alinta to the Babcock & Brown/Singapore Power consortium proceed the divestment obligations may change.
- In 2006 APA Group acquired GasNet Australia, which operates the Victorian transmission system.[10] APA Group has interests in other transmission pipelines, including the Goldfields Gas and Parmelia pipelines, and owns gas storage and processing facilities and electricity infrastructure. APA Group expects to increase its share of the natural gas market from 20 per cent to 28 per cent over the next 15 years.[11]
- In 2007 Origin Energy sold its network assets, including its interest in Envestra and its asset management business, to the APA Group.

5 Following a merger with GPU Inc, First Energy Corporation sold GPU GasNet (renamed GasNet) through a public float.

6 Enertrade's gas assets will transfer to Stanwell Corporation in September 2007.

7 Epic Energy initially consisted of El Paso Energy (30 per cent); CNG International (30 per cent); Allgas Energy (10 per cent); AMP Investments (10 per cent); Axiom Funds Management (10 per cent) and Hastings Funds Management Limited (10 per cent).

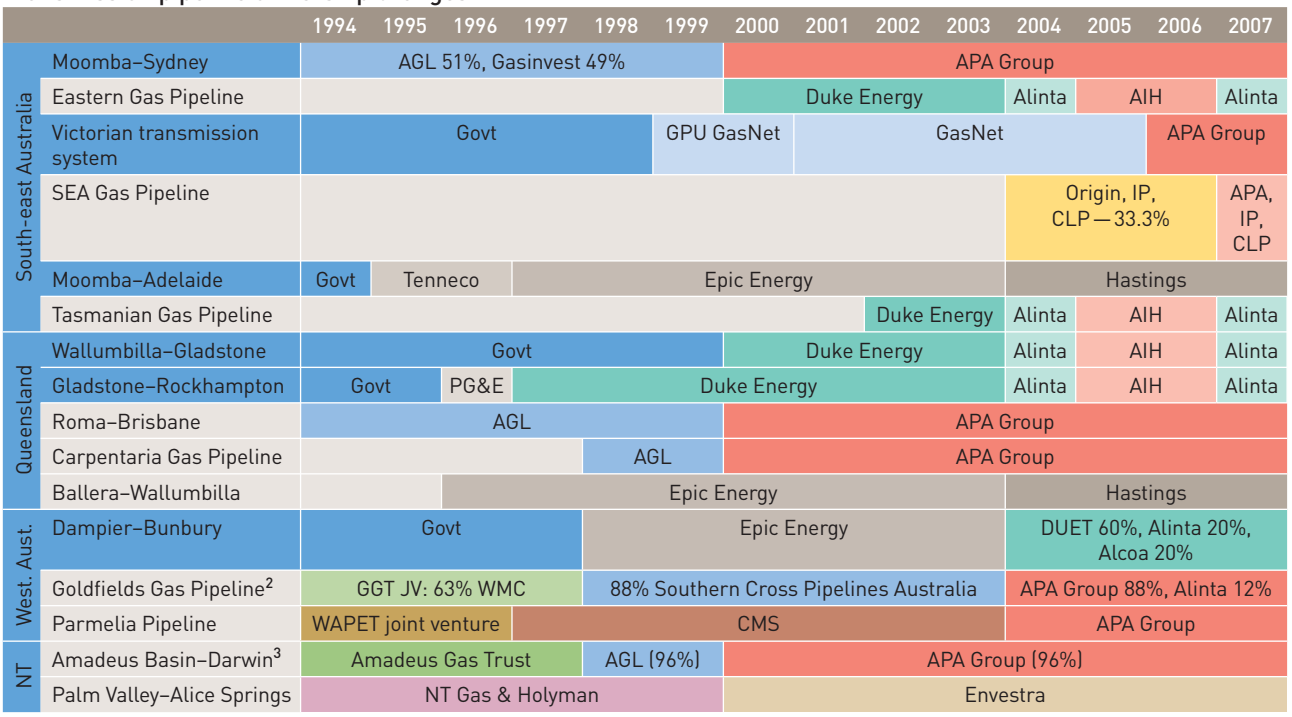
8 Hastings Diversified Utilities Fund invests in utility infrastructure. The fund is managed by Hastings Funds Management Ltd, which the Westpac Institutional Bank acquired in September 2005. The funds manager now operates as a division of the bank. Under a service agreement, Epic Energy Corporate Shared Services Pty Ltd operates the MAPS.

9 Diversified Utilities and Energy Trusts (DUET) was formed from the restructure of an AMP consortium and WA Gas Holdings Pty Ltd (WAGH).

10 The Victorian transmission system is often referred to the as the principal transmission system or the GasNet transmission system.

11 Australian Pipeline Trust, 'What's new', http://www.pipelinetrust.com.au/, viewed 11 October 2006.

Figure 9.2
Transmission pipeline ownership changes[1]



AIH: Alinta Infrastructure Holdings. CLP: China Light & Power. DUET: Diversified Utilities and Energy Trusts. GGT JV: Goldfields Gas Pipeline Joint Venture. PG&E: Pacific Gas and Electric. WAPET: West Australian Petroleum Pty. Limited joint venture (Chevron, Texaco and Shell with a two-seventh interest each, and Ampolex with a one-seventh interest). WMC: Western Mining Company. 1. Changes in ownership in the year it occurred. 2. Duke Energy (now Alinta) acquired an 11.8 per cent stake in the GGT JV in 1999. In 2007 AIH became a wholly-owned subsidiary of Alinta. 3. The Amadeus Pipeline Trust leases the Amadeus Basin to Darwin Pipeline from a consortium of financial institutions.

Source: Australian Gas Association, *Gas statistics Australia*; company websites.

9.4 Economic regulation of gas transmission services

Given the capital intensive nature of pipeline infrastructure, it is generally cheaper to transport gas using a single transmission pipeline between a gas producing area and a major load centre. Where major load centres are served by only one gas producing area, the transmission pipeline is likely to have significant market power. Where a load centre can be served by multiple gas producing areas, each connected by a transmission pipeline, there may be a constraint on the ability of pipeline operators to exercise market power. Regional transmission systems and distribution systems are generally natural monopolies. To address risks associated with the market power of pipeline operators, governments introduced a regulatory regime for third-party access to natural gas pipelines to complement structural reform in the industry.

Pipeline access is regulated under the National Third Party Access Code for Natural Gas Pipeline Systems (the Gas Code), which operates under the gas pipeline access Acts (Gas Law) in each state and territory.[12] The Gas Code applies only to pipelines assessed as meeting the following coverage criteria set out in s. 1.9:

(a) That access (or increased access) to Services provided by means of the Pipeline would promote competition in at least one market (whether or not in Australia), other than the market for the Services provided by means of the Pipeline

12 All state and territory gas access regimes, other than Queensland's, have been certified as effective under the *Trade Practices Act 1974*, which precludes the relevant pipelines from declaration of third-party access under the generic access provisions of Part IIIA of the Trade Practices Act.

Natural gas pipe

(b) That it would be uneconomic for anyone to develop another Pipeline to provide the Services provided by means of the Pipeline

(c) That access (or increased access) to the Services provided by means of the Pipeline can be provided without undue risk to human health or safety and

(d) That access (or increased access) to the Services provided by means of the Pipeline would not be contrary to the public interest.

Most pipelines were 'covered' under schedule A when the Gas Code was implemented in 1997. Subsequent coverage of pipelines occurred through extensions to existing covered systems, through a competitive tendering process or application to the National Competition Council (NCC).[13] It is also open to a pipeline operator to apply to the NCC for a recommendation to have coverage revoked.

In assessing applications for coverage and revocation of coverage the NCC assesses the merits of the application against the coverage criteria and makes a recommendation to the minister,[14] who makes the coverage/revocation decision. Parties may seek review of a ministerial decision by the Australian Competition Tribunal or state review body.

To date ministers have adopted all but one of the NCC's recommendations on coverage. In 2002 the NCC recommended retaining coverage of the MSP system, but the minister decided to revoke coverage for that part of the pipeline system running from Moomba to Marsden. In addition, on 4 May 2001, the Australian Competition Tribunal overturned the minister's decision to cover the EGP.

Under reforms agreed to in the Australian Energy Market Agreement 2004 (amended 2006) the current Gas Law and Gas Code are to be replaced with the National Gas Law and National Gas Rules. The proposed reforms do not affect the coverage assessment process, but will amend criterion (a) to limit coverage to pipelines where regulated access is likely to generate a material increase in competition in a related market, provide for light-handed regulation and for binding up-front no coverage rulings for greenfield pipelines and price regulation exemptions for international pipelines. The gas pipeline access Acts were also amended in 2006 to give affect to the decision to alter coverage rulings for greenfield and proposed international gas pipelines that deliver gas to Australia.

The providers of covered pipeline services must submit access arrangements to the nominated regulator for approval and comply with other Gas Code provisions, such as ring-fencing. Pipelines that are not covered are subject only to the general anti-competitive provisions of the *Trade Practices Act 1974*. Access to non-covered pipelines is a matter for commercial negotiation between the access provider and access seeker, without regulation.

Covered transmission pipelines

The trend in the gas transport sector has been towards deregulation, particularly for transmission pipelines. Some recently constructed pipelines, such as South East Australia (SEA) Gas (Victoria–South Australia), the Tasmanian Gas Pipeline (Victoria–Tasmania), EGP (Victoria–New South Wales) and the Australian Pipeline Trust's (APA Group) section of the New South Wales–Victoria Interconnect have never been covered. In addition, coverage (in whole or in part) has been revoked for 14 transmission systems (table 9.2).[15]

As at 1 April 2007 there were 14 covered transmission pipelines. Figure 9.1 depicts major covered pipelines in green. Uncovered gas pipelines are shown in purple.

13 A service provider can also seek coverage through a voluntary access arrangement.

14 The minister with responsibility for energy makes the coverage decision in Western Australia, South Australia and the Northern Territory. In other states and territories the decision maker is the Australian Government Minister for Industry, Tourism and Resources.

15 As at 1 April 2007, the South Australian Minister for Energy had not made a decision on the NCC's recommendation to revoke coverage of the MAPS.

Table 9.2 **Coverage status of transmission pipelines that have been or are covered**

PIPELINE	STATUS AT 1 APRIL 2007
COVERED UNDER SCHEDULE A AT GAS CODE INCEPTION	
NEW SOUTH WALES AND THE AUSTRALIAN CAPITAL TERRITORY	
Moomba to Sydney Pipeline System	Covered (except for Moomba to Marsden)
Central West (Marsden to Dubbo)	Covered
VICTORIA	
Victorian transmission system (incl. Western Transmission System)	Covered
QUEENSLAND	
Wallumbilla (Roma) to Brisbane	Covered
Kincora to Wallumbilla	Coverage revoked November 2000
Ballera to Wallumbilla	Covered
Dawson Valley Pipeline[1]	Covered
Wallumbilla to Gladstone/Rockhampton (Queensland Gas Pipeline)	Covered
Moura Mine to Queensland Gas Pipeline	Coverage revoked November 2000
Ballera to Mt Isa (Carpentaria)	Covered
SOUTH AUSTRALIA	
Moomba to Adelaide Pipeline System	Covered[2]
Riverland Pipeline System	Coverage revoked September 2001
South East Pipeline System	Coverage revoked April 2000
WESTERN AUSTRALIA	
Dongara to Perth/Pinjarra (Parmelia)	Coverage revoked March 2002
Karratha to Cape Lambert	Coverage revoked September 1999
Beharra Springs to CMSG	Coverage revoked August 1999
Dampier to Bunbury Natural Gas Pipeline	Covered
Tubridgi System	Coverage revoked April 2006
Goldfields Gas Pipeline	Covered
WMC laterals	Coverage revoked July 1999 (except Kalgoorlie to Kambalda)
Goldfields Gas Pipeline to Kalgoorlie PS	Coverage revoked July 1999
NORTHERN TERRITORY	
Palm Valley to Alice Springs	Coverage revoked July 2000
Amadeus Basin to Darwin	Covered
City Gate to Berrimah	Coverage revoked May 2003
COVERAGE SINCE IMPLEMENTATION OF THE GAS CODE	
Eastern Gas Pipeline (Vic and NSW)	Not covered: the Minister's decision to cover (October 2000) was overturned by the Australian Competition Tribunal (May 2001)
Berri Mildura Pipeline (SA and Vic)	Covered by competitive tender in 1997 Coverage revoked August 2001
Central Ranges Pipeline (NSW)	Covered by competitive tender May 2004

1. Coverage of the Dawson Valley pipeline was revoked in November 2000. Following an application to the NCC the pipeline was covered April 2006.
2. A recommendation to revoke coverage of the Moomba to Adelaide Pipeline System is currently before the Minister for Energy in South Australia.

Source: Information provided by the National Competition Council.

Regulation of covered pipelines

Regulated access arrangements for covered pipelines specify the reference services that a pipeline operator must offer and reference tariffs, which set benchmark prices that form the basis for negotiation of pipeline services. Typically reference tariffs apply to firm forward haulage services. Transmission services are mostly sold under long-term contract on a forward haul basis. Gas users seeking short-term or interruptible supplies can seek to negotiate for those services directly from the pipeline operator or other gas shippers.

Section 8 of the Gas Code requires that reference tariffs:

- be based on the efficient cost (or anticipated efficient cost) of providing the reference services
- where appropriate, provide the service provider with the ability to earn greater profits (or less profits) than anticipated between reviews if it outperforms (or underperforms against) the benchmarks that were adopted in setting the reference tariffs. This provides a market-based incentive to improve efficiency and to promote efficient growth of the gas market.

For new pipelines the reference tariffs for the first access arrangement period may be determined through a competitive tender process approved by the regulator. For other pipelines reference tariffs are determined on the basis of forecast revenue and demand for the services of a covered pipeline. The Gas Code specifies three methods for determining total revenue:

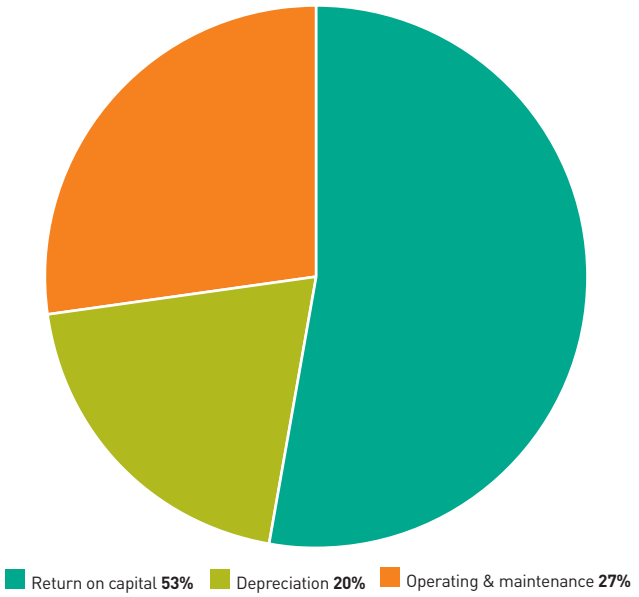
- cost of service—where revenue is set to recover costs using a building block approach that comprises:
  - a rate of return on capital
  - asset depreciation
  - operating and maintenance expenses.
- internal rate of return—where revenue is set to provide an acceptable internal rate of return for the covered pipeline on the basis of forecast costs and sales
- net present value—where revenue is set to deliver a net present value for the covered pipeline (on the basis of forecast costs and sales) equal to zero, using an acceptable discount rate.[16]

In determining price paths, a CPI-X formula is usually applied to provide incentives to improve efficiency.

Most access arrangements apply for a fixed term, usually five years, and are then subject to review and update. Where an access arrangement extends for more than five years there is generally a trigger to allow for early review in the event of a major change occurring. In addition, a service provider may submit unscheduled revisions to the regulator at any time.

Figure 9.3 shows the revenue components under the access arrangement for the DBNGP (Western Australia) for the period 2005 to 2010. This provides a guide to the composition of the building block components in a revenue determination used to determine reference tariffs. Capital and depreciation make up about three-quarters of the revenue determination. Operating and maintenance costs account for around a quarter of the determination.

Figure 9.3
Revenue components for the Dampier to Bunbury Natural Gas Pipeline

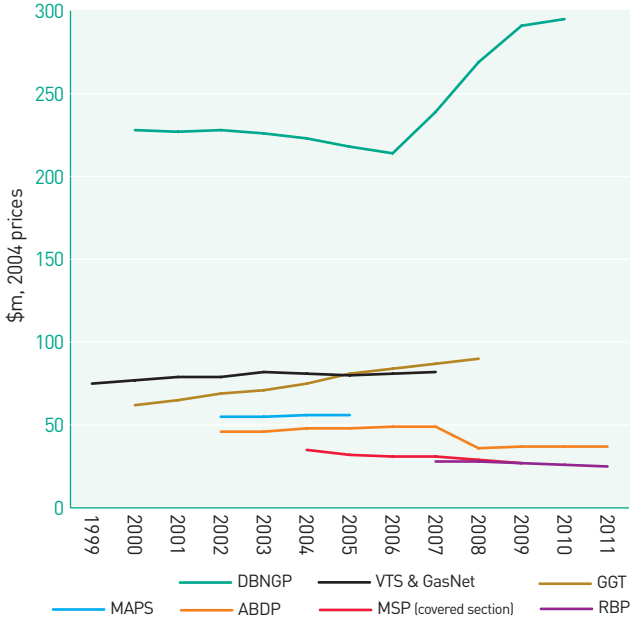


Source: ERA, *Access arrangement information for the Dampier to Bunbury Natural Gas Pipeline*, Perth 2005.

16 Other methods that can be translated into one of these forms are also acceptable.

Figure 9.4 charts forecast revenue over the period 1999–2011 for selected major covered transmission pipelines. The variation in revenue across pipelines reflects differences in demand, age, capacity and length of the pipelines. With the exception of the DBNGP, forecast revenues are relatively stable with changes largely reflecting adjustments to capital expenditure. The significant increase in forecast revenues for the DBNGP reflects an increase in capital-related costs associated with the planned looping and extension of the pipeline, which provides for a substantial increase in gas throughput.

Figure 9.4
Total benchmark revenue for selected transmission pipelines 1999–2011[1]



ABDP: Amadeus Basin to Darwin Pipeline. MAPS: Moomba to Adelaide Pipeline System. DBNGP: Dampier to Bunbury Natural Gas Pipeline. GGP: Goldfields Gas Pipeline. MSP: Moomba to Sydney Gas Pipeline. RBP: Roma to Brisbane Pipeline. 1. Data for the Western Australian pipelines are based on calendar years. For the other pipelines the data relates to fiscal years.

Source: Approved access arrangement information for each pipeline.

Ongoing reforms

The Australian Energy Market Agreement 2004 (amended 2006) adopts a national approach to the regulation of gas pipelines. It designates the Australian Energy Regulator as the national regulator of transmission and distribution pipelines. Responsibility for the regulation of transmission and distribution pipelines, except in Western Australia, is scheduled to transfer to the Australian Energy Regulator from 2008 following the implementation of the National Gas Law and the National Gas Rules, which will replace the current Gas Law and Gas Code.

The functions to be transferred to the Australian Energy Regulator are expected to include:

- regulating access arrangements submitted by pipeline service providers under the National Gas Rules
- monitoring compliance with the National Gas Law and National Gas Rules
- arbitrating disputes relating to the terms and conditions of access
- overseeing competitive tendering processes for new transmission pipelines.

The Economic Regulation Authority regulates covered gas transmission and distribution pipelines in Western Australia. It will retain this function under the new framework in recognition that there is no interconnection of pipelines between Western Australia and other states and territories. In support of the new arrangement, Western Australia will implement legislation equivalent to the National Gas Law and the National Gas Rules. In signing the Australian Energy Market Agreement, Western Australia also agreed to conduct an independent review of its institutional arrangements for gas within five years, or earlier, if its pipeline network is to become interconnected with another state or territory.

Details of institutional arrangements for the gas industry are provided in appendix A.

9.5 Investment

Typically investment in the transmission sector involves large and lumpy investments associated with the expansion of existing pipelines (through compression and looping) and the construction of new pipelines.[17]

Table 9.3 provides details of completed, planned and proposed major pipeline infrastructure investment projects since 2000. Information in the table indicates that investment spending on major projects over the period 2000–06 was around $2 billion in nominal terms. Current and proposed development activity suggests that the pipeline network will continue to expand at a relatively rapid rate. Several pipelines are being developed, including the Dampier to Bunbury expansion in Western Australia ($1.9 billion, including the $433 million stage 4 project completed in December 2006); the Corio Loop on the Victorian transmission system and a pipeline to connect the Blacktip gas field with the Amadeus Basin to Darwin Pipeline.

New gas developments in Queensland and New South Wales have been accompanied by changes to pipeline proposals. The AGL Petronis consortium have decided not to proceed with the PNG gas pipeline at this time. Instead there are a number of new proposals to expand the Queensland network and connect it with New South Wales and South Australia. Epic Energy and APA Group have entered a heads of agreement on the North Gas Link, (recently renamed the Queensland to South Australia/New South Wales Link or QSN Link), which is a proposal to join the South West Queensland Pipeline at Ballera to the MSP and the MAPS and would make Queensland a part of the interconnected gas pipeline system. Hunter Energy has proposed constructing a gas pipeline to ship gas from Wallumbilla (Queensland) to Hexham (New South Wales).

These projects in combination with highly speculative ventures, such as the transcontinental pipeline from Western Australia to Moomba, or the alternative trans-Territory pipeline connecting Moomba with Timor Sea Gas, could potentially result in further investment spending in excess of $3 billion (in nominal terms) into the future.

All major capital cities now have access to natural gas supplies. Sydney, Melbourne, Canberra and Adelaide are served by more than one transmission pipeline. Pipeline investment has therefore provided gas users with access to alternative gas basins and pipeline infrastructure.

Table 9.4 lists the pipelines serving each major market in Australia by gas source and producer. The construction of new pipelines has opened the Cooper–Eromanga, Sydney, Gippsland, Otway and Bass basins to increased interbasin competition in south-eastern Australia. In some cases, however, it may only be possible to source gas from a particular basin using backhaul and swap arrangements (for example, supplying Sydney Basin gas into Victoria). More generally, gas tends to be purchased from the closest source possible to reduce the cost of transporting gas.

While Santos, Origin Energy and BHP Billiton have production interests in several of the main gas basins, expansion of the pipeline network has provided new markets for a number of smaller producers, such as Beach, Queensland Gas Company and Sydney Gas. In addition, expansion of the transmission system can enhance competition in the electricity sector by providing opportunities for investment in new gas-fired electricity generators.

17 Capacity of a pipeline can be increased by adding compressor stations to raise the pressure under which gas flows and by looping or duplicating sections of the pipeline system. Extending the length of the pipeline can increase line-pack storage capacity.

Erin Jonasson (Fairfax Images)

Laying of new gas pipeline

Table 9.3 Completed, planned and proposed major pipeline infrastructure investment projects since 2000

PIPELINE	STATE	LENGTH (KM)	PROJECT COST	THROUGHPUT (PJ/YR)	PROJECT COMPLETION
Central Ranges Pipeline	NSW	300	$130m	na	2006
Wagga–Tumut pipeline	NSW	65	na	na	2001
Hunter Gas Pipeline	NSW	37	na	na	2007
Hoskintown–Canberra	NSW–ACT	31	na	na	2001
Eastern Gas Pipeline	Vic–NSW	795	$490m	110	2000
SEA Gas Pipeline	Vic–SA	660	$526m	125	2004
VicHub	Vic	2	$100m	na	2003
Corio Loop–Vic Transmission System	Vic	48	$62m	na	2008
Tasmanian Gas Pipeline	Vic–Tas	732	$476m	na	2002
Queensland-Hunter Gas Pipeline	Qld–NSW	850	$700m	100	2008
North Gas Link (now QSN Link)	Qld–NSW	180	$140m		2008
Wandoan to Roma–Brisbane main	Qld	111	na	na	2001
Roma–Brisbane pipeline looping project	Qld	434	$70.7m	na	2002
Gladstone–Bundaberg Pipeline	Qld	300	na	1.4	2000
North Queensland Gas Pipeline	Qld	369	$150m	20	2005
Central Queensland Pipeline	Qld	440	$220m	20–50	2008
Ballera to Moomba Interconnect	Qld	180	$90m	20–90	2008
Townsville to Ballera Pipeline (Ballera lateral)	Qld	1200	$1b	na	2010[1]
Weipa to Gove Pipeline	Qld	na	na	na	2009[1]
Wallumbilla Pipeline	Qld	152	na	na	2008
Ballera to Omicron valve station Pipeline	Qld	180	na	na	na
Kambalda to Esperance	WA	350	$45m	9	2004
Telfer Gas pipeline	WA	443	na	na	2004
Dampier–Bunbury pipeline	WA				
> Additional compression		na	na	na	2000
> Stage 4 expansion[2]		na	$433m	46	2006
> Stage 5 expansion[2]		570	$1.5b	137	2009
> *Stage 5A*		*na*	*$700m*	*na*	*2008*
Trans-continental pipeline	WA–SA	3000	na	na	na
Bonaparte gas pipeline	NT	na	$130m	30	2009
Trans-Territory pipeline	NT–Qld–SA	na	$650m[3]	na	2009[1]

na not available. 1. Proposed project commencement. 2. Looping and compression project. 3. Northern Territory component only.

Source: ABARE, Minerals and Energy, *Major development projects*, 2006 and earlier issues.

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Table 9.4 Pipeline links between major gas sources and markets

PIPELINE (OWNER)	GAS BASIN[1]	PRODUCERS
SYDNEY AND CANBERRA		
Moomba–Sydney Pipeline (APA Group)	> Cooper–Eromanga > Sydney	> Santos, Beach Petroleum, Origin Energy > AGL, Sydney Gas
Eastern Gas Pipeline (Alinta) NSW-Vic Interconnect (APA Group)	Gippsland, Otway, Bass	BHPB, ExxonMobil, Origin Energy, Santos AWE, Beach Petroleum, Mitwell
MELBOURNE		
NSW-Vic Interconnect (APA Group)	Cooper–Eromanga (via MSP); Sydney	See above
Eastern Gas Pipeline (Alinta) Victorian transmission system (APA Group)	Gippsland, Bass, Otway	See above
TASMANIA		
Tasmanian Gas Pipeline (Alinta)	Cooper–Eromanga (via MSP and NSW–Vic Interconnect), Gippsland, Otway, Bass	See above
BRISBANE		
South West Queensland Pipeline (Hastings Diversified Utilities Fund)	> Cooper–Eromanga > Bowen–Surat	> See above > Mosaic, Origin Energy, Santos, Sunshine Gas, Arrow, Mitsui, Molopo, Qld Gas Corp
ADELAIDE		
Moomba–Adelaide Pipeline (Hastings Fund Management)	Cooper–Eromanga	See above
SEA Gas Pipeline (APA Group, IP, CLP)	Otway and Gippsland	See above
ALICE SPRINGS AND DARWIN		
Amadeus Basin–Darwin (leasehold, 96% APA Group)	Amadeus	Magellan, Santos
PERTH		
Dampier–Bunbury Natural Gas Pipeline (DUET (60%), Alcoa (20%), Alinta (20%))	> Carnarvon > Perth	> Apache, BHPB, BP, Chevron, ExxonMobil, Inpex, Kufpec, Santos, Royal Dutch Shell, Tap Oil, Woodside Petroleum > Arc, Origin Energy
Parmelia Pipeline[2] (APA Group)	Perth	Arc, Origin Energy

1. In some cases it may only be possible to source gas from a particular basin using backhaul and swap arrangements. 2. Industrial supplies only.

Source: EnergyQuest, *Energy quarterly production report*, December 2006.