

# 11.0 Energy

## Summary

- Improving energy affordability and security will require significant reform of the energy sector.
- The NSW Government is delivering the sale of the generation businesses and has rationalised the network businesses, creating Networks NSW, to achieve efficiencies.
- Draft changes to the regulatory process, rates of return and reliability standards are also expected to better balance the interests of the network businesses and the electricity consumers.
- Infrastructure NSW will review the capital plans of the amalgamated distribution business, Networks NSW.
- Infrastructure NSW supports the Commission of Audits recommendation that the Government undertakes a study that considers the scope and implementation strategy for privatisation of distribution networks.
- Infrastructure NSW supports later investigation of options for the Government's investment in Snowy Hydro Limited.
- The competitiveness of the national wholesale electricity market works best when there is enough transmission capacity between the states. Infrastructure NSW recommends:
  - projects to increase capacity between NSW to Queensland and NSW to Victoria; and
  - projects to strengthen supply to the Sydney metropolitan area.
- Acting to bring large reserves of coal seam gas to market is potentially game changing for NSW's economic growth and productivity.
- Infrastructure NSW recommends supporting private sector investment by:
  - Facilitating the augmentation of the existing national gas transmission networks to connect new NSW supply areas;
  - Facilitating development of new industries, including, investigating options for LNG export infrastructure.

## 11.1 Energy snapshot

- The NSW Government has \$30 billion invested in electricity infrastructure (in State Owned Corporations (SOC)). This is \$26 billion in network businesses and \$4 billion in generation businesses. The electricity sector accounts for 27 percent of past capital and 28 percent of all the Government's future capital program<sup>1</sup>.
- The electricity sector has invested an average of \$2 billion a year for the past decade. The capital plans of the businesses are to double this to an average of \$4 billion a year for the next decade to 2021.
- Each electricity business has borrowed heavily to fund its capital programs and this increase in debt (and forecast increases) contributes significantly to the increase in the Government net debt position. While each business has assessed its capital structure to be prudent, the consolidated position has caused the State to approach its borrowing limit. This has caused constraints on borrowing in other Government sectors.
- Electricity network investment in NSW is significantly higher than investment in other states where the private sector owns the network.
- The Government has decided to sell the generation businesses and amalgamate the network businesses to reduce pressure on electricity prices and the capital drag on Government resources.

<sup>1</sup> NSW Treasury, 2012-13 Budget Paper 4.

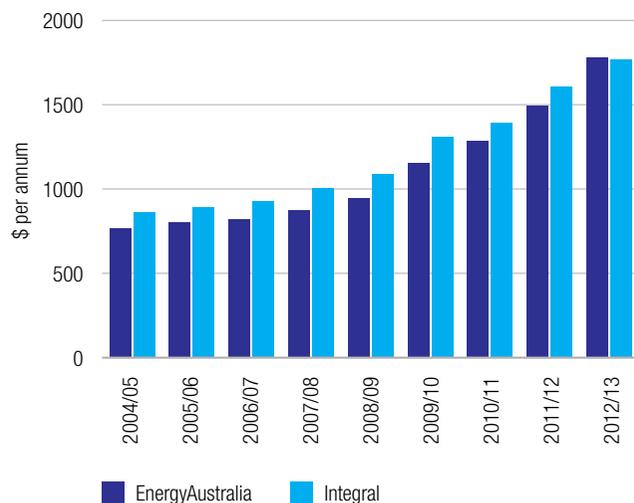
- Infrastructure NSW recommends reducing the capital invested in electricity assets in the short term.
- Private sector investment in gas infrastructure and electricity generation over the next 20 years will increase competition in the energy market and lower production costs for the whole economy.

## 11.2 Prices and demand

The NSW economy has traditionally benefited from the competitive advantage of low priced energy based upon abundant reserves of coal. This long term competitive advantage has all but disappeared over the last 5 to 10 years.

The era of low cost energy is over. High levels of investment in electricity networks and the proliferation of primarily Federal Government renewable energy schemes have caused the average electricity retail bill to double over the past eight years for NSW residential customers, from around \$800 to near \$1,600 per annum. This is shown in Figure 11.1.

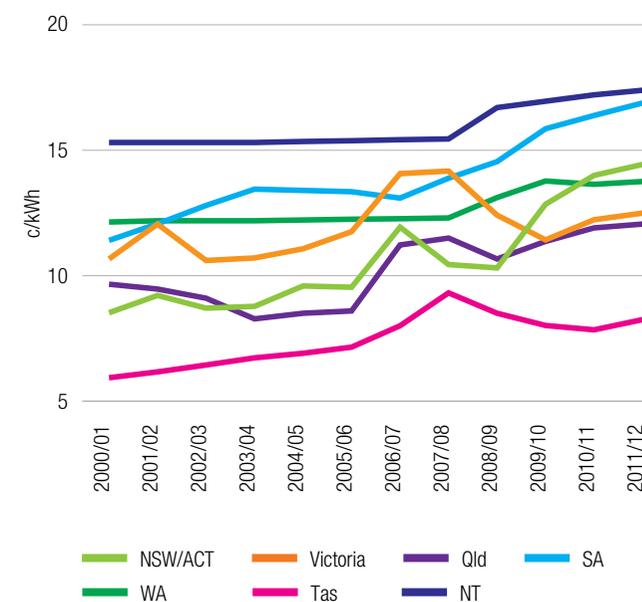
**Figure 11.1 NSW Electricity bills for residential customers**



Source: IPART.

NSW prices have also grown faster than prices in other States, reducing the attractiveness of NSW to businesses and as a place to live. This is shown in Figure 11.2 below.

**Figure 11.2 Average Electricity Retail Prices 2001-11**



Source: KPMG for AEMC.

The forecast is for further large price increases over the next few years, these increases will continue to be driven by network price increases, carbon pricing and Federal renewable energy policies, which will drive changes in the mix of generation technology.

These price forecasts reflect:

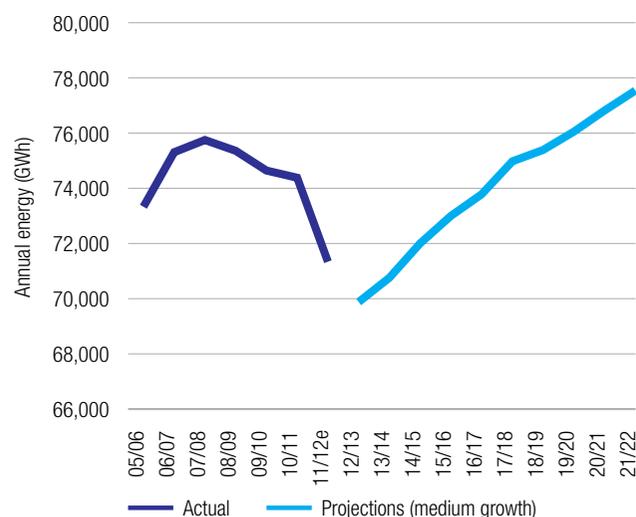
- The cost of renewable generators, to meet legislated targets of 20 per cent by 2020.
- The majority of renewable plant will be wind which needs to be supplemented by back-up gas peaking plant.
- The combination of wind with peaking generation is an expensive generation mix and increases the price to business and households.

Higher energy prices are a risk for economic growth and are creating hardship for parts of the community<sup>2</sup>. The large increase in costs for industry is contributing to structural adjustments in NSW's industrial composition. NSW is energy rich and these resources need to be maximised to ensure that NSW businesses are competitive.

### Demand

As a result of these price increases, electricity demand is declining – demand in 2011 is at the same level as 2006. This is shown in Figure 11.3 below.

**Figure 11.3 Electricity Despatched (GWh) History and Forecast**



Source: AEMO.

### Peak demand

While energy demand is declining, peak demand has grown at nearly two percent per annum. The 'gap' between average energy and peak demand drives the price up further as more infrastructure is needed for less time. Nationally, it is estimated that over \$11 billion of infrastructure is used for less than one percent of the time<sup>3</sup>.

Infrastructure NSW has concluded that there are insufficient incentives on electricity network businesses to manage peak demand and there is evidence that:

- forecasts of demand (for capital planning) are conservative and do not take into account the potential of demand management, including price elasticities
- high level analysis of data on energy flows are not used to any extent in capital planning
- automation and active configuration and balancing of electricity supply systems are not used to avoid capital expenditure.

This has contributed to the high level of electricity distribution investment and consequent high prices.

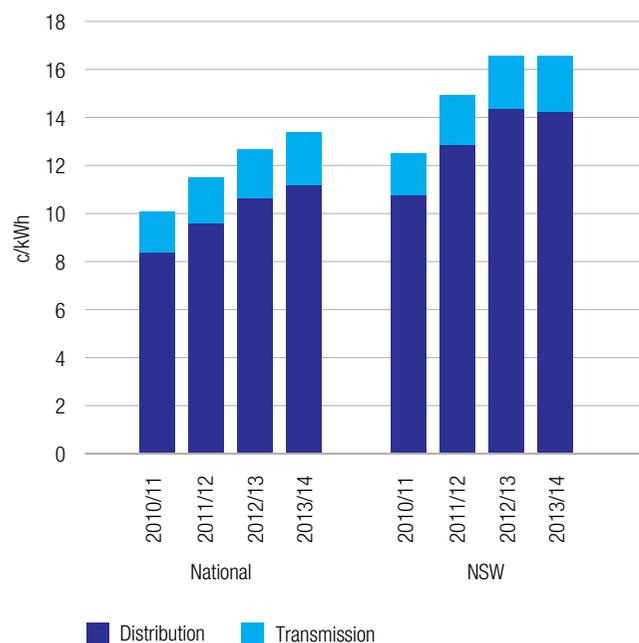
<sup>2</sup> IPART 2012, NSW Retail Electricity Review.

<sup>3</sup> Ernst & Young 2011, AEMC Power of choice: Rationale and Drivers for DSP in the Electricity Market – Demand and supply of Electricity, prepared for the AEMC.

## 11.3 Electricity distribution investment

Infrastructure investment by the NSW Government-owned network businesses has been the largest contributor (over 60 percent) to the electricity price increases. Figure 11.4 shows that the network increases in NSW have been higher than national average.

**Figure 11.4 Comparison of Network Prices from 2010/11 to 2013/14**

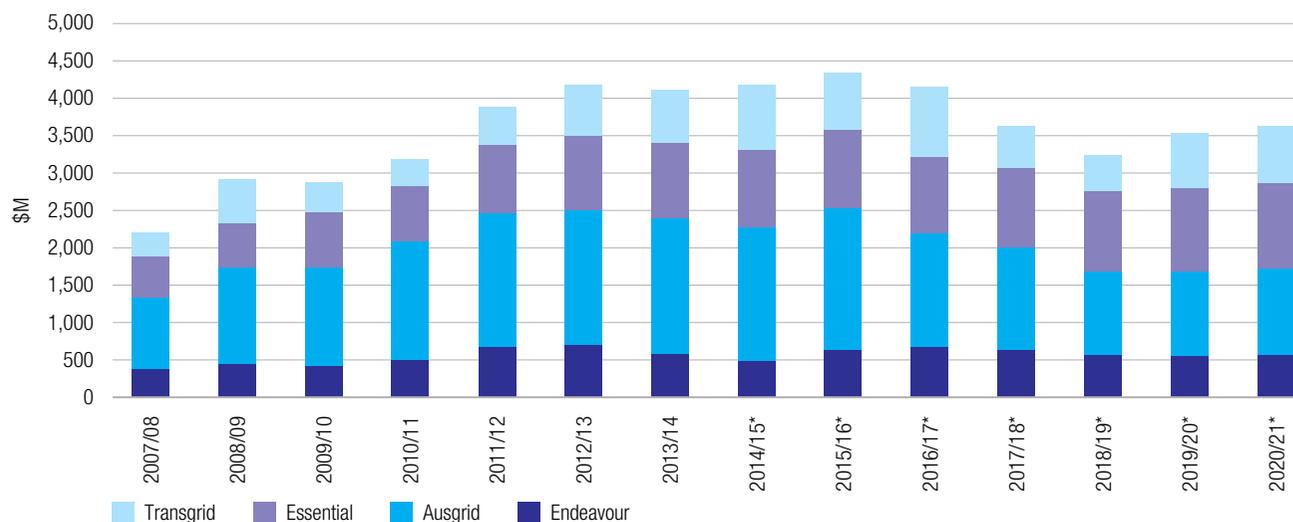


Source: AEMC.

Price increases are due to the investment in the electricity network. Investment has more than doubled in the past five years from around \$2 billion per annum to over \$4 billion per annum from 2012-13 to 2016-17 as shown in Figure 11.5 below.

This rate of investment represents a dramatic growth of over 80 percent in the Regulated Asset Base (RAB) as shown in the table below. This means that network prices will continue to rise (as the largest portion is return on RAB).

**Figure 11.5 Distribution Businesses' Planned Investment in Electricity 2008-21**



Source: NSW Treasury.  
Note: Capital plans for 2014-15 onwards yet to be reviewed.

**Table 11.1 2009-2014 Regulated Asset Base Growth\***

	RAB (2009 \$million)	Investment 2009-2014	% Added
TransGrid	4,213	2,440	58%
Ausgrid	8,431	7,837	93%
Endeavour	3,744	2,721	73%
Essential	4,382	3,826	87%
<b>Total</b>	<b>20,770</b>	<b>16,824</b>	<b>81%</b>

Source: Australian Energy Regulator.

Infrastructure NSW has concluded that the planned increase in investment and borrowing for electricity businesses is not the most beneficial use of the State's constrained funding and borrowing capacity.

The economic reforms that have taken place in the energy sector have successfully delivered competition in the wholesale and retail gas and electricity markets. The competition reforms are complemented by national regulation of the monopoly transmission and distribution sectors. The Government therefore does not require direct investment in infrastructure in order to achieve reliability and other objectives. Instead, stable and transparent policy and governance frameworks have replaced the need for direct Government investment.

**Recommendation** Infrastructure NSW supports the Commission of Audit's recommendation that the Government undertakes a study that considers the scope and implementation strategy for privatisation of distribution networks.

### Regulatory incentives for investment

The regulatory framework is designed to support the national objective to promote efficient investment for the long term interests of consumers.

However, Infrastructure NSW has concluded that there has been high capital spending in NSW networks which is partly due to the high incentive for capital investment arising from the regulated cost of capital.

Table 11.2 below shows the history of regulated cost of capital:

**Table 11.2 WACC Determinations – History and Comparison**

1999-2004	2004-2009	2009-2014	UK Comparison: Ofgem 2011
7%	8.7%	10.2%	6%

Note: The Weighted average cost of capital (WACC) is the return on capital for regulated network business for a regulatory control period. It is calculated by the Australian Energy Regulator in accordance with the National Electricity Rules.

A large value wedge can occur between the return on capital, the weighted average cost of capital allowance and shareholder capital costs in Government-owned and privately-owned networks.

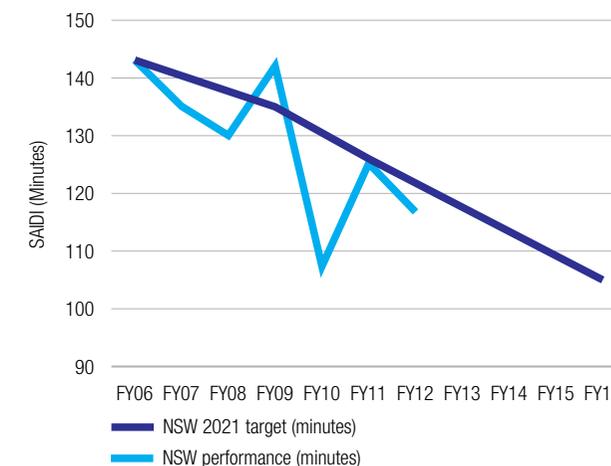
Infrastructure NSW supports the Australian Energy Market Commission's efforts to amend the regulatory framework through national reviews now underway<sup>4</sup>.

<sup>4</sup> AEMC 2012, Draft Rule Determinations for economic regulation of network service providers, August 2012.

### Reliability

As shown in Figure 11.6, reliability has improved by 25 per cent since 2006, or 25-30 minutes fewer interruptions per year on average. Customers are getting very marginal and in many cases questionable benefit, given the significant cost increases that they face.

**Figure 11.6 NSW Networks reliability performance: Customer minutes without supply**



Source: NSW Department of Trade and Investment.

Infrastructure NSW has concluded that the NSW 2021 reliability target can continue to be achieved with lower (recommended) capital investment.

Infrastructure NSW supports the Government's efficiency measures to amalgamate distribution businesses to reduce investment. The amalgamated business, Networks NSW, is yet to recommend a capital program which will be reviewed by Infrastructure NSW.

## 11.4 Electricity transmission investment

Infrastructure NSW considers that strengthening the transmission links between the regions will enhance competition in the national wholesale electricity market.

The capacity of inter-regional electricity trade has a direct impact on the wholesale costs and competitiveness of the national market and therefore the prices paid by businesses and households. This is because market impacts from constraints or congestion prevent lowest priced generation being available to NSW consumers<sup>5</sup>.

A recent study investigating increased inter-regional power transfer capabilities in the national electricity market has demonstrated potential market benefits. The maximum net benefits (benefits greater than costs) were found to occur when combining the three mainland components: Queensland to NSW; NSW to Victoria; and Victoria to South Australia. The results from the analysis indicate that the high capacity backbone may approach economic viability by approximately 2020-21 under high demand growth and high carbon price conditions.

Infrastructure NSW concurs with the proposed program submitted by TransGrid and contained in the National Transmission Network Development Plan to develop the southern high voltage link to supply the Sydney area, and to accommodate gas-fired generation development in the south and to strengthen the interstate links over the next 20 years.

**Recommendation** Infrastructure NSW recommends that the Government:

- prioritise transmission projects to strengthen the capacity of interstate flows in the national electricity market
- prioritise transmission projects to strengthen supply to the Sydney metropolitan area.

## 11.5 Generation and gas

### 11.5.1 Electricity generation

The Government will sell its electricity generation assets (expected during 2013) and all future investment in NSW generation will be made by the private sector. The Government's future role is to remove any barriers to that investment and to encourage the private sector to invest in the lowest cost generation available.

Infrastructure NSW supports the Commission of Audit's recommendation for a review of the options to divest the public ownership of Snowy Hydro Limited.

Significant private investment will be needed over the next 20 years in electricity generation for both base load and renewable energy, despite the flattening of electricity consumption<sup>6</sup>.

Achieving the estimated additional 7,000 megawatts (MW) of base load generation capacity by 2029-30<sup>7</sup> will require significant time for planning and approval processes to be completed.

However, Infrastructure NSW has concluded that in the short to medium term the market is more likely to invest in higher cost, smaller plant units to manage supply and peak price risks. Further, Infrastructure NSW is concerned that the Federal Government's 20 percent renewable energy target is crowding out other types of viable investment. The emerging mix of generation technology will result in higher electricity prices.

Infrastructure NSW notes that the NSW Government will facilitate investment in low cost electricity generation, especially base load capacity, by providing consented development sites in the generation sale packages which are fuel and technology neutral. This would enable the buyer to choose the most cost effective investment and accelerate the development of the project by up to two years faster than would otherwise be the case.

Infrastructure NSW also supports the NSW Government's policy for a review of the renewable energy targets and carbon policies to remove duplication of schemes that have the same objectives. The introduction of the carbon price suggests that the design and operation of the renewable energy targets across all schemes may no longer be efficient or effective. Closing down the various schemes would reduce generation costs and electricity prices.

<sup>5</sup> AEMO 2012, Electricity Network Regulation Submission to Issue Paper.

<sup>6</sup> AEMO 2011; prepared for the Electricity Statement of Opportunity.

<sup>7</sup> AEMO 2011, National Transmission Network Development Plan.

### 11.5.2 Encouraging private sector investment in gas infrastructure

Infrastructure NSW considers that the development of the Coal Seam Gas (CSG) industry will be game changing for NSW, providing a number of strategic benefits. It will help to address the security risk of declining reserves of conventional natural gas from interstate basins; meet the increasing demand for gas fired generation; and help to contain upward pressures on wholesale gas prices because of declining reserves and increased demand including for exports.

The CSG reserves have the potential to supply residential, commercial and industrial energy users and to substitute for the declining reserves of natural gas from traditional interstate sources. The vastness of the reserves has the potential to provide gas to other Australian states and for export to overseas markets. Gas production in the eastern market is projected to grow at rate of five percent a year to 2,492 petajoules (PJ) in 2034-35<sup>8</sup>. This is greater than the total amount of gas currently produced in Australia. In 2010-11, Australia in total produced 2,091 PJ of gas<sup>9</sup>.

The emergence of a NSW CSG industry is a significant opportunity that will provide employment and economic growth to regional areas in NSW as it has done in Queensland.

Timely investment in NSW CSG infrastructure offers a number of other strategic advantages:

- Lower cost supply for gas-fired generation. There are eight 'committed' gas generators in various stages of development.
- NSW relies on gas piped from interstate basins. Security of gas supply is an emerging issue due to the lack of conventional natural gas reserves within NSW and the decline in interstate conventional reserves. The major gas producers appear increasingly to be earmarking gas reserves for the export market as the LNG production and export facilities in Queensland<sup>10</sup> come on line.
- New additional sources of gas, such as NSW CSG, will enhance competition among gas producers. Encouraging more competition in the gas sector will be important to counter the risk of higher wholesale gas prices that are emerging.

Uncertainty about availability and about prices in the future for gas in NSW can be alleviated by developing the CSG sector in NSW.

Securing new low cost sources of gas will be essential to meet increasing demand for gas in NSW. This, in turn, will fuel economic growth and prosperity.

The NSW Government, in its submission to the NSW Legislative Council Coal Seam Gas Inquiry, presented the position that ensuring security of gas supply for NSW electricity generation will require bringing the State's CSG reserves into production and/or the expansion of transmission pipeline capacity from

interstate. Without bringing reserves into production or expanding interstate capacity, potentially significant price rises could be expected to flow on to large gas consuming industries as well as smaller commercial and residential consumers. In addition, these price rises will flow into electricity prices as the penetration of gas fired electricity generation expands in NSW.

The Government is putting in place a series of measures to ensure that the NSW gas industry meets the safety, health and environmental requirements expected from the community. The planning and approval processes need to be streamlined, proportionate and timely.

NSW CSG reserves will need to be linked to the existing national gas transmission network if they are to address the supply demands from business, households and export customers. This will require additional intrastate pipeline infrastructure supporting the development of NSW gas sector and to ensure unconstrained access to gas supplies. Additional intrastate pipeline infrastructure from the NSW CSG-producing basins to gas markets will increase security of supply for NSW consumers.

This significant investment in gas transportation infrastructure will undertaken by private interests with regulatory oversight by the Government. The priority is to ensure that investment in gas infrastructure occurs in a timely manner and does not delay production or create supply bottlenecks.

8 Syed, A and Penney, K 2011, Australian Energy Projections to 2034-35, Bureau of Resource and Energy Economics.

9 Bureau of Resource and Energy Economics 2012, Energy in Australia 2012.

10 Santos 2012, GLNG to Purchase 365PJ of Gas From Origin Energy, ASX Media Release, 2 May 2012. Origin Energy 2012, Origin Announces major gas sales agreement with GLNG, ASX Media Release, 2 May 2012.

**Recommendation** Infrastructure NSW recommends private sector investment to augment the interstate gas transmission network for developing gas resources by:

- putting in place a regulatory framework that ensures the development of a safe and environmentally responsible coal seam gas industry that co-exists with agricultural production
- facilitating development of new industries, including, investigating options for LNG export infrastructure
- facilitating the augmentation of the existing national gas transmission networks to connect new supply areas including the Gunnedah Basin.

## 11.6 Recommended actions

The key strategies for NSW energy sector are listed below.

Recommendations	Year	Type	Capital and Funding Implications
48 Investigate options and strategy for privatisation of networks and Snowy Hydro Limited	0 – 5	Review	Cost of review is not material
49 Upgrade electricity transmission lines to strengthen interstate capacity and Sydney supply	5 – 10	Major project	Existing agency program
50 Augment interstate gas transmission network	0 – 20	Major project	Investment to be funded by the private sector