

UNIVERSITY OF
TECHNOLOGY SYDNEY

INSTITUTE FOR SUSTAINABLE FUTURES



NSW BUSINESS ENERGY PRICES TO 2020



NSW business energy prices to 2020

FINAL REPORT

Revision 1

FOR THE NSW OFFICE OF ENVIRONMENT AND HERITAGE

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INSTITUTE FOR SUSTAINABLE FUTURES

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Revision 1: a revised report and spreadsheet issued June 2012 to correct an error in the projection of the wholesale electricity price. The high carbon price projection has also been modified to take account of the lower greenhouse intensity of the electricity mix with a higher carbon price.

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Abbreviations

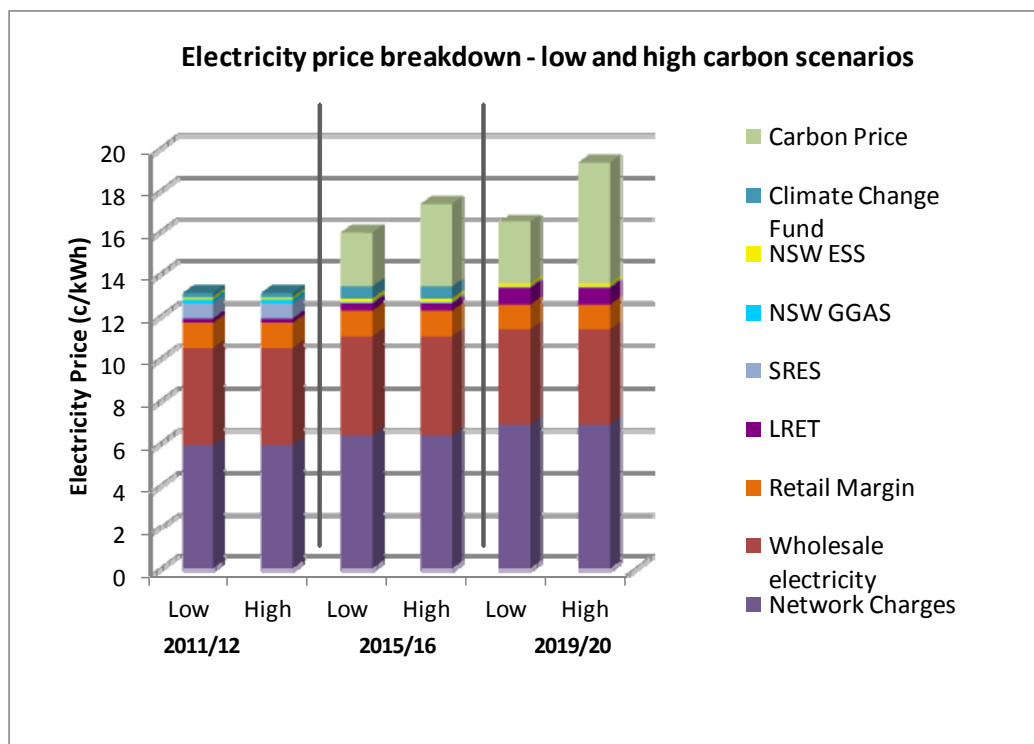
ABS	Australian Bureau of Statistics
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CCF	NSW Climate Change Fund
CEC	Clean Energy Council
c/kWh	Cents per kilowatt hour
c/MJ	Cents per Mega-joule
CPI	Consumer Price Index
DNSP	Distribution Network Service Provider
EBIT	Earnings Before Interest and Tax
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortization
ESAA	Electricity Supply Association of Australia
ESS	NSW Energy Savings Scheme
IPART	Independent Pricing and Regulatory Tribunal (NSW)
ISF	Institute for Sustainable Futures
kW	Kilowatt
kWh	Kilowatt hour (measure of energy)
kVA	Kilovolt ampere
LGC	Large-scale Generation Certificate
LRET	Large-scale Renewable Energy Target
MW	Megawatt
MWh	Megawatt hour
NTNDP	National Transmission Network Development Plan
NEM	National Electricity Market
OEH	NSW Office of Environment and Heritage
OPEX	Operating Expenditure
ORER	Office of the Renewable Energy Regulator
REC	Renewable Energy Certificate
SRES	Small-scale Renewable Energy Scheme
STC	Small-scale Generation Certificate
STP	Small-scale Technology Percentage
RPP	Renewable Power Percentage
UTS	University of Technology, Sydney

Executive summary

The NSW Office of Environment and Heritage commissioned the Institute for Sustainable Futures to project NSW energy prices for medium to large business users to 2020. All prices are expressed in real terms, in 2011/12 dollars. Only volume charges which are applied per unit of energy consumed are considered in this report, which does not include fixed charges or capacity charges.

Over the 13 years from 1996 to 2009 electricity prices generally trended slightly downwards in real terms, apart from one spike in 2006/07. From 2011 to 2020 electricity prices are projected to rise steeply, with a particularly sharp rise to 2013/14. Figure 1 shows business electricity prices from 2011 to 2020 under low and high carbon price scenarios. In 2011/12, the estimated average NSW business electricity price is between 10.7 c/kWh and 13.3 c/kWh, depending on the distribution area. The real projected rise to 2020 in the low carbon scenario is 28%, with the price reaching 16.5 c/kWh^a in 2020. In the high carbon scenario the business electricity price rises 50%, to 19.3 c/kWh. Network charges contribute the greatest proportion to the retail cost of electricity throughout the period, with the percentage varying from 36% to 44%. The carbon price is a significant component by 2020 in both scenarios (18% with a low and 30% with a high carbon price).

Figure 1 Business electricity prices 2011/12 – 2019/20 (2011/12 dollars)

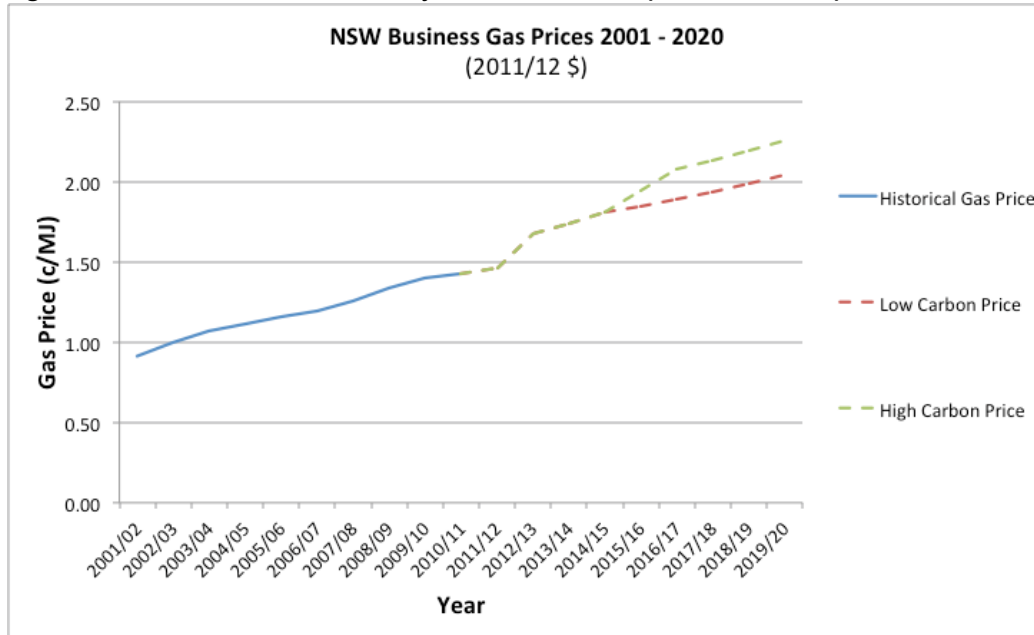


Gas prices increase slowly over the 10 years to 2020 in real terms as seen in Figure 2. The price is projected to increase more steeply to 2013 as a result of increases in distribution charges, and then more slowly after the introduction of a carbon price in 2012/13.

^a Note figures used in the Executive Summary and Results section of this report are for the Ausgrid Distribution Area.

In 2011, the gas price is 1.47 c/MJ. By 2020, in a low carbon price scenario, gas prices are predicted to rise by 39% to 2.04 c/MJ. Under a high carbon price scenario the price goes up by 54%, to 2.25 c/MJ (Figure 2). Note that while regulated gas prices have been used in this analysis, large gas users may be able to negotiate lower prices.

Figure 2 NSW Business Gas Price Projections 2001-2020 (2011/12 dollars)



There is considerable uncertainty in projecting energy prices, and it is much more difficult to forecast prices for large energy users than for residential customers. While the effect of a low and high carbon price is captured here, there is uncertainty in the increases projected for each of the components of the price. For example, wholesale electricity and gas prices may be subject to upward pressure beyond what is included in the projections used here because of potential fuel supply competition with coal and gas exports, however consideration of these factors was beyond the scope of this report. The cost of the LRET and the SRES may be either lower or higher than projected here. No change has been applied to network charges after the current regulatory period, as there is no information in the public domain about expected prices after this date. The uncertainty attached to each component means that overall uncertainty is large.

In addition, individual large businesses may be subject to significantly different rates than are presented here, as customers are generally on negotiated time of use tariffs that reflect their own usage pattern. A spreadsheet has been supplied to OEH that allows users to enter their own tariffs, which may increase the applicability for particular businesses. It is particularly encouraged that users enter the actual proportion of their energy use in peak, shoulder and off-peak times into the spreadsheet.

It was beyond the scope of this work to project increases for different time of use rates, which could make price rises for particular businesses markedly different from those projected here.

1. Introduction

The Office of Environment and Heritage (OEH) commissioned the Institute for Sustainable Futures (ISF) to undertake a projection of NSW energy prices to 2020 for medium to large business users, and to obtain historical energy price data.

For the purpose of this work, medium to large business users are defined as using:

- Electricity, 160 MWh/year – 10,000 MWh/ year, and
- Gas: 1 TJ/ year – 10 TJ / year.

Only the volumetric (per kWh) component of energy charges is included in the projection, which does not include fixed daily or monthly service (per day or per metering point) or capacity (per kVA) charges.

OEH has a program of energy audits for medium to large businesses, and wishes to use projected energy prices to calculate potential savings for the implementation of energy efficiency measures.

Challenges and limitations

It is significantly more difficult to forecast electricity and gas prices for large energy users than for small customers, either residential or business, and to obtain historical data.

The electricity market in NSW has been deregulated for customers over 160 MWh per year since 1997, and for all sites since 2002. While regulated tariffs exist for each year, these generally only apply to small business users.

Electricity network tariffs are published yearly for businesses, but these do not include the wholesale energy costs and retail margin component, which is negotiated on a case-by-case basis between customers and energy retailers. It is therefore very difficult to obtain standardised historical data for electricity or gas business tariffs, as energy retailers do not publish the complete tariff for these customers. The same applies to current tariffs, so an average tariff for electricity has been calculated using the wholesale price, network charges, 'pass through charges'^b and an assumed retail margin. Details of the assumptions used are given in the methodology section.

In addition, large business users would almost without exception be on time of use tariffs, with different rates for peak, off-peak, and shoulder periods and monthly peak demand or capacity charges. It is beyond the scope of this work to report either projected or historical time of use pricing, and instead only an averaged rate for current, historical and projected prices are presented. These may not reflect a particular business usage pattern, which in turn will affect the prices that business is charged.

Particular business users may therefore be subject to significantly different rates than are presented here, either because they are able to negotiate better rates, or because their particular use pattern and/or location is difficult to service.

^b Including market charges, the Renewable Energy Target, the NSW Greenhouse Gas Abatement Scheme (GGAS) and the NSW Energy Savings Scheme (ESS).

2. Methodology

2.1 Electricity

Retail electricity prices from 2012/13 for any customer are composed of five main components:

1. Wholesale electricity price;
2. Retail margin and costs;
3. Network charges including transmission and distribution;
4. Current environmental obligations and market administration charges,
5. Carbon price, and
6. Demand and capacity charges (note these are not included in these projections)

While demand and capacity charges may make up a significant portion of business electricity charges, they were outside the scope of this work, which is a projection of prices for the volumetric component of electricity charges.

The baseline (2011/12) tariff used in this modelling was derived by component, as electricity tariffs for business customers consuming over 160MWh/yr are not reported in their entirety.

The costs are calculated from a number of sources including information from the three NSW distribution businesses, Ausgrid, Essential Energy and Endeavour Energy, as well as a number of the electricity retailers.

In order to project the price of electricity for large energy users (160MWh/yr - 10GWh/yr), ISF has applied the projected increases associated with each component to the derived business electricity tariff for 2011/12. The calculations do not differentiate between peak, shoulder and off peak rates, and have used an assumed split of 30:30:40 to derive a weighted tariff.

The following sections detail how the baseline tariff was derived, and how each component is projected to 2020.

Baseline tariff derivation

Published large business electricity tariffs do not include an energy component, as this is negotiated with each customer, so the electricity wholesale pool price has been used, with an assumed margin for retail costs and profit.

The 2011/12 wholesale price is taken from the updated 2011 ROAM Consulting report to Treasury¹. However, it is possible for users to enter their own energy tariff into the spreadsheet that accompanies this report.

It is assumed that the retail margin is a constant 26% of the wholesale electricity price from 2010 – 2020, based on the percentage estimated from IPART determinations for the retail margin on regulated tariffs, and financial reporting from retailers.

The network component was taken from each network business's time of use network price for low voltage business customers for the 2011/12 financial year. Network charges are associated with the cost of building, operating and maintaining the electricity transmission and distribution systems, known colloquially as the poles and wires, as well as payments to

the NSW Climate Change Fund (CCF). It should be noted that this baseline and the subsequent projection does not include capacity (\$/kVA) and access (\$/day) charge components of the network tariffs; only the energy component of the tariff (c/kWh) is included. Additionally, it is possible for users to enter their own network energy tariff into the spreadsheet that accompanies this report.

The CCF is funded from network charges, so the projected cost for the CCF is subtracted from the network component and identified separately as discussed below.

The specific network tariffs used are:

- a) Ausgrid (formerly Energy Australia): Low Voltage 160-750 MWh pa TOU Capacity tariff (EA305)
- b) Endeavour Energy (formerly Integral): LV demand TOU tariff, code N19
- c) Essential Energy (formerly Country Energy): LV demand TOU tariff BLND3AO

The final component of the baseline electricity tariff is the environmental obligations. Costs for the NSW Greenhouse Gas Abatement (GGAS) Certificates, and the NSW Energy Savings Scheme (ESS) for 2010/11 to 2014/15 were taken from an Energy Australia's 2009 Retail Electricity contract schedule for 160 MWh/ year customers². The cost of Large-scale Renewable Energy Target (LRET) and the Small-scale Renewable Energy Scheme (SRES) are calculated from the current Renewable Power Percentage (RPP) and the current Small-scale Technology Percentage (STP) from the Office of the Renewable Energy Regulator (ORER), combined with the certificate price for Large Generation Certificates (LGC) taken from Frontier Economics report to IPART³ and the Renewable Energy Certificate (REC) price modelling for Treasury^{4,5}.

The cost of the NSW Solar Bonus Scheme was calculated from the Distribution Network Service Provider (DNSP) liabilities to the CCF as outlined in the NSW Auditor General's Report⁶ and NSW's projected 2011/12 electricity generation taken from ROAM Consulting⁷.

Wholesale electricity price projection 2011/12-2019/20

ISF uses the projection of the NSW wholesale pool price projection by ROAM Consulting, published by Treasury in September 2011 (the Government Policy)⁸. It should be noted that the cost of the carbon price is subtracted from this projection and identified separately.

Network price projection 2011/12-2019/20

Network price increases to 2013/14 are calculated for each network area using their respective statements on network increases.

For Ausgrid (formerly Energy Australia), the percentage increases from 2010/11 to 2013/14 are the rates in Energy Australia's 2010 *Statement of Expected Network Price Trends* adjusted from nominal to real using their stated value for the Consumer Price Index (CPI)⁹. As Energy Australia reports charges and a percentage increases in nominal terms, these were adjusted to remain in 2010/11 dollars, assuming a constant inflation rate of 3.1%¹⁰.

For Essential Energy (formerly Country Energy), the increase is taken from the 2010 *Statement of Expected Network Price Trends* adjusted.¹¹

For Endeavour Energy (formerly Integral), we have used the stated increase for 2011/12 and 2012/13 in their 2010 *Statement of Expected Network Price Trends*¹².

There is considerable uncertainty about network cost increases beyond the current regulatory period, and network businesses have not been able to give even indicative figures. The uncertainty is increased by the forthcoming Australian Energy Market Commission (AEMC) review of the costs and benefits of different levels of reliability in the NSW electricity distribution system. The outcome of the review is likely to impact the level of distribution investment and prices in NSW over the longer term. The final report should arrive in time for amendments to be made and take effect from the next distribution regulatory control period starting July 2014.

Discussions with network businesses have confirmed that network prices could either increase or decrease in real terms after the current regulatory period, so no increase is applied after 2014/15 to any of the network prices. This is consistent with ROAM Consulting electricity price projections to Treasury, which states:

“ROAM has used the gazetted transmission price increases from 2010-11 to 2014-15, with network costs remaining constant in real terms beyond this point. The expectation of constant transmission and distribution costs per kWh in real terms from 2014-15 is reasonable, since the transmission and distribution infrastructure will have reached a highly developed stage and the market is growing in volume sufficiently to support investment while maintaining prices in real terms.”¹³

Retail margin and costs projection 2011/12-2019/20

The retail margin and costs for unregulated business electricity prices are commercially sensitive, and are not disclosed. However, ISF was advised that the margin is only applied to the wholesale electricity price, and not to the other charges such as network costs, environmental schemes, and market costs¹⁴.

IPART made a determination for retail margins on regulated tariffs of 5% in 2007 and 5.4% in 2010, with the percentage relating to the total electricity price¹⁵, including network and pass through charges. IPART also make an allowance of retail costs that varies from 4.8% to 5.9% of the total costs.

We have estimated an allowance for retail margin and costs assuming the same overall percentage as regulated tariffs, and converted this to a percentage of the wholesale electricity price. This results in a retail margin and cost allowance of 26% of the wholesale electricity cost, equivalent to a retail gross margin (including costs) of between 9% and 11% compared to the final retail price. These percentages were compared to the reported Earnings Before Interest and Tax (EBIT) for the major retailers. Unfortunately, retailer reporting is not consistent. Most retailers do not report EBIT separately for retail electricity and retail gas, and only two retailers gave any indication of the percentage of operating costs. None of the retailers report EBIT or operating expenditure (OPEX) by class of customer.

EBIT varied from 5.3% to 18%; only one retailer separated retail electricity, which had an EBIT of 9.25%. OPEX was only reported by two retailers, with a range from 5.4% to 6.6%. All three retailers reported an increasing trend for EBIT.

Adding OPEX and EBIT, this would result in retail cost and margin of between 11.6% and 16% compared to overall revenue. Our assumption of 26% results in an overall retailer margin (including costs) of 9% in the Ausgrid area, and 11% in the Essential and Endeavour areas. This is in line with the IPART determination for regulated tariffs.

The EBIT and OPEX figures are given in Table 1. Note that figures are not directly comparable between retailers, as the reporting methodology is not standard.

Table 1 EBIT and OPEX, AGL, Origin and TruEnergy

	AGL Note 1		ORIGIN Note 2		TRUENERGY Note 3	
	2009/10	2010/11	2009/10	2010/11	2009/10	2010/11
EBIT	5.9%	6.2%	6.5%	9.3%	16%	18%
OPEX	5.7%	5.4%	5.4%	6.6%	n/a	n/a
TOTAL	11.6%	11.5%	12.9	15.9%		

Note 1, AGL

- Operating EBIT is for the retail section, including both gas and electricity
- EBIT and OPEX from 2011 Annual report, ASX statement.

Note 2, Origin

- EBIT is for the electricity retail only, from Guthrie (2011a, p6)¹⁶
- OPEX is for entire retail section, including both gas and electricity, from Guthrie (2011b p47)¹⁷.

Note 3, TruEnergy

- Earnings Before Interest, Taxes, Depreciation and Amortization (EBITDA) are reported, and it is for all of TruEnergy's operations, not only retail. Information is from McIndoe and Holmes, 2011¹⁸.

Carbon price projection 2008/09-2019/20

The legislated price of \$23/tonne in 2012/13 increasing by 2.5% a year for two years in real terms was used for both the high and low carbon price projection¹⁹. From 2015/16 to 2019/20, ROAM Consulting's Government Policy carbon price projection for Treasury is used for the low scenario, and the High Price projection is used for the high scenario²⁰. These projections were provided to ROAM Consulting by the Department of Treasury and are based on the following assumptions:

“Government Policy scenario — Assumes a world with a 550 ppm stabilisation target and an Australian emission target of a 5 per cent cut on 2000 levels by 2020 and an 80 per cent cut by 2050. Assumes a nominal domestic starting price of A\$20/t CO₂-e in 2012-13, rising 5 per cent per year, plus inflation, before moving to a flexible world price in 2015-16, projected to be around A\$29/t CO₂-e.

High price scenario — Assumes a world with a more ambitious 450 ppm stabilisation target and an Australian emission target of a 25 per cent cut on 2000 levels by 2020 and an 80 per cent cut by 2050. Assumes a nominal domestic starting price of A\$30/t CO₂-e in 2012-13, rising 5 per cent per year, plus inflation, before moving to a flexible world price in 2015-16, projected to be around A\$61/t CO₂-e.”²¹

To convert these projection from \$/tonne to \$/MWh, the carbon price per tonne was multiplied by the projected intensity of NSW's electricity generation in tonnes/MWh.

The NSW emissions intensity was calculated for both a low and a high carbon price using the Government policy and high carbon price NSW generation mix projection from Treasury²² and the emissions factors from the 2011 National Transmission Network Development Plan (NTNDP)²³.

Environmental obligations price projection 2008/09-2019/20

The current environmental obligations include the Large-scale Renewable Energy Target (LRET) and Small-scale Renewable Energy Scheme (SRES), the NSW Greenhouse Gas Abatement Scheme (GGAS), the Climate Change Fund (which includes the Solar Bonus Scheme), and the NSW Energy Savings Scheme (ESS).

In order to calculate the cost of the Large Generation Certificates (LGCs) and Small-scale Technology Certificates (STC) obligations, a projection of the Renewable Power Percentage (RPP) and the Small-scale Technology Percentage (STP) are made for 2011-2020, which is applied to the projected cost for the LGCs and STCs respectively.

The RPP is calculated using the 2010/11 RPP from ORER of 5.98%, multiplied by the ratio of the 2010 target to the 2012 target; this is repeated for subsequent years. The 2011 target is not used as it has been adjusted downwards to take account of the excess of RECs that were created prior to splitting the Renewable Energy Target into the LRET and the SRES. The RPP is adjusted to financial years by averaging the two calendar year percentages.

This methodology does not take into account that the projected growth of electricity consumption would result in a smaller RPP to meet the GWh targets. However there are a number of reasons that this may not be reflected in the final RPP. Firstly, the target might be increased as there is a commitment to meeting an actual 20% of electricity from renewable energy. Secondly, the 2010 percentage does not take into account exempted sectors, which will increase the RPP for the non-exempted sectors. Exemptions came to more than 27,000 GWh in 2011.

The STP is taken as the actual value for 2011, and ORER's estimates for 2012 and 2013 (14.8%, 20.87%, and 6.25% respectively). The numbers of STCs created per year for 2012 – 2020 are estimated as 4,300 from ROAM (2010)²⁴, Figures 1.1 and 1.2. This is used to calculate an STP of 2.2% for these years from the ratio with the STC numbers for previous years. The STP is adjusted to financial years by averaging the two calendar year percentages. The STC price is taken as the STC clearing house price of \$40. While STCs are currently trading around \$30, this is assumed to be a short-term effect of the current oversupply.

The LGC price for 2010/11, 2011/12, and 2012/13 are taken from Frontier Economics report to IPART (2011, Table 2)^{25,c}. The prices for 2015/16 and 2019/20 are taken as the average value from the ROAM²⁶ and the SKM MMA²⁷ reports to Treasury. Intermediate years are calculated assuming linear increases. The REC price for 2009/10 is taken from the ROAM report to the Clean Energy Council (CEC) (2010)²⁸.

Some businesses in the target group (160 MWh pa to 10,000 MWh pa) will be exempt or partially exempt from the LRET and SRES requirements because they fulfil the requirements of an Emissions-Intensive Trade-Exposed industries. However, the price projections contained in the report assume that businesses are liable for the LRET and SRES payments.

The costs of the NSW GGAS and the NSW ESS to 2014/15 were taken from Energy Australia's schedule of pass-through costs for 160MWh + NSW customers. The NSW ESS target is set to increase between 2009 and 2014, and then is capped at 5% of retail sales until 2020. It is therefore assumed that the NSW ESS continues at the same level from 2014/15–2019/20.

^c Frontier Economics give prices in in 2010/11\$, which were adjusted using their stated inflation of 3.3% and 3%.

The Solar Bonus scheme is entirely funded from the NSW Climate Change Fund (CCF), which is a component of Network Use of System (NUOS), the DNSP's tariffs. No organisations are exempt from paying the levy. The Solar Bonus Scheme is not identified as a separate cost component in this report, and is expected to account for between 64% and 81% of the Climate Change Fund²⁹.

The DNSP liabilities to the CCF are stated in the NSW Auditor General's Report:

*"In 2010-11, the DNSPs are required to contribute a total of \$150 million to the NSW CCF. The 2011-12 NSW State Budget detailed the NSW CCF will require DNSPs to contribute \$250 million in 2012-13 and \$400 million per annum from 2013-14 to 2016-17. The Parry Duffy report states that this would be equivalent to about a one per cent increase in regulated retail tariffs for electricity customers"*³⁰.

These liabilities were divided by NSW's projected electricity generation taken from ROAM Consulting³¹ to obtain a c/kWh figure.

As the CCF is a component of the network charge, the calculations for the CCF do not affect the total tariff. Instead, they are used to adjust the Network charge in order to identify the CCF component in the network charge separately.

The total CCF fund is \$1,973 million, made up from DNSP contributions as follows:

- 2007/08	\$40,000,000
- 2008/09	\$40,000,000
- 2009/10	\$142,728,545
- 2010/11	\$150,449,616
- 2011/12	\$150,000,000
- 2012/13	\$250,000,000
- 2013/14	\$400,000,000
- 2014/15	\$400,000,000
- 2015/16	\$400,000,000

Historical electricity data

Historical business electricity prices were taken from three sources. Firstly, for 1995/96 to 2002/03, the Electricity Supply Association of Australia's (ESAA) historical business retail electricity prices for NSW were used. ESAA stopped collecting retail electricity price data in 2003 and from 2003/04 to 2008/09 NSW non-residential prices were taken from a KPMG report to Australian Energy Market Operator (AEMO)³². For 2009/10 and 2010/11, the prices were calculated using the same methodology as the 2011/12 baseline tariff described above. However, it should be noted that Energy Australia (now Ausgrid) figures were used, instead of all three distribution companies as calculated in the baseline tariff.

2.2 Gas

Large users were identified for this project as customers using between 1 and 10 TJ per year.

Gas prices presented here are the volumetric components only, as fixed charges (such as supply charges and meter reading) can not be avoided though a reduction in gas consumption. Prices are indicative only as larger customers may be able to negotiate different rates. In addition, charges are levied in blocks, with the unit charge reducing significantly at higher consumption levels, and considerable variation in how the blocks are applied (for example, per day or per month). The majority of potential savings for businesses

implementing energy efficiency measures will occur on gas charged at the lower rates. In order to calculate the prices presented, a weighted average of the block charges is used, and it is assumed that gas consumption occurs at a constant rate over the year.

Retail gas prices for 1-10 TJ pa customers in NSW are composed of the following three main components:

1. Wholesale gas price
2. Network charges including transmission and distribution, and
3. Retail operating costs and retail margin

From July 2012 the carbon price is introduced in the projection.

Indicative figures were collated for each of the above components where these are publicly reported. For other components, such as retail margin, ISF produced estimates and confirmed their veracity in discussions with industry.

The baseline price of gas for business customers was calculated using AGL 1 – 10 TJ pa tariffs. AGL was selected as they are the largest gas retailer in NSW, with greater than 70% of the NSW gas market in 2009³³.

Gas distribution costs for the current year until 2014/15 were taken from the AER final determination (September 2011) for the Jemena network tariff schedule. Jemena was selected as it owns the principal NSW gas distribution network³⁴.

Combined wholesale gas cost including transmission charges were obtained using a baseline wholesale price from the MMA report to IPART (2010)³⁵ which was projected based on the ROAM NEM (Eastern gas market) projection produced for Treasury³⁶.

Retail margin and retail operating expenditure were estimated by component and verified with industry and the IPART³⁷ retail margin estimate based on EBITDA.

For both the high and low carbon price component projection, the legislated interim price of \$23/tonne in 2012/13 increasing by 2.5% a year for two years in real terms was used³⁸. From 2015/16 to 2019/20, Treasury's *Government Policy* carbon price projection is used for the low scenario, and the *High Price projection* is used for the high scenario³⁹. To convert these projection from \$/tonne to \$/MJ, the carbon price per tonne was multiplied by the emissions intensity of natural gas, taken from the Australian National Greenhouse Accounts Factors⁴⁰.

Historical gas data

Historical NSW non-residential gas data was taken from a KPMG report to AEMO⁴¹. This data series started in 2001/02, and is in an index format. The baseline gas price calculated for 2011/12 was used to back-calculate the gas price in cents per megajoule to 2001/02.

2.3 Real and nominal prices

All prices have been presented in 2011/12 dollars by adjusting the source data using average annual inflation figures from the Australian Bureau of Statistics publications ABS 6401.0 - Consumer Price Index, September 2011⁴².

3. Energy Price Projections - Results

Based on the methodology outlined above, NSW electricity and gas prices have been projected to 2019/20. The following section discusses the results of these projections. All the price rises in the report are expressed in 2011/12 dollars, and are real price changes, disregarding the effects of inflation. Prices reported are volumetric charges only, and do not include fixed charges or capacity charges.

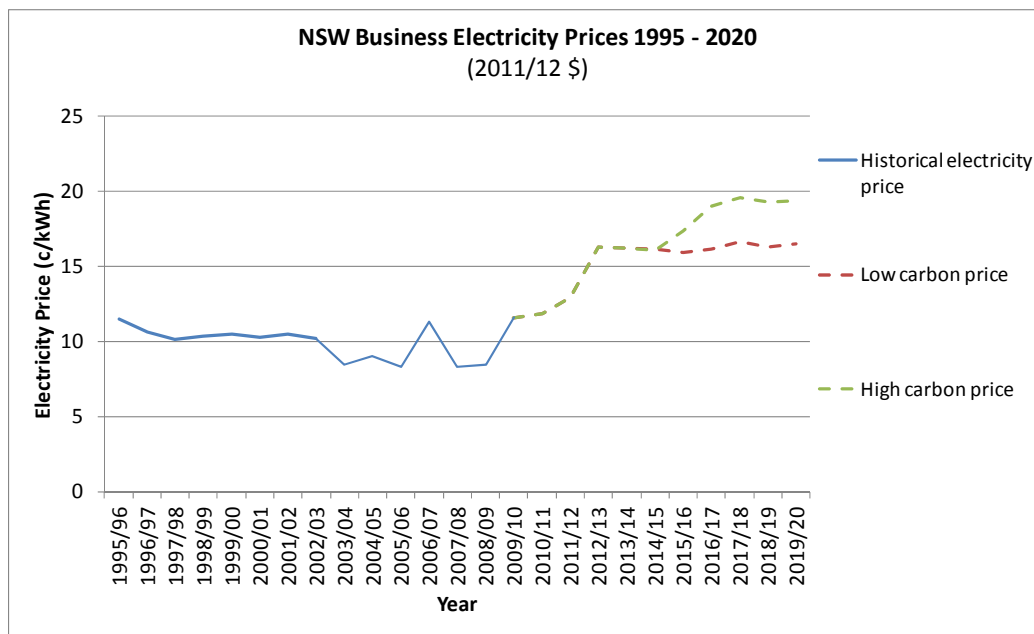
3.1 Electricity

Figure 3 shows that over the 13 years from 1995/96 to 2008/9 electricity prices generally trended slightly downwards in real terms, apart from one spike in 2006/07. A sharp rise is shown between 2008 and 2009, but this may be a disjuncture between the historical dataset, which is taken from reported KPMG economic modelling, and the current work, rather than a real effect.

In the current work electricity prices are projected to rise sharply from 2009/10 to 2013/14. The real projected rise on 2011/12 levels to 2013/14 is 26% (3.3c/kWh) for the low and high carbon price scenarios. From 2014/15 to 2019/20, the cost of electricity rises slightly under the low carbon price scenario and more rapidly under a high carbon price scenario.

In 2011/12 the baseline electricity price is calculated as 12.9 c/kWh^d. Under a low carbon price scenario, NSW business electricity prices in 2013/14 are projected to rise to 16.2 c/kWh, and to 16.5 c/kWh in 2019/20. In the high carbon price scenario the electricity price is the same in 2014/15, but by 2020 has risen to 19.3 c/kWh.

Figure 3: NSW Business Electricity Prices 1995-2020 (expressed in 2011/12 dollars)



^d Note figures used in the Executive Summary and Results section of this report are for the Ausgrid Distribution Area.

The breakdown of these projections by price component is shown in Figure 3. The sharp rise between now and 2015/16 is associated with price rises in almost all components – particularly network charges and the carbon price. The cost of current environmental obligations declines slowly to 2019/20, fluctuating as the cost of different schemes rise and fall.

In 2019/20, the carbon price constitutes a significant proportion of the price at 18% under the low carbon price scenario and 29% under the high carbon price scenario. The effect of carbon on electricity prices in the low carbon scenario will go from 2.39 c/kWh in 2012/13 to 2.93 c/kWh in 2019/20, indicating that the largest proportional increase will be in 2012/13 when the scheme is first introduced. In a high carbon scenario the carbon component is projected to rise from 2.35 c/kWh in 2012/13 to 5.79 c/kWh in 2019/20.

Figure 4: NSW business electricity price breakdown via component (2011/12 dollars)

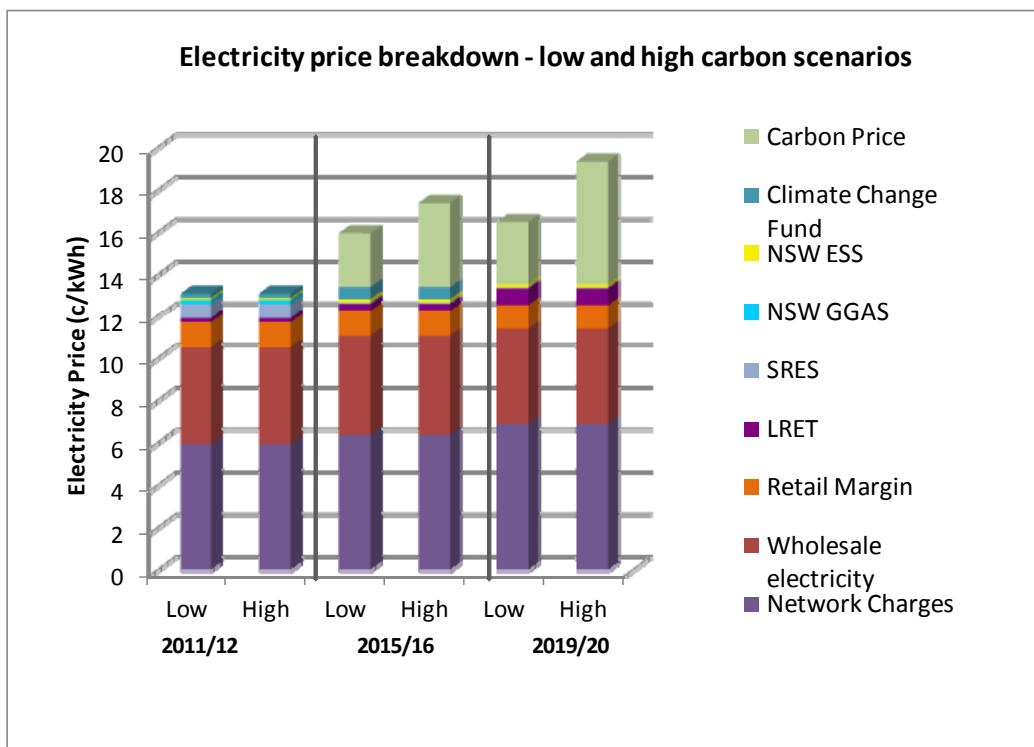


Table 2: Projection of real NSW business electricity prices 2001/02-2019/20

NSW Electricity price projections	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Low carbon price scenario (c/kWh, expressed in 2011/12 dollars)	10.51	10.19	8.42	9.03	8.30	11.3	8.3	8.5	11.6	11.9	12.9	16.3	16.2	16.1	16.0	16.2	16.6	16.3	16.5
% Increase from previous year - Low Carbon Price Scenario	2%	-3%	-17%	7%	-8%	36%	-27%	2%	37%	3%	9%	26%	0%	-1%	-1%	1%	3%	-2%	1%
% of 2011/12 prices - Low Carbon Price Scenario												126%	126%	125%	124%	125%	129%	126%	128%
High carbon price scenario (c/kWh, expressed in 2011/12 dollars)	10.51	10.19	8.42	9.03	8.30	11.3	8.3	8.5	11.6	11.9	12.9	16.3	16.2	16.1	17.4	19.0	19.6	19.3	19.3
% Increase from previous year - High Carbon Price Scenario	2%	-3%	-17%	7%	-8%	36%	-27%	2%	37%	3%	9%	26%	0%	-1%	8%	9%	3%	-2%	0%
% of 2011/12 prices - High Carbon Price Scenario												126%	126%	125%	135%	147%	152%	149%	150%

Table 3: Projection of real NSW business gas prices 2001/02-2019/20

NSW Gas Price Projections	2001/02	2002/03	2003/04	2004/05	2005/06	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
Low carbon price scenario (c/MJ, expressed in 2011/12 dollars)	0.91	0.99	1.07	1.11	1.16	1.20	1.26	1.33	1.40	1.42	1.47	1.67	1.74	1.81	1.85	1.89	1.94	1.99	2.04
% Increase from previous year - Low Carbon Scenario		9%	8%	4%	4%	3%	5%	6%	5%	2%	3%	14%	4%	4%	2%	2%	3%	2%	3%
% of 2011/12 prices - Low Carbon Price Scenario												114%	119%	123%	126%	129%	132%	136%	139%
High carbon price scenario (c/MJ, expressed in 2011/12 dollars)	0.91	0.99	1.07	1.11	1.16	1.20	1.26	1.33	1.40	1.42	1.47	1.67	1.74	1.81	1.94	2.08	2.13	2.19	2.25
% Increase from previous year - High Carbon Scenario		9%	8%	4%	4%	3%	5%	6%	5%	2%	3%	14%	4%	4%	7%	7%	3%	3%	3%
% of 2011/12 prices - High Carbon Price Scenario											0%	114%	119%	123%	133%	142%	146%	149%	154%

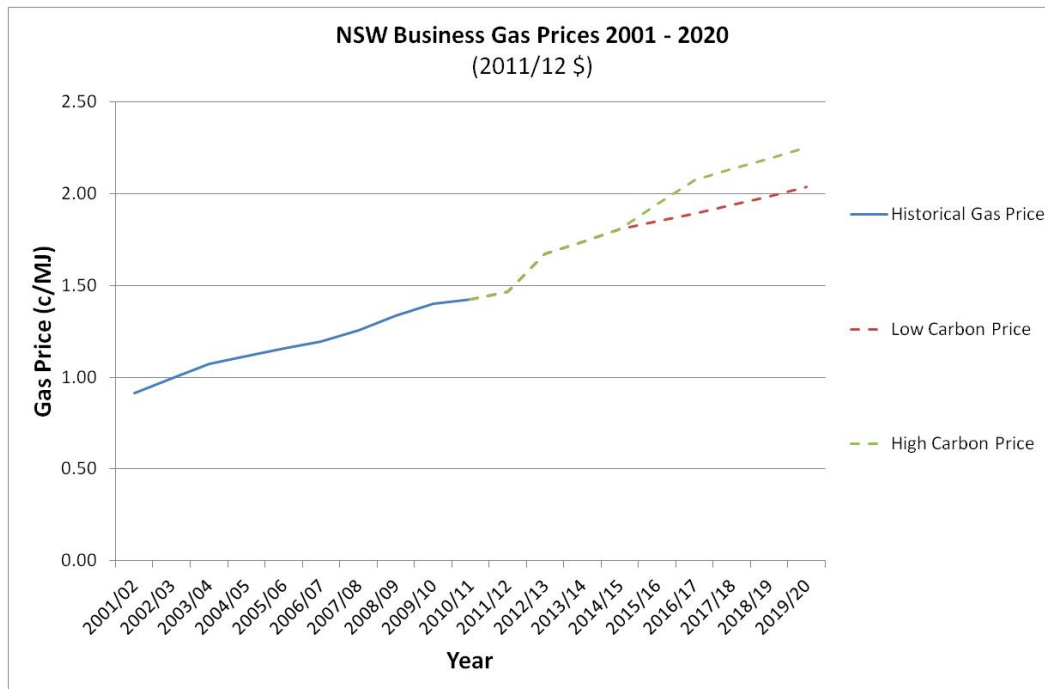
3.2 Gas

Figure 5 shows that over the past 10 years to 2011/12, gas prices have slowly increased in real terms. The price is projected to increase at a greater rate due to an increase in distribution costs and the introduction of a carbon price in 2012/13. By 2019/20, in the low carbon price scenario unit gas prices are predicted to increase by 39% in real terms. For a high carbon price scenario this goes up by 54%. This translates to a unit cost difference for gas between high and low carbon price scenarios in 2019/20 of 0.21 c/MJ.

In 2011/12 the baseline gas price is approximately 1.47 c/MJ. In the low carbon scenario, NSW business gas prices are projected to be 1.85 c/MJ in 2015/16 and 2.04 c/MJ by 2019/20. In the high carbon price scenario these prices are 1.94c/MJ in 2014/15 and 2.25 c/MJ in 2020, as shown in Table 2.

The gas price projection can be broken down into four components – wholesale, distribution, retail costs and margin and carbon price. All four components contribute fairly evenly to the rise in gas prices between 2011/12 and 2019/20. Wholesale gas (29%) and carbon price (28%) make the largest contribution to the projected price rise in the low carbon price scenario. While under the high carbon price scenario, the carbon price contributes the most (43%) to the rise in price.

Figure 5: NSW Business Gas Price Projections 2001-2020 (2009/10 dollars)



3.3 Conclusion

NSW retail electricity prices for business are projected to rise sharply to 2013/14 due to rising network prices and the introduction of a carbon price. Over the eight years to 2020, electricity prices are set to increase by between 28% (3.6 c/kWh) and 58% (6.8 c/kWh) in real terms from 2011/12 levels, depending on whether a high or a low carbon price eventuates and the customers location.

Gas prices are projected to increase by between 0.57 c/MJ (39%) and 0.78 c/MJ (53%) on 2011/12 levels in the low and high carbon price scenarios respectively. The increase is a result of projected rise across all component costs, with rising wholesale costs accounting for 29% of the price rise under the low carbon price scenario and carbon price accounting for 43% of the price rise under the high carbon price scenario.

There is considerable uncertainty in projecting energy prices, and it is much more difficult to forecast prices for large energy users than for residential customers. While the effect of a low and high carbon price is captured, there is uncertainty in the increases projected for each of the components of the price. For example, wholesale electricity and gas prices may be subject to upward pressure beyond what is included in the projections because of potential fuel supply competition with coal and gas exports, but consideration of these factors was beyond the scope of this report. The cost of the LRET and the SRES may be either lower or higher than projected here. No change has been applied to network charges after the current regulatory period, as there is no information in the public domain about expected prices after this date.

In addition, individual large businesses may be subject to significantly different rates than are presented here, as customers are generally on negotiated time of use tariffs that reflect their own usage pattern. A spreadsheet has been supplied to OEH that allows users to enter their own tariffs, and the actual distribution between peak, shoulder, and off peak rates, which may increase the applicability for particular businesses.

Lastly, it should be remembered that this report only covers the volume component of energy charges for electricity. While capacity and access charges make up a significant element of energy bills, they were not included in the scope of this work.

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