

‘Unburnable carbon’ risk and the Australasian-listed gentailers

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Glossary

Access charges: charges for the right to the use of facilities or networks, often referred to as ‘supply’ charges in the context of power and gas distribution.

Carbon or emissions intensity (of energy supply): the quantity of greenhouse gas emissions (measured in CO₂ equivalent units) per unit of energy supply. It is generally stated in units of tonnes of CO₂ per terajoule.

Carbon or emissions intensity (of power generation): the quantity of greenhouse gas emissions (measured in CO₂ equivalent units) per unit of electricity generation. It is generally stated in units of tonnes per MWh or grammes per kWh.

ETS: Emissions Trading Scheme.

Gentailer: a company whose business operations involve both power generation and retail distribution of electricity and/or gas.

IEA: International Energy Agency

RET: Renewable Energy Target. It is a government scheme designed to increase the amount of electricity generated from renewables. It comprises the large-scale renewable energy target (LRET) and the small-scale renewable energy scheme (SRES).

Risk ‘treatment’: In the jargon of risk management, risks are typically evaluated pre-and post-treatment. Initially risk exposure is rated ‘pre-treatment’ according to the likelihood and severity of potential impact on the business. Then, risks are rated ‘post-treatment’ accounting for all the mitigation strategies currently in place, for example, in the context of carbon emissions, targets to reduce emissions or emissions intensity.

Stranded: an economic term used to describe an asset which loses economic value prior to the expiry of its useful life. For example, if you remove a working incandescent light bulb, throw it out and replace it with a compact fluoro or LED bulb, the incandescent bulb has been “stranded”.

Usage charges: ‘volume’ based charges for the usage of a network or facility, for example, charges per kWh for power.

Executive Summary

This paper deals with the exposure to unburnable carbon risk of five Australian and New Zealand listed gentailers – AGL, Contact Energy, Infratil, Origin and Trustpower.

As nations, Australia and New Zealand stand at polar ends of the spectrum with regard to the carbon intensity of their economies. The carbon intensity of energy supply is 35% *above* the world average in Australia and 30% *below* in New Zealand. Globally, carbon intensity needs to decline very significantly to hold global warming to the agreed 2° C threshold.

It seems almost inevitable over the next decade that Australia will choose to reduce significantly the overall carbon intensity of its economy. If, say, Australia chose to ‘be a world average citizen’, it would need to reduce the carbon intensity of the energy supply sector by 59% by 2035 on 2005 levels. To be a world average citizen, the pressure on New Zealand would be significantly less because its carbon intensity is already so much lower.

Judged by their actions rather than their words, it is difficult to escape the conclusion that the two Australian gentailers, AGL and Origin, are not well prepared for the impending decarbonisation of Australia’s energy sector. The New Zealand companies, Infratil, Trustpower and Contact Energy, are significantly less exposed.

Introduction

This paper deals with the exposure of the major Australasian-listed gentailers to ‘unburnable carbon’ risk. In other words, it considers the risk that the fossil fuel emissions they generate will become a problem either for them, and/or for their shareholders, because of the world’s fossil fuel budget. The paper has 3 sections.

The first section provides economic background. At some point in the future, energy supply including power generation will have to shift away from fossil fuels, firstly from coal. In consequence, there will be both a substantial impact on the operations of energy suppliers, and almost inevitable write-downs of fossil fuel and fossil fuel-related assets. This pressure is likely to be particularly acute in Australia.

The second section provides some background to assist with an assessment of the magnitude of this risk as it affects particular companies. It deals with the nature of the exposure of five companies – 3 ASX and 3 NZX listed companies. They are AGL, Infratil (dual listed), Origin, Contact Energy² and Trustpower.

Section 3 describes the current responses of each of these companies to unburnable carbon risk.

1. Economic background³

Under the United Nations Framework Convention on Climate Change, countries have agreed that 2° C of global warming is the maximum acceptable upper threshold. This agreed ceiling sets a ‘budget’ on worldwide fossil fuel emissions for future decades.

Clearly the resulting problem of unburnable carbon needs addressing and, as with the removal of tariff protection, initially there will be winners and losers. Eventually everybody will be better off if this problem is addressed but initially some countries and businesses will be a lot worse off, so the *political* process of recognising the need for physical constraint of emissions is slow and difficult. However, slowly escalating regulatory action, reduced fossil fuel subsidisation⁴ and socio-political stigmatisation, particularly of thermal coal extraction and use, are all bringing mounting pressure on the ‘carbon bubble’. Whether it will burst with a sudden bang, a long slow whimper or some combination of both is not yet clear.

² Contact plans to dual list by September 2015.

³ For a more extensive discussion of public policy, investment risk and company valuations see *Climate proofing your investments: moving funds out fossil fuels*, TAI, March 2014 at <http://www.tai.org.au/content/climate-proofing-your-investments-moving-funds-out-fossil-fuels> .

⁴ Which, globally, exceed renewable subsidies by about a factor of 6, see <http://newclimateeconomy.net/content/press-release-economic-growth-and-action-climate-change-can-now-be-achieved-together-finds> .

Because of their position as high and high-profile emitters the gentailers have 3 potential sources of exposure to this ‘unburnable carbon bubble’ risk:

- compression of the profit margin on operations stemming from price or regulatory changes;
- immediate on balance sheet loss resulting from write-downs of generating assets or reserves;
- reputational exposure - in particular, the risk of being seen to be ‘part of the problem’ resulting in loss of custom, diminished credibility and influence on public policy, and reduced attractiveness as an employer.

1.1 Public policy

The discussion below firstly sets out some relevant statistics, in an international context, of the carbon intensity of overall energy supply and the power grid in Australia and New Zealand. Secondly, it canvasses the potential impact of likely public policy response on energy suppliers.

The IEA calculates carbon intensity of energy supply across time and countries. Globally, energy sector carbon intensity needs to decline from current levels by 6% by 2020, 43% by 2035 and 64% by 2050 to hold global warming to the agreed 2° C.

The carbon intensity of energy supply is exceptionally high in Australia by world standards - 35% above the world average in 2011. By contrast, it is 30% below world average in New Zealand. Likewise the Australian power grid is exceptionally carbon intensive by world standards - 54% above world average.⁵ The carbon intensity of world energy supply has remained reasonably steady over the past two decades. This has comprised a reduction in energy sector carbon intensity in the OECD countries which has been offset by a significant increase in the non-OECD countries. However, the carbon intensity of energy supply in Australia has increased in excess of the increase in the non-OECD countries since 1990.⁶ By contrast, in New Zealand it has decreased in line with other OECD countries.⁷

⁵ This reflects Australia's reliance on coal. In tonnes CO₂e/ MWh brown coal generation intensity is typically 1.2 (Loy Yang A) to 1.5 (Hazelwood); black coal is typically 1 (Eraring); CCGT gas generation is typically 0.5 (Darling Downs), renewables are zero or near zero. See ACIL Allen Consulting *Emission Factors* 2014 at www.aemo.com.au.

⁶ In most OECD countries since 1990 small emissions increases have been driven by population and GDP growth offset by reductions in energy and carbon intensity. By contrast in Australia significantly faster than average emissions growth has only been offset by a reduction in energy intensity. Note that emissions intensity of power generation has fallen in the past 10 years in Australia, but it rose rapidly beforehand and is now at similar levels to what it was in 1990.

⁷ In 2011 Estonia was the only OECD country with carbon intensity of energy supply in excess of that in Australia. Kosovo, North Korea and Mongolia were the only non-OECD countries in this category. The carbon intensity of the New Zealand power grid was 74% below world average in 2011 but this figure varies significantly across time in NZ. See *CO₂ emissions from fuel combustion (highlights)*, 2013, IEA, 2013 <http://www.iea.org/publications/freepublications/publication/co2emissionsfromfuelcombustionhighlights2013.pdf> pp 92, 93, 110 & 113.

Black thermal coal and gas are internationally tradable commodities although is only recently that the latter has become so for east coast customers⁸. International policy efforts to hold global warming to a 2° C limit are likely first to reduce producer prices received by Australian and foreign country thermal coal exporters. This will mean an initial reduction of prices paid by Australian coal buyers. Thus Australia, if it were to choose to remain an international laggard with respect to its climate change response, could likely enjoy lower wholesale power prices for a time. Though note recent excessive investment in the grid has resulted in rapid escalation of retail electricity prices which has materially curtailed demand.

The Australian government recently published an Energy White Paper. Inexplicably, it contains minimal reference to climate change.⁹ Nevertheless, given the figures above and the recently announced 26-28% emission reduction target it is hard to imagine, viewed over a period of the next decade or more¹⁰, that Australia will not implement policies to reduce the carbon intensity of its energy supply by significant amounts in order to make some contribution to assist global efforts to keep emissions consistent with a 2° warming outcome.¹¹ Given its current position any similar international pressure on New Zealand will be muted.

⁸ Export of LNG has recently commenced from QLD which is connected by pipeline to the major Australian east coast gas markets so domestic pricing now reflects international pressures not solely local supply and demand. Note that brown coal is not tradable and little value is generally ascribed to brown coal reserves.

⁹ See <http://ewp.industry.gov.au/>. The Commonwealth has, recently, released Australia's 2030 emissions reduction target. See <http://www.dpmc.gov.au/taskforces/unfccc>. The target is for a 26 to 28% reduction on 2005 emission levels by 2030. Currently, minimal detail is available as to the policies the Commonwealth intends to implement to achieve this target. In the lead up to release of the new target, the Minerals Council of Australia released a report *Climate Policy and Australia's Resources Trade*. The issues paper released by the Commonwealth prior to settling upon the new target, the material accompanying the target announcement and the Minerals Council paper all ring a very similar note. Australia was one of the first countries to join the UNFCCC which was established in 1992. Despite that fact all three documents are of the view fair international commitment should focus on equalising the costs of abatement from today. So a late starter on the road to decarbonisation, like Australia, should not be expected to absolutely catch up, just play along. (See http://www.minerals.org.au/news/climate_policy_and_australias_resources_trade_-_a_new_report p 35. In 1990 the carbon intensity of Australian energy supply exceeded that of the European OECD countries by one quarter, by 2011 that had grown to one half. The Commonwealth's attitude today to that divergence is best summarised as "more fool them".

¹⁰ For example, a Green/ALP government might commit Australia to, at least, to play the part of a "world average" citizen. Likewise, the attitude of the Australian Coalition parties, in power, in future might resemble more the current attitudes of some of the European conservative parties than the current Abbott government's climate change scepticism. Already, Australia is being queried internationally for adopting a 'bludger's' attitude to carbon emission commitments.

¹¹ For example, if Australia agreed or was obliged to reduce the carbon intensity of our energy supply sector to the world average 2035 2° C consistent requirement we would need to reduce it by 59% on 2005 levels, 57.8% on 2011 levels. The Australian Climate Change Authority currently recommends Australia set a target to reduce emissions by 30% by 2025 and by 40 to 60% by 2030 on 2000 levels to 'catch up' to other countries in regard comparative emission measures. See <http://www.climatechangeauthority.gov.au/special-review/first-draft-report>. Australia's emissions increased 12% between 2000 and 2005 so the Climate Change Authority's targets are equivalent to reductions of 38% on 2005 levels by 2025 and 47% to 64% by 2030. The current 26 to 28% absolute reduction on 2005 by 2030 target is inadequate to 'catch up'. Still, if genuine policies are implemented in pursuit of this target significant reductions in energy supply carbon intensity will be necessary.

If it is assumed the most likely scenario is that Australia will adopt public policy intended to make, say, a ‘world average’ contribution what might that policy looked like? Energy taxes are attractive even to a climate change sceptic.¹² Carbon taxes are attractive to any government seeking to reduce carbon emissions because they satisfy ‘polluter pays’ principles.¹³

By contrast the current policy approach comprises no taxes. Instead we have four somewhat contradictory ‘subsidy’ streams – ‘Direct Action’ subsidies for delivery against a notional benchmark of specifically identified and contracted emission reductions¹⁴, the RET¹⁵, the Federal government’s fossil fuel use and industry tax exemptions and concessions¹⁶ and the

¹² Because they satisfy the ‘Ramsey inverse elasticity rule of tax design’.

¹³ Having raised \$15.4b in its first two years of operation, the carbon tax was repealed effective 1 July 2014 but already one of Australia’s most eminent economists Max Corden is, sensibly, calling for its return. See <http://theconversation.com/for-this-generation-and-the-next-its-time-to-bring-back-the-carbon-tax-38224>. The ALP has foreshadowed its intent to reintroduce carbon pricing if it wins government at the next Federal election.

¹⁴ The budget allocation for the Emissions Reduction Fund is \$2.55b over four years, indicatively a subsidy of \$0.6b pa. The first ‘auction’ was held in April 2015. There is also a plan to introduce a ‘safeguard mechanism’ to ‘ensure that emissions reductions purchased by the Government are not offset by significant rises in emissions elsewhere’. See <http://www.environment.gov.au/climate-change/emissions-reduction-fund/about/safeguard-mechanism>.

¹⁵ The RET which mandates a certain proportion of total generation must derive from renewables is neither a tax nor a subsidy. It is equivalent to a tax on fossil fuel generators paid as a subsidy to renewable generators. Indicatively, if the LRET had remained as originally agreed (41,000 GWh) for the next 16 years the NPV of the renewable subsidy is estimated as 80% of \$22.4b, ie \$17.9b. See <https://retreview.dpmc.gov.au/appendix-c-executive-summary-acil-allen-modelling-report>. See also Table 1 p 6 of *Who Wins and Who Loses from changing the LRET*, 2014, IES at <http://downloads.iesys.com/Insider/Insider%20017.pdf>. At a Treasury bond rate of 3% \$17.9b equates to an annual renewable subsidy of \$1.4b over the next 16 years. Note that the annual value of this subsidy is fairly small at present building up slowly. Political agreement has been reached to pare back the target to 33,000 GWh. So, the new LRET annual producer subsidy equivalent is likely to be less than \$1b pa. The NPV of the Small – Scale Renewable Energy Scheme (SRES) is estimated as \$4.5b over the next 16 years by the ACIL-Allen report – 20% of \$22.4b. This equates to an annual subsidy of \$0.4b pa. In the past generous state feed-in tariffs, like the RET, acted like a subsidy for installation of small-scale PV generation funded by a tax on all electricity users. These programs have all ceased.

¹⁶ Many of these are focused on transport rather than stationary energy supply, for example, the avgas concessional rate of excise (F8). Some, for example accelerated depreciation against economic life (not generally estimated in the Tax Expenditure statement but partially captured in B73) or the capital works deduction (B75) benefit any capital intensive industry. Immediate deduction of exploration and prospecting costs \$0.5b pa (B72). See http://www.treasury.gov.au/~media/Treasury/Publications%20and%20Media/Publications/2015/Tax%20Expenditures%20Statement%202014/Downloads/PDF/TES_2014.ashx. Industry benefits from approximately \$5.2b pa fuel tax credits (aka diesel fuel rebate)-there has been significant debate as to whether this should be seen as a ‘tax expenditure’. See, for example, Deloitte Access Economics *The economics of fuel taxation in the mining sector*, 2014 at http://www.minerals.org.au/news/the_economics_of_fuel_taxation_in_the_mining_sector commissioned by the Minerals Council. If fuel excise is seen as a user charge for the public road network then the fuel tax credits for off-public-road transport are eminently sensible and should not be viewed as tax expenditure. However, seen as an energy tax concessional treatment of remote power generation and other non-transport usage is, simply, special interest industry assistance. Seen against this benchmark the tax expenditure to fossil fuel use (excluding the transport sector) is some \$4.2b each year but this covers transport use in mining and agriculture as well as stationary energy supply and other non-transport usage. The text assumes roughly half of this is attributable to non-transport use, for example, stationary energy supply, ie a tax expenditure of \$2b pa. The

state governments' fossil fuel industry assistance.¹⁷ In total, the cost to Australian taxpayers of this suite of 'subsidies', is some \$5b pa. If the RET was brought on budget this might increase to \$6.5b¹⁸, roughly comprising \$2.0b¹⁹ public policy contribution towards emissions reduction and offset by \$4.5b public policy contribution towards emissions increase²⁰. Further, it is unclear whether, even with this suite of contradictory subsidies²¹, Australia will meet its, comparatively undemanding, 2020 emissions target.²² Given the excessive budget deficit and the increasing international pressure, the longevity of this 'subsidy' suite must be in serious doubt.

The board and shareholders of any gentailer operating in Australia should reasonably plan for long-term reductions in fossil fuel use subsidisation, reintroduction of carbon taxes, emissions trading schemes and/or direct regulation of power station technology or emissions²³. Institutional investors already recognise this need.²⁴

1.2 Potential impact on the operations and balance sheets of the Australian gentailers

1.2.1 Operations

In the short term, the combination of international climate change action, downward pressure on thermal coal prices and local inaction could benefit the margins of the Australian coal-dominated gentailers.²⁵

¹⁷ These are estimated around \$1.9b pa over the past six years, ie \$11.6b in total in TAI, *Mining the Age of Entitlement*, 2014 figure 1 but excluding 'Mining other than coal', 'Multiple' & 'Minerals processing'. See <http://www.tai.org.au/content/mining-age-entitlement>.

¹⁸ This figure assumes \$3.2b of the annual cost of fuel tax credits should not be treated as a tax expense because it relates to transport use and fuel excise for transport use should be understood as a user charge for the public road network. It also excludes other transport related fossil fuel tax expenditures.

¹⁹ This comprises \$0.6b Direct Action plus \$1.4b RET equivalent subsidy for renewable generation - \$1b pa new LRET plus \$0.4b SRES.

²⁰ This comprises an assumed \$2b pa fuel tax credit for non-transport use plus \$1.9b state government industry assistance plus fossil fuel industry share of \$0.5b immediate deduction for exploration and prospecting plus accelerated depreciation (not estimated).

²¹ The situation is strongly reminiscent of Black Jack McEwen's mantra 'protection all-round'.

²² That target is to reduce emissions by 5% on 2000 levels by 2020. See <http://climatechangeauthority.gov.au/files/files/Target-Progress-Review/Targets%20and%20Progress%20Review%20Final%20Report.pdf>. For an assessment of efficacy see http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/BudgetReview201415/Emissions.

²³ For example, in the US, the EPA is implementing emissions standards for new power plants and targeted emission reduction plans for the portfolio of existing power stations in each state. See <http://www2.epa.gov/carbon-pollution-standards>.

²⁴ See Investor Group on Climate Change Australia and New Zealand, Position paper on Post 2020 emission reduction targets for Australia, April 2015, at http://www.igcc.org.au/Resources/Documents/IGCC%20INDC%20discussion%20paper_150424.pdf

²⁵ Wholesale energy prices are not regulated. Retail price regulation is in the process of being phased out. In regards gas only New South Wales regulates prices for small customers. In regards electricity regulation has been phased out in Victoria, NSW, SA and will be phased out in SE QLD in July 2015. See <https://www.aer.gov.au/sites/default/files/State%20of%20the%20energy%20market%202014%20->

In the medium term, gentailers will likely face three significant pressures - falling demand, the need to discontinue the practice of recovering access costs through usage charges²⁶ and the introduction/reintroduction of policies genuinely intended to substantially curb carbon emissions or emissions intensity.²⁷

1.2.2 Power stations and reserves

Power stations are long-lived assets.²⁸ If Australia's public policy response to climate change shifts from the current scepticism towards a 'we will be a world average citizen, so we need at least to catch up' attitude some of our younger coal-fired power stations are likely to become 'stranded'.²⁹ It is very unlikely there will be similar pressure on NZ gentailers.

Global carbon reserves, if used, will exceed the 2° C compatible global carbon budget by about 300%, that is, by a factor of four! In order to achieve a 2° warming outcome only one quarter of listed company reserves can be used.³⁰

Coal reserves would appear to be a stronger candidate than gas for earlier write-downs and/or effective proscriptions on use. But, the current focus on coal could easily be 'replayed' in future years prior to the end of the economic life of gas assets.

Section 2 provides some background to assist with the assessment of the nature of these risks as they relate to particular companies. The New Zealand companies are insulated by that country's current, significant use of renewables. By contrast, the potential impact on operations as a consequence of Australian policy response is significant.

[%20Chapter%205%20-%20Energy%20retail%20markets%20A4_0.pdf](#) . Prices paid to the state owned statutory bodies and private owners that have responsibility for the electricity networks are regulated.

²⁶ Since 2009 total electricity demand has been falling. In 2014 it was similar to 2000 levels in all states bar Queensland. Peak demand has also been falling in recent years. See Wood, T et al *Sundown, sunrise: How Australia Can Finally Get Solar Power Right*, Grattan Institute, 2015 p 7. See also Nelson, T et al, *Energy – only markets and renewable energy targets: complementary policy or policy collision*, Economic Analysis and Policy, Vol 46, Jun 2015. Of the three cost components of energy supply - wholesale costs, network costs and retailing costs network costs account for the largest share. However, reflecting a legacy of historical regulated pricing arrangements network costs are currently, inappropriately, partially recovered from usage prices paid by consumers. The AEMC (Australian Energy Market Commission) will require network businesses to develop electricity pricing structures that better reflect cost structures by 2017.

²⁷ Whilst, given current budgetary stringency, these are more likely to take the form of taxes or reduced subsidies or subsidy equivalents it is conceivable they could provide some immediate benefit to the Australian gentailers in the form of increased subsidies to do things they were already, anyway planning to do.

²⁸ Many of the base-load power stations operated by Australian gentailers today were first commissioned 30 to 50 years ago. Indicative working lifespan is about 50 years.

²⁹ Evidently, the extent of the economic impact will depend on future life. For example, the AGL owned Liddell was commissioned between 1971 and 1973 , ie over 40 years ago and is scheduled for closure in 2022, see p 717 of http://www.competitiontribunal.gov.au/data/assets/pdf_file/0006/24873/AF21-Confidential-Restriction-on-Publication-Claimed.pdf . Bayswater, also owned by AGL was commissioned between 1985 and 1986. Eraring, owned by Origin, was commissioned between 1982 and 1984. Loy Yang B owned by GDF Suez and Mitsui was commissioned only 20 years ago. The entire Australian 'fleet' is aged - the mean age of brown and black coal power stations is 34.2 and 27.4 years respectively. See Nelson, T et al, *Energy – only markets and renewable energy targets: complementary policy or policy collision*, Economic Analysis and Policy, Vol 46, Jun 2015.

³⁰ Unless state owned reserves are not used in greater proportion to their current share of total reserves.

2. Exposure

Figure 2.1 describes the nature of the operations of the five ASX and NZX listed companies.

Figure 2.1: 5 Australasian listed energy suppliers and retailers

Company	Nature of operation	Portion of generation from renewables ³¹	Comment
ASX listed			
i. AGL	Power generator, gas storage operator and gas and electricity retailer and brown coal reserve owner in Australia ³²	19% / 9.1% ³³	Owns and operates Loy Yang A and the adjacent brown coal mine ³⁴ , in September 2014 acquired Macquarie Generation ³⁵
ii. Infratil	Diversified NZ-based infrastructure owner ³⁶ , owner of gas generation facilities in Australia ³⁷	0% direct, 40% indirect by book value ³⁸	Dual ASX & NZX listed
iii. Origin	Generator, retailer, oil and gas reserve owner in Australia,	0.06% ⁴⁰	Also owns 37.5% of Australia Pacific LNG ⁴¹

³¹ By GWh unless otherwise noted.

³² By revenue AGL is roughly 80% an electricity company, 20% a gas company. AGL's accounts do not facilitate an understanding of this split up. By revenue, its retail energy operation is about 73% electricity, by gross margin wholesale operations are roughly 86% electricity. Less than 5% of their identified segment assets are oil and gas reserves. The AGL balance sheet does not separately identify brown coal reserves but any value ascribed is likely minimal. See the 2014 4E pp 18 & 22 of Directors Report and pp 24,35 and 36 of the Financial Statements. AGL's operations are conducted in Australia.

³³ The 19% figure is for 13/14, ie prior to the purchase of Macquarie Generation in September 2014. See p 14 of the 2014 Annual Report. The 9.1% is a pro forma estimate on the counterfactual assumption AGL had acquired Macquarie Generation on 1 July 2013. Pro forma AGL's generation output is roughly split brown coal 33%, black coal 53%, gas 4%, renewables 10%. This estimate assumes output from Liddell & Bayswater is 23000 GWh pa, see <http://www.agl.com.au/about-agl/how-we-source-energy/thermal-energy/agl-macquarie> . See also <http://aglblog.com.au/2014/07/agls-electricity-generation-portfolio-201314/> .

³⁴ See <http://www.agl.com.au/about-agl/media-centre/article-list/2012/jun/agl-completes-purchase-of-loy-yang-a-power-station-and-adjacent-mine> .

³⁵ Macquarie generation owns and operates the Bayswater and Liddell black coal fired power stations in NSW. It is the largest domestic buyer of NSW coal. See <http://www.agl.com.au/about-agl/how-we-source-energy/thermal-energy/agl-macquarie> .

³⁶ Approximately 65% of Infratil's assets are energy-related including 40% renewable (Trustpower). See p 40 2014 Annual Report.

³⁷ Infratil Energy Australia and Perth Energy have 285MW gas-fired generation capacity.

³⁸ But note Infratil's investment in Trustpower(which is 100% renewables) represented 40% of the book value of assets as at 31 March 2014

	LNG exporter from 15/16 ³⁹		
NZX listed			
i. Contact Energy	Power generator and retailer of electricity and gas in NZ	69% ⁴²	Was 53% owned by Origin until August 2015
ii. Trustpower	Hydro and wind generator in NZ and Australia	100%	51% owned by Infratil

Two observations stem from this table:

- firstly, the three NZX listed companies (Contact Energy, Infratil and Trustpower) are all considerably less exposed to unburnable carbon related risks because they generate far higher fractions of their electricity from renewables, the bulk of their generation assets are located in New Zealand and the magnitude of the response necessary to make New Zealand a ‘world average citizen’ is significantly less than that necessary in Australia;
- by comparison, the impact of any changes in public policy on AGL and Origin⁴³ could be significant and potentially dramatic, given their regression evident over the last few years. At present, both should be characterised as predominantly coal-fired electricity vendors. In addition, AGL owns reserves of non-tradeable brown coal and both have interests in tradable gas reserves.⁴⁴ There is a significant difference between AGL and Origin not evident in this table because it is yet to materialise. AGL is an energy utility and plans to stay that way. By contrast, upon the completion

⁴⁰ The 0.06% refers to Origin’s ‘internal generation portfolio’, ie excludes Contact Energy which was 53% owned by Origin until August 2015. See p 20 of the 2014 Annual Report. Origin’s internal generation is roughly split 66% black coal (Eraring), 33.4% gas & 0.6% renewable. Like AGL, Origin’s operations are focused on Australia, however, Origin does derive 1% of its revenue outside Australia.

⁴¹ Australia Pacific LNG owns CSG reserves in Qld and is anticipated to commence export of LNG from its Curtis Island CSG to LNG facility in mid-2015.

³⁹ Origin is best thought of, to date, as: a conventional gas explorer, reserve owner and wholesale producer (about 7% of revenue in 13/14); a gas and LPG vendor (about 15% of revenue), most of the balance (78%) of revenue is due to electricity generation and retailing in 13/14. In addition it is an owner of CSG reserves and CSG supplier to LNG plant through its interest in Australia Pacific LNG. See Origin 2014 Annual Report pp 17-27 & 75.

⁴² See p 14 Contact Energy 2014 Annual Report.

⁴³ Such changes might stem, for example, from the implementation of policies directed towards achievement of the recently announced 26 -28% target or stronger steps to move in the direction of becoming at least a ‘world average citizen’.

⁴⁴ But they are more significant to Origin. In regard generation plant capacity 5% of Origin’s (excluding Contact Energy) and 17% of AGL’s is renewable. Neither company would appear to be highly exposed to stranded reserve balance sheet risk by international standards. Origin has no coal reserves, AGL’s brown coal reserves are of minimal value. Both have gas reserves but they are less likely near term candidates for write-downs. The risks to operations and to the longevity of the power stations are more significant.

of Australia Pacific LNG’s export facilities, Origin will be about one third an LNG exporter.⁴⁵

Section 3 below deals with some of the responses of these gentailing companies to unburnable carbon risk - for example, the extent of their disclosure, any targets they have set to reduce emissions or emissions intensity, performance against targets where they have been set, and the incorporation of climate change related goals into executive remuneration structures.

3. Responses

Response to climate change is assessed by international investor groups such as members of the UN PRI⁴⁶ as well as by international responsible investment ratings agencies. Companies which score well, are positioned to prosper in a 2° C constrained world. For example, they have targets for emissions reductions. Figure 3.1 sets out the nature of the responses to unburnable carbon risk of the five companies as assessed by the ratings agency EIRIS.

Figure 3.1: Assessed responses to unburnable carbon risks

Company	Assessed management response to climate change ⁴⁷	ACCR Comment
ASX listed		
i. AGL	Intermediate	a. AGL scores well on disclosure b. but it had no explicit ‘long-term strategic goal linked to emission reductions’ ⁴⁸ ;

⁴⁵ Based on contribution to cash flow from operations. See p 54

<http://www.originenergy.com.au/content/dam/origin/about/investors-media/results-presentation-investment-analysts-2014.pdf> .

⁴⁶ See <http://igcc.org.au/Resources/Documents/Climate-Change-Investment-Solutions-GuideFINAL.pdf> p 15.

⁴⁷ The ratings in this column are sourced from the EIRIS/CAER profiles of each company. Assessed responses range from ‘No evidence’ through ‘Limited’ and ‘Intermediate’ to ‘Good’ and ‘Exceptional’. EIRIS rates over 3000 companies worldwide. Management response to climate change is assessed using four criteria - policy and governance, management and strategy, disclosure, performance and innovation. Each criterion is assessed by evaluating the fulfilment of various indicators. For example, the criterion ‘performance and innovation’ includes indicators such as recent ‘reductions in operational emissions’ & ‘operational efficiency relative to sector’.

⁴⁸ Note this was the EIRIS/CAER assessment of the situation at AGL uniformly assessed across a database of over 3000 listed companies as at November 2014, ie before the announcement of a revised GHG policy in April 2015. In their 2015 CDP response at CC3.1 AGL does claim to have absolute targets for emissions reductions. Those targets are: for a 1% reduction from 2013 to 2016 in emissions as a consequence of their commitment to invest in renewable capacity; a 0.3% reduction from 2014 to 2017 as a consequence of their commitment to carbon sequestration at a specific power station; and a 94.2% reduction from 2014 to 2050 as a consequence of their commitment to not build, finance or acquire new conventional coal fired power stations and to close conventional coal fired power stations by 2050. Though none of these plans is formally framed as a quantitative goal for emissions reductions they can, as AGL has reasonably done, be equated to such a goal. At

		<ul style="list-style-type: none"> c. AGL had a ‘new investment’ emissions intensity target but appears to have discarded it. d. Several key executives have remuneration linked to the achievement of climate change goals.
ii. Infratil	No evidence	
iii. Origin	Intermediate	<ul style="list-style-type: none"> a. Origin scores well on disclosure but b. it has dropped an earlier target dealing with comparative carbon intensity of supply chain emissions.⁴⁹ c. Remuneration is not linked to climate change performance.
NZX listed		
iv. Contact Energy	Limited	
v. Trustpower	Na	

AGL

AGL ‘had a policy’ on carbon emissions dating back to 2010.⁵⁰ It contained 7 commitments, none of which involved any quantitative target for emissions or emissions intensity. In 2012 AGL did set a quantitative target “From next year, AGL’s target will be for investments in new generation capacity to have a combined intensity lower than 0.7 tCOe/MWh.”⁵¹ There is no mention of this target on the ‘Greenhouse and Energy’ page of the 2014 Sustainability Performance Review.⁵²

In stark contrast to this target, during the period 2011 to 2014 AGL’s generation intensity actually tripled from 0.32 to 0.97.⁵³ In September 2014 AGL purchased Macquarie Generation owner of the Liddell and Bayswater black coal fired power stations in NSW

CC3.1d AGL notes it made no progress towards any of these goals during the most recent reporting year. See <http://aglblog.com.au/2015/07/agls-cdp-climate-change-2015-response/>.

⁴⁹ In answer to CDP question CC3.1 in its 2015 response Origin states it did not have an active emissions reduction target during 2013/14. It gives as its reason for not having a target that its absolute emissions are expected to increase. See CC 3.1e. No mention is made of the earlier intensity target.

⁵⁰See

http://www.agl.com.au/~media/AGL/About%20AGL/Documents/How%20We%20Source%20Energy/CSG%20and%20the%20Environment/Camden/Northern%20Expansion/V3_Appendix%20H.pdf p 14.

⁵¹ See <http://2012.aglsustainability.com.au/files/assets/basic-html/page68.html>.

⁵² See <http://agl2014.sustainability-report.com.au/environment/greenhouse-and-energy>.

⁵³ See the graph entitled ‘Carbon intensity of operated generation assets’ at <http://agl2014.sustainability-report.com.au/data-centre/environment>.

which in 2013/14 had a combined estimated emissions intensity estimated as 1.02 further, albeit slightly increasing AGL's overall intensity.⁵⁴

In April 2015 AGL revised its Greenhouse Gas Policy.⁵⁵ It now contains nine commitments but, again, none of them involve any explicit, quantitative targets for emissions or emissions intensity reductions. It does contain commitments with likely, similar impact to quantitative reduction targets. For example, coal-fired power station closure by 2050. It also contains no reference to the 2012 emissions intensity target. In place of the previous numeric intensity target AGL now commits to "improve the greenhouse gas efficiency of our operations, and those in which we have an influence".

Origin

Origin also 'has a policy' on carbon emissions. It states "We acknowledge and continue to maintain that climate change is a global societal challenge and as such, Origin continues to support measures to reduce carbon emissions." In fact, over the past 3 years Origin's own scope one emissions have increased by 55% pa.⁵⁶ In 2007 Origin set itself 4 objectives concerning its carbon emissions.⁵⁷ These included an objective to reduce the greenhouse gas intensity of the company's electricity supply chain⁵⁸ emissions to 10% less than the national electricity market average by 2020. No reference is made to this target in Origin's current website emissions or CDP disclosure. It appears to have been dropped.⁵⁹ Since 2008/09 Origin's scope one and scope two emissions have increased 12.7X.⁶⁰

NZ companies

⁵⁴ See Fig 18 of ACIL Allen Consulting *Emission Factors* 2014 at www.aemo.com.au.

⁵⁵ See

http://www.agl.com.au/~media/AGL/About%20AGL/Documents/Media%20Center/Corporate%20Governance%20Policies%20Charter/1704015_GHG_Policy_Final.pdf.

⁵⁶ On an equity basis, see

http://www.originenergy.com.au/sustainability/sites/default/files/gri_download/GRI_environment.pdf p 8.

⁵⁷ See http://reports.originenergy.com.au/2010/sustainability/gri/energy_use_and_air_emissions/.

⁵⁸ That is for electricity supplied to Origin's customers. AGL's 2010 commitments also included benchmarking supply chain carbon intensity. Their public disclosure does not appear to track this metric.

⁵⁹ In the years 2007, 08 and 09 Origin's supply chain emissions intensity was similar to the grid average. See http://reports.originenergy.com.au/2010/sustainability/our_communities/5-year-strategies/#two. Current disclosure focuses on the emissions intensity of Origin's internal generation which has nearly doubled over the past 3 years on an equity basis. Nevertheless, on an operational control basis it is now about 10% under the grid average. See p 9 of

http://www.originenergy.com.au/sustainability/sites/default/files/gri_download/GRI_environment.pdf. See also chart 3 of <http://www.originenergy.com.au/sustainability/material-aspects/emissions>. The distinction between electricity sold and generated is significant because Origin retailed over twice the GWh it generated. By contrast, with the purchase of MacGen, AGL distributes itself only about two thirds the GWh it generates. See pp 37 & 45 of

http://www.agl.com.au/~media/AGL/About%20AGL/Documents/Media%20Center/Investor%20Center/2014/2014Results_Pres_release.pdf.

⁶⁰ See 2015 CDP response CC7.1 for base year 08/09 emissions and CC8.3 for reporting year 2013/14 emissions.

The assessed management response to climate change of the 3 NZ listed companies is significantly weaker than that of the 2 ASX listed companies. However, in the context of their lesser levels of exposure described in sections 1 and 2, this does not warrant significant concern.

4. Conclusion

This paper has dealt with the exposure to unburnable carbon risk of five Australian and New Zealand listed gentailers.

As nations, Australia and New Zealand stand at polar ends of the spectrum with regards to the carbon intensity of their energy supply. Carbon intensity of energy supply is 35% above the world average in Australia and 30% below in New Zealand. Globally carbon intensity needs to decline very significantly to hold global warming to the agreed 2° C threshold.

It seems almost inevitable that, over the coming decade, Australia will choose to reduce the carbon intensity of its economy significantly. If, say, Australia chose to ‘be a world average citizen’ it would need to reduce carbon intensity of energy supply by 59% by 2035 on 2005 levels. Any similar pressure on New Zealand will be significantly muted by its current position.

As a consequence, unlike their New Zealand counterparts the gentailers with Australian operations face significant unburnable carbon risk.

Clearly, the most appropriate response for the gentailers is to adopt targets to reduce their carbon intensity, for example, the carbon intensity of their power generation.⁶¹

Judged by their actions rather than their words, it is difficult to escape the conclusion that the two Australian gentailers, AGL and Origin, are basing business decisions to adopt or drop quantitative carbon targets on the assumption that whatever happens to be current as local policy settings will continue in perpetuity.

In 2007 the Coalition government’s “Shergold report” recommended Australia adopt an ETS and then PM Howard promised, if re-elected, to do that. In that year, Origin adopted a supply chain emissions intensity target. In late 2011 the ETS legislation was passed under the ALP. In 2012 the initial ‘carbon tax’ phase commenced. In that year, AGL set itself a quantitative target for new generation capacity. In September 2013 the Abbott Coalition government

⁶¹ Shareholder resolutions seeking such targets have been put to numerous US utilities in recent years. Often they have been withdrawn because the company has agreed to address the issue. See www.ceres.org/investor-network/resolutions#/.

came to power and repealed the carbon tax/ETS.⁶² Now, no mention is made by the 2 gentailers of the earlier targets. They both appear to have none.

The New Zealand companies (Infratil, Trustpower and Contact Energy) appear less prepared 'on paper' but as they are so much less exposed this stance is reasonable.

The two Australian gentailers seem to have lost their way with respect to their approach to long term business planning under a 2° C constrained world. They risk failing their shareholders. Both have adopted and later dropped vital commitments to ensure continued long-term profitability. They need to re-establish appropriate targets and stick with them.

ACCOR

⁶² See

http://www.aph.gov.au/About_Parliament/Parliamentary_Departments/Parliamentary_Library/pubs/rp/rp1314/ClimateChangeTimeline .