

Emission critical – the coming upheaval in electricity generation



With strong policy statements on greenhouse gas reduction targets, by both 2020 and 2050, AMP Capital has undertaken research to analyse the actual implications for the electricity sector if these targets are to be achieved.

The results point to significant changes which have real investment implications for a significant portion (43.5%¹) of the Australian share market – representing the electricity sector and industries linked with high energy use.

Meeting the needs of an increasingly energy hungry world, while at the same time reducing the effects of global warming, is currently one of the major challenges for governments worldwide. Increasing scientific evidence indicates the need for substantial cuts in greenhouse gas emissions, translating into international political pressure for reduction targets.

The likelihood of emissions cuts raises important questions for the electricity sector, which is Australia's single biggest contributor to greenhouse pollution and will need to deliver large emissions reductions if significant economy-wide reductions are to be achieved. A research paper by AMP Capital's Dr Ian Woods, 'The significance of medium and long term emissions caps on electricity investments', published in May 2008, has analysed the potential implications of tighter emissions controls on the sector.

The findings of the report indicate that emissions cuts will impact decisions about the investment life and replacement of existing electricity generation assets and will create both opportunities and risks for future investment in the sector.

Finding the right mix of energy sources will be essential. Currently Australia's electricity generation assets are predominantly coal-fired, the most greenhouse gas intensive form of energy production. Going forward, our research has found that even if the most advanced coal-fired combustion technologies are used, continued reliance on coal-fired power will not result in greenhouse gas reductions. Therefore Australia will need to diversify its electricity supply to include gas-fired generation assets and renewable energy if it is to meet more stringent emissions regulations.

Below we provide a summary of the key findings of this analysis – with the full report available on request.

1 Representing Materials, Utilities, Property Trusts, Transport (ex Infrastructure) and Energy. Percentage of S&P/ASX 200 as at 31 March 2008.

Background – the nature of the problem

Current scientific advice suggests that emissions cuts of 50% or greater, will be required by 2050 if the negative environmental impacts of climate change are to be minimised. Recently a degree of political consensus has been reached that accepts that cuts of 20-30% are required by, or should be aimed for, by 2020.

This target will be a considerable challenge for Australia. For example, to meet Australia's Kyoto Protocol commitment, Australia's emissions will be in the order of 108% of 1990 levels in 2012 and 'business as usual' scenarios predict further significant increases by 2020.

Australia has achieved most of its reductions in emissions from land use change and forestry since 1990 (equivalent to a 17% reduction on total 1990 emissions). All other emission sectors will need to return to 1990 levels by 2020 if Australia is to meet its target. In reality, not all sectors offer the same opportunity for emission reductions in the short to medium term. An example is the transport sector. Greater reduction in other sectors such as electricity generation will also be required if a reduction target of 20% is to be achieved.

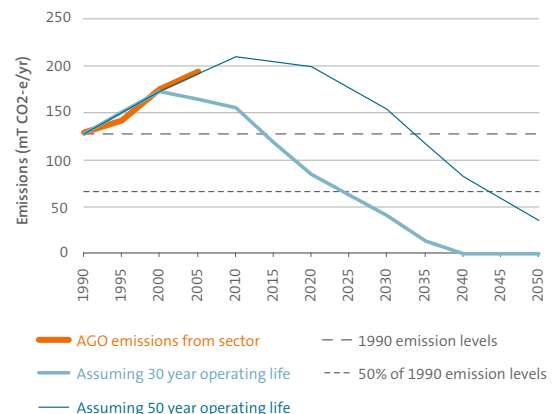
Investment cycles for Australia's electricity generation

Australia's existing electricity generation assets are primarily coal-fired, with many approaching the economic life (typically 30 years) assumed when they were first built. From an engineering and operational perspective, these existing plants have a potential lifespan of 50 years.

By 2010, approximately 32% of total existing generation capacity will be over 30 years old and in 2020, 64% will be more than 30 years old. Nearly 11% of existing generation assets will be operating well beyond their initial economic life (ie greater than 40 years old) by 2010.

Figure 1 shows the historical and predicted contribution to total sector greenhouse gas emissions from existing generating plants from 1990 to 2050, assuming asset life of 30 years and 50 years. The Australian Greenhouse Office (AGO) estimates of emissions from the sector are also shown.

Figure 1: Historic and predicted greenhouse gas emissions from existing generation plant



Source: AMP Capital Investors and Federal Department of Climate Change

Figure 1 highlights that, if existing generation capacity operates for 50 years, a medium term target for the sector of returning to 1990 levels by 2020 will not be met, with emissions from just the existing generating plants being approximately 50% more than 1990 levels.

The implications for investors of Australia meeting a medium term greenhouse gas emission reduction target are that:

- many existing assets in the electricity sector are unlikely to operate much beyond their initial economic life; and as consequence
- significant investment in the electricity sector will be required in the next 10-15 years, which is over and above what is currently being considered.

Implications for future investment in the industry

In the near to medium term, investors are faced with a choice between primarily coal-fired generation and gas-fired generation. Low emissions technologies, such as those incorporating carbon capture and storage may become commercially available around 2025 and so are unlikely to contribute to meeting a medium term target. Renewable energy, driven by renewable energy targets, is also expected to make a contribution.

Assuming business as usual energy demand associated with economic growth and population increases, the scale of change required of the electricity sector to reach proposed targets is very material. To provide an indication, even to achieve the 2020 targets:

- continued investment in conventional fossil-fuelled generation technologies will not result in sector emissions returning to 1990 levels by 2020;
- the renewable component would need to exceed the current stated government policy of 20%; and
- at the same time the balance of energy being sourced from natural gas and coal would need to undergo a seismic shift (full details of the changes are available within the full paper/briefing).

In order to meet both the 2020 and 2050 targets, investors will need to fundamentally rethink their expectations of the operating life of investments and the mix of energy. The electricity sector would need to substantially change its mix of gas-fired and renewable energy power generation. Additionally for the 2050 targets the need for new low emission technology (with emission intensity of less than 0.13 tonnes CO₂-e/MW-hr) is paramount. The results indicate the significant risk associated with new coal-fired investment, even assuming the most advanced coal-fired combustion technologies currently available are used.

To obtain a copy of Dr Ian Woods' paper, 'The significance of medium and long term emissions caps on electricity investments', or to find out more about how AMP Capital is incorporating these findings into its investment strategy, please contact us.

Impact of investment and policy options

For investors in the Australian share market, the scale of change associated with the 2020 and 2050 targets is a material issue for the electricity generation and high energy use industries.

Current thinking is that an emissions trading scheme will drive the necessary changes in the electricity sector but we expect, given the scale of the issue, there will also be strong use of the other policy levers to achieve the desired outcome. Additional measures could include steps to encourage energy efficiency, new technology and investment in renewable energy. An emissions trading scheme and other related policy measures are expected to flow on beyond pure electricity generation to high energy use and related sectors including materials, utilities, property trusts and transport.

There are a number of ways in which AMP Capital is working to understand how changes in domestic and international policy on climate change could impact investments. As part of its investment analysis process, our Sustainable Alpha team has conducted a detailed breakdown of the key risk areas by sector and estimated company greenhouse gas emissions down to business division level for the majority of our investments in the high energy use and related sectors.

AMP Capital Sustainable Research

Dr Ian Woods is AMP Capital Investors' Senior Environmental, Social and Governance Researcher (ESG) and is part of the Sustainable Alpha Team. He is also Deputy Chair of the Investor's Group on Climate Change.

AMP Capital Sustainable Alpha Team has focused on the implications of ESG issues for investors for over seven years. AMP Capital's Sustainable Share Fund systematically addresses these issues as a core and integrated element of the investment strategy.

Contact us

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