



CLIMATE PROOFING YOUR INVESTMENTS: MOVING FUNDS OUT OF FOSSIL FUELS

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*"The looming choice may be either stranding those assets or stranding the planet."*³

- OECD Secretary-General Angel Gurría

*"Rethink what fiduciary responsibility means in this changing world. It's simple self-interest. Every company, investor and bank that screens new and existing investments for climate risk is simply being pragmatic."*⁴

- World Bank Group President Jim Yong Kim

This paper deals with issues that arise for “mezzanine level” institutional investors – religious investment groups, universities, foundations and state government authorities considering the imposition of a carbon emissions intensity-related screen on their investment portfolio and/or support for shareholder actions aimed at improving company climate change responses. It does not deal with retail investors and self-managed super funds. Nor does it deal with other large institutional investors – for example public offer super funds.

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GLOSSARY

Community finance: the practice of making loans to, or deposits with, banks, deposit taking institutions and finance companies that specialise in environmental or socially responsible lending.

Engagement: includes letter writing, meeting and discussing ESG issues with company management or industry associations and the process of gaining support for proposed actions (for example, AGM resolutions).

ESG: acronym meaning ‘environmental, social and governance’.

Ethical investment: a generic term covering ‘investment processes that combine investors’ financial objectives with their concerns about ESG issues’. Ethical investment is generally defined to encompass three activities – portfolio screening for moral, ethical or religious purposes, engagement and advocacy and community finance.

Passive management: an approach to portfolio construction that eschews any active assessment of the merits, advantages or problems of particular companies. The most common form of passive management is ‘market capitalisation weighting’. Passive managers often won’t vote their stock on environmental and social issues. From a social perspective, passive managers are ‘bludgers’ – they take the benefits of share ownership without accepting the responsibilities.

Private ancillary fund (PAF) (previously known as ‘prescribed private funds’): private foundations that can accept tax-deductible donations but must distribute at least five per cent of their assets each financial year, subject to the obligation to make these distributions only to other tax-deductible entities.

Responsible investment: an investment based on the premise that ESG issues affect returns and that consideration of these issues is required for delivery of superior risk-adjusted returns. Responsible investment is generally defined to encompass engagement and integration. Integration is the explicit inclusion of ESG risk into traditional financial analysis.

Portfolio screening: deliberately including or excluding companies or sectors.

Shareholder advocacy: an umbrella term that covers filing statements with a company for distribution to shareholders, lodging resolutions for consideration by shareholders in a company and soliciting proxy votes in support of resolutions and statements. Advocacy is a public activity – institutional shareholders may support advocacy actions, but they are rarely instigators.

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’.

EXECUTIVE SUMMARY

Debates about climate change have recently been reframed in terms of financial risks. Current global fossil fuel reserves, if extracted and burnt, would release far more greenhouse gas emissions than is compatible with meeting the internationally agreed limit of no more than two degrees of global warming.

Consequently, fossil fuel business valuations involve a fundamental intellectual ‘fallacy of composition’ – analogous to the traditional speculative bubble. Investors’ expectations cannot be met as they have become divorced from the physical reality and committed policy response. Currently, in aggregate, fossil fuel companies are estimating they will freely be able to extract (for subsequent sale and combustion) over three times more carbon than is compatible with the agreed two degree limit.

‘Unburnable carbon risk’ is the risk to investors who hold shares in companies owning reserves that those reserves will become ‘stranded’, that is, they will lose economic value prior to the end of their useful life.

Valuations of fossil fuel reserves are based on discounted cash flow analysis. Anticipated future changes in the use of fossil fuel reserves, even though they may have little impact on price and production trajectories for, say, a decade, can still have a significant impact on current values. So the investment risk to shareholders in fossil fuel companies is significant.

This paper deals with these investment risks particularly as they face decision makers at religious funds, universities, public authorities and private foundations. This group of investors often have pertinent ethical and/or responsible investment obligations or policies.

All prudent investors should assess their attitudes and exposure to unburnable carbon risk. There are then three options that should be assessed in relation to each asset class –

1. Do nothing but plan for regular risk assessment,
2. ‘Walk’ or
3. ‘Talk’.

In relation to Australian equities there is a wide range of company-specific exposures to unburnable carbon risk – from pure play coalminers through to oil and gas majors, power generators, diversified miners with some fossil fuel operations, to companies providing services to fossil fuel producers. We grouped these companies and US based analysts Aperio Group simulated historical performance of a screened portfolio that eliminated from the ASX 200 index companies with business models dominated by fossil fuel production or use. Consistent with well-established theoretical and empirical results about screening, this portfolio exhibited similar risk return characteristics as the index.

Many religious groups and foundations and some universities and public authorities will have legal constituting documents that impose an ethical, environmental objective. A screen eliminating companies whose business model is dominated by fossil fuels can readily be conducted, reducing unburnable carbon risk without compromising returns and, if necessary, without compromising tracking error.

Many institutions will have governing documents that express no ethical objective but impose a trustee or trustee-like duty. If trustees take the view that a fossil fuel screen like the one described above, for example, may well improve and be unlikely to compromise risk-adjusted returns (if policy action is delayed) by reducing unburnable carbon risk, then they are free to adopt it.

INTRODUCTION

“For years, investors have looked on corporate reserves of coal, oil or gas as an asset, that can only lead to long term profits. Times are changing. Now, the smart money is figuring out that more fossil fuels are a liability, right now.”

- Steve Kretzman, Executive Director of Oil Change International

This paper is addressed to decision makers at religious investment funds, universities, state-operated authorities and private foundations. It is particularly directed at decision-makers at those bodies concerned with risk and with portfolio construction.

Fossil fuel business valuations involve a fundamental intellectual ‘fallacy of composition’, analogous to the traditional speculative bubble. All investors’ expectations cannot be met as they have become divorced from physical reality and committed policy response. Currently, in aggregate, fossil fuel companies are estimating with 90 per cent certainty that they will be able to extract freely (for subsequent sale and combustion) over three times more carbon than is compatible with the internationally agreed 2 degree limit on global warming. This fundamental contradiction is referred to as the ‘unburnable carbon bubble’.

Section 1 of this paper describes the methodology of company valuation and the likely impact on the value of fossil fuel businesses from risks of the carbon bubble bursting, driven by policy, market and political

trends. It also outlines appropriate investor responses.

Section 2 describes what is currently being done and what can be done by concerned investors, with a focus on ‘walking’ or divesting to reduce risk exposure. It first describes the implications of the fiduciary duty commonly imposed on decision makers at religious investment funds, universities, state-operated authorities and private foundations. Appendices A to D deal with the legal situation relevant to each of these institutions.

Section 2 also compares the carbon intensity of the Australian share market with that of foreign markets. Finally, it provides a categorisation of Australian listed fossil fuel companies and gives example categorisations for assessing where divesting may be considered an appropriate response. It describes a simulation of a ‘fossil fuel free’ screened portfolio, which shows screening fossil fuel companies from an Australian portfolio is likely to have minimal impact on portfolio risk and return. Appendix E describes the general theory and evidence for the low impacts from screening, provided it is not too restrictive.

Section 3 deals with options for ‘talking’ – the ways that concerned investors can better understand risk to their investments and improve responses at exposed investee companies.

1. PUBLIC POLICY, INVESTMENT RISK AND INVESTOR RESPONSES

“What keeps us up at night is climate change.”
– Eric Smith, Swiss Re Americas CEO, July 2013

Carbon Tracker, a UK-based think tank, has calculated the remaining ‘carbon budget’ – the total emissions the world can release before overstepping agreed ‘safe’ levels of global warming – and compared it to the carbon in current fossil fuel reserves.⁵ Under the United Nations Framework Convention on Climate Change, countries have agreed that two degrees of warming is the maximum acceptable upper threshold according to science.

Global reserves are more than three times the size of the agreed ‘two degree-compatible’ budget.⁶ Action taken in pursuit of this target will mean stranding is inevitable if governments act in accordance with their stated objectives.⁷

This ‘large scale stranding’ diagnosis is now widely accepted by global authorities. As the head of the OECD has said,

“The looming choice may be either stranding those assets or stranding the planet.”⁸ Moreover, even action insufficient to prevent runaway climate change will have a significant negative impact on fossil fuel asset prices. The current situation constitutes a ‘carbon bubble’, where carbon risks have not been incorporated into asset valuations and remain vastly inconsistent with agreed public policy goals.⁹

This section describes the investment risks, the relevant mechanics of company valuation and appropriate investor responses.

1.1 PUBLIC POLICY AND INVESTMENT RISK

There are three 'public policy-related' drivers of investment risk faced by owners of fossil fuel reserves: regulation aimed at reducing emissions; market competition from cleaner energy systems and reduced subsidies for fossil fuel use; and socio-political pressure.¹⁰

Regulatory action

"Corporate leaders should not wait to act until market signals are right and national investment policies are in place. Be the first mover. Use smart due diligence. Rethink what fiduciary responsibility means in this changing world. It's simple self interest. Every company, investor, and bank that screen new and existing investments for climate risk is simply being pragmatic."

- World Bank Group President Jim Yong Kim, World Economic Forum, 23 January 2014

Climate change is a global collective action problem. Preventing catastrophic climate change requires that all major countries reduce their emissions, but many major emitting countries will take limited action without some certainty that others will also reduce their own emissions. Countries have agreed to commit by 2015 to some agreement with legal force, to come into effect in 2020, under which all parties will take action to limit global emissions.

Investors should not focus simply on the timing and design of a coordinated, unified global price on carbon. As the World Bank President has said, prudent investors "should not wait until market signals are right" when facing such large risks.¹¹ There is, moreover, already a 'bottom-up' trend towards carbon constraints through domestic policies. There are 60 carbon trading schemes in place at national and sub-national levels, and a wide range of other policies.¹²

Countries may also act against the significant local damage from fossil fuel extraction and use. This includes health damage from air pollution, overuse and damage to water resources, and damage to ecosystems.¹³ China, for example, is planning to peak coal consumption to reduce severe air pollution in its cities.¹⁴

Reduced fossil fuel subsidies for and market competition

"Goldman Sachs finds this market incredibly compelling... It is at a transformational moment in time."

- Stuart Bernstein, Goldman Sachs head of renewables investment banking.

Fossil fuel use and extraction is heavily subsidised in many countries.¹⁵ Even in the absence of concern about global warming, the continued unwinding of these subsidies will affect energy pricing, the pattern of fossil fuel exploitation and reduce necessary ambition in carbon policy.¹⁶

At the same time as pressure is growing for reduced fossil fuel subsidy, renewable technologies are dropping in price. The top three consumers of energy – China, the US and the EU – all have renewable energy mandates and/or targets. In 2012, worldwide, a half of the new electricity generation capacity installed was renewable.¹⁷

Sociopolitical stigmatisation

"Direct impacts of fossil fuel divestment on equity or debt are likely to be limited... "The outcome of the stigmatisation process, which the fossil fuel divestment campaign has now triggered, poses the most far-reaching threat to fossil fuel companies and the vast energy value chain."

- Ansar et al, "Stranded assets and the fossil fuel divestment campaign", Stranded Assets Programme, Oxford University, 2013.

In the past year a movement of hundreds of community campaigns has spread across the US, Australia and now also Europe, calling on civic institutions to divest from fossil fuels.¹⁸ A recent study from Oxford University argues the divestment movement threatens the market value of fossil fuel companies.¹⁹ It shows previous divestment campaigns have successfully stigmatised industries, leading to new regulation and increasing the cost of (particularly debt) finance, reducing perceived future cash flows and, as a consequence, asset values.

1.2 COMPANY VALUATION RISK

"Today, we're piling up carbon emissions in the atmosphere. When there's a recognition that it cannot absorb an unlimited amount of carbon, there's a risk that people will very quickly revalue all the assets producing those emissions." – Dr Robert Litterman, Risk Committee Chairman, Kepos Capital LP, 2013.

The value of a company and its assets can be approached from two perspectives:

- so-called 'book' value – the value of, say, a gas field as calculated by the directors and auditors and used in the balance sheet of the company;
- so-called 'market' value – the value implied for the same field by the stock exchange value of the entire company.

Construction of both valuations requires a 'discounted cash flow' calculation. The parameters involved in such a calculation are a discount rate and the expected future cash flows – an estimate of prices likely to be paid to the producer in future years and an estimate of the likely quantity of the fuel that can be extracted and the costs of extraction.²⁰

Individual company book value of the fossil fuel reserves held by particular listed companies is likely currently overstated. Most companies are assuming that they can both go on exploiting reserves without reference to the likelihood that public policy will impose quantity constraints; and that current low or absent prices for carbon emission permits will be maintained into the indefinite future.²¹ The market value attributed to those individual company reserves may also be overstated if share market participants underestimate the probability, extent and impact of eventual binding government action on that company.

The aggregated book value of the fossil fuel reserves held by all listed companies is almost certainly overstated because it is

implicitly predicated on an assumption that no constraint is placed on the quantity of fossil fuel exploitation by each company.²² The aggregate market value attributed to those individual company reserves is also almost certainly overstated. Even if pricing assumptions are proven accurate, current listed company reserves are sufficient to consume close to the entire two-degree emissions budget.²³ Such pricing assumptions assume global climate change response negotiations will break down permanently and completely, or individual country responses will cease, or all state-owned reserves will be kept in the ground. These scenarios seem unlikely. Yet current fossil fuel valuations, taken in aggregate, assume they are likely.

Two features of discounted cash-flow valuation are relevant to understanding the potential impact on investment portfolios from the unburnable carbon scenario eventuating:

- Small changes in smooth expected trajectories of future cash flows generated by fossil fuel exploitation can result in significant changes in current values.
- At current low interest rates, changes that have little impact on expected production trajectories for, say, a decade can still have a significant impact on current values.²⁴

If the world acts towards its stated goal, most carbon reserves will be 'stranded', meaning they will lose economic value ahead of their useful life. Even if they are insufficient to reach the stated goal, policy action, market competition and political stigma still threaten stranded assets. Companies conducting projects with the highest extraction costs (for example, tar sands or Arctic oil) and the most intensive emissions profiles (for example, coal) are likely to be the first to have to write down the book value of their assets because of stranding.

1.3 HOW SHOULD INVESTORS RESPOND TO FOSSIL FUEL RISKS?

How should an Australian investor approach these issues? Most portfolios will contain significant exposure to Australian and foreign companies whose value depends on fossil fuel reserves. All investors should identify the extent of 'unburnable carbon' risk embedded in their portfolios. There are three perspectives an investor might then take, having assessed exposure:

- do nothing but keep the matter under review
- divest from exposed companies:sectors:countries
- engage and advocate, to encourage a better understanding of risk and to improve responses at exposed investee companies.

Section 2 deals with the second response option – divestment. It describes the most carbon intensive companies listed on the ASX and the most carbon intensive markets overseas.

It also deals with the legal situation of investors, which is relevant to the choice between these options. Some 'ethical' investors may believe it morally reprehensible to profit from the actions of companies whose business operations cause long-term social harm and environmental damage.²⁵ Other 'responsible' investors might decide that the significant risk to the value of their portfolio is unacceptable and so base decisions to divest on the longer-term financial impact of the carbon exposure of different companies and industries.²⁶

Yet others (both ethical and responsible) might seek to *engage* with investee companies and *advocate* that they quantify and respond to the risks they face.²⁷ Section 3 deals with this third option. The Appendices deal with the impact of divestment on risk-adjusted returns and the particular legal arrangements applicable to religious investment groups, universities, state government authorities and private foundations.

2. ASSESSING AND REDUCING FOSSIL FUEL RISK

What legal considerations are relevant to investors who might seek to exclude ('screen out') fossil fuel companies from their Australian portfolios? Is the Australian share market more or less exposed to carbon risk than other markets? If an investor does wish to divest in Australia, which companies are most exposed to carbon risk? This section deals with these questions.

2.1 DIVESTMENT, ADVOCACY AND TRUSTEE RESPONSIBILITIES

"Institutional investors must think over the long-term, which means that we must take environmental risks into consideration when we make investments," - Thomas P. DiNapoli, New York State Comptroller and trustee of the \$160.7 billion New York State Common Retirement Fund.

Almost all decision makers responsible for the mezzanine portfolios covered in this paper (including those for religious groups, universities, public authorities and foundations) will have a trustee or trustee-like duty. The money is not theirs personally but it is their responsibility to manage it well. Suppose, for example, a proposal is made to divest from companies with material revenue from thermal coal extraction. Is that compatible with the duty of a trustee? There are two potential underlying legal situations:

- in the first case, the legislation, governing rules or trust deed explicitly deal with the issue. If that is the case, the decision makers or trustees must ensure that the monies are invested in a manner consistent with that objective;
- in the second 'plain vanilla' situation, the trust deed is silent on the issue.

Appendices A through to D deal in turn with the legal situation relevant to religious, university, public authority, and foundation decision makers.

Because engagement and advocacy with fossil fuel companies involve no compromise to risk-adjusted returns they do not introduce the legal issues for fund trustees presented by screening. Provided beneficiaries do not suffer undue administrative costs, engagement for the purposes of establishing risk, support for resolutions or involvement in their filing is unlikely to involve any trust deed or governing rules issues.

Screening might potentially compromise returns if investment in profitable companies is eschewed. It is clear, from the legal perspective, that trustees may not make screening decisions based on their personal attitudes to social or environmental issues.²⁸ But if trustees take the view that a particular screen under consideration may improve and is unlikely to compromise risk-adjusted returns then they are legally free to adopt it. There is extensive literature supporting the conclusion that screening does not compromise risk-adjusted returns, provided it is not very restrictive. See **Appendix E**.

2.2 HOW CARBON INTENSIVE IS AUSTRALIA'S SHARE MARKET?

"The significance of Australian coal for investors goes far beyond its own shores, with more Australian coal owned by companies listed on exchanges outside Australia than by those listed domestically." - The Climate Institute, "Unburnable Carbon - Australia's Carbon Bubble", 2013.

The world's stock exchanges can be compared in terms of their exposure to unburnable carbon risk. Australia's stock exchange has significant carbon exposure, more than most share markets. Yet despite the attention on the mining boom, the ASX's fossil fuel intensity is lower than many of its peers, both in terms of total carbon and in terms of carbon intensity.

Carbon Tracker compares the total embodied carbon held by the world's top fossil fuel companies on stock exchanges around the world.²⁹ **Table 1** summarises some key results. It shows that total global carbon reserves are 317 per cent over the global carbon budget. Unless all state-owned company reserves are stranded,

TABLE 1: LISTED COMPANY FOSSIL FUEL RESERVES IN CONTEXT³¹

LISTED COMPANIES	Carbon Reserves (GtCO2)	Fraction of 2°C budget (900GtCO2)	Rank	Composition
S&P500 (USA)	215	24%	1	Over 2/3 oil
MICEX (Russia)	144	16%	2	2/3 oil
FSTE 100 (UK)	113	13%	3	Half oil, 40% coal
Hang Seng (Hong Kong)	60	7%	4	80% coal
SHASHR (Shanghai)	41	5%	5	Nearly all coal
S&P/TSX (Toronto)	33	4%	6	75% oil
Ibovespa (Sao Paulo)	30	3%	7	87% oil
ASX200 (Australia)	28³²	3%	8	88% Coal
CAC 40 (France)	20	2%	9	
TPX (Japan)	13	1%	10	
Total listed carbon	762	85%		
State-Owned ³³	2088	232%		
Total reserves	2850	317%		

action towards the stated global climate goal will likely cause significant stranding of listed company reserves.

Carbon Tracker also compares the fossil fuel intensity of key indexes on global stock exchanges in terms of the total carbon in listed reserves on the index divided by the total market capitalisation.³⁰ **Table 2** summarises some key results.

Australian investors with exposure to foreign share markets, for example through passive funds, may carry significantly more carbon risk than results from their listed Australian investments. For example, the UK FTSE 100 has double the exposure to carbon risk compared to the ASX 200.³⁴ Any prudent trustee should assess the extent of their exposure to carbon risk resulting from foreign share market exposure and consider their selection of funds or choice of stocks to reduce exposure.

TABLE 2: COMPARISON OF AGGREGATE CARBON INTENSITY OF SELECTED SHARE MARKET BENCHMARKS

LISTED COMPANIES	Intensity (GtCO2/ US\$ trillion market cap)	Rank
MICEX (Russia)	213	1
ASEGI (Greece)	101	2
FTSE MIB (Italy)	41	3
FSTE 100 (UK)	36	4
BUX (Budapest)	30	5
Hang Seng (Hong Kong)	23	7
ASX200 (Australia)	18	11
S&P500 (USA)	17	12
SHASHR (Shanghai)	14	15
TPX (Japan)	4	23
Total Listed company intensity	14	
Global intensity compatible with 2°C budget³⁵	4.5	

2.3 SCREENING OUT FOSSIL FUEL EXPOSURE FROM THE ASX 200

"The fossil fuel sector is unnecessary to prudent portfolio structure...it is possible to produce risk adjusted returns that are competitive with appropriate broad-market benchmarks through a portfolio that does not invest in fossil fuel companies." - HIP Investor, "Resilient Portfolios and Fossil-Free Pensions", 2013.

Investors must decide which sectors or companies to exclude or underweight in accordance with their own legal and financial situation.³⁶ Investors must also make their own judgments about ethical and financial materiality of company involvement in fossil fuels, and how companies manage associated carbon risks.³⁷

This said, we have conducted some analysis to assist with this process. We categorised ASX 200 companies according to their exposure to fossil fuels and used this to construct portfolios screening out the most fossil fuel-exposed companies. Then US-based analysts at the Aperio Group used simulation software to assess the impact of the screens on risk and return compared to the ASX 200.³⁸

We considered the following categories for companies on the ASX 200. The companies included in each 'Tier', and suggested response for each, are shown in **Table 3** - next page

2.3 SCREENING OUT FOSSIL FUEL EXPOSURE FROM THE ASX 200 CONT'D

Table 3: ASX 200 company categorisation

Category	Suggested response	Companies
TIER 1: substantially involved in fossil fuel extraction.	Divestment candidates.	WOODSIDE PETROLEUM, ORIGIN ENERGY, SANTOS, CALTEX, OIL SEARCH, BEACH ENERGY, AURORA OIL & GAS, WHITEHAVEN COAL, KAROON GAS, AWE, SENEX ENERGY, DRILLSEARCH, LINC, AQUILA RESOURCES, HORIZON, BURU ENERGY, COALSPUR
TIER 2: large 'downstream' fossil fuel exposure.	Divestment candidates.	ENVESTRA, APA GROUP, AGL ENERGY, ENERGY WORLD
TIER 3: large absolute direct fossil fuel exposure but less significant relative exposure.	Divestment or engagement candidates.	BHP BILLITON, RIO TINTO, WESFARMERS
TIER 4: indirect fossil fuel exposure.	Initial engagement (see Section 3); divestment if outcome of engagement not satisfactory	ASCIANO, ANZ, AURIZON, AUSDRILL, BOART, CARDNO, COMMONWEALTH BANK, DECMIL GROUP, DOWNER EDI, INCITEC PIVOT, LEIGHTON HOLDINGS, LEND LEASE, MACQUARIE GROUP, MINERAL RESOURCES, MONADELPHOUS, NATIONAL AUSTRALIA BANK, NRW HOLDINGS, ORICA LIMITED, QBE INSURANCE, QUBE HOLDINGS, SUNCORP, TOLL HOLDINGS, TRANSFIELD SERVICES, TRANSPACIFIC INDUSTRIES, UGL, WESTPAC, WORLEYPARSONS.

Tier 1 consists of companies substantially involved in extracting fossil fuels: 17 companies in the 'oil, gas and coal' industry sector.³⁹ These companies have the highest exposure to carbon risk.

Tier 2 includes companies with 'downstream' fossil fuel operations, but which still have large exposure to carbon risk: two pipeline companies and two power generators. In contrast with the US, many of Australia's power generation assets are state-owned⁴⁰ or foreign-owned.⁴¹ There are two major coal power generators on the ASX 200, both with operations in retail and fossil fuel extraction – AGL⁴² and Origin.⁴³ Both also have minor interests in renewables.

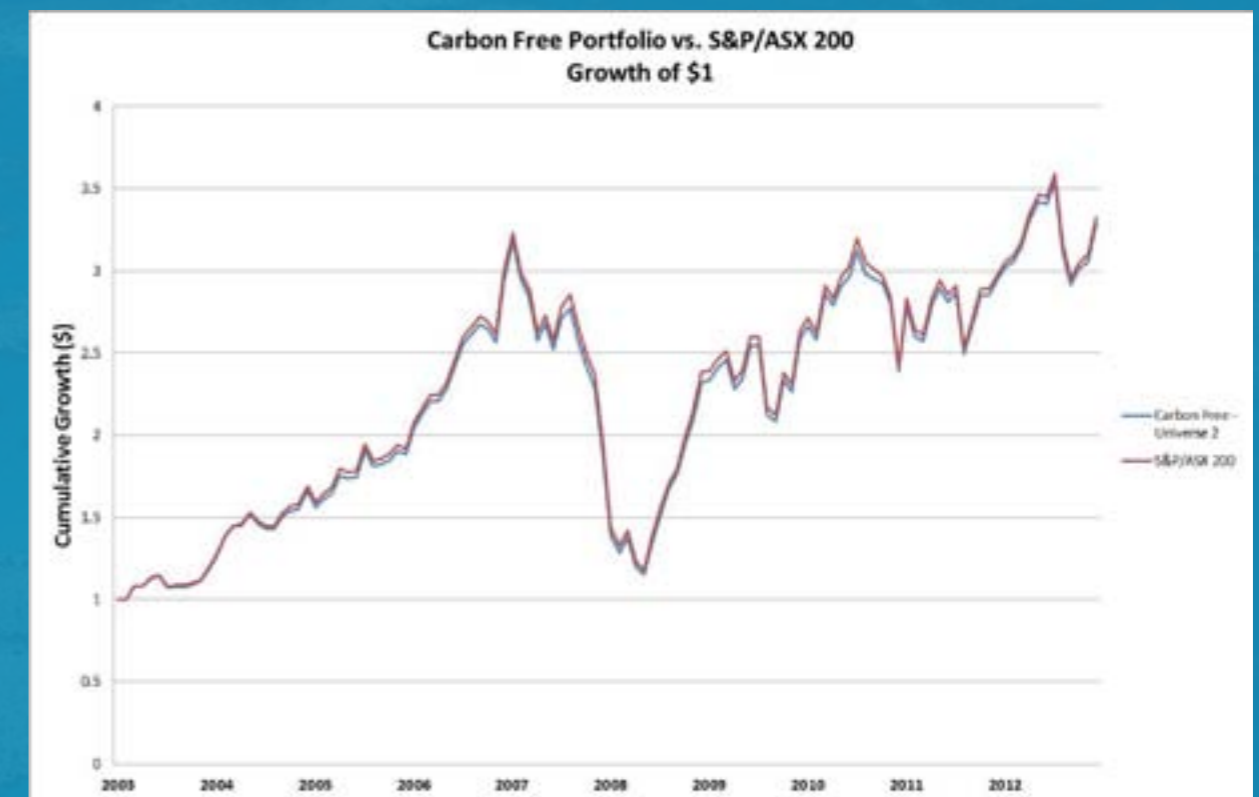
Tier 3 includes companies with significant absolute exposure to fossil fuels – among the top 200 largest owned by listed companies globally – but where fossil fuels do not dominate the business in relative terms: BHP Billiton⁴⁴, Rio Tinto⁴⁵ and Wesfarmers⁴⁶. Both Rio Tinto and Wesfarmers own coal mines but these contribute less than 10 per cent of revenue for Rio Tinto and less than five per cent for Wesfarmers. BHP has the eighth largest carbon reserves of listed companies worldwide, but fossil fuel accounts for only about one third of earnings, though about two thirds of operating assets.

Tier 4 involves companies with indirect fossil fuel exposure, through providing services to **Tier 1** companies, including financing, insurance, engineering and waste services.

We used these classifications to make 'fossil free' portfolios by screening out Tiers from the ASX 200. First we eliminated **Tier 1** and **Tier 2** companies from the ASX 200. Using this screen, US analysts Aperio group constructed an 'optimised'⁴⁷ portfolio excluding these stocks and simulated performance based on historic data.⁴⁸ The portfolio tracked the broad share market very closely, achieving very similar month to month returns to the ASX 200. (See **Figure 1** and **Table 4**.)

These results suggest that screening out fossil fuel extraction and downstream industries can have negligible impact on risk-adjusted returns. That might seem surprising, given the attention paid to the Australian mining boom and ongoing (but declining) incumbency of fossil fuels in Australia's energy mix. In fact this result simply illustrates a well-established result from a substantial body of theoretical and empirical literature. The impact on risk-adjusted returns from screening out companies or sectors is minimal provided the screen is not excessively restrictive. The theory and evidence is described in **Appendix E**.

Figure 1: Historical simulation: fossil free portfolio, optimised to minimise tracking error⁴⁹



2.3 SCREENING OUT FOSSIL FUEL EXPOSURE FROM THE ASX 200 CONT'D

Investors may have further concerns about also excluding **Tiers 3** and **4** companies. Compared to **Tiers 1** and **2**, **Tier 3** companies in particular are more diversified, less dominated by fossil fuels and together make up a larger portion of the ASX 200. A portfolio designed on the basis of such a screen is likely to diverge more from the index than one based on simply screening **Tiers 1** and **2**. Nonetheless, investors may also consider excluding some or all of these stocks, and some ethical investors are taking this approach. Active investors may be more amenable to such a screen than passive

investors who are more concerned about tracking the index, as will investors open to spreading risk outside of the index, for example through impact investing. Those who decide against divestment in the first instance should consider options for engagement and advocacy.

Table 4: Results from simulations⁵⁰

Barra Scenario Portfolio Metric	S&P ASX 200	Screening Tiers 1 & 2
Beta	1.00	0.99
Tracking Error (%) ⁵¹	0.00	0.88
Annual return	13.36% pa	13.22% pa

2.4 CONCLUSION

Many religious groups and foundations and some universities and public authorities will have legal constituting documents which impose an ethical objective. In that case a decision may be taken to screen out companies whose business model offends that objective. Such screens can be imposed without compromising risk-adjusted returns, as shown above. Many institutions' governing documents express no ethical objective but impose a trustee or trustee-like duty. If decision makers take

the view that a fossil fuel screen under consideration may avoid losses when the carbon bubble bursts, and is unlikely to compromise risk-adjusted returns, they are legally free to adopt it.

Some decision-makers may conclude that a vocal response is most appropriate. The following section describes the role of shareholder engagement and advocacy as an alternative to divestment in such institutions.

3. ENGAGEMENT AND ADVOCACY ON FOSSIL FUELS

"[Carbon asset risk] resolutions are making tackling climate change real for investors and the companies they own - this will start to align capital expenditure with reducing emissions, which is essential to avoid stranded assets,"

- James Leaton, Research Director at Carbon Tracker, 12 February, 2014.

'Walking' from fossil fuels – that is, divestment – is not the only response open to investors. 'Talking' with such companies is also a constructive alternative. Speaking privately with investee companies is known as 'engagement'. Speaking publicly, for example filing resolutions for consideration at shareholder meetings, is referred to as 'advocacy'. The significance of these activities as part of the shareholder 'toolkit' in a particular country varies a lot with legal arrangements and cultural norms.

In Australia, trade associations such as the Investor Group on Climate Change (IGCC) often pursue engagement but rarely advocacy. Advocacy is a healthy part of corporate

democracy in the US, the UK, Canada, Japan and northern Europe, where religious groups, local governments and universities often play a leadership role. Some leading examples are described in the **Appendices**.

While shareholder advocacy is less common in Australia than many developed countries, it is not unknown. At the Woodside Petroleum AGM in 2011 a resolution was put that the company describe its assumptions about future carbon prices. In 2013 Ian Dunlop, a fossil fuel executive turned climate advocate, stood for election as a director of BHP on a platform that he would assist the company to reduce its carbon emissions. Shareholder advocacy also played a powerful role in the campaign against the Gunns pulp mill in Tasmania, and against ANZ financing for that project. The Australasian Centre for Corporate Responsibility (ACCR) is a newly formed Australian organisation with a mission that involves support for these sorts of advocacy actions in Australia.⁵²

3. ENGAGEMENT AND ADVOCACY ON FOSSIL FUELS CONT'D

Both engagement and advocacy seek to ensure investee companies appropriately respond to the risks posed by the unburnable carbon bubble. The aim is to better understand and/or reduce the risk holdings of those companies to investors. For example, an investor who implemented the screen described in **Section 2** in relation to **Tier 1** and **Tier 2** companies might then choose to engage in relation to Tier 3 and Tier 4 companies. They might propose that those companies should, among other things:

- measure and disclose their carbon footprint
- create and disclose their business plans for the '2 degree' carbon constrained world
- adopt company targets for GHG reductions
- cease support for global warming denier groups
- reduce capital expenditure on fossil fuel extraction and increase dividend payout ratios to shareholders

- support stronger public policy responses to climate change
- link executive remuneration to prudent climate risk management
- divest coal mines or diversify operations away from coal exposure.

Some proposals are relevant to many companies. For example, many companies –including many not involved in fossil fuels directly – have set company emissions targets, some following shareholder advocacy. Other proposals would apply only to specific companies or sectors. For example, shareholders may propose banks rule out financing risky projects that would unlock large new coal reserves or that threaten national icons such as the Great Barrier Reef. Some investors, frustrated by inadequate responses following engagement and advocacy, have gone on to divest.

4. CONCLUSION

There is no single 'correct' response to unburnable carbon risk universally suitable for all 'mezzanine' investors. But there is a bubble and there are steps a prudent investor should take. **Firstly**, all investors should ensure that they understand their legal obligations in relation to ethical and responsible investment issues as they relate to carbon exposure.

Secondly, in a manner consistent with those legal obligations, they should assess exposure to carbon intensive businesses and unburnable carbon risks. **Thirdly**, in relation to each relevant asset class, one of three formal decisions should be taken (and carefully documented) –

- to keep the matter under review
- to walk or
- to talk.

APPENDIX A: RELIGIOUS INVESTMENT GROUPS - LEGAL FRAMEWORK AND BACKGROUND - SCREENING AND ADVOCACY

Australian religious investment entities fall into three major categories:

- Religious charitable development funds. These funds are primarily invested in cash and fixed interest.
- Superannuation funds, subject to the *Superannuation Industry (Supervision) Act 1993* (SIS Act), primarily operated for staff of organisations run by religious bodies, for example Catholic Super, Christian Super, Australian Catholic Superannuation and Retirement fund.
- Specific denomination-linked funds management or 'diocese/synod church treasury' operations. For example, UCA Funds Management in Victoria operates a funds management business on behalf of the Uniting Church in Australia, Synod of Victoria and Tasmania. While some of the larger operators in this category manage equity portfolios (like UCA), most are primarily cash and fixed interest managers.⁵³

The church linked super funds will, generally, have the legal capacity to screen their portfolios and so, should they choose, divest holdings of carbon intensive investee companies. Typically the trustees will be subject to a trust deed which contains or refers to a screening policy consistent with the values of the associated church. In addition they are subject to the SIS Act. If that screening policy contains reference to environmental stewardship or global warming issues it will be open to the trustees

to screen out carbon intensive investee companies. In addition, like any 'plain vanilla' trustee, they could divest if they came to the conclusion that risk-adjusted returns on carbon intensive investee companies are financially unattractive.

Christian Super provides a clear example. Christian Super's ethical investment policy involves negative screening, positive screening, engagement and impact investing.⁵⁴ Christian Super currently excludes 20 companies under the broad 'environmental damage' category. This includes carbon pollution as well as other damage such as rainforest destruction. There are also 17 companies 'on watch', which will be excluded if there is no improvement, and 23 companies under review due to inconclusive evidence.⁵⁵ Company names are not made public. In relation to climate change, Christian Super negative screens companies supporting deception around climate change risks, and underweights companies deemed too carbon intensive or that poorly manage carbon risk. It conducts corporate engagement, generally in private, either unilaterally or in conjunction with others, and conducts 'positive impact' investment through a 'clean-tech' fund.

In the US, church-linked funds have for over 40 years been dominant advocacy forces. The General Board of Pensions and Health Benefits of the United Methodist Church, for example, filed about 20 resolutions each season for many years. Similarly, Sister Pat Daly of the Sisters of St Dominic of Caldwell, N.J. was a pioneer in the use of

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APPENDIX A: RELIGIOUS INVESTMENT GROUPS - LEGAL FRAMEWORK AND BACKGROUND - SCREENING AND ADVOCACY

shareholder resolutions requiring target companies to adopt greenhouse gas emission reduction goals and cease funding global warming denier groups.⁵⁶ Surprisingly, to date the Australian churches have played no similar role. To our knowledge, no resolution on environmental or social issues has been filed in recent decades by an Australian church fund manager or church-related group. There is no ‘church legal structuring-specific’ reason for this failure by the Australian churches to provide the corporate moral leadership shown by the US churches.⁵⁷

The most likely institutional religious supporters of climate change-related advocacy in Australia are the church super funds simply because they have substantial equity portfolios. Some of these are members of the Investor group on Climate Change and/or signatories to the UNPRI. See Table 5 below. There is a strong opportunity for the Australian religious investment sector to provide moral leadership in this context. Some church groups have already announced divestment policies, including the Melbourne Unitarian Church⁵⁸ and the Uniting Church NSW/ACT Synod,⁵⁹ which has already begun implementing its policy.

Table 5 Selected church investors – participation in trade organisations with an interest in ESG issues⁶⁰

	UNPRI	IGCC	RIAA
Australian Catholic Superannuation and Retirement Fund	x	x	x
Catholic Superannuation Fund	x	x	
Christian Super	x	x	x
Uniting Financial Services	x		
Australian Christian Superannuation			x
UCA Funds Management	x		x
Uniting Financial Services	x		x

APPENDIX B: LEGAL FRAMEWORK – UNIVERSITIES – SCREENING AND ADVOCACY

The ‘fossil free’ divestment movement began on US college campuses in 2012. There are now hundreds of campus campaigns across the US, Australia and Europe. Universities are typically not the first to join such movements, but their involvement has been important in previous campaigns successful in compelling government action, according to an Oxford University study.⁸⁷ So far nine US colleges have committed to some form of divestment.

No Australian university has yet made a clear statement either in favour of or against investments in fossil fuels. Responsible investing policy in general is underdeveloped across Australian universities. There are isolated cases of negative screening, for example against tobacco. To our knowledge none engage in active ownership, unlike in the US where many colleges conduct extensive and public shareholder advocacy.

Most universities in Australia are public institutions established under state law. Founding legislation, combined with other laws, prescribes allowable investments and practices.⁸⁸

For example, the legal framework applicable to the ANU, under federal law, involves a **weak ethical investment obligation**.⁸⁹

Requirements for both negative and positive screens were formalised in a ‘Responsible Investment Policy’ adopted October 2013, however no screens have yet been adopted.⁹⁰

Universities in Australia have a wide range of portfolio sizes and structures. Most are under \$100 million and the largest are just over \$1 billion. Only larger universities have substantial amounts invested directly in listed companies. This limits opportunities for shareholder advocacy by Australian universities. Those with direct shareholdings over \$10 million include ANU, University of Sydney, Melbourne University, University of Queensland and Macquarie. Use of managed funds also varies greatly: ANU has around seven per cent in managed funds while QUT’s portfolio is almost entirely in managed funds.⁶¹

Hampshire College, a private liberal arts college in Massachusetts, prides itself on responsible investment. It was first to commit to divest from companies supporting the South African apartheid regime and was first to commit to fossil fuel divestment. Its policy includes principles for positive and negative screens, used when selecting fund managers. Socially responsible investment is consistent with the “fiduciary obligation to optimize the financial return to the college”, because ESG factors impact on long-term returns and the college’s reputation. The college will ‘ask’ its fund managers to vote the fund’s shares responsibly.

APPENDIX C: STATE GOVERNMENT AND STATE GOVERNMENT AUTHORITIES – LEGAL FRAMEWORK AND BACKGROUND - SCREENING AND ADVOCACY

In each Australian state and territory there are investment funds established for some or all of the following purposes:

- staff superannuation (for example, in WA GESB)⁶² – there are often separate schemes for state and local government employees. There has been a trend in some states (for example, NSW) to close these schemes to new staff. By contrast QIC is now the third largest institutional funds manager in Australia with numerous external clients.⁶³ The investment obligations of the board and/or the bureaucrats involved in the management of the monies of a state government staff super fund are typically set out in state legislation and/or guidelines set by the state treasurer. These schemes are generally exempt from the SIS Act.⁶⁴ Still, enabling legislation will often contain language similar to the common law obligations on a trustee⁶⁵
- centralised treasury function (for example, Treasury Corporation of Victoria providing the state cash and fixed interest asset and liability management)
- mandatory insurance (for example, in NSW the Safety, Return to Work and Support Board is responsible for managing investment funds for workers compensation and motor vehicle accident compensation)⁶⁶
- long service leave payment arrangements for staff in selected industries. For example, in the ACT the Long Service Leave Authority runs a defined benefit fund to provide long service leave benefits for staff in the construction, security, community and cleaning sectors. Similar schemes operate in every state with varying coverage
- court, public trustee and disability related payments.

To our knowledge no Australian state government authority has ever had any involvement in the instigation of environmental or social advocacy actions. This stands in stark contrast to the situation in the US where it is not uncommon for state governments to pursue their public policy purposes (for example, improving worker safety) by engaging with companies and filing resolutions.⁶⁷ Most Australian state governments and state government authorities fail even to disclose their voting record.⁶⁸

In relation to screening, there is negligible top-down lawful prescription of activities or sectors that should be avoided.⁶⁹ This also stands in stark contrast to the situation in the US where three states – Vermont, Maine and Massachusetts – have bills before them to screen out fossil fuel-intensive companies from state-owned investment portfolios.

In relation to superannuation some fairly minimal ‘employee/member driven’ choice has been provided.⁷⁰ The highly varied pattern of responsible investment initiatives has primarily reflected the strength of the interests of individual board members and staff – **see Table 6 on the next page.**⁷¹

Table 6 Selected Commonwealth and state investment authorities – participation in trade organisations with an interest in ESG issues and stated interest in ESG issues⁷²

Commonwealth	UNPRI	IGCC	RIAA	ESG
Commonwealth Superannuation Corporation (formerly ARIA)	x	x		Engagement, voting
AvSuper	x			Managers may use ESG factors & screen
Military Superannuation and Benefits Scheme				Some consideration
Future Fund				
Reserve Bank of Australia Officers Super Fund				
NSW	UNPRI	IGCC	RIAA	ESG
State Super NSW (SAS) Trustee Corporation	x	x		Under Review
NSW Public Trustee				
Local Government Superannuation Scheme	x	x	x	Integrated
ACT	UNPRI	IGCC	RIAA	ESG
ACT Government	x			Transparency, Negative screens
QLD	UNPRI	IGCC	RIAA	ESG
Queensland Investment Corporation	x			Integrated
LGsuper				Member Options
VIC	UNPRI	IGCC	RIAA	ESG
Victoria Funds Management Corporation	x	x		Some consideration

APPENDIX D: PRIVATE FOUNDATIONS – LEGAL FRAMEWORK AND BACKGROUND – SCREENING AND ADVOCACY

From the perspective of tax law there are two sorts of ‘foundation’ in Australia.⁷³ Both are entitled to receive tax-deductible donations.

The first – generally ‘charities’ – are open to the public to make donations. There is a black letter set of categories under which the purpose of the charity must fall – for example, health, education, research, environment, among other things. The bulk of these public charities have not traditionally invested in equities. They have had a shorter-term time horizon – funding programs out of recurrent donations, holding surplus assets in cash and fixed interest.⁷⁴

The second – referred to as ‘private ancillary funds (PAF’s)’, are more commonly equity investors. They can accept tax-deductible donations; they must distribute at least five per cent of their assets each financial year; and these distributions can only be made to other tax-deductible entities. The trustee must formulate an investment strategy.

There is no barrier to inclusion of a screen in that strategy. Evidently, there is the possibility for a conflict of purpose to enter the investment

strategy of a foundation – a foundation devoted to improving welfare for indigenous Australians might find itself a holder of shares in a company with a poor record in this regard. Such conflict of purpose may justify a screen, but is not necessary for a screen. For example, a foundation established with an environmental purpose should introduce fossil fuel screening into its investment strategy consistent with that purpose provided its portfolio remains sufficiently diverse.⁷⁵ A PAF without an explicit environmental purpose might also consider introducing a fossil fuel screen into its investment strategy to position its portfolio to avoid exposure to expected future fossil fuel company share price drops.

Similarly, there is no legal barrier to exercising governance and advocacy rights, although to date in Australia it has been virtually unknown.⁷⁶ There will often be structural barriers. For example, a small PAF might find it more attractive to manage its entire portfolio by investing in a pooled fund.

APPENDIX E: HOW INVESTMENT SCREENS IMPACT ON RISK AND RETURN⁷⁷

1. Definitions

A ‘screen’ is a set of restrictions imposed on the composition of a portfolio. An unscreened portfolio manager is free to choose any stock from the universe of companies listed on a particular share market. By contrast, a manager subject to a screen has a restricted set to choose from. This appendix firstly sets out some relevant definitions, secondly describes the theoretical impact on risk-adjusted return of the imposition of a screen and thirdly describes the results of numerous empiric studies of this issue.

‘Return’ is the long-term annualised average increment in the value of the portfolio (reinvested dividends plus capital gains or losses). ‘Risk’ is the short-term variation in return which might occur year-to-year about the long-term average return.⁷⁸ A benchmark is the external measure of return against which a portfolio manager is measured.⁷⁹ ‘Tracking error’ is a measure of the extent of deviation of the year-to-year return on a portfolio against the return on the benchmark.

2. Theory

Portfolio theory describes the factors which influence return on a portfolio. It splits returns on particular stocks into two components:

- The return on a risk-free asset like a government bond, which is currently at historically very low levels.⁸⁰
- The risk premium on the shares of the particular company. This premium is generally expressed as the product of the premium required on equity in general and a β coefficient which is a measure of the systematic or market risk of the security.⁸¹ This coefficient is a measure of the correlation between the return on the particular security and the return on the market. Cyclically sensitive stocks (such as white goods manufacturers) have high β 's.

It is an important insight of portfolio theory that, (in a well-functioning market) the return on a particular

security does not depend on the ‘unique risk’ that attaches to that security. Unique risk arises from factors specific to the company, for example, the risk of fire, the risk of being sued for the environmental damage a mine causes to nearby residents. Investors do not require a high level of return to hold securities with high levels of unique risk because they can diversify that risk by holding a portfolio of shares. Across that portfolio unique risks will tend to cancel. Though one company may face large legal claims, another make strike gold.

The impact of a screen can be assessed from the perspective of this approach. If the screen is so restrictive as to allow only the purchase of a few stocks the unique risks will not cancel. The returns will suffer. ‘Jensen’s formula’ sets out the impact of increasing the number of securities in a portfolio on aggregate unique risk and hence the deviation between the return on the hypothetical screened portfolio and the β risk adjusted market return.⁸² Evidently, the number of securities necessary to reduce aggregate unique risk to a negligible level will depend on the levels of unique risk of the particular stocks in the portfolio.⁸³ Nevertheless, on the basis of US evidence, most unique risk is eliminated in a portfolio of 15 or more securities.⁸⁴

A number of conclusions flow from this analysis. Firstly, screening (provided it’s not very restrictive) doesn’t compromise risk-adjusted returns. Secondly, a screened portfolio comprising stocks with a weighted average β of 1 will exhibit risk and return characteristics similar to the risk/return performance of the entire market.

3. Evidence

A voluminous literature confirms this theoretical result. In Australia staff at the asset consulting company Russell surveyed over 40 empirical studies of the impact of ethical, sustainable or socially responsible screens on performance. It concludes that “there is no necessary performance penalty” from pursuing such an approach.⁸⁵ More recently, similar results have been found in the “carbon free” context.⁸⁶

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- 1 This paper deals with issues that arise for “mezzanine level” institutional investors – religious investment groups, universities, foundations and state government authorities considering the imposition of a carbon emissions intensity-related screen on their investment portfolio and/or support for shareholder actions aimed at improving company climate change responses. It does not deal with retail investors and self-managed super funds. Nor does it deal with other large institutional investors – for example public offer super funds
- 2 Richard Denniss, Howard Pender and Tom Swann were involved in the preparation of this paper. Aperio Group provided modelling.
- 3 Gurria, A, The Climate Challenge – achieving zero emissions, London, October 9, 2013.
- 4 Yong Kim, J, World Bank President Jim Yong Kim Remarks at Davos Press Conference (Transcript), Davos, January
- 5 Carbon Tracker (2013) *Unburnable Carbon 2013*, <<http://carbontracker.live.kiln.it/Unburnable-Carbon-2-Web-Version.pdf>>
- 6 ‘Reserves’ are fossil fuels that have a 90 per cent chance of being extracted profitably under expected market and political conditions. Governments and private companies own about 90 per cent of the oil and gas reserves and about two thirds of the coal reserves. The rest is owned by companies listed on stock exchanges. For most investors, most exposure to fossil fuels results from direct or indirect ownership of shares in publicly listed companies.

Publicly listed fossil fuel reserves are equivalent to around a quarter of all reserves. This is nearly the entire remaining carbon budget to 2050. Both governments and companies can be expected to resist ‘stranding’ these assets. But that is just what is needed, on a large scale, to keep global temperatures to within a 2°C increase.
- 7 Stranding means recognising an asset has lost economic value prior to the expiry of its useful life.
- 8 Gurria, A, The Climate Challenge – achieving zero emissions, London, October 9, 2013.
- 9 Mainstream financial commentators, who have warned of the risks faced by fossil fuel investors, have described the implications of this situation. For example, HSBC found fossil fuel companies could lose 40-60 per cent of their value. Citi also found major risks to Australian fossil fuel businesses.
- 10 This framework is adapted from a 2013 report by Generation Foundation *Stranded Carbon Assets* <<http://genfound.org/media/pdf-generation-foundation-stranded-v1.pdf>>.
- 11 Yong Kim, J, World Bank President Jim Yong Kim Remarks at Davos Press Conference (Transcript), Davos, January
- 12 See ECOFYS, Mapping Carbon Pricing Initiatives, The World Bank, Washington DC, May 2013. See also UNEP FI (2013) *Portfolio Carbon - Measuring, disclosing and managing the carbon intensity of investments and investment portfolios* see <http://www.unepfi.org/fileadmin/documents/UNEP_FI_Investor_Briefing_Portfolio_Carbon.pdf>.

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- 13 See Muller et al (2011), “Environmental Accounting for Pollution in the United States Economy”, in *American Economic Review*, 101(5), pp.1649-75 <<http://www.aeaweb.org/articles.php?doi=10.1257/aer.101.5.1649>>, Doctors for the Environment (2013) “How coal burns Australia”, <http://dea.org.au/images/general/How_coal_burns_Aust._.True_cost_of_burning_coal_04-13.pdf>
- 14 Garnaut, John, Time for change: China flags peak in coal use, The Sydney Morning Herald, February 6, 2013
- 15 Worldwide, these subsidies exceed those for agriculture. Phasing out these subsidies could lead to a 10 per cent reduction in global GHG emissions. See IEA, OECD, OPEC, World Bank *Analysis of the scope of energy subsidies and suggestions for the G-20 initiative*, 2010.
- 16 A good example of this slow unwinding of fossil fuels subsidisation is the recent announcement by the UK government it will join with the US to cease support for public financing of new coal fired power stations, for example, by export credit agencies.
- 17 See Generation Foundation (2013) *Stranded Carbon Assets* <<http://genfound.org/media/pdf-generation-foundation-stranded-carbon-assets-v1.pdf>> p.6.
- 18 Already three US state legislatures (Vermont, Massachusetts and Maine) have bills before them to divest shares they hold (directly or through employee pension funds) in fossil fuel intensive businesses.
- 19 Ansar, Caldecott and Tilburry (2013), *Stranded Assets and the Fossil Fuel Divestment Campaign: What Does Divestment Mean for the Valuation of Fossil Fuel Assets?* <<http://www.smithschool.ox.ac.uk/research/stranded-assets/SAP-divestment-report-final.pdf>>.
- 20 Though aggregate carbon emissions from fossil fuel extraction and use needs to fall to meet the two-degree budget the same is not the case in regard the price received by the reserve owners of each fuel and the quantity extracted. In particular, though it seems likely carbon pricing will reduce thermal coal producer prices, a switch in demand to lower-greenhouse-intensity natural gas could result in higher producer prices for gas.
- 21 To our knowledge, no public company auditor has yet required a write-down of carbon reserves as a consequence of ‘stranding’. By contrast, some companies have incorporated future assumptions about carbon pricing into their DCF calculations in relation to investment decisions and for valuation purposes.
- 22 This assumption is made by each auditor for each company when they assume that particular company will be able to extract its own reserves knowing all companies cannot do likewise.
- 23 This calculation is based on ‘proven’ reserves – that is, reserves that, according to the company, have a 90 per cent certainty of being extracted.
- 24 For a more detailed discussion of valuation see Smith School of Enterprise and Environment, University of Oxford, <<http://www.smithschool.ox.ac.uk/research/stranded-assets/SAP-divestment-report-final.pdf>>, especially p.24. The paper stresses the impact on DCF calculations of changes in the estimate of the probability of outcomes.

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- 25 They may also wish to position their portfolio to benefit from expected future fossil fuel company share price drops. For example, *Bright Now: towards fossil free Churches* is a report by the Operation Noah campaign from within the UK churches, calling on them to disinvest from companies involved in fossil fuel extraction. It describes the theological and moral, as well as the scientific and financial, cases for disinvestment.
- 26 For example, the Victorian Funds Management Corporation is a UNPRI member and uses information it obtains from the Investor Group on Climate Change to assist it with the assessment of climate change-related ESG risk – see <<http://www.thesustainabilityreport.com.au/investor-profile-victorian-funds-management-corporation/652/>>.
- 27 For example, in relation to *engagement*, a spokeswoman for the California public employees retirement system (CALPERS), one of the largest institutional asset owners in the world, said in reference to BHP that, “We want them to revisit their business plans and strategies to factor in scenarios on climate risk and we want them to give back the money which is allocated to exploring for more fossil fuels which we know cannot be burned ...”. See <<http://www.abc.net.au/lateline/content/2013/s3889681.htm>>. For an example of *advocacy*, see recent resolutions put by the New York Comptroller to US company AGMs on climate change issues at <<http://www.ceres.org/investor-network/resolutions#!/subject=Climate%20Change&year=&company=&filer=New%20York%20City%20Office%20of%20the%20Comptroller§or=&status=&memo=&all=>>>
- 28 The most significant authority on this issue in Anglophone law is the *Mine Workers Pension Scheme* case, commonly referred to as *Cowan v Scargill*. That case made clear trustees must put to one side strongly held personal interests and views when assessing investments.
- 29 Unburnable Carbon 2013 p.19, <<http://www.carbontracker.org/carbon-bubble-interactive>>
- 30 Carbon Tracker uses only reserves numbers for the top 200 companies globally, all of which are on the chosen indexes and which represent most of the world’s listed carbon. The indexes, however, also include some smaller reserves that are not captured by the Carbon Tracker analysis.
- 31 Some reserves owned by companies on a given stock exchange will be physically located in other countries. For example, the ASX includes 23GtCO₂ of Australian located coal reserves. But a further 28GtCO₂ Australian located reserves are listed on foreign stock exchanges (excluding dual listings), including exchanges in the UK, Japan, USA and China. The ASX also includes 5GtCO₂ of coal located outside of Australia.
- 32 This figure is from the Carbon Tracker’s “Australia’s Carbon Bubble” report. <http://www.carbontracker.org/wp-content/uploads/downloads/2013/05/Unburnable-Carbon_Australias_Carbon_Bubble.pdf>
- 33 This row also includes non-listed company owned reserves.
- 34 The figures above relate to ‘reserves’, Carbon Tracker also considers ‘resources’, defined as fuel that is 50 per cent likely to be extracted. Although less reliable than reserves figures,

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- resources analysis show Australian listed companies currently intend to expand Australia’s carbon exposure significantly, both in absolute terms but also relative to other stock exchanges. The ASX 200 holds the fourth largest pool of carbon resources and is the fourth most carbon intense. Ninety-four per cent of Australia’s resources are in coal, by emissions potential, equivalent to 300 times Australia’s 2012 emissions (excluding land-use change).
- 35 This row is based on global market capitalisation figures for 2012 from the World Bank and assumes pro rata stranding of all listed and state-owned resources. It also, implicitly, assumes adoption of the two-degree target is ‘aggregate value neutral’ – that is, the loss of value in fossil fuel businesses is offset by increased value elsewhere, for example, among insurers and reinsurers.
- 36 Many have already done so: see the discussion in the Appendices.
- 37 There are a number of businesses selling information of this nature, see for example <www.caer.org.au>.
- 38 Aperio used the Barra software to conduct these simulations for The Australia Institute, 28 November 2013
- 39 We excluded all members of the GICS ‘oil, gas and consumable fuels’ sector except for one uranium miner. Ethical or responsible investors may also have concerns about this industry. Linc is no longer ASX listed and Coalspur is no longer on the ASX 200.
- 40 For example, CS Energy in Queensland or Delta Electricity in NSW.
- 41 For example, Energy Australia is owned by Hong Kong listed CLP Holdings.
- 42 AGL is a national electricity market ‘gentailer’: it both generates and retails power. Forty-one per cent of AGL’s generation capacity is brown coal-based. AGL also manages, operates and part owns the brown coal mine adjacent to the Loy Yang power station. AGL is listed as the 56th largest global coal company by carbon reserves. AGL is the second largest national electricity market generator.
- 43 Origin is also a national electricity market ‘gentailer’: it both generates and retails power. Since acquiring Eraring Energy in August 2013, around two thirds of Origin’s generation capacity is black coal-based. However, unlike AGL, Origin does not have coal reserves. It has significant oil and gas interests. Origin is making large investments in LNG plants to open coal seam gas expansion to the global export market. It owns nine gas power plants. Once an early driver of renewables in Australia, Origin has now become obstructionist.
- 44 BHP is the world’s largest diversified miner and one of the world’s largest companies. Although focused on Australia, BHP has interests in various resources all over the world. According to Carbon Tracker, in 2011 BHP had the third-largest coal reserves by emissions equivalent among listed companies and 26th largest oil and gas based reserves, which combined make it owner of the eighth largest listed reserves. According to the 2012 Annual Report, fossil fuels generated 34 per cent of earnings before interest and tax, with 23 per

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- cent in oil and gas, six per cent coking coal and five per cent in thermal coal. Sixty-nine per cent of BHP's net operating assets were in fossil fuels, with 49 per cent in oil and gas, 10 per cent in coking coal and seven per cent in thermal coal. Forty-five per cent of BHP's oil reserves and 47 per cent of its gas reserves are developed. BHP's oil and gas operating assets more than doubled between 2011 and 2012 after BHP acquired Petrohawk Energy Corporation and existing reserves estimates were revised up.
- 45 Rio is a resources company dual listed in London and Australia. It had the largest carbon footprint of all ASX listed companies in 2012. Globally it had the 14th largest carbon emission equivalent coal reserves in 2011, including both thermal and coking coal. Gross revenue in 2013 is expected to include nine per cent from coal. Most of this comes from Australian coal production: in 2013 38 per cent coking coal and 62 per cent thermal coal.
- 46 Wesfarmers is a diverse federation of businesses included in the consumer staples industry sector (because of its ownership of Coles and Bunnings) but it also operates in the insurance, chemicals and coal mining -- mostly coking coal. Wesfarmers is the 38th largest coal reserves holder in the world. However, coal contributes about three per cent of Wesfarmers revenue and only about five per cent of assets.
- 47 The remaining universe of stock was reweighted to minimise tracking error.
- 48 See the description of the methodology in Geddes, P *Do the Investment Math: building a carbon free portfolio*, 2013, Aperio. Geddes uses Barra simulation software to estimate the ex-poste impact on historic simulated risk and return of excluding carbon intensive companies from an investment universe then optimising for minimum tracking error. See the Appendix for more discussion.
- 49 The back tested simulation used 10 years of data up to October 2013.
- 50 The back tested simulation used 10 years of data until October 2013
- 51 Tracking error is a measure of deviation from the index. One per cent or lower is generally considered negligible and equivalent to the index. It is not a measure of loss.
- 52 See <www.accr.org.au> if you wish to keep up-to-date with similar future resolution activity.
- 53 These funds are often exempt from the managed investment scheme provisions of the Corporations Act.
- 54 <<http://www.christiansuper.com.au/why-we-are-different/ethical>>
- 55 Personal communication.
- 56 Daly leads a coalition of religious investors who lodge over 100 resolutions every year.
- 57 There are significant differences in Australian and US corporations law which make it harder for individual shareholders to file resolutions in Australia. But it is no harder than in the UK where churches have filed resolutions.
- 58 Unitarian Church divests from fossil fuels, ABC Environment, 1 August 2013.

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- 59 Church to divest from corporations engaged in the extraction of fossil fuels, UCA Insights, 16 April 2013.
- 60 UNPRI is the United Nations Principles for Responsible Investment, IGCC is the Investor Group on Climate Change, RIAA is the Responsible Investment Association of Australia.
- 61 Where universities use a 'mandate' to engage a fund manager to invest on their behalf but remain the beneficial owner of shares purchased, they have the legal right to vote their shares. In cases where universities invest in pooled funds, they do not have the legal right to vote their shares. But they might choose funds with exclusions or tilts related to fossil fuels.
- 62 The Government Employees Superannuation Board manages the super of current and former WA public sector employees.
- 63 Queensland Investment Corporation. It was originally established to manage the long-term assets of the Queensland government.
- 64 For a list of SIS Act exempt public sector super schemes in Australia see <<http://www.apra.gov.au/Super/Documents/EPSSS-list.pdf>>.
- 65 For example, in the ACT the *Financial Management Act 1996* states at section 58 "... funds of the territory authority may only be invested under this section to increase or protect the financial wealth of the authority."
- 66 It is established pursuant to the Safety, Return to Work and Support Board Act 2012. The Act imposes no particular obligations nor gives any guidance as to the investment policy arrangements which may be set by the Board.
- 67 For an example of this example of this sort of activity see <www.ceres.org>.
- 68 The ACT Government's 'Responsible Investment Policy' includes a commitment to disclosing how its voting record in Treasury's Annual Report, with the first disclosure due in the next Annual Report. <http://apps.treasury.act.gov.au/__data/assets/pdf_file/0004/491566/Responsible-Investment-Policy.pdf> p.10
- 69 In 2012 the ACT Legislative Assembly considered but rejected a bill (*Financial Management (Investment) Legislation Amendment Bill 2012*) to mandate screening in regard a small number of activities (tobacco, armaments manufacture, animal tested cosmetics etc). In January 2013 the ACT government implemented a Responsible Investment policy that includes exclusion screens for tobacco and cluster bombs.
- 70 For example, StatewideSuper in SA and LGsuper in QLD offer SRI options to members.
- 71 And in many cases reflects little more than a desire to be "seen to be doing something".
- 72 This table is updated from ACF (2008) *Responsible Public Investment In Australia*, <http://www.acfonline.org.au/sites/default/files/resources/govt_investment.pdf>
- 73 The term "foundation" has not traditionally been part of common parlance in Australia.

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- 74 There are two exceptions to this – philanthropic trusts (of which there are only seven currently listed) and scholarship funds established under each of the purpose categories.
- 75 In practice this means directly held equity portfolio should contain at least about 15 stocks. See appendix E.
- 76 Much like the situation as regards religious organisations and government authorities, this stands in stark contrast with the activities of these bodies in both the US and the UK.
- 77 This appendix is written with reference to an equities portfolio. It ignores any active management underperformance/outperformance. Screening of fixed interest portfolios is feasible but less common.
- 78 It is generally measured as the variance of annual or monthly returns but other measures, such as the probability of a year with a negative return are also used.
- 79 For example, an Australian equities portfolio might be benchmarked against the All Ordinaries, the market cap weighted return on all listed companies.
- 80 The yield on a 20-year government bond in Australia at present is about five per cent.
- 81 The long-run tax-free equity premium is generally taken, in Australia, to be around six to seven per cent. See Dimson et al *Global investment returns yearbook*, various years, which calculates the risk premium on Australian shares from 1900.
- 82 See Jensen, M 1979 'Tests of Capital Market Theory and Implications of the Evidence' in *Handbook of Financial Economics*, Bicksler, J ed, ,North Holland
- 83 A portfolio of highly speculative mining companies will need to contain more companies to diversify away unique risk than a portfolio with broad sectoral composition.
- 84 Id p.25
- 85 See Taylor, N and Donald, S *Sustainable Investing marrying Sustainability concerns with the quest for financial return for superannuation trustees*, Russell Research August 2007
- 86 See Geddes, P *Do the Investment Math: building a carbon free portfolio*, 2013, Aperio. Geddes uses the Barra simulation software to estimate the ex-poste impact on historical simulated risk and return of excluding carbon intensive companies from an investment universe then optimising for minimum tracking error. Consistent with the theoretic and empiric discussion above the calculated impact is minimal. Modelling presented in Section 2.3 of this paper shows this applies also in the Australian context.

There are a number of specialist US funds making index-comparable returns net of fees without fossil fuel investments. Humphreys, J, *Endowment Management in a Warming World* 2013 <<http://631nj1ki9k11gbkxh39b3qpzua.wpengine.netdna-cdn.com/files/2013/06/institutional-pathways-final-061813.pdf>>

ENDNOTES

- 87 <<http://www.smithschool.ox.ac.uk/research/stranded-assets/SAP-divestment-report-final.pdf>>
- 88 For example, NSW law empowers the Education Minister to schedule allowable investments for UNSW. But UNSW's current investments are unrestricted, under the *Public Authorities (Financial Regulations) Act 1987*.
- 89 ANU should not invest in a manner likely to compromise its "national and international role".
- 90 The policy requires ANU to avoid investments in activities that cause "substantial social injury" and promote those that provide social benefits. Other Universities have similarly general obligations for negative screens.

