

Your Future, Your Super Performance Test

Constraint on ESG, Sustainability and Carbon Transition Activities

9 November 2022

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1. Introduction

One of the most controversial elements of the Your Future, Your Super (YFYS) reforms was the YFYS performance test. While intended to address under-performance of superannuation funds, the design and implementation of the test has created a range of unintended consequences.

One area of concern is the constraining impact the performance test may have on investment activities relating to ESG, sustainability and carbon transition. To date we have heard many anecdotal concerns¹. However, there has been little in the way of objective research to assist policymakers and industry.

This paper attempts to help bridge that gap². We do this by estimating the performance test tracking error resulting from implementation of three different portfolios that have various ESG, sustainability and/or carbon transition objectives. The performance test tracking error is then compared to what research suggests is a sustainable level of tracking error, defined as a level which provides a trustee a high likelihood of passing the YFYS performance test without having to make sizable portfolio changes through time.

Through this lens we find that some of the mainstream implementations of ESG, sustainability and carbon transition activities create unsustainably high levels of performance test tracking error, which increases the risk of a 'false positive' YFYS test failure. Further we find that dedicated unlisted investments in greenfield opportunities such as private equity and infrastructure are likely to incur sizable incremental tracking error.

In short, trustees face a difficult challenge: they have multiple portfolio objectives but a limited budget of performance test tracking error to facilitate implementation. These objectives include return enhancement, risk management, diversification, and accounting for ESG, sustainability and climate transition. Trustees are faced with a difficult decision between living with a heightened likelihood of failing the YFYS performance test at some point or having to pare back the degree to which these activities are implemented, which may be inconsistent with investing in accordance with the long-term financial interests of members, and/or with members' sustainability preferences.

This paper does not propose solutions. The contribution of the paper is to bridge an acknowledged information gap.

This has been a collaborative project between The Conexus Institute, FTSE Russell, ASFI (Australian Sustainable Finance Institute) and RIAA (Responsible Investment Association of Australasia). Unless stated otherwise in this document, calculations relating to individual public markets were produced by FTSE Russell, while private market and portfolio calculations were produced by The Conexus Institute. ASFI consulted with a number of its members on the formation of appropriate ESG, sustainability and carbon transition scenarios.

¹ See, for example Bell, D, 2022 ["Assessing the impact of YFYS through interviews with CIOs of funds with performance "buffer"'](#), The Conexus Institute

² We encourage other researchers to add to the research base in this important area.

2. Background information on YFYS

The YFYS performance test was introduced in the 2020-2021 Budget. The Treasury Laws Amendment (Your Future, Your Super) Act 2021 (the YFYS Act) came into effect on 1 July 2021, first applied in August 2021. Key features of the performance test are summarised as follows:

- The test is based on creating a tailored reference portfolio for funds based on their reported SAA (strategic asset allocation, through time). The performance of the fund is compared against the performance of the reference portfolio. Eleven different benchmark indices are used, none of which account for ESG, sustainability or carbon transition. For this reason the YFYS performance test is often described as an implementation test. The test further accounts for present administration fees (relative to a peer median).
- Test failure has strong consequences. Initial failure requires a letter to be sent to affected fund members. Two consecutive failures prevent those funds from being able to accept new members until performance is rectified.
- The test was, and continues to be, applied on a bright lines and retrospective basis. There is no qualitative consideration of a fund's circumstances.

Given the consequences of failure, including associated media coverage and reputational impact, industry strongly accounts for the performance test in their portfolio management activities. Since the introduction of the performance test industry jargon like “performance test tracking error” has become commonplace, and forms an important part this paper

3. Performance test tracking error explained

To explain performance test tracking error we first explain the concept of tracking error and then explain performance test tracking error and the workings of the YFYS performance test.

3.1. Tracking error explained

The tracking error or active risk of a portfolio is a measure of the variability between returns of a portfolio and the returns of a benchmark. It indicates how closely a portfolio tracks the index to which it is benchmarked (noting that investment managers generally select their benchmark).

Mathematically, tracking error is calculated as the volatility of performance between portfolio and index returns (otherwise known as relative performance). It can be calculated on a realised basis (*ex post*) or estimated on a forward-looking (*ex ante*) basis. A fund which perfectly replicates the index has no tracking error. All else equal, relative position sizing (to benchmark) and positioning sizing in relatively volatile stocks impact tracking error.

Generally, tracking error is knowingly taken on by investment managers as part of their investment strategy, most commonly to facilitate their attempts to outperform their benchmark.

The impact of tracking error is illustrated in Diagram 1. We plot the distribution of outcomes for two products with the same expected active returns but different degrees of tracking error. The

horizontal axis reflects the range of outcomes, and the vertical axis reflects their associated probability. The blue line reflects a lower tracking error product and the red line a product with higher tracking error.

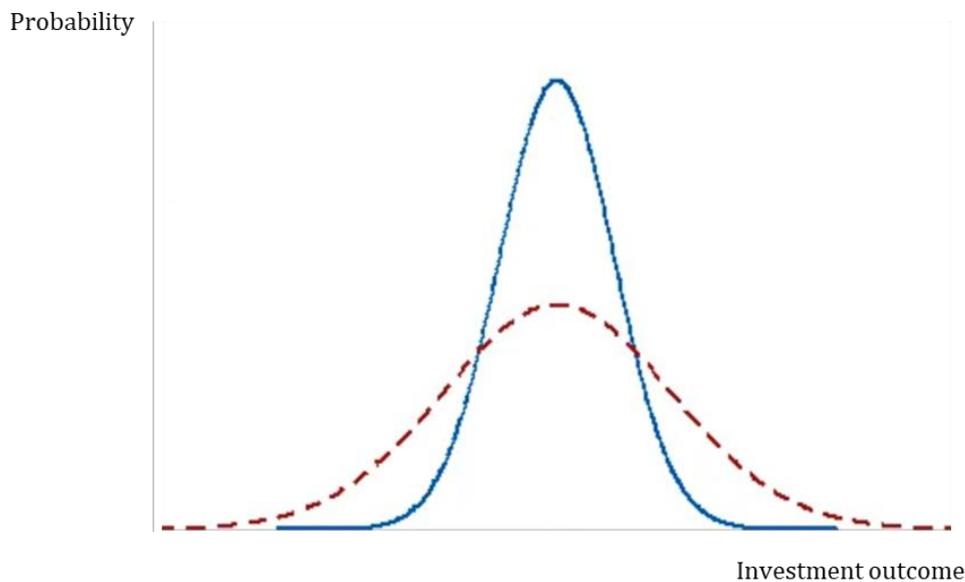


Diagram 1: Stylised illustration of the range of possible performance outcomes for two different levels of tracking error.

In Diagram 1, we can see that higher tracking error results in a wider range of possible active return outcomes. All else equal, most investors would seek higher expected active returns to compensate for this variability, meaning that in this case investors would choose the product associated with the blue line (it has the same expected active return but lower tracking error). Higher expected returns would be reflected through shifting the entire return distribution to the right.

3.2. Performance test tracking error explained

For the YFYS performance test, the tracking error concept just explained broadly carries over. However, there are some important differences between tracking error and performance test tracking error.

The main difference, or distortion as we will shortly explain, is that the YFYS performance test is based on a prescribed set of benchmarks, and the selected indices may not accurately benchmark the range of investment activities undertaken by a super fund. This includes:

1. A range of investment sectors which super funds invest into, to enhance returns, manage risk and diversify portfolios, are not well-represented by the existing set of benchmarks. Some notable examples include inflation-linked bonds, credit, private equity and emerging markets equity and debt.
2. A range of approaches used to manage investment exposures are not acknowledged by the performance test. Techniques to manage risk include targeting a lower market risk

exposure within a sector (e.g. low volatility equities or low duration bonds) and managing ESG and sustainability risks.

Funds which undertake these activities will incur a higher level of performance test tracking error. This tracking error is unintended (regardless of whether implementation is passive or active) and simply results from the limited number of benchmarks used in the YFYS test. Performance test tracking error can only be equal to or larger than the true level of tracking error taken by super funds, and any difference could be described as distortion.

Now we apply this framing to a YFYS performance test setting, illustrated in Diagram 2. The vertical line reflects the performance test threshold (the level of implementation performance that must be met to pass the performance test). All else equal, it is easy to identify that a product with larger tracking error (red line) has a higher likelihood of failing the performance test. This type of failure is known as a 'false positive': the expected outcome of the fund is above the performance test threshold, but the degree of performance test tracking error can create variability in rolling performance test outcomes over time.

The industry concern is that the unintended sources of performance test tracking error unfairly increase the risk of failing the YFYS performance test and motivate funds to pull back on activities which align with the long-term financial interests of members (such as generating returns, managing risk, and diversifying portfolios), and/or with members' sustainability preferences.

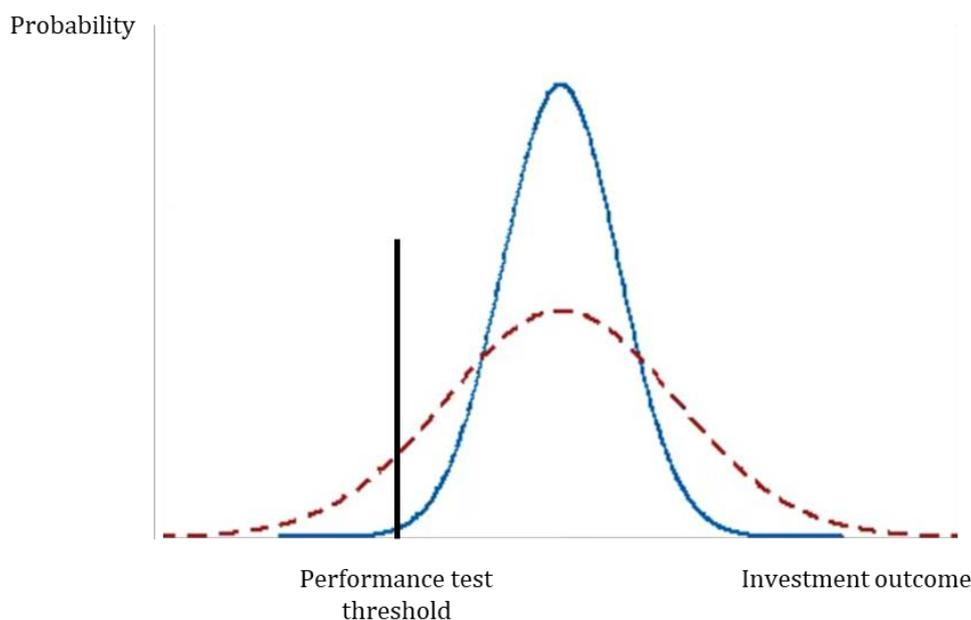


Diagram 2: Stylised illustration of the performance test applied to two products with different levels of performance test tracking error.

In this paper we do not explore the potential for or likelihood of different returns between portfolios which do and do not account for ESG and sustainability considerations. Estimating this performance differential into the future is difficult and subjective. We note research (including

RIAA³) which identifies that funds which account for ESG and sustainability considerations have outperformed regular funds. Observed outcomes may be dependent on time horizon.

The focus of this research is on exploring the impact of accounting for ESG and sustainability considerations on performance test tracking error. Estimating performance test tracking error is a more objective exercise than estimating expected returns, while it is performance test tracking error which proxies the constraining impact of the YFYS performance test.

4. Sustainable tracking error

Under the SIS Act super fund trustees are required to implement an investment strategy in the best interests ^{of} members which accounts for a considered trade-off between risk and return⁴. Due to the severe consequences of failure, the YFYS performance test creates an additional consideration: trustees will account for the risk of failing the performance test when designing their investment strategy. Funds will be motivated to manage their performance test tracking error to limit the likelihood of failing the YFYS performance test.

Many trustees are now measuring their performance test tracking error and considering what level is appropriate. This is a complex consideration. A recent research piece by The Conexus Institute⁵ explored this issue with the aim to determine a sustainable level of performance test

³ Banhalmi-Zakar Z, Goodwin M, Parker E, Blake J, Gacic M, Herd E and Vidulich B, 2022, "[Responsible Investment Benchmark Report 2022 Australia](#)", Responsible Investment Association Australasia, Melbourne.

⁴ Source: <https://www.legislation.gov.au/Details/C2017C00052>

The covenants referred to in subsection include the following covenants by each trustee of the entity:

(a) to formulate, review regularly and give effect to an investment strategy for the whole of the entity, and for each investment option offered by the trustee in the entity, having regard to:

(i) the risk involved in making, holding and realising, and the likely return from, the investments covered by the strategy, having regard to the trustee's objectives in relation to the strategy and to the expected cash flow requirements in relation to the entity; and

(ii) the composition of the investments covered by the strategy, including the extent to which the investments are diverse or involve the entity in being exposed to risks from inadequate diversification; and

⁵ Bell, D, 2022 "[Your Future Your Super Performance Test: Constraints and Sustainable Tracking Error](#)", The Conexus Institute

tracking error. Beyond the desire to minimise the likelihood of failing the test, it is rational to expect that funds want to avoid the need to significantly alter their investment strategy in response to short-term performance test results (hence the term ‘sustainable’).

The outcome of this research determined 1% to be a reasonable proxy for a sustainable level of performance test tracking error. This is the reference level used throughout this paper.

5. Exploring sustainability and tracking error

There are a range of ways to implement portfolios which account for ESG, sustainability and carbon transition. We consider three different approaches as follows:

- ESG portfolio implemented through exclusions
- Carbon transition portfolios
- Unlisted “green” assets

We describe each strategy and then assess the performance test tracking error across individual asset classes. We then reflect these approaches into model portfolios and estimate performance test tracking error.

5.1. ESG portfolio implemented through exclusions

ESG views can be expressed through exclusions. RIAA⁶ describes negative / exclusionary screening as follows:

“Negative/exclusionary screening: the exclusion from a fund or portfolio of certain sectors, companies or practices based on specific ESG criteria, such as what goods and services a company produces, or how inadequate a company or country response is to emergent risks such as climate change impacts.”

The RIAA sets out a list of minimum requirements which deem (certify) a product as avoiding significant harm. The intent of the certification program is to:

- Mitigate the risk that consumers find certified products containing holdings that are principally in the business of activities that inflict significant harm on people, animals and the environment; and
- To reduce harm to people, animals and the environment by directing capital away from companies that produce goods and services and behave in ways that systematically undermine respect for human rights, environmental protection and economic stability (through unsound corporate governance as an example).

The minimum standards consist of activity-based exclusions and conduct-based exclusions.

⁶ RIAA, [“Responsible Investment Explained”](#), Responsible Investment Association Australasia, Melbourne.

The minimum activity-based standards for RIAA certification of avoiding significant harm are exclusions based on:

- Tobacco, nicotine alternatives and tobacco-based products
- Controversial weapons
- Nuclear weapons

Further detail, including other activity-based exclusions are detailed in Appendix 1.

In addition to activity-based exclusions, the principles contained within the UN Global Compact are also used by many fund managers as a benchmark for determining acceptable business practices. Controversies in the following areas can lead to exclusion: human rights, labour, environment, anti-corruption) and failing on diversity. Further details are provided in Appendix 2.

For the purposes of this analysis, ESG exclusions are based on the RIAA minimum criteria plus compliance with UNGCC (UN Global Compact Controversy) exclusion screens⁷. Companies which have any revenue exposure to tobacco, controversial weapons and nuclear weapons are excluded from the model portfolios. Additionally, companies which are deemed to be non-compliant according to a UNGCC screen are also excluded from the model portfolio.

The public market tracking error analysis is detailed in Table 1:

Asset Class	Index	No of Stocks	No of Stocks Excluded	% of Market Cap	Tracking Error vs Benchmark (ex-ante)	Tracking Error vs Benchmark (ex-post)
Australian Equity	FTSE Australia 300	300	1	11.4%	2.8%	3.9%
International Equity	FTSE All World ex Australia	3980	117	5.3%	0.7%	1.2%
Australian Property	FTSE Australia 300 A-REITs	27	0	0	0	0
International Property	FTSE EPRA/NAREIT Developed ex-Australia Rental	338	0	0	0	0
Australian Infrastructure	FTSE Developed Core Infrastructure Index	134	2	0.9%	0.2%	0.2%

Table 1: Estimates of tracking error created across different publicly traded asset classes through the incorporation of exclusions consistent with RIAA RI certification. Calculations by FTSE Russell, An LSEG Business.

We explore the Australian equity calculations in further detail as they represent an interesting case study. BHP was deemed to be non-compliant according to the UNGCC screen, linked to environmental and human rights violations caused by the collapse of a dam. If BHP was not on

⁷ UNGCC Exclusions relate to companies which are deemed to have violated one of the ten principles of the UN Global Compact ([The Ten Principles | UN Global Compact](#)). For the purposes of this analysis, we use UNGCC violations as determined by Sustainalytics.

the exclusion list then the tracking error for Australian equities in Table 1 would be zero. One interesting reflection on this case study is the instability it brings (in the context of performance test tracking error) to any fund which applies the UNGCC screen, especially in Australian equities where resource and material firms are a significant component of the index (BHP is approximately 11% of the Australian equities benchmark).

5.2. Carbon transition portfolios

Carbon transition portfolios seek to align capital with decarbonisation activities. Broadly, assets are selected, weighted or excluded in such a manner that the resulting benchmark portfolio is on a decarbonization trajectory. This is a subjective area in terms of how to reflect this into portfolio construction and the assessment of portfolio outcomes. There is no set definition for a transition benchmark, but generally, they have two properties: (1) they are lower carbon; and (2) there is a lot of emphasis on company engagement.

Index providers offer carbon transition indices. As a case study, FTSE's suite ([FTSE TPI Climate Transition Index Series](#)) focus on the following activities:

1. Fossil fuel reserves: Underweight companies with fossil fuel reserves.
2. Carbon emissions: Over/underweight companies according to their greenhouse gas emissions whilst applying sector neutrality.
3. Green revenues: Overweight companies generating revenues from the global green economy.
4. Management quality: Over/underweight companies based on the extent to which they are managing the risks and opportunities related to the low-carbon transition and how they are addressing key aspects of the Taskforce on Climate-related Financial Disclosures (TCFD).
5. Carbon performance: Over/underweight companies according to the extent to which they are committed to carbon emissions pathways that are aligned with 2DC/below 2DC warming scenarios.

One special case is Paris-Aligned Benchmarks (PABs). Following ratification of the Paris Agreement, the EU introduced minimum standards for benchmarks which help investors identify low-carbon investment strategies which are aligned with the transition to a low carbon economy. The aim of the benchmarks is to provide investors with an appropriate tool to measure decarbonizing efforts of an investment strategy, improve transparency and comparability of products, reallocate capital towards climate friendly investments, and prevent administrators from making misleading low-carbon claims ('greenwashing'). The difference between PABs and other carbon transition portfolios is that PABs are focused more strongly to stated net zero goals.

Paris-Aligned benchmarks (PABs) require a 50% reduction in Greenhouse Gas Emissions (GHG) compared to a fund's parent index in year one and then a 7% year-on-year reduction of GHG emissions relative to the fund itself. Additionally, there are various exclusions including mining activities and high-intensity energy generation. Further, PABs must adhere to the EU Taxonomy's "Do No Significant Harm" (DNSH) requirements. Exclusions and DNSH requirements are further detailed in Appendix 3.

We note that PAB benchmarks will be required to largely include Scope 3 emissions from January 2023⁸. Scope 3 is an important consideration for assessing a company’s alignment with net zero goals.

Presently there is no PAB-equivalent benchmark offered on the Australian stock market. In the Australian setting high concentrations in sector and stock weights make the challenge highly difficult. Considering the make-up of the Australian stock market, it could become even more difficult to construct a decarbonised benchmark given a lot of the emissions from Australian companies are downstream.

In this case study on carbon transition portfolios we use a PAB for global stocks but create a low carbon portfolio for Australian stocks. In line with the exclusion criteria, 11 stocks are removed for this case study with a total weighting of 18.3%. After applying the exclusions, the emissions profile of the index is reduced by 50.3% across Scope 1 and Scope 2 emissions.

Estimated tracking errors for PABs for global and the Australian equity low carbon portfolio are detailed in Table 2.

Asset Class	Index / Source	Tracking Error vs Benchmark
International Equity	FTSE All World PAB Index	1.2%
Australian Equity	FTSE constructed portfolio	5.1%

Table 2: Ex-post estimates of tracking error for Paris-aligned benchmark for global equities and a portfolio construction consistent with the rules of a Paris-aligned benchmark for Australian equities. Calculations by FTSE Russell, An LSEG Business.

5.3. Unlisted “green” assets

There exists the opportunity for funds to invest directly into projects and assets that have an explicit or integrated approach to (one or all of) low-carbon, energy efficiency and climate adaptation. The PRI identifies that investments in clean energy exist across unlisted asset classes (such as property, infrastructure, private equity, agriculture and timberland) and projects (such as renewable energy and energy efficiency projects).

Through the lens of YFYS we make the following observations:

- Property: sustainability activities tend to be integrated into operating models rather than as a standalone activity, so it is less likely to be a distinct capital allocation activity of super funds. Affordable housing is a separate issue not considered in this paper.
- Infrastructure: there are dedicated assets in this space. Greenfield assets in areas like wind and solar are estimated to take one year of development. Under YFYS all sustainable infrastructure assets are benchmarked against the unlisted infrastructure benchmark (MSCI Australia Quarterly Private Infrastructure Fund Index), which has approximately 3% allocation to renewable energy.

⁸ As per [“Minimum standards for EU Climate Transition Benchmarks and EU Paris-aligned Benchmarks”](#), 17 July 2020

- Private equity: there are many investment opportunities in this space, especially in new technologies. All private equity is benchmarked against public market benchmarks. We estimate the J-curve (the period of flat expected performance while assets are invested and businesses become established) to be three years.
- Agriculture: there is no specialised benchmark for agriculture assets. Some interpretations are that they should be benchmarked against unlisted property and in other cases the 'Other' category (which is benchmarked 50% against international shares and 50% blend of Australian and global fixed income). While we acknowledge that relevant ESG, sustainability and carbon transition opportunities exist in this sector we believe the general (likely to be high) performance test tracking error of investing in this sector will dominate the specific additional tracking error generated by an agriculture investment with a dedicated ESG, sustainability or carbon transition focus.
- Timberland: the same issues as for agriculture.

We create case studies for sustainable infrastructure and private equity to estimate the impacts of YFYS. We consider these areas to be the most sizable in terms of tracking error impact on portfolios focused on sustainability. It is beyond the scope of this paper, due to unlisted asset data limitations, to estimate the impact of sector effects on unlisted asset performance test tracking error. What we can do is focus on the impact of development time (infrastructure) and J-curve (private equity). Here, we assume zero expected returns for an initial period and estimate the performance test tracking error for that period⁹. The outcomes are detailed in Table 3.

	Unlisted Infrastructure	Private Equity
Benchmark average return	9%	9%
Benchmark volatility	7%	13%
Estimated period of flat returns	1	3
Estimated YFYS performance test tracking error (during flat return period)	11.4%	15.8%

Table 3: Estimates of tracking error created by new investments in unlisted infrastructure and private equity. Calculations and estimates of average return and benchmark volatility are by The Conexus Institute. Private equity is benchmarked against public market benchmarks.

5.4. Other asset classes

Other asset classes can generate performance test tracking error but we believe the overall impact on portfolio-level tracking error is modest because of the existing sector-level tracking (refer to discussion on unlisted agriculture assets) and portfolio allocation. Further, for some

⁹ Some manipulation of the volatility formula yields that $Vol_{zero\ mean}^2 = Vol_{exp}^2 + Mean_{exp}^2$, where 'exp' denotes the expected parameter values.

sectors there is no consistent interpretation of how to implement exclusion policies or Paris-Aligned Benchmarks.

The most obvious omission from this paper is fixed income and credit.

- For credit portfolios we observe that there are Paris-Aligned Benchmarks. Analysis of these benchmarks suggests a relatively small level of tracking error (less than 0.2%)¹⁰. Under the present YFYS benchmarks there is no standalone credit benchmark, meaning that the performance test tracking error created by investing in credit likely far exceeds the marginal tracking error created by following PABs.
- For fixed income portfolios there is no sovereign-selection policy which conforms with PABs. Some fund managers set explicit carbon targets¹¹. Due to the lack of a uniform approach it is difficult to create a standardised estimate of performance test tracking error. Our intuition is that the number is relatively small.

Finally, there exists a large range of investment strategies categorised as ‘alternatives’. Alternatives are benchmarked against the ‘Other’ benchmark (50% global equities / 50% fixed income blend) and are generally a source of large tracking error. In this context the marginal additional tracking error from an alternative investment strategy focused on ESG, sustainability or carbon transition is likely modest.

5.5. Aggregated portfolio-level tracking error

Having completed our exploration of the primary sources of performance test tracking error associated with ESG, sustainability and carbon transition, we focus now on aggregated portfolio risk. Once again, we acknowledge that no two portfolios are the same, so we consider a few different case studies.

We account for Australian shares and global shares, along with dedicated sustainability / energy transition focused positions in unlisted infrastructure and private equity. For public markets we assume ex-post tracking error. We assume the correlation between public markets (Australian and global equities) is 0.5¹². We assume all other pairwise correlations are zero.

¹⁰ This document is an excellent reference on the topic: [“Understanding Paris-Aligned Indexes: A Guide for Fixed Income Investors”](#).

¹¹ For example, [Robeco](#).

¹² Positive selection thematics will have some overlap. Exclusions are assumed to have a stronger overlap. Given the thematics driving exclusions have some consistency we think it appropriate to acknowledge a degree of positive correlation.

Case Study 1: Socially Responsible Growth Option

This portfolio is constructed applying RIAA certification standards (described in 5.1). Portfolio construction and tracking error assumptions:

	Allocation	Assumed Tracking Error
Australian Shares	30%	3.9%
International Shares	40%	1.2%
Fixed Income	25%	0%
Cash	5%	0%

We assume the correlation between the tracking error for Australian and international shares is 0.7. The estimated YFYS performance test tracking error of this portfolio was 1.5%.

We note that if BHP was not on the UNGCC exclusion screen the portfolio tracking error would be 0.5%.

Case Study 2: Carbon Transition Aligned Portfolio

This portfolio is constructed applying Paris-Aligned Benchmarks and a low carbon proxy for the Australian public equity market (described in 5.2). Portfolio construction and tracking error assumptions:

	Allocation	Assumed Tracking Error
Australian Shares	30%	5.1%
International Shares	40%	1.2%
Fixed Income	25%	0%
Cash	5%	0%

The estimated YFYS performance test tracking error of this portfolio was 1.8% pa.

Case Study 3: MySuper Option applying universal ownership to public market exposures and implementing additional exposures to unlisted “green” assets in sustainability and energy transition

We assume the public market portfolio is managed passively with no exclusions and that universal ownership principles are applied. We assume the targeted exposures to unlisted “green” assets in sustainability and energy transition are built out over a three year window (applying the asset class modelling undertaken in 5.3).

	Year 1 Allocation	Year 2 Allocation	Year 3 Allocation	Assumed Tracking Error
Australian Shares	29%	28%	27%	0%
International Shares	39%	39%	39%	0%
Private equity – sustainable / energy transition	1%	1%	1%	15.8% (initial year, 0% thereafter)
Unlisted Infrastructure – sustainable / energy transition	1%	2%	3%	11.4% (initial three years)
Fixed Income	25%	25%	25%	0%
Cash	5%	5%	5%	0%

The estimated YFYS performance test tracking error of this portfolio was 0.2% pa. In this example the 0.2% performance test tracking error carries through for the first three years, as the term of the private equity J-curve is assumed to be three years and an additional 1% allocation is made to unlisted infrastructure each year (funded by reducing Australian share exposure), thereby incurring the one year tracking error induced by this investment.

5.6. Reflections on results

When it comes to super fund portfolios, it is important to keep the 1% reference point (for a sustainable level of performance test tracking error) in mind. In this context we make the following observations:

1. It appears that is not presently possible for a super fund to offer an SRI-style option based on exclusions, like those set out by RIAA, without creating an untenable level of YFYS performance test risk. The performance test tracking error created through these exclusions is greater than the level identified as sustainable. This is before we consider the tracking error incurred through other portfolio activities such as managing risk to member outcomes.

We note that this situation may change if BHP is moved off the UNGCC exclusion screen. However, this in itself portrays the instability inherent in offering these products in a YFYS setting: if a large stock is excluded by UNGCC then the product may find itself instantly carrying an unsustainably high level of performance test tracking error.

2. Similarly, it appears that super funds will not be able to create portfolios which align with carbon transition consistent with meeting the Paris Agreement goals for limiting global temperature rise to 1.5 degrees Celsius, without creating an untenable level of YFYS performance test risk.
3. The third case illustrates the degree of performance test tracking error created by small, dedicated investments to greenfield opportunities in private equity and infrastructure. In this case a 1% new exposure to each of these sectors created 0.2% of performance test tracking error, 20% of the sustainable level. Trustees would have to consider the other competing uses of scarce performance tracking error such as active return opportunities, risk management and diversification.

6. Conclusion

The constraining impact of the YFYS performance test on investment activities relating to ESG, sustainability and carbon transition has been regularly raised as a concern by industry. This paper complements these primarily anecdotal concerns with some objective research to assist policymakers and industry.

We do this by estimating the performance test tracking error created by different implementations of portfolios that have ESG, sustainability and/or carbon transition activities objectives. The performance test tracking error is then compared to what research suggests is a sustainable level of tracking error, defined as a level which provides a trustee a high likelihood of passing the YFYS performance test without having to make sizable portfolio changes through time.

Through this lens we find that some of the mainstream implementations of ESG, sustainability and carbon transition activities create unsustainably high levels of performance test tracking error, which increases the risk of a 'false positive' YFYS test failure.

In short, trustees face a difficult challenge: they have multiple portfolio objectives but a limited budget of performance test tracking error to implement these with. These objectives include return enhancement, risk management, diversification, and accounting for ESG, sustainability and climate transition. Trustees are faced with a difficult decision between living with a heightened likelihood of failing the YFYS performance test at some point or having to pare back the degree to which these activities are implemented, which may be inconsistent with investing in accordance with the long-term financial interests of members, and/or with members' sustainability preferences.

Appendix 1

Details of activity-based exclusions.

Activity	Effective Threshold
<p><u>Tobacco, nicotine alternatives and tobacco-based products</u>: The scope for excluding companies (and their subsidiaries and investments) are as follows: The company is involved in the production of tobacco, manufacture of nicotine alternatives and tobacco-based products.</p>	<p>An effective threshold of 0% revenue should apply to companies (and their subsidiaries and investments) involved in the production of tobacco, manufacture of nicotine alternatives and tobacco-based products.</p>
<p><u>Controversial weapons</u>: Companies which are involved in the development and production of biological and chemical weapons, depleted uranium ammunition/armour, anti-personnel mines or cluster munitions/sub-munitions and their key components.</p>	<p>An effective threshold of 0% revenue applies to companies involved in the manufacture of controversial weapons.</p>
<p><u>Nuclear weapons</u>: Companies (and their subsidiaries and investments) involved in the development, production and maintenance of nuclear weapons.</p>	<p>An effective threshold of 0% revenue should apply to companies involved in the prohibited activity.</p>
<p><u>Other activity based exclusions</u> which are used by fund managers to align portfolios with minimum ESG or sustainability standards are: palm oil related exclusions; adult entertainment (production, distribution and retail), alcohol (production, distribution or retail), gambling (operations, equipment and support services), cannabis (production, distribution or retail), tobacco, fur and specialty leather, animal testing, pesticides and plastics.</p>	<p>No industry standards.</p>

Table A1: exclusion details of RIAA's minimum activity-based standards for RI certification.

Appendix 2

Details on areas of the ten principles of the UN Global Compact.

Area of Controversy	Principles
<p><u>Human Rights</u>: controversies related to principles 1 and 2 of the UN Global Compact, which is derived from the Universal Declaration of Human Rights.</p>	<ul style="list-style-type: none"> • Principle 1 – Businesses should support and respect the protection of internationally proclaimed human rights; • Principle 2: make sure that they are not complicit in human rights abuses
<p><u>Labor</u>: controversies related to Principles 3, 4, 5 and 6 of the UN Global Compact, which is derived from the International Labor Organization’s declaration on Fundamental Principles and Rights at work.</p>	<ul style="list-style-type: none"> • Principle 3: Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining; • Principle 4: the elimination of all forms of forced and compulsory labour; • Principle 5: the effective abolition of child labour; • Principle 6: the elimination of discrimination in respect of employment and occupation.
<p><u>Environment</u>: controversies related to Principles 7, 8, and 9 of the UN Global Compact, which is derived from the Rio Declaration on Environment and Development.</p>	<ul style="list-style-type: none"> • Principle 7: Businesses should support a precautionary approach to environmental challenges; • Principle 8: undertake initiatives to promote greater environmental responsibility; • Principle 9: encourage the development and diffusion of environmentally friendly technologies.
<p><u>Anti-Corruption</u>: controversies related to Principle 10 of the UN Global Compact, which is derived from the United Nations Convention Against Corruption.</p>	<ul style="list-style-type: none"> • Principle 10: Businesses should work against corruption in all its forms, including extortion and bribery.
<p><u>Diversity</u>: for this criterion an “Excluded Company” will fail to meet two out of three diversity indicators: 1. Woman/women on the Board 2. Diversity policies 3. Diversity management system</p>	

Table A2: Activity-based exclusions based on the principles contained within the UN Global Compact.

Appendix 3

Paris-aligned benchmarks: exclusions and DNSH requirements.

The following represents the TEG's minimum standard recommendations for EU Paris Aligned Benchmarks.

Fossil fuel exposure – exclusions criteria

1. Companies that derive 1% or more of their revenues from exploration, mining, extraction, distribution or refining of hard coal and lignite;
2. Companies that derive 10% or more of their revenues from the exploration, extraction, distribution or refining of oil fuels;
3. Companies that derive 50% or more of their revenues from the exploration, extraction, manufacturing or distribution of gaseous fuels;
4. Companies that derive 50% or more of their revenues from electricity generation with a GHG intensity of more than 100 g CO₂ e/kWh.

Do No Significant Harm (DNSH)

A key feature of the Paris Aligned benchmarks is accounting for the DNSH requirement. The EU Taxonomy has strict requirements and stipulate that companies which operate in a taxonomy-eligible sector, must disclose that they do no significant harm to any of six environmental objectives: climate change adaptation, water & marine resources, circular economy, pollution prevention & control, biodiversity & ecosystem protection, and climate change mitigation.