Identifying Carbon Value:
The carbon responsiveness of ASX 200 Stocks
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Executive summary

Businesses worldwide are facing unprecedented challenges to preserve and generate wealth as new climate change and carbon risks flow through the economy.

Australian regulatory responses such as the proposed national Emissions Trading Scheme (ETS), the existing national Mandatory Renewable Energy Target (MRET) and the ACT and NSW Greenhouse Gas Abatement schemes, reflect the changing nature of the market in Australia, and the uncertainty facing business leaders as they plan for future development.

Traditional risk frameworks and investment valuation models are beginning to respond as the business landscape changes, and new competitive drivers—such as carbon intensity, energy efficiency and credit generation capacity—begin to impact upon company value.

As the market matures, the institutionalising of these new drivers demonstrates that climate change is no longer purely an environmental risk issue, but a significant opportunity for the corporate and investment communities.

Moving towards a low-carbon economy, all companies will now face scrutiny over their capacity to deliver goods and services in a way that secures shareholder value. In a market where carbon intensity is now a key economic driver, highly energy-intensive companies must demonstrate a capacity to adapt to new market pressures by implementing strategies to improve efficiency and maintain competitiveness.

All companies, as supply chain partners and energy users, face an inevitable exposure to efficiency demands on goods and services that flow through the economy.

THE REPUTEX WHITE PAPER

This RepuTex White Paper seeks to address the current market gap by presenting the findings of the RepuTex proprietary research which, for the first time, values the relative impact of carbon risk on Australian companies.

The market effects of climate change are already having an inescapable impact on businesses and shareholder value. However, while business leaders acknowledge that the rules of the game are changing, many companies are yet to fully understand the financial impact of carbon risk on their businesses.

In the corporate sector, growth and development have been greatly hindered by failure to effectively value the impact of carbon risk. General awareness of climate change has now reached a critical level of maturity, yet initial policy responses from corporates have been driven largely by PR, not by core company value.

In part, this approach is reflective of the current incapacity of the market to price and value carbon risk. Without this level of analysis, and without understanding the financial consequences and deliverables of their actions, business leaders face a difficult task in preparing for a ‘new economy’.

A lack of understanding of the impact of carbon risk on company value may be resulting in missed opportunities, and an oversight of significant risk in transactions.
In evaluating S&P ASX 200 stocks, analysis concludes that Australian companies are not sufficiently prepared to mitigate carbon liabilities or capitalise on potential revenues. Furthermore, analysis shows that correlation between carbon value and share price performance is beginning to grow as the Australian market begins to recognise new economic drivers.

This correlation indicates that pressure is mounting on local companies to address their carbon management strategies in order to improve efficiency and maintain competitiveness.

For the investment community, while drivers such as carbon trading can represent a significant windfall, identifying a company's management capacity remains the most important means of identifying company carbon value.
Key findings

1. ASX 200 Performance and Value:
   - Overall preparedness for carbon risk within the ASX 200 is low.
   - The average RepuTex Carbon Valuation for the ASX 200 is -0.08, showing that at an overall level, Australian companies are not positioned to mitigate carbon liabilities or capitalise on potential revenues.
   - While business leaders acknowledge that the rules of the game are changing, results suggest that many companies are yet to fully understand the financial impact of carbon risk on their competitive position and bottom line performance.
   
   NB: RepuTex valuations are represented on a scale from -1 to +1. A positive ratio indicates that a company is outperforming its exposure and is competitively positioned to deliver value based on its specific opportunities.

   - The negative trend is indicative of an immature market with a developing regulatory framework.

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Relative Sector Performance

![Graph showing relative sector performance](image_url)

- Materials
- Financials
- Industrials
- Health Care
- Consumer Staples
- Property Trusts
- Consumer Discretionary
- Telecommunications
- Services
- Energy
- Information Technology
- Utilities

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RepuTex White Paper. Identifying Carbon Value: The carbon responsiveness of ASX Stocks
**KEY HIGHLIGHTS**

- Notably, two of the highest exposed sectors, Materials and Utilities, have the highest and lowest sector valuations.

**Materials Sector**

![Graph](image)

- Leading stocks within the Materials sector have anticipated carbon liabilities and demonstrate an awareness of potential revenues.
- Market leaders have taken steps to overcome key business model risks such as total emissions and overall carbon intensity by targeting energy efficiency and technology related strategies.
- Investment in technology and offsets has increased, with credit generation capacities providing a significant opportunity; however preparedness across the sector is mixed.
- Therefore while credit generation potentially represents a significant windfall for the sector, inefficiency also represents a substantial liability.

**Utilities Sector**

![Graph](image)

- The Utilities sector as a whole represents negative value despite its high awareness of carbon risk and public scrutiny due to the high carbon intensity of businesses.
- In comparison to the Materials sector, the majority of stocks have failed to adequately address efficiency and technology vulnerabilities.
• While leading Utilities stocks have taken steps to address carbon intensity, lowly valued stocks unable to improve efficiency are likely to face increased operating costs and reduced competitiveness upon the introduction of an Emissions Trading Scheme (ETS).
  » The liability of these stocks to an ETS is indicative of the importance of company strategy in minimising carbon risk and maximising potential returns.
• Comparative analysis between Materials and Utilities sectors demonstrates that micro carbon management capacity is more robust within the Materials companies, therefore impacting overall sector value.
• The above charts indicate that the Materials sector has taken steps to counterbalance its exposure by targeting strategies to meet key risks.
• In comparison, the Utilities sector has failed to offset its exposure.
• The Materials sector is therefore better positioned to hedge its risk exposure and take advantage of profit opportunities from efficiency of operations, products and services.

**Financials Sector**

• Overall performance within the Financials sector is positive, indicating that stocks are adapting well to carbon risk. However, as with the similarly-performing Materials sector, value at an individual stock level is scattered.
• Companies appear to be focusing on brand enhancement via carbon neutrality initiatives, without addressing the bulk of their carbon exposure rising from the application of capital into investments, insurance and investment portfolios.
CONSOLIDATED SECTOR FINDINGS

ASX 200 Sector Performance

- Low to moderately exposed sectors such as Information Technology, Telecommunications and Health Care as expected, have been slow to adapt and take advantage of growth opportunities presented by carbon risk.
- General awareness of exposure within these sectors is low. Efficiency strategies capable of reducing supply chain costs are likely to competitively position early movers to reduce flow on costs to consumers.

2. Correlation Between Carbon Leaders and Share Price Performance

- Analysis shows that companies with a positive RepuTex Carbon Valuation are outperforming both carbon laggards and local ASX benchmarks.
- Climate change is no longer purely an environmental risk issue, but a significant opportunity for the corporate and investment communities.

Overall Leaders vs Laggards Year 1 Carbon Performance

- Analysis shows that value and performance varies across industries in line with a range of factors – namely exposure.
Materials Leaders vs Laggards 1 year

Stocks must be exposed to carbon risk in order to deliver value. Analysis below shows the outperformance of carbon leaders from within the Materials sector (Asia-Pacific stocks) in comparison to carbon laggards.

- Outperformance is indicative of stocks maximising exposure and taking advantage of carbon opportunities.
- However, in sectors where opportunities are minimal, the rigour of company strategy is yet to be priced in to company value.
- The below chart shows the underperformance of leading stocks within the Consumer Discretionary sector. While leading stocks have effective risk management strategies in place, their low exposure to carbon market opportunities means that positive performance is not yet impacting value

Asia Pacific Consumer Discretionary Leaders vs Laggards 1 Year

- The emerging nature of carbon risk for these sectors suggests that as the regulatory framework continues to mature, value will grow. These stocks therefore represent mid term value.
3. **Relative Exposure of Companies Through Carbon Intensity**

- Carbon intensity analysis determines the carbon intensity and energy dependence of each company’s products and services by breaking down energy consumption across upstream, direct and downstream operations.
- It is not only large direct emitters that are vulnerable to carbon risk. Given the interconnectedness of the economy, highly carbon-reliant sectors, and those that contribute to overall climate change, also face a moderate to high degree of risk.
- Interestingly, while the Utilities sector has the highest carbon intensity, it represents only 3.41% of the ASX 200 contribution to climate change.

**ASX 200 Intensity vs Total Footprint**

- The Materials sector shows the highest contribution to climate change, representing 26.23% of the total share.
- Real Estate is the third highest contributing sector, surprisingly representing 17.55% of the total ASX 200 footprint.
- Similarly, Banks – which are often classified as low carbon-intensive industries – represent more than 11% of the footprint with a carbon intensity of close to 1500 tonnes carbon dioxide equivalent per $million (CO2e/$million).
4. Relative Exposure of Companies to an Emissions Trading Scheme

- The likely introduction of an emissions trading scheme represents a considerable opportunity for companies with high credit generation capacity.

Carbon Cost Exposure Per Industry Group

- Given the potential scope for the Australian ETS to include only large direct emitters, currently only four industries (Energy, Utilities, Materials, Transportation) would face a real EBITDA impact risk should a carbon price exceed $15.
- Companies with low direct emissions but high value chain exposure do not show a high degree of revenue potential under an ETS due to the likely scope of the first phase of the ETS.
- The possible future expansion of the ETS to include both indirect contributors to climate change and highly intensive energy users, could have significant financial consequences for some sectors, such as Real Estate and Banks.

Expanded ETS Focus

FOOLS RUSH IN – THE IMPORTANCE OF ASSESSING COMPANY STRATEGY RESPONSE

- However, fools rush in. While carbon trading can represent a significant windfall for investors, an understanding of a company’s management capacity remains the most important means of identifying company value and credit generation capacity.
The RepuTex methodology

THE REPUTEX METHODOLOGY

RepuTex carbon research is undertaken in line with the RepuTex Carbon Valuation Model, which expands traditional financial models by applying a series of quantitative and qualitative carbon factors.

Analysis is built on a risk response formula, identifying key exposures and business model vulnerabilities which are offset by company specific action and investment.

Importantly, RepuTex does not apply a 'one size fits all' framework; instead, analysis is tailored according to each company's specific exposure, enabling research to quantify bottom line risks that are relevant to each company's footprint.

The RepuTex Carbon Valuation Model brings together three inputs: macroeconomic factors, carbon intensity data and micro company analysis.

Combined, these inputs deliver the RepuTex Carbon Valuation which represents a company's overall carbon value – its capacity to adapt and compete in a low-carbon economy.
Carbon intensity analysis

Snapshot

- Carbon intensity analysis determines the carbon intensity and energy dependence of each company’s products and services by breaking down energy consumption across upstream, direct and downstream operations.

- While the Utilities sector has the highest carbon intensity, it represents only 3.41% of the ASX 200 contribution to climate change.

- The Materials sector shows the highest contribution to climate change, representing 26.23% of the total share.

INTRODUCTION
Carbon intensity analysis determines the carbon intensity and energy dependence of each company’s products and services by breaking down energy consumption across upstream, direct and downstream operations.

Constructed using EnvlImpact®, data is formulated via input/output analysis which quantifies carbon intensity based on segmental analysis of the costs associated with company-specific activities.

THE IMPORTANCE OF THE VALUE CHAIN BREAKDOWN
Expressed in terms of tonnes of CO₂ emitted per $million of turnover, carbon intensity corresponds to the total emissions (direct and indirect) throughout a company’s value chain in order to put goods or services in the market, including the end usage of these products and services.

For example: for the Automotive sector, total carbon intensity analysis includes the quantity of carbon needed to produce a car, the energy consumed during production, and the carbon emitted during the use and eventual disposal/recycling of a car.

In contrast, resource intensive industries such as steel production are highly exposed during the manufacturing phase, as opposed to the downstream distribution and use of product within the market.

By taking a comprehensive approach, RepuTex analysis more accurately reflects a company’s entire carbon risk and dependence.
Conversely, low carbon-intensive sectors such as Hydropower are naturally adapted to the new market, due to the inherent energy efficiency within their business models.

The chart below demonstrates the relative exposure of industries in terms of reliance on carbon and energy, and the competitive advantage that clean technology and renewable energy stocks possess over more traditional energy utilities.

**Economic Sectors – Carbon Intensity**
RESEARCH RESULTS – CARBON INTENSITY VIA INDUSTRY

The chart below details upstream, direct and downstream carbon intensity of each sector, incorporating the whole life cycle of products and services.

Analysis is therefore able to identify each company’s specific energy and carbon risk profile.

Carbon Intensity (tonnes CO₂e/millions $)

- Utilities and Energy sectors are the most carbon-intensive due to the nature of their business operations.
- Real Estate and Banking sectors face considerable downstream exposure due to the high energy consumption of buildings and the exposure of investments to highly energy-intensive activity.
- Direct exposure for the Banking sector is minimal, however many banks have sought to enhance brand value by going carbon neutral (direct only) to offset emissions.
- Consumer Durables and Apparel demonstrate interesting profiles, with minimal direct exposure offset by large downstream and upstream profiles.
BENEFIT OF INTEGRATING SUPPLY CHAIN ANALYSIS

- While the direct phase is currently the primary exposure for companies, downstream and upstream phases have an impact on business operations due to the interconnectedness of the market and potential cost implications of supply chain partners.

- For example, potential constraints on the Automobile sector for lower emissions in vehicle usage will result in upstream obligations on producers and supply chain partners to develop new technologies.

- Within the Materials sector, choice of process for material production (e.g. steel) and optimising of strategies, are crucial in terms of carbon intensity. As well as reducing carbon intensity, these initiatives will have cost savings and improve competitor advantage.

The charts below detail carbon intensity via each phase — isolating upstream, direct and downstream exposure via industry group.

Notably, the profile for each sector is starkly different in each phase. By taking this three-dimensional approach, RepuTex is able to identify each stock’s entire carbon risk and reliance.

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Industry Group Average Upstream CIU Breakdown (tonnes CO₂e/millions $)

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Industry Group Average Direct CIU Breakdown (tonnes CO₂e/millions $)

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CARBON INTENSITY AND CLIMATE CHANGE CONTRIBUTION

Although an industry may be carbon-intensive, its overall contribution to climate change may vary according to the size of the industry within the market.

The chart below compares average carbon intensity per industry against total value chain footprint and climate change contribution.

ASX 200 Carbon Intensity vs Total Footprint

- Interestingly, the Utilities sector has the highest carbon intensity, yet only represents 3.41% of the ASX 200 contribution to climate change.
- The Materials industry has the highest contribution to climate change, representing 26.23% of the total share.
- Real Estate is the third highest contributing sector, surprisingly representing 17.55% of the total ASX 200 footprint.
- Similarly, Banks – often classified as ‘low exposed’ – represent more than 11% of the footprint with a carbon intensity of close to 1500 tonnes CO$_2$e/$million.
Emissions trading exposure and value

Snapshot

- The likely introduction of an ETS represents a considerable opportunity for companies with high credit generation capacity such as Energy, Utilities, Materials and Transportation.
- These sectors would face a real EBITDA impact risk should a carbon price exceed $15.
- However, fools rush in. While carbon trading can represent a significant windfall for investors, an understanding of a company’s management capacity remains the most important means of identifying company value and credit generation capacity.

The context of exposure introduces an important overlay to valuation models by determining a company’s opportunity profile – potential revenues and liabilities. As a result, exposure may be positive or negative according to a company’s micro-management capacity.

In the Australian setting, the likely introduction of an emissions trading scheme represents a considerable opportunity for companies that are able to generate credits as a result of the implementation of micro-efficiency strategies.

TRADING VALUE – PRICING THE IMPACT OF EMISSIONS TRADING

From a company valuation perspective, the expected exposure of large, direct emitters to trading risk represents a significant opportunity for the investment community to capitalise on hidden revenue and asset value.

The chart below shows the theoretical impact of carbon trading on EBITDA for each sector by taking into account a series of carbon price signals assuming 100% free allocation. Each industry has been assessed in terms of current direct emissions.
Carbon Cost Exposure per Industry Group

- Given the potential scope for the Australian ETS to include only large direct emitters, currently only four industries (Energy, Utilities, Materials, Transportation) would face a real EBITDA impact risk should a carbon price exceed $15.
- A carbon price signal of more than $40 has major implications for some industries, as its impact on EBITDA can range from 10% to 18%.
- Companies currently exposed to downstream or upstream phases of business operations do not show a high degree of possible sensitivity or revenue potential under an ETS. This is due to their direct emissions.

POTENTIAL EXPANSION OF AN ETS

The possible future expansion of the ETS to include indirect contributors to climate change, as well as highly intensive energy users, can have significant financial consequences for some sectors, such as Real Estate and Financials.

The chart below identifies trading risk for companies at a sector level, based on the expected scope of the ETS to cover only large, direct emitters. Also plotted is the relative risk of sectors such as Real Estate and Banks, which face mid-term trading exposure as the ETS is expanded to include other highly carbon-intensive sectors.

Forecasted Trading Pressure Sector Analysis
Further analysis shows that based on an entire carbon intensity perspective, a greater number of industries are ‘potentially at risk’ upon their inclusion in the ETS. Conversely, this risk may be translated into revenue and therefore impact on EBITDA.

The example below (for the Real Estate sector) demonstrates the impact on EBITDA caused by the sector’s inclusion in a local ETS.

**Expanded ETS Focus**

![Impact on EBITDA graph]

While trading risk can represent a considerable windfall, where a company fails to adapt and reduce emissions, the resulting exposure can have a significant cost impact.

Therefore for investors, the challenge remains to identify progressive companies that are capable of utilising their exposure in order to return value to shareholders.
Micro company analysis – risk vs response

**Snapshot**

- Assessing a company’s carbon management capacity in comparison to its macro exposure is essential in order to identify the added value of management teams.
- Overall preparedness for carbon risk within the ASX 200 is low.
- Many companies are yet to fully understand the financial impact of carbon risk on their competitive position and bottom line performance.
- Market leaders have taken steps to overcome key business model risks such as total emissions and overall carbon intensity by targeting energy efficiency and technology related strategies.

Assessing a company’s carbon management capacity in comparison to its macro exposure is essential in order to identify the added value of management teams.

Analysis focuses on existing revenue streams, products and services, investments and specific company strategies, in order to identify positive correlation between a company’s primary energy exposure and the impact of its management response.

Companies with positive correlation demonstrate a higher capacity to mitigate exposure, generate credits and overcome business model risks – therefore delivering greater returns.

For example: companies A and B below both face carbon exposure (blue area) within the manufacturing phase and potentially stand to benefit from emissions trading provided they are able to generate credits.

We would therefore expect to see correlated application of resources within the manufacturing phase (represented by light grey area) based on strategies with respect to investment in technology, alternative fuels and overall energy efficiency.
Company A has taken minimal steps to address its manufacturing exposure, with its efforts concentrated on the raw materials phase, not the company's primary direct exposure. In comparison, Company B has implemented an integrated strategy to improve efficiency in the direct manufacturing phase.

Company B is therefore strategically better positioned to maximise both credit generation and opportunity within an ETS.

**RELATIVE VALUE OF ASX 200 COMPANIES**

The analysis below breaks down carbon exposure at a consolidated and sector level, detailing the relative value of stocks within each sector, represented in the RepuTex Carbon Valuation.

The RepuTex Carbon Valuation is designed to represent a company's risk profile, combining a company's potential opportunity and exposure with its capacity to deliver growth for investors.

The valuation ranges from -1 to +1, with a positive ratio indicating that a company is outperforming its exposure and is competitively positioned to deliver value based on its specific opportunities.

**CONSOLIDATED FINDINGS**

- The average RepuTex Carbon Valuation for the ASX 200 is -0.08, demonstrating that at an overall level, Australian companies are not positioned to mitigate carbon liabilities, nor capitalise on potential revenues.
• Highly exposed sectors represent the best value due to the exposure of these industries to carbon-related opportunities.

• Despite this, two of the most highly exposed sectors, Materials and Utilities, have respectively the highest and lowest sector valuations, reflecting their potential volatility based on individual companies’ micro capacity to leverage, or to be adversely affected by risk.

**ASX 200 Consolidated Valuations**

- Data indicates that the ‘early mover’ stage is over within the Australian market. As leading stocks consolidate their position, ‘watch’ stocks must increase competitiveness to minimise current and future liabilities in light of mounting regulatory and stakeholder pressures.

- The negative trend is indicative of an immature market with low overall performance.

**ASX 200 Sector Performance**

- Leading stocks within the Materials sector have anticipated carbon liabilities and demonstrate an awareness of potential revenues.

- Market leaders have taken steps to overcome key business model risks such as total emissions and overall carbon intensity by targeting energy efficiency and technology-related strategies.

- The Utilities sector as a whole represents negative value despite its high awareness of carbon risk and public scrutiny due to the high carbon intensity of businesses.

- While leading Utilities stocks have taken steps to address carbon intensity, lowly valued stocks unable to improve efficiency are likely to face increased operating costs and reduced competitiveness upon the introduction of an ETS.
• Value within the Financials is positive, indicating that stocks are adapting well to carbon risk. However, as with the similarly-performing Materials sector, value at an individual stock level is scattered.

• As expected, low exposed sectors such as Information Technology have been slow to adapt and take advantage of growth opportunities. Despite this, the application of specific strategies by individual management teams could result in likely improvement in value, via the reduction of costs passed on to consumers and potential competitive gains.

SECTOR SPECIFIC ANALYSIS

Consumer Discretionary

The detachment of stocks between high and low fields reflects the indifferent value within this sector. At an overall level, there is a moderate mismatch between sector carbon exposure and ‘use’ phase strategy.

Product development has led to increased market share and competitive advantage for high performing stocks, as markets shift towards low carbon-intensive products/services.

Given the sector’s low overall exposure (only 2% of the ASX 200 carbon footprint), the grouping of stocks within the upper area of the ‘watch’ field reflects the overall combination of this exposure with low added value.

Low value for the majority of stocks represents a concern, in light of potentially reduced competition and loss of markets to leading stocks.

Consumer Staples

Despite its moderate-to-high exposure and vulnerability to weather-related risks, the majority of Consumer Staples stocks are misplacing resources in terms of addressing value chain exposure. Inadequate supply chain carbon risk management (i.e., not sourcing low-carbon materials and transportation) therefore has resulted in poor overall correlation.
- While the sector represents only 4% of the ASX 200 carbon footprint, leading stocks demonstrate a mature preparedness, likewise current low exposed stocks represent growth potential, based on their transition to undervalued status, as consumer expectations and market pressure shift.

- The passing on of costs to consumers represents a significant risk for inefficient companies in light of the potential for leading stocks to minimise cost flow-ons.

- Early movers who are capable of reducing supply chain exposure and cost via reduced carbon intensity, are likely to be competitively positioned to gain market share.

### Energy Analysis

![Energy Analysis Diagram]

- Notably the Energy sector represents only 14% of the ASX 200's total carbon footprint, yet at an absolute level has the second highest carbon intensity level with over 3700 tonnes CO₂e per million dollars.

- The Energy sector represents mixed value, based on its high exposure yet scattered performance.

- Low-performing stocks demonstrate insufficient attention to the ‘use’ phase of their operations through actions to overcome this considerable risk, especially in light of the positive performance of market leaders and the sector’s high exposure. For these stocks, the commercial potential afforded by investment in renewables remains mostly untapped.

- Sector leaders demonstrate a positive capacity to capitalise on lower emission technologies, alternative energy development and efficiency mechanisms. These stocks appear to be enhancing their competitive position through new investment into new growth markets, such as bio-fuel, CO₂ capture and geosequestration.

### Financials Analysis

![Financials Analysis Diagram]
• The sector faces increased regulatory exposure in light of its 22% contribution to climate change from within the ASX 200.

• Aside from clear market leaders who have anticipated climate change risks and adapted their businesses to utilise growth opportunities, the Financial sector is yet to address carbon financing opportunities, or provide services for adaptive technology and alternative products.

• At an overall level, correlation with value chain exposure is moderate. Companies appear to be focusing on brand enhancement via carbon neutrality initiatives, without addressing the bulk of their exposure rising from the application of capital into investments, insurance and investment portfolios.

**Health care Analysis**

![Health care Analysis Chart]

- While representing only 0.5% of the total carbon footprint of the ASX 200, the Health care sector is not immune to risks associated with direct and supply chain energy efficiency, and gains in these areas remain untapped.

- Given the low exposure and public scrutiny of the sector, limited value is expected, however surprisingly there is no clear leader.

- As market awareness increases and supply chain energy pressures increase on all stocks, RepuTex would expect both performance and value to improve.

**Industrials Analysis**

![Industrials Analysis Chart]

- The Industrials sector accounts for 15% of the total climate change contribution, however overall carbon mitigation capacities are inconsistent and low. Given the relative size of the sector (eight stocks within the sector sit within the ASX 50) and current capacity levels, outlook is negative.

- The sector exhibits poor correlation between its value chain exposure and strategy response. Consequently, overall value is low.
• Despite the downstream phase being the most carbon-intensive and exposed, most stocks appear to be concentrating on recycling initiatives (‘disposal’ phase).

• In the ‘undervalued’ quadrant there is one clear market leader. This stock demonstrates excellent adaptation capacity, and value chain management that entails addressing user-based emissions through innovative solutions.

Information Technology Analysis

• The IT sector shares with Health care the lowest systemic risk exposure, accounting for only 0.3% of the total ASX 200 climate change contribution footprint.

• Although the sector faces risk via higher energy costs, this is likely to have minimal impacts. The sector does sit behind international benchmarks, where leading stocks are demonstrating a strong innovation capacity by delivering offsets as supply chain partners.

• Net effect on this sector from climate change is expected to be positive, given its low capital-intensive nature.

• Poor value chain correlation within the sector has arisen from a lack of attention to supply chain exposure, such as higher energy prices etc.

Materials Analysis

• Correlation between direct exposure and strategy response is high in the Materials sector, suggesting a high degree of adaptability, boosted by naturally high exposure at a regulatory, physical and trading level.

• The sector represents positive value based on its high exposure; yet at 30% of the total carbon footprint for the ASX 200, many companies are considered ‘at risk’ based on their vulnerability to exposure.

• Market leaders have anticipated commercial risks and have integrated the cost of carbon into
their investment feasibility assessments, yet mid-tier competitors have failed to utilise growth opportunities.

- The sector has successfully targeted key exposures within the raw materials and direct manufacturing phases. Their highly-adapted carbon management initiatives entail energy efficiency measures and R&D in alternative process development, as do the development of capture and sequestration capabilities.
- Investment in technology and offsets has increased, with credit generation capacities providing a significant opportunity; however preparedness is mixed.

**Property Trusts Analysis**

- The Property Trusts sector, interestingly, has the third-highest carbon intensity within the ASX 200, yet accounts for only 8% of the total ASX 200 footprint.
- The sector has primarily downstream exposure arising from the nature of carbon-intensive operations and investments. Likewise the sector’s physical exposure to changing weather patterns suggests that a lack of adaptation is likely to be felt by low-performing stocks.
- The high number of ‘watch’ stocks may be a concern as the sector’s exposure mounts. For instance, increasing cost of key materials, and possible inclusion in future liabilities from emissions trading schemes.
- Market leaders demonstrate initiatives to improve energy efficiency, especially in terms of downstream impacts. In this market, constituents face a first-mover advantage, via progressive innovation and action.
- Poor value chain correlation suggests a gross misplacement of resources within the sector, with most companies concentrating on supply chain and direct carbon exposure, instead of the highly energy-intensive downstream implications of buildings.

**Telecommunications Analysis**
The Telecommunications sector represents just 1% of the total footprint of ASX 200 companies, and has the lowest carbon intensity of all industries.

Despite this, the sector is one of the largest electricity consumers, and given the scale of networks, is continuously exposed to changing weather patterns.

The sector has the highest level of resource application, yet the second-worst integrated strategy. This is reflected in its poor value chain correlation capacity. The sector as a whole is therefore failing to effectively address its climate change vulnerabilities in the 'raw materials' phase of its operations.

Utilities Analysis

Despite its high carbon intensity, the Utilities sector accounts for only 4% of the ASX 200 footprint. The sector faces considerable direct exposure based on greenhouse gas regulations. This presents an immediate financial charge on utilities to reduce output, switch fuel sources, invest in new technologies, or purchase carbon credits to reduce their exposure.

Although having high exposure and awareness, most companies in this sector are currently under-performing and not addressing that exposure. A number of stocks have failed to align themselves with a market shift towards cleaner energy; these stocks are considered highly at risk due to potential regulatory interference and a lack of foresight.

Aside from market leaders, value chain performance trends within the sector show lack of initiatives to utilise cleaner energy instead of coal-based fuels, and to promote end-user energy efficiency to offset downstream risks.
Share price performance analysis

Snapshot

- Analysis shows that companies with a positive RepuTex Carbon Valuation are outperforming both carbon laggards and local ASX benchmarks.

- Climate change is no longer purely an environmental risk issue, but a significant opportunity for the corporate and investment communities.

- Analysis shows that value and performance varies across industries in line with a range of factors – namely exposure.

- For investors, the challenge remains to identify progressive companies that are capable of utilising their exposure in order to deliver on opportunities.
Series 1: ASX 200 Share Price Performance Analysis

Series 1 details the comparative share price performance of the RepuTex ASX 200 Carbon Leaders and Carbon Laggards over the mid- and short-term.

Carbon Leaders are defined as those stocks with a positive RepuTex Carbon Valuation (highlighted in red below). A positive valuation indicates that a company is outperforming its exposure and is competitively positioned to deliver value, based on its specific opportunities.

Carbon Laggards are defined as those stocks with a negative RepuTex Carbon Valuation. These stocks are less likely to return value due to reduced carbon competitiveness.

**ASX 200 Consolidated Valuations**

ASX 200 Carbon Leaders are circled in red, represented by a positive RepuTex Carbon Valuation. Carbon Laggards are grouped in the ‘watch’ and ‘at risk’ quadrants.
CORRELATION BETWEEN CARBON LEADERS AND SHARE PRICE RETURNS

Analysis shows that companies with a positive RepuTex Carbon Valuation have outperformed both the Carbon Laggards and the ASX 200 and ASX 300 benchmarks.

From a macro perspective it is interesting to note the sizeable jump in returns in early 2007. This movement, when considered in the context of wider market events, potentially demonstrates the maturing nature of the Australian market and the emergence of carbon risk as a key performance driver.

1 Year Carbon Risk Ratio Performance

IDENTIFYING THE CARBON WINNERS

The RepuTex Climate Change Growth Index

Based on the above findings, in May 2007, RepuTex launched the RepuTex Climate Change Growth Index, consisting of stocks best positioned to adapt and compete in a carbon-constrained environment.

The RepuTex Climate Change Growth Index currently consists of 47 Australian companies selected from the S&P ASX 300. A portfolio of these companies would have outperformed the S&P/ASX 300 Index by 11.37 per cent over the last three years ending 12 November 2007 (total return), and 11.96 per cent year to date.

RepuTex Climate Change Growth Index 3 Years
Series 2: Winners from an Australian emissions trading scheme

EMISSIONS TRADING LEADERS ANALYSIS

Exposure to an emissions trading scheme can represent a considerable windfall, however exposure to a scheme can also represent significant cost impacts for a company via cost of offsets, credit purchase etc.

Series 2 identifies Carbon Leaders by their capacity to generate credits in line with effective mid- and long-term carbon efficiency strategies. These stocks stand to mitigate potential carbon costs and generate revenue through carbon trading.

VALUE IN STOCKS WITH HIGH CREDIT GENERATION CAPACITY

A portfolio of these companies would have outperformed the S&P/ASX 200 Index by 16.41% over one year, and 22% year to date.

It is interesting to note that the trading leaders started to outperform in the second quarter of 2007, a few months after major announcements of inevitable carbon risks in the Australian market place and globally.

Trading Leaders 1 Year
Series 3: Regional analysis, Asia-Pacific

CORRELATION BETWEEN CARBON LEADERS AND SHARE PRICE PERFORMANCE IN ASIA-PACIFIC

Consolidated data from stocks across China, Hong Kong, Singapore, Korea and Australia reveal the emergence of carbon risk over the past 12 months across the region.

Notable outperformance from mid-2007 therefore confirms the material link of the carbon agenda and the emergence of associated business liabilities and opportunities.
SECTOR ANALYSIS: CORRELATION BETWEEN EXPOSURE AND CARBON VALUE

Carbon Exposure + Management Capacity = Carbon-Driven Returns

As evident by the detailed sector-specific analysis, value and performance varies across industries in line with a range of factors – namely exposure.

Analysis below assesses the correlation between carbon leaders and share price performance over a one-year period, isolating the Materials and Energy sectors due to their high exposure. Based on the RepuTex Carbon Valuations, these sectors represent the best value, based on their capacity to outperform their exposure and deliver value, based on specific opportunities.
Analysis for both the Materials and Energy sectors follows a trend similar to consolidated analysis, suggesting the emergence of carbon risk over the short term.

As certainty with respect to emissions targets and the introduction of a regional emissions trading scheme grows, outperformance within these sectors is expected to continue.
Low Exposure + Management Capacity ≠ Carbon-driven Returns

Analysis below isolates lowly exposed sectors across the Asia-Pacific region, in order to determine the relative performance of high valued stocks in low exposed sectors. By definition of value, stocks must have the capacity to deliver growth based on their ability to leverage exposure to deliver on opportunities.

However, in sectors where opportunities are minimal, the rigour of company strategy is yet to be priced in to company value.

The emerging nature of carbon risk for these sectors suggests that as the regulatory framework continues to mature, value will grow. As energy users and supply chain partners, exposure and cost implications will begin to impact these stocks as mechanisms such as the an ETS flow through the economy. As exposure grows, capacity to deliver on opportunities will ultimately impact value for these stocks. RepuTex therefore considers these sectors a “watch”, representing mid term value. Analysis below details the performance of leaders within the low exposed Consumer Discretionary sector.

Consumer Discretionary: Leaders vs Laggards – 1 Year

![Graph showing performance of Consumer Discretionary Leaders vs Laggards over 1 year.]

Series 4: Carbon value in China

As a Non-Annex I country and one of the largest greenhouse gas (GHG) emitting nations, China faces a high degree of regulatory pressure with respect to industry-based carbon initiatives. Consequently, while no restrictions are in place regarding emission reduction targets, increasing awareness of carbon- and climate change-related risks is beginning to infiltrate the local market.
Driven largely by the influx of investment in technology, and public awareness of issues such as environmental stress and air quality, climate change is emerging as a new risk for mainland companies.

From a regulatory perspective, the government's current and short term policies are tailored towards improving energy efficiency and promoting clean technology. As the biggest Clean Development Mechanism (CDM) market in the world, the burgeoning carbon market is providing an important platform for Chinese participants.

**China Carbon Leaders**

At a stock value level, RepuTex analysis demonstrates the current state of the China market, considered as slightly less mature than the Australian and wider regional settings.

Despite this, analysis suggests that based on regional trends, the China market provides for an appealing carbon-based investment, notably in the context of increasing awareness, driven not by western market-based incentives, but by local issues – such as air quality and the Beijing Olympics.

### 3 Year Performance HK H Shares

![Graph showing 3 Year Performance HK H Shares](image)

### 1 Year Performance HK H Shares Carbon Index

![Graph showing 1 Year Performance HK H Shares Carbon Index](image)