Corporate Knights
The Company for Clean Capitalism

Measuring Sustainability Disclosure

Ranking the World's Stock Exchanges

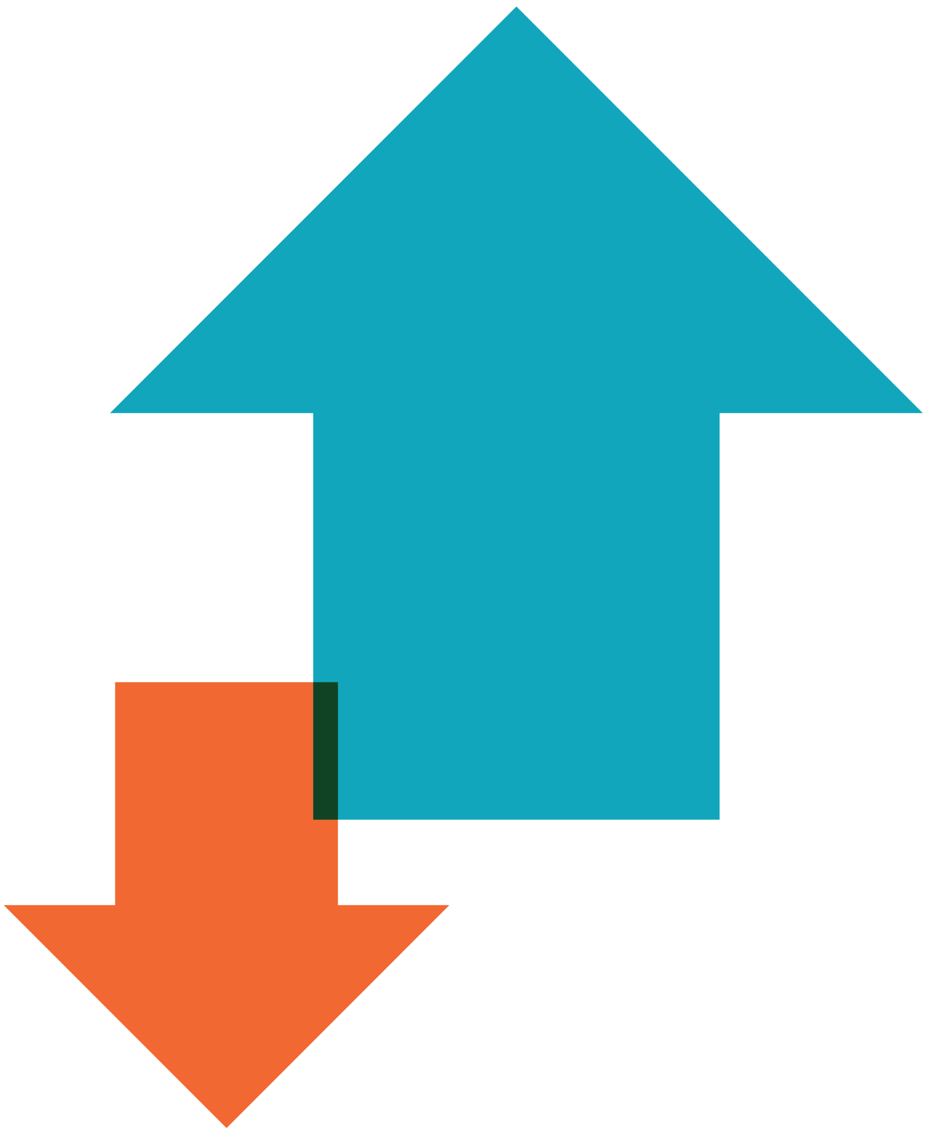

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Table of Contents

List of Figures

5

About This Report

This report is the fifth instalment of an annual series that tracks the extent to which the world's publicly traded companies are disclosing the seven "first-generation" sustainability indicators, namely: employee turnover, energy, greenhouse gas emissions (GHGs), injury rate, payroll, waste and water. The analysis is conducted at the level of individual stock exchanges – 45 in total – and is based on disclosure rates according to Bloomberg for the year 2014 (the most recent time period for which the majority of data has been disclosed), growth in disclosure rates on a trailing five-year basis (2010–14) and disclosure timeliness.

Corporate Knights
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Corporate Knights Inc. (CK) has a media and research division, which includes the award-winning business and society magazine *Corporate Knights*, and a research division, which produces corporate rankings, research reports and financial product ratings based on corporate sustainability performance. Its best-known rankings include the Best 50 Corporate Citizens in Canada and the Global 100 Most Sustainable Corporations. In June 2013, Corporate Knights was named Magazine of the Year by Canada's National Magazine Awards Foundation.

For more information about CK, please visit www.corporateknights.com.

AVIVA

Aviva is one of the largest pensions and insurance companies in the world. We manage over €300 billion of assets, making us a global institutional investor. Our history goes back more than 300 years to 1696. As both insurers and investors, we are accustomed to thinking about the long term and we have developed a deep understanding of how investors can play an important role in encouraging sustainable business practices and ultimately support sustainable development and growth.

Acknowledgements

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Notes

The opinions expressed in this report are those of Corporate Knights and do not necessarily reflect the views of Aviva.

Comments on this paper are invited and may be addressed to the authors at capital@corporateknights.com.

FOREWORD

A LONG-LASTING DIFFERENCE

One of our core values at Aviva is to create legacy or, as I call it, "being a good ancestor." We have been in business for 320 years, so we know exactly what longevity means – and our relationships with our customers often last a lifetime. That means our investments have to last lifetimes as well. Being sustainable and creating long-term value are bred in our collective bones.

So sustainability, as part of the strong environmental, social and governance criteria that underpin our investment philosophy, is at the heart of how we do business. Our Climate Change Strategy, published within the last year, shows how seriously we have treated this issue for over a decade. We are also major investors in the transition to a low-carbon economy and have committed to invest even more. And we are also an active investor, challenging fossil fuel companies to look longer-term – and to the low-carbon economy.

For us, being a good ancestor also extends to leading and contributing to the big debates about sustainability. We are major participants in the debates on how to implement the UN Sustainable Development Goals and the Climate Change Treaty agreed to at Paris in December 2015.

Creating a sustainable future is the shared responsibility of governments, regulators, NGOs and business – but inevitably business will be the agency that delivers it.

But markets are driven by the quality of the information available to them. So to make the right decisions, business must have access to transparent, high-quality data on sustainability.

That is why Aviva's partnership with Corporate Knights to publish annual data ranking the world's stock exchanges on disclosing data on sustainability is so important to us.

This is the fifth such report – which means we have access to five years' worth of data. Over those five years, the quality of the data has improved significantly – a clear demonstration of the rightness of the concept that we have advocated.

That said, we clearly still have a long way to travel. This year's report clearly shows that mandatory disclosure is a powerful instrument, but that over the five years, uptake in disclosure of greenhouse gas emissions by large companies has been slow, increasing by just 40%, with disclosure of energy, waste and water only 22%, 23% and 26%, respectively. Disclosure of social metrics is also unsatisfactory. Forty per cent of the materials sector disclosed injury rates, but the corresponding figures for other sectors are in the range of only 10 to 30%. We see similar low rates for employee turnover.

To tackle this problem, I call for exchanges and regulators to establish a mandatory requirement for the disclosure of ESG information, introduced on a "comply or explain" basis, which can help establish and maintain clear expectations while allowing companies the flexibility they need.

I also call again for a role for IOSCO (the International Organization of Securities Commissions), the global setter of standards for the securities sector as a whole, to develop globally consistent listing rules. Only then will investors have access to the consistent high-quality information they need.

I am grateful to Corporate Knights for being such an excellent partner. This is an important report and can make a real and long-lasting difference.

Mark Wilson,
Group Chief Executive Officer
Aviva

FOREWORD

INCREASING MOMENTUM

The tone set by a stock exchange sends a powerful signal to the market it operates in. An exchange's influence in bringing about a more inclusive capital market system should not be overlooked. Over the last couple of years there have been concerted efforts from all corners of the world's political and economic arenas to ensure capital markets play their role in contributing toward sustainable development. The significant agreement in Paris last year and the following Financial Stability Board (FSB) Task Force on Climate-related Financial Disclosures, as well as the announcement of the Sustainable Development Goals, are important milestones in the increasing momentum toward ensuring businesses account for the broad range of resources that they use and affect.

The Singapore Exchange is one of several exchanges to introduce mandatory sustainability reporting recently. The Singapore Exchange itself is leading the way, having produced its first integrated report in September 2015. While we welcome an increase in specific disclosure requirements across markets, which delivers a level playing field of data that aids comparability, the missing link is the connection to corporate strategy. To lock in the benefits of enhanced disclosures, businesses must explain the implications of sustainability-related information for value-creation potential. Larry Fink, CEO of the world's biggest investor, BlackRock, reiterated the importance of connecting information to strategy by writing to the CEOs of S&P 500 companies urging them to "lay out for shareholders each year a strategic framework for long-term value creation." Singapore property company City Developments Limited (CDL) is a prime example of how an innovative sustainability reporter has transformed its reporting over the last two years to demonstrate how sustainability contributes toward the company's value-creation story. Esther An, general manager, City Developments Limited, has said, "After adopting integrated reporting for two years now, we are more than convinced that it is the way to go. Tracking and assessing sustainability integration through the financial lens make business sense for both the reporter and the readers, in particular the investors."

It is right to agitate for further change, and there are still too many companies that are not producing reliable and insightful information beyond the pure financials. I do believe, however, that the action we have seen over the past year means that we are at a turning point. These issues are becoming increasingly mainstream. Mark Carney, chair of the Financial Stability Board, is one of a number of figures calling for this, saying, "By improving reporting requirements for organizations, integrated reporting can bring additional information, in particular about the longer-term costs of climate change, to feed into markets and inform decision-making and policy formulation by institutions. If achieved, it will lead to better-informed and more sustainable long-term investment, for the benefit of society."

The IIRC is working with a number of stock exchanges to bring about real behaviour change, such as what's happening in Italy, Brazil and Japan – from Deutsche Börse, which is leading by example in adopting integrated reporting, to Johannesburg, which was in many ways the initiator of this movement, having encouraged the adoption of integrated reporting over five years ago. There is much more work to be done, but I am heartened that increasing numbers of stock exchanges are following the evidence, hearing the call from investors and starting to act.

Paul Druckman
Chief Executive Officer
International Integrated Reporting Council

FOREWORD

CORPORATE TRANSPARENCY

I'm very pleased to once again have the opportunity to provide a few opening words for this important Corporate Knights publication, which highlights trends, updates and best practices in sustainability disclosure by stock exchanges and listed companies around the world.

The year 2015 was a banner one for sustainability, with the realization of crucial international agreements such as the Sustainable Development Goals (SDGs) and the Paris Agreement on climate change, but 2016 is the year for putting this vision and these commitments into action. Transparency and sustainability disclosure continue to be an ever more integral part of addressing global sustainability challenges as they provide a critical link needed to move from ambitions to concrete action and are necessary to measure, plan and assess what has been done and what is still needed.

In the past year GRI has seen an increase in policy initiatives on reporting, particularly in Europe, Asia Pacific and Latin America. According to the 2016 edition of *Carrots & Sticks*, a report developed by GRI, KPMG, Stellenbosch University and UNEP, there are currently almost 400 sustainability reporting instruments in 64 countries – stock exchanges and financial market regulators have put in place almost one-third of them. Interestingly, almost half the new stock exchange reporting instruments identified in the study are in emerging markets. This year's Corporate Knights study confirms these findings, showing that, although stock exchanges in developed economies still dominate the ranking, exchanges in emerging markets are closing the gap. This indicates that stock exchanges in emerging markets see advantages in implementing sustainability reporting instruments because they promote market stability and facilitate proper risk management in listed companies. Incentivizing corporate transparency also encourages companies to assess how they can contribute to tackling global sustainability challenges.

These are very encouraging trends; however, more has to be done because the majority of companies around the world still do not communicate externally about their sustainability policies and performance. It is crucial that stock exchanges continue to play a pivotal role as market facilitators, building trust by introducing initiatives to enhance corporate transparency. This is necessary to increase the trust in companies and in regulators and to cultivate a well-functioning, stable and resilient capital market that is able to effectively and concretely contribute to achieving the global goals and vision for sustainable development.

In particular, I support the recommendation put forward in this report that stock exchanges that have not yet developed their own policies in this area should follow the guidance recently issued by the Sustainable Stock Exchanges and the World Federation of Exchanges. GRI, bolstered by its recent transition to formal Sustainability Reporting Standards, continues to play a crucial role in supporting companies and regulators to ensure the disclosure of robust, comprehensive and globally comparable sustainability information.

I praise Corporate Knights for continuing to provide excellent insights that inform the work that GRI and many other global stakeholders do in making sustainability policies and practice truly mainstream.

Michael Meehan
Chief Executive
Global Reporting Initiative

Executive Summary

Considerable effort goes into sustainability reporting, but to what end? On the critical issue of climate change, we now have a potentially game-changing answer from finance ministers: to protect the financial system.

Last year, G20 finance ministers asked the Financial Stability Board (FSB) to consider how the financial sector could take account of the risks climate change poses to our financial system. The upshot is an FSB climate task force report due later this year that will recommend consistent climate-related financial risk disclosures. The recommendations will penetrate the financial mainstream standard-setters in a way that previous efforts by NGOs could not. The G20's Green Finance Study Group, created under China's presidency, provides a valuable forum for such recommendations to be taken up.

Climate disclosure is just one part of sustainability disclosure, but it is a good starting point because no other issue is as important for both the health of the financial system and future of our civilization.

As policy-makers grapple with how to improve disclosure on these vital issues, this report offers two essential insights.

Number one: Mandatory and prescriptive sustainability disclosure requirements work. Countries that have them lead; countries that don't lag. This may seem like an obvious proposition, but when we first started measuring the state of sustainability disclosure five years ago, the conventional wisdom was that the best way forward was to issue principles-based guidance. We now have evidence that the "report what you feel you like" approach in the absence of minimum mandatory standards is not a recipe for useful disclosures. With the exception of Switzerland (which is affected by its European context), all of the top 10 exchanges are domiciled in countries with mandatory sustainability disclosure requirements, and the converse holds for the bottom 10 exchanges (with the exception of the Shenzhen Stock Exchange, likely due to enforcement issues).

Number two: Corporate sustainability disclosure is not keeping up with the changing world. Much progress has been made improving sustainability disclosure over the past 10 years (most notably at the stock exchange level by the Stock Exchange of Thailand, Bolsa Colombia, Shanghai Stock Exchange and Nasdaq), but this progress has significantly tapered off over the past five years. Despite the landmark Paris climate deal, the majority of large companies still do not disclose any greenhouse gas emissions data. In fact the only metric tracked in this report that is disclosed by the majority of large companies is payroll, which by no coincidence is covered by International Financial Reporting Standards (IFRS).

Bill Gates remarked that, "Most people overestimate what they can do in one year and underestimate what they can do in 10 years." As the map of corporate sustainability disclosure takes shape across the world, this report provides a useful window into the state of progress. Over the past five years, it has been heartening to see a gathering appreciation that sustainability reporting is an essential precondition to safeguarding our most cherished assets.

The task for the next five years is to take a lesson from the old joke about the drunk who lost his keys:

A policeman questions a drunk man searching for something under a street light. The drunk says he has lost his keys, and the policeman joins in the search. After searching for a few minutes, the policeman asks whether the drunk is sure he lost them here, and the drunk replies no, that he lost them in the park. The policeman asks why he is searching here, and the drunk replies, "This is where the light is."

Therein lies our challenge. Investors and insurers decide how to allocate capital and price premiums based only on available information. But right now, much of the information necessary to assess critical mega-risks, such as the transition and litigation risks posed by climate change, remains in the dark. Accounting standards-setting bodies are in a unique position to install street lamps around these risk-relevant factors.

Only with the right information can investors and insurers fulfill their critical role as we transition to a sustainable economy. Let's make sure their path is well lit.

Toby A. A. Heaps
Chief Executive Officer
Corporate Knights

Top 10

Figure 1: Top 10 exchanges by Overall Score

Rank 2016	Rank 2015	Rank 2014	Rank 2013	Rank 2012	Stock exchange	Number of large companies	Overall Score
1	2	2	10	1	Euronext Amsterdam	39	89.7%
2	6	4	6	10	Euronext Paris	130	88.4%
3	4	10	17	11	Australian Securities Exchange	91	86.1%
4	11	14	12	6	Stockholm Stock Exchange	62	85.0%
5	3	5	7	2	Copenhagen Stock Exchange	25	84.9%
6	8	3	5	5	Johannesburg Stock Exchange	51	83.8%
7	1	1	2	3	Helsinki Stock Exchange	17	83.0%
8	5	9	11	12	London Stock Exchange	194	83.0%
9	7	20	15	13	Deutsche Börse	102	82.1%
10	12	15	8	15	SIX Swiss Exchange	65	80.8%

Key Findings

Environmental indicators disclosed by a minority of large companies: GHGs were disclosed by 47% of the 4,469 large companies included in this research, followed by energy (41%) and water (28%); a majority of large companies are still not disclosing any of the four environmental indicators (energy, GHGs, water and waste) tracked in this research, a finding also made in last year's study.

Slow uptake in disclosure: Over a five-year period (2010–14), the number of large companies that disclosed GHGs increased by only 40%. While this is a notable improvement, 53% and thus a majority of the world's large companies are still not reporting their GHGs. In the case of energy, waste and water, the increases over the same period were 22%, 23% and 26%, respectively.

Stock exchanges offer cases of successful uptake in sustainability disclosure: While governments remain the most prevalent initiator of policy instruments aimed at sustainability disclosure, the cases of the BM&FBOVESPA, the Bursa Malaysia, the Johannesburg Stock Exchange and the Stock Exchange of Thailand represent cases where stock exchanges, through their ability to direct the reporting behaviour of their listed entities, are successfully generating a rapid uptake in sustainability disclosure.

Mandatory disclosure can be a powerful instrument: Of the top 11 stock exchanges (first quarter of

OVER A FIVE-YEAR PERIOD (2010–14), THE NUMBER OF LARGE COMPANIES THAT DISCLOSED GHGs INCREASED BY ONLY 40%.

the ranking), 10 have at least one mandatory, prescriptive and broad policy instrument designed to regulate sustainability disclosure that is in force in the jurisdiction where they operate.

Developed economies lead on disclosure: The disclosure of the seven indicators is lower among companies trading on stock exchanges based in emerging countries; while 55% of the 3,267 large companies based in developed economies disclosed GHGs for 2014, only 23% of their 1,202 counterparts from emerging countries reported GHGs for the same year.

Relatively low GHG disclosure by the energy industry: While the energy industry is arguably one with the highest impact on the environment, only 44% of the energy sector disclosed GHGs, which is lower than the GICS consumer staples sector's disclosure of GHGs at 51%.

Weak disclosure of social responsibility: Injury rate was timidly disclosed by all 10 sectors in general. With the exception of the materials sector, of which 40% reported injury rate in 2014, the corresponding figures for the other sectors are in the range of only 10–30%. For instance, only 23% of companies in the GICS industrials sector reported their injury rate for 2014; for the energy sector, the reporting rate stood at 30%. Equally low reporting rates for the employee turnover indicator were noted; it appears that large companies are prioritizing the disclosure of environmental metrics at the expense of social or employee-related performance metrics.

Euronext Amsterdam reclaims the top spot: The Euronext Amsterdam claimed the top spot in this year's ranking; it placed first as well in the 2012 ranking and occupied the second position in the last two rankings. Large listings on the Euronext Amsterdam disclosed all four environmental metrics – energy, GHGs, water and waste – above the 50% mark. The 39 large companies traded on the Euronext Amsterdam were also noted for their high disclosure of injury rate (54%), the fourth highest rate among all 45 stock exchanges studied and up from only 21% five years ago. Disclosure rates of all seven indicators rose continuously over the period 2010–14, a remarkable performance for an exchange with already high disclosure rates; this has helped the Euronext Amsterdam to be placed in the first position the ranking. The disclosure of employee turnover grew from 21% of the large listings for 2010 to 44% for 2014. In terms of disclosure timeliness, 17 of the 25 large listings with a fiscal year-end on or after September 30, 2015 (68%) had already disclosed their sustainability-related performance data by April 1, 2016.

Continued dominance of stock exchanges from European developed economies in the top quarter of the ranking: Once again, stock exchanges based in European developed countries occupied 10 of the 11 spots in the top quarter of the ranking (1st–11th). The Johannesburg Stock Exchange, as it was in last year's ranking, was the only stock exchange based in an emerging economy to be placed in the top quarter of the ranking.

The SIX Swiss Exchange progresses: Switzerland's SIX Swiss Exchange progressed from the 12th place to the 10th place in this year's ranking. Switzerland is characterized by the absence of any policy instrument, voluntary or mandatory, to encourage or regulate corporate sustainability disclosure, thus pointing to other socio-economic forces that may be in play.

North American exchanges on the rise: North American exchanges continue their progression in the ranking – the Toronto Stock Exchange showing at the 21st place in the year's ranking (2015: 24th, 2014: 32nd), Nasdaq at the 25th place (2015: 32nd, 2014: 39th) and the New York Stock Exchange at the 26th spot (2015: 29th, 2014: 34th). All three exchanges showed a relatively slow but continuous rise in the disclosure of all seven indicators over the period 2010–14.

Emerging-economy-based stock exchanges closing the gap: The Stock Exchange of Thailand and Bursa Malaysia climbed consistently in the annual ranking, with the former climbing 14 spots to the 13th spot compared to 2014 and the latter landing in the 17th position in this

100%

The percentage of large companies on the Helsinki Stock Exchange that disclosed both energy and GHGs for 2014.

year's ranking after having gained six places over the last two years thanks in part to decisive action on the part of the stock exchanges and market regulators in both jurisdictions to enact a number of policies aimed at corporate sustainability disclosure. Two other stock exchanges based in emerging economies also joined the second quarter (12th–22nd) of this year's ranking, namely the BM&FBOVESPA and the Mexican Stock Exchange. Large Brazilian companies were noted for the high disclosure of environmental metrics energy, GHGs, water and waste, which for the year 2014 were all disclosed by close to 70% of the large listed companies. Disclosure of GHGs by large Mexican companies on the other hand grew at an impressive 22% on an annualized basis over the period 2010–14 to be disclosed by 47% of all large companies for 2014, roughly at par with New York Stock Exchange-listed large companies for the same year.

Absence of progress among stock exchanges placed in the lower half of the ranking: A number of stock exchanges have consistently remained in the bottom half of the ranking; fully 21 stock exchanges have been placed in the bottom half of the ranking at least three consecutive times and are still in the bottom half in this year's ranking. In contrast, seven exchanges have left the bottom half to be placed in the top half of the ranking in this year's study. With the exception of payroll, the disclosure rates of the seven indicators by large companies among those exchanges are worrying low – usually hovering around the 20% mark. Most importantly, disclosure growth rates among those same exchanges have historically been and remain among the weakest. It appears that certain jurisdictions would benefit from a redoubling of efforts to try and spark interest and uptake in corporate sustainability disclosure.

Sustainability disclosure takes hold in Taiwan: The Taiwan Stock Exchange continued to impress with high growth in the disclosure of the seven indicators. In this year's research, it claimed the first spot in terms of overall disclosure growth, with a notable increase in the disclosure of injury rate at a 54% annualized growth rate over the period 2010–14, followed by employee turnover (31%) and water (23%).

Finnish large companies lead on disclosure: The Helsinki Stock Exchange led in terms of the Disclosure Score with strong disclosure rates across all seven first-generation indicators for the year 2014. It was the only exchange where all large listed companies disclosed energy, GHGs and waste for 2014; the disclosure of the remaining indicators is also high (payroll: 94%, injury rate: 88%, water: 82% and employee turnover: 59%).

Australian-listed large companies are the fastest disclosers: The Australian Securities Exchange was found to be home to the fastest disclosers of corporate sustainability performance information in this year's study, with 94% or 15 out of 16 of its qualifying companies having already released their sustainability performance data by April 1, 2016. The Australian Securities Exchange-listed large companies were already known to be fast disclosers because they were consistently among the top five in terms of disclosure timeliness over the past five rankings.

The Qatar Stock Exchange found to be the most carbon-intensive stock exchange: With 2,033 metric tons of GHGs per million of revenue in U.S. dollars in 2014, the Qatar Stock Exchange was on a weighted basis, the most carbon-intensive of the 45 exchanges studied. This may in part be due to the lack of industrial diversification whereby at least 10 of the 26 large listed Qatari companies are in the energy, chemicals and heavy industrial sectors.

The Moscow Exchange's potential carbon emissions is the highest: Of the 45 stock exchanges studied, it was found that large companies on the Moscow Exchange have the highest potential carbon emission at 211,364 metric tons per US$1 million of market capitalization as at December 31, 2014.

Investing in the new economy: Large companies trading on the New Zealand Exchange were found to have the highest proportion of their total revenue (9.1%) from renewable energy, energy-smart technologies, carbon capture and storage, and carbon markets ("green revenues").

47%

The proportion of the 4,469 large listed companies that publicly disclosed their GHGs for 2014.

Recommendations

Policy-makers and securities regulators

- Policy-makers in both developed and emerging economies are encouraged to study the possibility of influencing investment returns based on the corporate sustainability performance of the securities issuer. For instance, dividends of an issuer with a certain sustainability performance rating could be taxed more highly than the dividends declared by another issuer in the same industry but with a better sustainability rating. This may act as a system to (i) urge corporations to become more transparent and encourage the flow of capital toward more responsible issuers, (ii) motivate corporate executives to integrate sustainability into corporate strategy and (iii) align the interest of the stockholders, debtholders and corporate management with that of the transitioning economy.
- In view of the fact that most highly ranked stock exchanges have at least one mandatory, prescriptive and broad policy instrument designed to regulate sustainability disclosure that is in force in the jurisdiction where they operate, it is recommended that policy-makers consider adopting such policies or convert existing voluntary policies into mandatory ones that provide specific and itemized disclosure requirements. Examples of such policies include France's Grenelle II Act and the United Kingdom's 2013 update to the Companies Act making GHG disclosure mandatory for listed U.K.-incorporated companies.
- We also urge policy-makers to conduct a study of the socio-economic factors that may favour or hamper the uptake of corporate sustainability disclosure in their jurisdiction. More specifically, we suggest that policy-makers engaged in promoting sustainability disclosure identify cases of best practices from other jurisdictions to use as benchmarks for their own.
- Where mandatory requirements exist, the securities regulator is encouraged to actively monitor and enforce such mandatory sustainability disclosure requirements while providing clear indication of the related penalties for violation.

Investors, stock exchanges and securities regulators

- Stock exchanges are encouraged to keep track and publish a list of their respective listed entities that are engaging in sustainability disclosure and those that are not so as to create competitive pressure on those that are still lagging behind. Such an initiative would be more effective if implemented across all member exchanges through the IOSCO and WFE.
- We urge institutional investors and global investor networks such as the Principles for Responsible Investment (PRI) to redouble their engagement efforts with the International Organization of Securities Commission (IOSCO) to bring about mandatory and standardized sustainability disclosure by listed companies among member exchanges globally, particularly in jurisdictions where disclosure rates are comparatively weak; this is a crucial step to achieve uniform disclosure rates of comparable sustainability information around the world and especially to spur increased sustainability disclosure among the stock exchanges that remain in the bottom half of the ranking.

Sustainability leaders

In order to allow for a more accurate determination of the strategic direction taken by a given company, principally by investors, companies are encouraged to become more transparent and break down their capital expenditure amounts into the types of assets being funded. It is suggested that global and national financial reporting standard-setters issue standards and guidances in this respect.

Introduction

Welcome to the fifth edition of Corporate Knights' *Measuring Sustainability Disclosure: Ranking the World's Stock Exchanges,* a research report that tracks the disclosure of quantitative sustainability-related information by the world's large publicly traded corporations. As in the prior-year reports, we rank the world's stock exchanges based on the extent to which their respective listed companies disclose seven of the most widely tracked quantitative sustainability performance indicators, namely: energy use, carbon emissions, water use, waste generation, rate of employee injury, rate of employee turnover and personnel costs (hereinafter collectively referred to as "the seven indicators"). Because the methodology for this annual exercise has remained unchanged since it was first presented in 2012, it is possible to therefore compare and contrast stock exchanges on any progress made in terms of the public availability of quantitative sustainability performance data.

While corporate sustainability data is generally used by a wide variety of stakeholders, over the past few years, one group of users has risen to become the focus of various studies and has become the reason for much effort to make sustainability data more relevant and useful: the investor. The role of the investor in fostering corporate sustainability has never been as important as it is today. Firstly, investors, being the ultimate owners of the corporation, have the power through their voting rights to directly or indirectly drive changes in the way corporations behave vis-à-vis the environment and society. Secondly, investors as owners and managers of investment capital have the power to channel funds toward technologies and activities that may be beneficial for the planet as a whole, such as cleaner energy technologies; for instance, this is the objective of the Breakthrough Energy Coalition through its Mission Innovation initiative.[1]

Clearly, the demand for corporate sustainability performance data and information by investors is rising; a 2015 report and Ernst & Young[2] revealed that, based on responses from over 200 institutional investors, 59% "consider corporate social responsibility (CSR) or sustainability reports essential or important when making investment decisions," up from 35% a year before. Equally important was the finding that 62% of the surveyed investors considered non-financial data relevant to all sectors, up from 34% in 2014. Similarly, over 70% of the now over 1,500 global signatories to the Principles for Responsible Investment (PRI) have asked companies to integrate environmental, social and governance (ESG) information into their financial reporting.

It is therefore not a surprise that 2015 and 2016 so far have not been lacking in terms of notable initiatives aimed at fostering the availability and quality of sustainability-related performance data for investors. In September 2015, the Sustainable Stock Exchanges Initiative launched its Model Guidance for exchanges. The purpose of the Model Guidance compiled by the SSE is to help exchanges address this need by providing a model, or template, that exchanges can use to develop their own custom guidance.[3] At the time of writing, 15 stock exchanges already provide guidance, while another 23 have committed to providing guidance by the end of 2016; we congratulate all those exchanges that already publish guidance documents and those that are committing to do so and encourage all stock exchanges, especially the large ones, to commit to promote long-term sustainable investment and improve sustainability disclosure by joining, for instance, the Sustainable Stock Exchanges Initiative.

In November 2015, the World Federation of Exchanges (WFE) presented recommendations to its member exchanges on how to implement their sustainability policies. The guidance is designed to be implemented by member exchanges on a voluntary basis. The WFE Guidance & Recommendations identify material ESG metrics that exchanges can incorporate into disclosure guidance to companies listed on their markets. Specifically, the enhanced guidance highlights 34 key performance indicators, including energy consumption, water management, CEO pay ratio, gender diversity, human rights, child and forced labour, temporary worker rate, corruption and anti-bribery, and tax transparency in addition to other corporate policies. It also offers practical advice on how to roll out enhanced sustainability disclosure. In addition, for those exchanges signed up to the UN's Sustainable Stock Exchanges Initiative, the adoption of the WFE guidance is a way to meet their SSE Guidance commitments.[4]

The Carbon Action,[5] an investor-led initiative comprising 304 investors with US$22 trillion in assets under management to accelerate company action on carbon reduction and energy-efficiency activities that deliver a satisfactory return on investment, was particularly active in 2015; it reached out to 1,300 companies across 17 high-emitting industries. The Carbon Action's mission is encourage companies to: (i) make emissions reductions (year on year), with targets publicly disclosed, and (ii) make ROI-positive investments in projects. In 2015, the initiative helped reduce global corporate greenhouse gas emissions by 641 million metric tons of CO_2e (equivalent to closing down over 165 coal-fired power plants) and led to a 130% increase in the number of emissions-reduction projects.

Some individual stock exchanges have also been quite active. The Taiwan Stock Exchange (TWSE) amended the Rules Governing the Preparation and Filing of Corporate Social Responsibility Reports by TWSE-listed companies (2014). According to these newly amended rules, any listed company that falls into the food, chemical, or financial and insurance industry with a market capitalization of at least New Taiwan $10 billion shall prepare and file a corporate social responsibility report.[6] The Hong Kong Stock Exchange (HKEx) has adopted a "comply-or-explain" requirement, which will come into effect for sustainability-related reports released after December 31, 2016. This regulatory requirement aims to encourage more widespread and standardized sustainability reporting and to help issuers meet the expectations about non-financial information from investors and other stakeholders. In October 2015, Bursa Malaysia issued amendments to the Main Market Listing Requirements relating to sustainability statements in annual reports. Under the amendments, listed issuers are required to disclose a narrative statement of the management of material economic, environmental and social risks and opportunities in their annual reports; the amendments are accompanied with guidances on sustainability reporting. The Singapore Exchange and the BM&FBOVESPA are also exploring further improvements to their existing comply-or-explain regimes.[7] The New Zealand Exchange is in its final stages of introducing sustainability reporting regulations following the Australian Securities Exchange example.[8] We congratulate all of these exchanges for their hard work and effort toward improving corporate transparency.

While the amount of sustainability data is set to increase going forward, one issue remains: the quality and, more importantly, the actionability of the data. In 2015, Ernst & Young found that over one-quarter of about 200 investors found it difficult to determine how material sustainability data is to financial performance because it is often not verified or is difficult to compare across companies. The authors suggest that a probable reason for investors' dissatisfaction with non-financial information lies in the strategy behind companies' reporting – it is not currently created to serve the needs of investors but rather of the regulators and customers.[9]

We therefore go further in this fifth annual issue of this report by going beyond disclosure and into performance analysis. More specifically, we use the set of available corporate sustainability data used to run the ranking to present a number of investor-relevant sustainability key performance indicators on a per-exchange basis. For instance, for each exchange, we assess carbon intensity, fossil fuel reserve intensity and the percentage of listed companies whose business involves environmentally friendly activities, technologies and services versus high-carbon-emitting business activities – "green" versus "brown" companies. The aim is to empower investors to increasingly integrate sustainability factors into investment decision-making.

By the middle of 2016, the United Nations-supported Principles for Responsible Investment (PRI) had over 1,500 signatories from more than 50 countries representing over US$60 trillion in assets under management (AUM), up from 800 signatories with US$22 trillion AUM in 2010. Many of these investors view ESG information as a proxy for quality of corporate management, and effective analysis of relevant ESG factors has become a fundamental part of assessing the value of an investment. For these reasons, investors are asking companies to communicate how they are managing ESG-related risks and opportunities.

This report therefore comes at a crucial time when investor interest in sustainability information has never been higher. It is our intention to augment an existing body of research with a fresh and up-to-date perspective on sustainability disclosure rates and on how such disclosures can be transformed into actionable key performance indicators critical for investor decision-making.

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1. http://www.breakthroughenergycoalition.com/en/index.html
2. http://www.ey.com/Publication/vwLUAssets/EY-tomorrows-investment-rules-2/$FILE/EY-tomorrows-investment-rules-2.0.pdf
3. http://www.sseinitiative.org/engagement/esg-guidance/#1
4. http://www.world-exchanges.org/home/index.php/news/world-exchange-news/world-exchanges-agree-enhanced-sustainability-guidance
5. https://www.cdp.net/en-US/Programmes/Pages/Initiatives-CDP-Carbon-Action.aspx
6. https://www.globalreporting.org/information/news-and-press-center/Pages/EXCHANGES-RAISING-THE-BAR-ON-TRANSPARENCY.aspx
7. Ibid.
8. Ibid.
9. Ibid.

Methodology

Our ranking model has remained unchanged since our inaugural report in 2012. As such, it is possible to track the changes in a given stock exchange's sustainability disclosure performance over time. The methodology is presented below.

Please refer to Appendix A for a more detailed review of the methodology.

Aspect	**Explanation**
Unit of analysis	Large publicly traded companies, defined as companies with a market capitalization in excess of US$2 billion as of the close of trading on April 30, 2016. The total was 4,469 companies.
Level of aggregation	The 4,469 large companies were aggregated according to the stock exchange on which their shares are primarily traded.[10] Stock exchanges with fewer than 10 large companies were removed from this study in order to maintain statistical significance. A total of 45 stock exchanges remained after applying the above filter, with 4,281 large companies.
Data source	The data used in the analysis was obtained from Bloomberg's ESG database on May 1, 2016. The seven indicators consist of: (i) Energy use (energy) (ii) Carbon emissions (GHGs) – scope 1 & 2 (iii) Water use (water) (iv) Waste generation (waste) (v) Rate of employee injury (injury) (vi) Rate of employee turnover (employee turnover) (vii) Personnel costs (payroll)
Key performance indicators	The 45 stock exchanges included in this study were assessed using three measures of performance: (i) The Disclosure Score (50% weight). The Disclosure Score measures the proportion of an exchange's large listings that disclosed the seven indicators in 2014. The indicators are equally weighted in terms of their contribution to the Disclosure Score. (ii) The Disclosure Growth Score (20% weight). The Disclosure Growth Score measures the growth rate in the proportion of an exchange's large listings that disclosed the seven indicators over the 2010–14 period. (iii) The Disclosure Timeliness Score (30% weight). The Disclosure Timeliness Score measures how quickly an exchange's large listings report sustainability data to the market after the end of their fiscal year.
Historical data	The Disclosure Score is based on data for the year 2014. The reason for this gap is data completeness. Companies' fiscal year-ends vary, and many companies still take over 12 months after their fiscal year-end to disclose their sustainability data. As of May 1, 2016, 2014 is the most recent time period for which the majority of companies engaged in sustainability reporting have disclosed.

10. Companies were aggregated on the basis of their "primary listing." For example, Rio Tinto plc trades on the London Stock Exchange (primary exchange) and on the New York Stock Exchange as an ADR. In our study, Rio Tinto plc is grouped under the London Stock Exchange only.

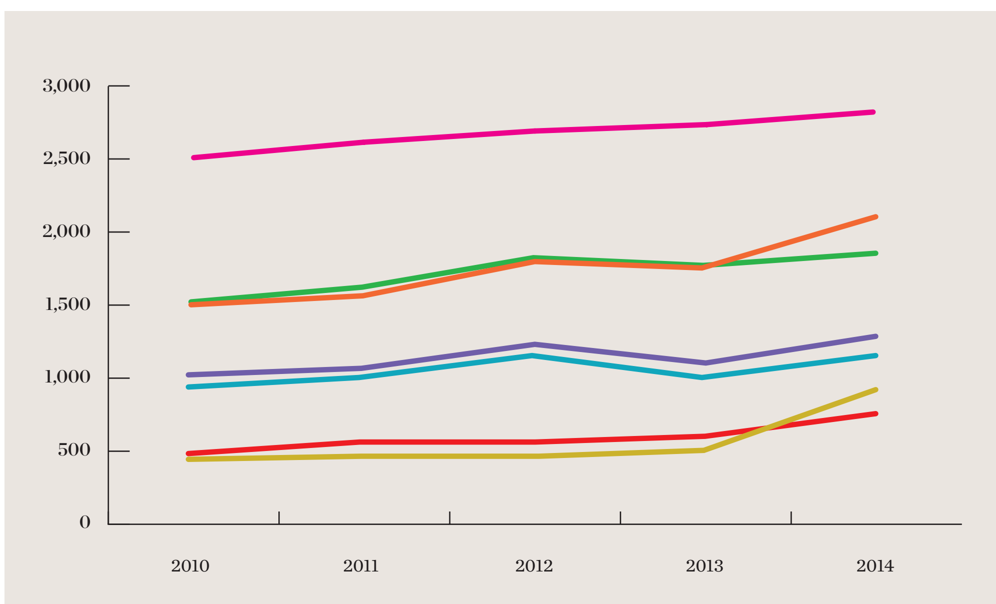
40%

The increase in the number of large companies that disclosed GHGs over the period 2010–14.

Sustainability Disclosure Trends

Of the seven indicators tracked in this report, personnel costs was the most highly reported indicator for 2014; this was reported by 62% of the 4,469 companies included in this research. This may in part be due to the existence of requirements under certain financial reporting standards to disclose personnel costs.[11] Of the remaining six indicators, which are largely disclosed on a voluntary basis, GHGs was the most highly disclosed (by 47% of the 4,469 companies included in this research), followed by energy (41%) and water (28%).

Figure 2: Number of large companies that disclose the seven indicators, 2010–14

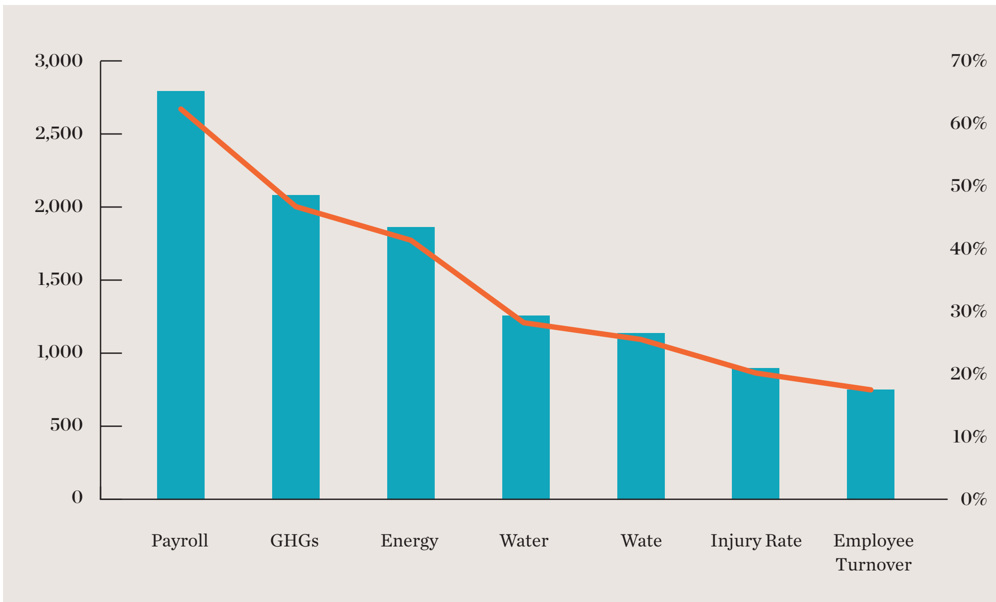


- Payroll
- GHGs
- Energy
- Water
- Waste
- Injury rate
- Employee turnover

11. The International Financial Reporting Standards (IFRS) as the financial reporting standard that, under IAS 19, "Employee Benefits," mandates the disclosure of payroll costs.

Leaving aside the disclosure of personnel costs, it is encouraging to note the rise in the disclosure of the remaining sustainability performance indicators over the period 2010 to 2014. However, it is disconcerting to also note that after five years, the number of large companies that disclose GHGs increased by only 40%. In the case of energy, waste and water, the increase is even more depressing – by a meagre 22%, 23% and 26%, respectively. The disclosure of injury rate and employee turnover increased by 106% and 62%, respectively, over the period 2010 to 2014, but both were still disclosed by fewer than 1,000 large companies in 2014.

Figure 3: The seven sustainability indicators – disclosure by large companies and as a percentage of the total number of large companies, 2014



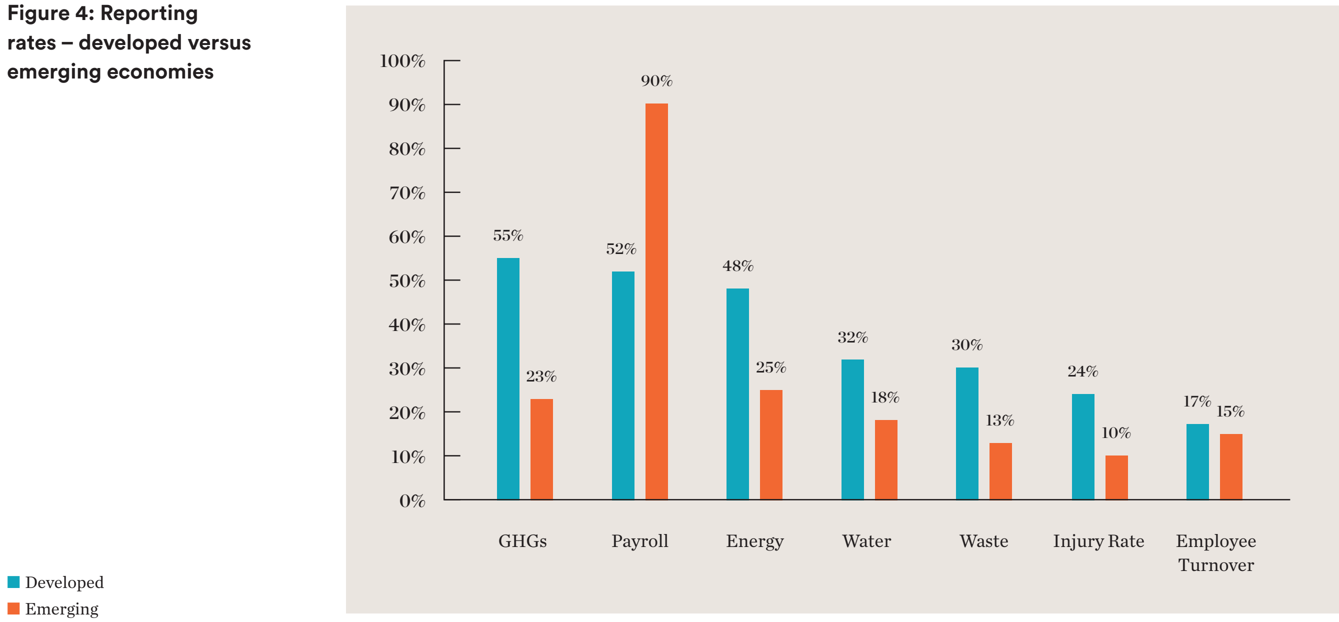
Number of large companies
As a percentage

Most importantly, as evidenced by Figure 3, companies that report GHGs, arguably the most heavily tracked sustainability performance indicator, still consist of a minority of all large companies worldwide. It seems that certain companies or companies of a certain type are persistently resisting calls to engage in sustainability reporting. In last year's report, our research pointed out that over 25% of the world's "non-disclosers" (companies that do not disclose energy, GHGs, water, waste, employee turnover or injury rate) are in the financials sector, with over half of them being smaller companies in the US$2–4 billion range in market capitalization; companies within the US$2–4 billion range in market capitalization represented 62.6% of the world's non-disclosers.

Consistent with the findings in the prior years, with the exception of payroll,[12] the disclosure of the seven indicators is still significantly lower among companies trading on stock exchanges based in emerging countries. For instance, while 55% of the 3,267 large companies based in developed economies disclosed GHGs for 2014, only 23% of their 1,202 counterparts from emerging countries reported GHGs for the same year. The same pattern is observed for the remaining five indicators as shown in Figure 4. However, it is interesting to note that the disclosure of GHGs by large companies in the developed economies has surpassed that of payroll (55% versus 52%).

12. The International Financial Reporting Standards (IFRS) as the financial reporting standard that, under IAS 19, "Employee Benefits," mandates the disclosure of payroll costs.

Figure 4: Reporting rates – developed versus emerging economies



Further efforts to boost the disclosure of the voluntary sustainability performance indicators among large companies listed among emerging economies would thus be beneficial.

On a sector basis, the materials sector is again the one with the highest reporting rates on five of the seven indicators: energy, GHGs, water, waste and injury rate. As shown in Figure 5 below, 57% of the materials sector companies reported GHGs for 2014, the highest among all 10 GICS sectors.

The financials sector happens to be the worst reporter on a majority of the seven indicators. For instance, only 30% of the sector reported on GHGs for the year 2014, the lowest among all 10 GICS sectors. The low reporting rate by large companies in the financials sector may in part be due to the relatively lower perceived environmental impact of their operations, but the recent movement for institutional investors to disclose GHGs and to divest from high-carbon-emitting industries may bring about higher transparency in terms of financed emissions.

Once again, we note the relatively timid disclosure performance by one of the most high-impact sectors – energy. For instance, only 44% of the energy sector disclosed GHGs, which is lower than the consumer staples sector's disclosure of GHGs at 51%. This finding is counterintuitive since it is usually generally accepted that companies in carbon-intensive sectors are more likely to report GHGs than others in less carbon-intensive industries such as the information technology and consumer staples sectors.

Also to be highlighted is the low disclosure performance of injury rate by all 10 sectors in general. With the exception of the materials sector, of which 40% reported injury rate in 2014, the corresponding figures for the other sectors are in the range of only 10–30%. For instance, only 23% of companies in the industrials sector reported their injury rate for 2014; for the energy sector, the reporting rate stood at 30%. We note equally low reporting rates for the employee turnover indicator. It therefore appears that large companies are prioritizing the disclosure of environmental metrics at the expense of social or employee-related performance metrics, which in itself is an issue since the whole concept of sustainability encompasses both the environmental and social dimensions.

Figure 5: Disclosure rate by GICS sector, 2014

Lowest reporting rate   Highest reporting rate

GICS sector	Energy	GHGs	Water	Waste	Employee turnover	Injury rate	Payroll
Consumer Discretionary	38%	46%	24%	22%	11%	13%	61%
Consumer Staples	52%	51%	34%	32%	18%	27%	70%
Energy	37%	44%	33%	26%	20%	30%	44%
Financials	35%	30%	22%	19%	17%	12%	64%
Health Care	40%	31%	28%	26%	11%	20%	55%
Industrials	46%	52%	31%	28%	15%	23%	74%
Information Technology	38%	45%	22%	22%	12%	13%	46%
Materials	56%	57%	46%	42%	26%	40%	70%
Telecom-munication Services	52%	55%	29%	30%	34%	29%	80%
Utilities	44%	51%	39%	32%	25%	27%	66%

44%

Only 44% of the energy sector disclosed GHGs, which is lower than the GICS consumer staples sector's disclosure of GHGs at 51%.

21

The number of stock exchanges that were placed in the bottom half of the ranking at least three consecutive times and are still in the bottom half in this year's ranking.

Ranking

In this fifth iteration of this annual report, once again we applied our ranking model to the 45 stock exchanges included in our study. The results are show in Figure 6 below. The Euronext Amsterdam claimed the top spot in this year's ranking after two consecutive years occupying the second position. The disclosure rates of the environmental metrics energy, GHGs, water and waste by the large companies listed on the Euronext Amsterdam were all above the 50% mark. The 39 large companies traded on the Euronext Amsterdam were also noted for their high disclosure of injury rate (54%), the fourth highest rate among all 45 stock exchanges studied and up from only 21% five years ago. The growth of the disclosure of employee turnover was equally striking – from 21% of the large listings for 2010 to 44% for 2014. In terms of disclosure timeliness, 17 of the 25 large listings with a fiscal year-end on or after September 30, 2015 (68%) had already disclosed their sustainability-related performance data by April 1, 2016.

Completing the top five are the Euronext Paris (2015: 6th), the Australian Securities Exchange (2015: 4th), the Stockholm Stock Exchange (2015: 11th) and the Copenhagen Stock Exchange (2015: 3rd).

The Johannesburg Stock Exchange (JSE), as it was in last year's ranking, was the only stock exchange based in an emerging economy to be placed in the first quarter (1st–11th) of the ranking. South-African-listed large companies continue to impress mostly with high disclosure rates of energy and GHGs, being disclosed by 78% and 80%, respectively, of all large listed companies for 2014. The JSE's listing rule embedding the King Code of Governance (King III) on a comply-or-explain basis remains one of the successful cases of a stock exchange-led initiative meant to spur corporate sustainability disclosure.

It is also interesting to note the continuous progression of Switzerland's SIX Swiss Exchange, now sitting at the 10th place in this year's ranking. Switzerland is characterized by the absence of any policy instrument, voluntary or mandatory, to encourage or regulate corporate sustainability disclosure; it appears that other socio-economic forces are in play. This stands in stark contrast with the remaining 10 stock exchanges in the top quarter, where at least one mandatory, prescriptive and broad policy instrument designed to regulate sustainability disclosure is in force in the jurisdiction where they operate. While mandatory regulation in itself is not a guarantee of superior corporate sustainability disclosure, as evidenced by the poorer performance of stock exchanges such as the Borsa Istanbul despite the presence of mandatory policies, we note that most of the stock exchanges ranked in the top half of the ranking have mandatory policies that are prescriptive and broad compared to stock exchanges placed in the lower half of the ranking where such policies are in most cases non-existent.

Equally remarkable has been the continuous progression of the Australian Securities Exchange to the third spot in this year's ranking, rising from the 17th position back in 2013. Large companies trading on the Australian Securities Exchange were noted for high disclosure rates of energy and GHGs – both being disclosed by almost 70% of all large listed companies – and of injury rate, which was disclosed by 53% of the large companies: the fifth highest rate among all stock exchanges studied. The Australian large companies were also noted for being home to the fastest disclosers of sustainability; 94% (15 out of 16) of its large listed companies with a fiscal year-end of September 30, 2015, and after had already released their sustainability performance data within six months.

The London Stock Exchange (LSE), the largest exchange among the first quarter with 194 large companies, impresses with a healthy increase in the disclosure rates of GHGs, energy and injury rate over the period 2010–14. For instance, while 91% of its large companies disclosed GHGs in last year's study, this year's research reveals that this metric has grown to 95% (2010: 75%); this makes the London Stock Exchange home to the largest proportion of disclosers of GHGs among large stock exchanges (at least 100 companies with a market capitalization of at least US$2 billion). Furthermore, 100% of the FTSE 100 constituents disclosed GHGs. This stands in contrast with the disclosure of the other indicators, particularly waste and water, where disclosure rates over the period 2010–14 changed only modestly.

The North American exchanges continue their progression in the ranking – the Toronto Stock Exchange showing at the 21st place in the year's ranking (2015: 24th, 2014: 32nd), Nasdaq at the 25th place (2015: 32nd, 2014: 39th) and the New York Stock Exchange at the 26th spot (2015: 29th, 2014: 34th). All three exchanges showed a relatively slow but continuous rise in the disclosure of all seven indicators over the period 2010–14.

Equally remarkable is the consistent progression of some exchanges based in emerging economies, namely the Stock Exchange of Thailand and Bursa Malaysia, with the former climbing 14 spots to the 13th spot compared to 2014 and the latter landing in the 17th position in this year's ranking after having gained six places over the last two years thanks in part to decisive action on the part of the stock exchanges and securities regulators in both jurisdictions to enact a number of policies aimed at corporate sustainability disclosure. Two stock exchanges based in emerging economies also joined the second quarter (12th–22nd), namely the BM&FBOVESPA and the Mexican Stock Exchange. Large Brazilian companies were noted for the high disclosure of environmental metrics energy, GHGs, water and waste, which for the year 2014 were all disclosed by close to 70% of the large listed companies; it appears that Brazil is now reaping the benefits of the various initiatives undertaken over the last decade by the Brazilian government, securities regulator and, most notably, the stock exchange through the BM&FBOVESPA's Recommendation of 2012 to spur corporate sustainability disclosure. The Mexican government enacted the Climate Change law in 2012,[13] which, among other things, requires the measurement, reporting and verification of emissions; indeed, our research shows that the growth in the disclosure of GHGs by large Mexican companies stood at an impressive 22% on an annualized basis over the period 2010–14 (2014: 47%).

The Borsa Italiana climbed 11 spots to be placed in the 19th position in this year's ranking; while the disclosure of environmental indicators has historically been around the 50% mark, we noted a remarkable jump in the disclosure of energy and GHGs for 2014 – to 62% of all large companies in each case. More importantly, the disclosure of injury rate jumped from only 11% of the large companies in 2010 to 40% in 2014.

Also noteworthy is Russia's Moscow Exchange landing in the 27th place; it is noted mostly for a high growth rate in the disclosure of GHGs over the period 2010–14 (CAGR of 39%). This progression may be related to the coming into force of regulatory instruments promulgated by the market regulator and the Russian government in 2011 and 2012, respectively, to encourage the disclosure of corporate environment-related performance data.[14]

At the other end of the table, the Lima Stock Exchange occupied the 45th and last place, unchanged from last year. The New Zealand Exchange (2015: 42nd), the Qatar Stock Exchange (2015: 41st), the Shenzhen Stock Exchange (2015: 20th) and the Caracas Stock Exchange complete the bottom five. Quite noticeable is the presence of the Shenzhen Stock Exchange in the bottom five after placing 20th in last year's ranking. However, the Shenzhen Stock Exchange experienced a decline in the disclosure of GHGs and water, and the disclosure of waste, employee turnover and injury rate remained unchanged at 0%.

Another notable drop is that of the Bombay Stock Exchange/National Stock Exchange, losing 13 spots compared to last year's ranking. This was due primarily to a fall in the disclosure of energy and waste from 2013 to 2014 (after rising slowly over the period 2010–13); in the case of energy, the disclosure rate for 2014 was at 37% (2013: 46%), and waste for 2014 stood at 11% (2013: 15%). Disclosure of the remaining indicators hardly changed; for instance, disclosure of GHGs increased from 24% of all large companies for the year 2010 to 32% for 2013 but rose to only 33% for 2014 – an increase of just 1%.

As in the prior-year rankings, European developed-economy stock exchanges occupy a majority of the first quarter of the ranking, taking 10 of the 11 spots; this may in part be due to the various government-led initiatives such as the Grenelle Act II in the case of France and the European Union's Directive on Disclosure of Non-Financial and Diversity Information – all being examples of mandatory, prescriptive and broad policies. However, the second quarter is predominantly occupied by exchanges based in emerging economies – seven out of 11. In fact, the first two positions in the second quarter (12th and 13th positions) were taken by the BM&FBOVESPA and the Stock Exchange of Thailand, respectively. Moreover, with the exception of the Shanghai Stock Exchange, all seven emerging country stock exchanges progressed in this year's ranking compared to last year. All these are encouraging signs for corporate sustainability disclosure among large companies traded on stock exchanges based in emerging economies.

A worrying fact is the chronically poor performance by certain stock exchanges that have remained in the bottom half of the ranking for at least three consecutive years out of the five annual rankings; fully 21 stock exchanges have been placed in the bottom half of the ranking at least three consecutive times and are still in the bottom half in this year's ranking. In contrast, only seven exchanges have left the bottom half to be placed in the top half of the ranking in this year's study. It appears that certain jurisdictions would benefit from a redoubling of efforts to try and spark interest and uptake in corporate sustainability disclosure.

13. https://www.globalreporting.org/information/policy/initiatives-worldwide/Pages/Mexico.aspx
14. Directive 1710p-P13, 2012; Order 11-46/pz-n, 2011; and Guidance # 03-849/r, 2003. Source: https://www.globalreporting.org/information/policy/initiatives-worldwide/Pages/default.aspx

Figure 6: Overall results

First quartile · Second quartile · Third quartile · Fourth quartile

Rank 2016	Rank 2015	Rank 2014	Rank 2013	Rank 2012	Stock exchange	Number of large companies	Overall Score
1	2	2	10	1	Euronext Amsterdam	39	89.67%
2	6	4	6	10	Euronext Paris	130	88.37%
3	4	10	17	11	Australian Securities Exchange	91	86.07%
4	11	14	12	6	Stockholm Stock Exchange	62	85.03%
5	3	5	7	2	Copenhagen Stock Exchange	25	84.91%
6	8	3	5	5	Johannesburg Stock Exchange	51	83.77%
7	1	1	2	3	Helsinki Stock Exchange	17	83.01%
8	5	9	11	12	London Stock Exchange	194	82.96%
9	7	20	15	13	Deutsche Börse	102	82.12%
10	12	15	8	15	SIX Swiss Exchange	65	80.82%
11	10	8	1	4	BME Spanish Exchanges	47	80.81%
12	26	24	21	9	BM&FBOVESPA	48	79.36%
13	17	27	40	31	Stock Exchange of Thailand	36	79.00%
14	9	7	4	7	Oslo Stock Exchange	12	78.32%
15	14	18	26	N/A	Shanghai Stock Exchange	358	75.03%
16	18	13	31	N/A	Bolsa Colombia	16	74.80%
17	19	23	24	23	Bursa Malaysia	40	74.77%
18	15	22	18	17	Singapore Exchange	48	73.55%
19	30	19	13	8	Borsa Italiana	55	73.45%
20	N/A	N/A	N/A	N/A	Abu Dhabi Securities Exchange	10	73.26%
21	24	32	30	28	Toronto Stock Exchange	130	73.03%
22	36	25	28	25	Mexican Stock Exchange	43	72.40%
23	25	29	22	19	Euronext Brussels	28	71.21%
24	23	17	23	18	Hong Kong Stock Exchange	264	70.51%
25	32	39	36	N/A	Nasdaq	392	70.28%
26	29	34	33	N/A	New York Stock Exchange	940	69.64%
27	37	30	19	26	Moscow Exchange	49	68.64%
28	21	12	3	N/A	Tokyo Stock Exchange	412	67.85%
29	16	35	34	30	Bombay Stock Exchange/ National Stock Exchange	123	66.96%
30	27	21	25	N/A	Taiwan Stock Exchange	60	65.19%
31	22	28	27	24	Wiener Börse	15	64.08%
32	28	33	39	20	Philippine Stock Exchange	32	60.68%
33	39	36	20	21	Santiago Exchange	25	59.98%
34	31	38	37	N/A	Indonesia Stock Exchange	33	59.73%
35	34	11	32	32	Borsa Istanbul	27	55.89%
36	38	41	45	33	Tel Aviv Stock Exchange	21	50.57%
37	40	N/A	N/A	N/A	Dubai Financial Market	15	50.17%
38	33	43	35	34	Warsaw Stock Exchange	18	44.46%
39	43	45	41	N/A	Kuwait Stock Exchange	18	37.49%
40	44	42	42	N/A	Saudi Stock Exchange	42	31.33%
41	42	40	N/A	N/A	New Zealand Exchange	12	30.73%
42	41	44	44	N/A	Qatar Stock Exchange	26	27.37%
43	20	26	38	N/A	Shenzhen Stock Exchange	88	25.43%
44	N/A	N/A	N/A	N/A	Caracas Stock Exchange	12	13.43%
45	45	46	43	35	Lima Stock Exchange	10	4.89%

Source: Corporate Knights

Ranking

Figure 7: Disclosure rates and score, 2014

Stock exchange	Number of large companies	Employee turnover	Energy	GHGs	Injury rate	Payroll	Waste	Water	Disclosure Score (maximum: 50%)
Helsinki Stock Exchange	17	59%	100%	100%	88%	94%	100%	82%	49%
BM&FBOVESPA	48	69%	81%	75%	38%	98%	67%	69%	48%
Euronext Paris	130	60%	78%	80%	50%	95%	57%	64%	47%
Taiwan Stock Exchange	60	53%	73%	78%	57%	95%	60%	62%	47%
BME Spanish Exchanges	47	47%	79%	79%	36%	96%	60%	60%	46%
Euronext Amsterdam	39	44%	69%	74%	54%	90%	51%	51%	44%
Copenhagen Stock Exchange	25	48%	68%	72%	48%	92%	48%	56%	44%
Oslo Stock Exchange	12	50%	75%	75%	58%	75%	50%	50%	44%
Stockholm Stock Exchange	62	39%	73%	76%	39%	90%	39%	35%	42%
Deutsche Börse	102	46%	60%	62%	40%	89%	48%	45%	42%
London Stock Exchange	194	26%	77%	95%	39%	89%	42%	38%	42%
Borsa Italiana	55	38%	62%	62%	40%	89%	47%	49%	42%
Johannesburg Stock Exchange	51	47%	78%	80%	25%	73%	27%	47%	42%
Bolsa Colombia	16	25%	81%	75%	38%	81%	31%	50%	41%
SIX Swiss Exchange	65	38%	65%	68%	37%	83%	42%	45%	41%
Borsa Istanbul	27	30%	59%	56%	22%	100%	37%	41%	41%
Australian Securities Exchange	91	20%	68%	70%	53%	82%	38%	41%	40%
Euronext Brussels	28	36%	54%	46%	29%	89%	39%	46%	40%
Stock Exchange of Thailand	36	33%	44%	42%	25%	97%	33%	42%	40%
Moscow Exchange	49	33%	37%	31%	20%	94%	43%	45%	39%
Tokyo Stock Exchange	412	2%	63%	67%	10%	82%	54%	53%	38%
Abu Dhabi Securities Exchange	10	40%	40%	60%	20%	90%	10%	40%	38%
Toronto Stock Exchange	130	24%	57%	62%	30%	18%	25%	31%	37%
Santiago Exchange	25	32%	28%	20%	28%	92%	24%	24%	36%
Mexican Stock Exchange	43	16%	49%	47%	16%	33%	30%	42%	35%
Wiener Börse	15	13%	53%	53%	13%	80%	27%	27%	35%
Bursa Malaysia	40	20%	30%	30%	20%	95%	15%	15%	35%
Singapore Exchange	48	31%	35%	42%	19%	69%	19%	35%	35%
Bombay Stock Exchange/National Stock Exchange	123	13%	37%	33%	12%	93%	11%	21%	34%
Philippine Stock Exchange	32	16%	22%	22%	3%	97%	13%	19%	33%
New York Stock Exchange	940	7%	36%	48%	22%	11%	20%	22%	33%
Hong Kong Stock Exchange	264	12%	20%	24%	5%	94%	6%	15%	32%

Stock exchange	Number of large companies	Employee turnover	Energy	GHGs	Injury rate	Payroll	Waste	Water	Disclosure Score (maximum: 50%)
Warsaw Stock Exchange	18	11%	28%	6%	6%	94%	11%	6%	31%
Shanghai Stock Exchange	358	4%	8%	6%	1%	96%	2%	5%	30%
Indonesia Stock Exchange	33	21%	21%	15%	9%	100%	0%	15%	29%
Nasdaq	392	4%	25%	39%	7%	17%	9%	9%	29%
Tel Aviv Stock Exchange	21	10%	19%	19%	10%	43%	10%	10%	29%
Dubai Financial Market	15	13%	13%	13%	13%	87%	13%	0%	27%
New Zealand Exchange	12	0%	33%	50%	8%	100%	0%	8%	26%
Kuwait Stock Exchange	18	17%	17%	11%	0%	72%	0%	11%	21%
Saudi Stock Exchange	42	0%	2%	7%	2%	79%	0%	2%	19%
Qatar Stock Exchange	26	4%	4%	4%	0%	77%	0%	4%	19%
Shenzhen Stock Exchange	88	0%	3%	0%	0%	99%	0%	1%	14%
Caracas Stock Exchange	12	0%	0%	25%	0%	58%	0%	0%	8%
Lima Stock Exchange	10	0%	0%	0%	0%	50%	0%	0%	4%

Disclosure Score

Once again, as noted in Figure 7 above, the Helsinki Stock Exchange led in terms of the Disclosure Score with strong disclosure rates across all seven first-generation indicators for the year 2014. It was the only exchange where all large listed companies disclosed energy, GHGs and waste for 2014; the disclosure of the remaining indicators is also high (payroll: 94%, injury rate: 88%, water: 82% and employee turnover: 59%).

It is also encouraging to note the BM&FBOVESPA as home to the second best overall disclosers of the seven indicators. As shown above, BM&FBOVESPA large companies are noted for the high disclosure of environmental metrics and employee turnover.

At the other end of the table, it is noted that with the exception of payroll, the disclosure rate of the seven indicators by large companies among those exchanges are worrying low – usually hovering around the 20% mark. Most importantly, disclosure growth rates among those same exchanges have historically been and remain among the weakest.

Disclosure Growth Score

The Taiwan Stock Exchange continued to impress with high growth in the disclosure of the seven indicators. In this year's research, it claimed the first spot in terms of overall disclosure growth with a notable increase in the disclosure of injury rate at a 54% annualized growth rate over the period 2010–14 followed by employee turnover (31%) and water (23%).

Stock exchanges based in emerging economies also continued to experience among the highest growth rates in the disclosure of the seven indicators, with the Bolsa Colombia and Mexican Stock Exchange experiencing, respectively, the second and third highest overall growth rates in the disclosure of the seven indicators; this is a phenomenon that was already noted in the prior editions of this report. The Shanghai Stock Exchange and the Stock Exchange of Thailand are the other stock exchanges that were among the top 10 exchanges with the highest overall disclosure growth rates. It is therefore not surprising to find stock exchanges based in emerging economies approaching the first quarter of the overall ranking as noted in the "Ranking" section on page 17.

The presence of the Euronext Paris and Euronext Amsterdam among the top 10 fastest-growing exchanges in terms of the disclosure of the seven indicators is remarkable because disclosure rates have historically already been on the high side; the fact that more and more large companies are engaging in the disclosure of the seven indicators indicates the presence of favourable socio-economic and regulatory factors that strongly support corporate sustainability disclosure.

Ranking

Figure 8: Disclosure growth, compound annualized growth rate, 2010–14

Stock exchange	Number of large companies	Employee turnover	Energy	GHGs	Injuries	Payroll	Waste	Water	Disclosure Growth Score (maximum: 20%)
Taiwan Stock Exchange	60	31%	20%	20%	54%	0%	16%	23%	18.0%
Bolsa Colombia	16	7%	34%	41%	100%	2%	14%	19%	17.9%
Mexican Stock Exchange	43	15%	18%	22%	9%	47%	17%	27%	17.9%
Hong Kong Stock Exchange	264	40%	16%	35%	19%	3%	7%	15%	17.7%
Toronto Stock Exchange	130	22%	7%	6%	20%	23%	11%	20%	17.6%
Shanghai Stock Exchange	358	6%	2%	117%	100%	8%	9%	3%	16.8%
Euronext Paris	130	15%	7%	8%	17%	3%	10%	9%	16.7%
Euronext Amsterdam	39	21%	3%	4%	27%	9%	4%	4%	16.2%
Stock Exchange of Thailand	36	41%	23%	26%	16%	0%	19%	21%	16.1%
Singapore Exchange	48	26%	17%	22%	200%	–4%	6%	21%	15.6%
Australian Securities Exchange	91	1%	7%	5%	11%	2%	12%	8%	15.6%
Borsa Istanbul	27	12%	12%	17%	57%	0%	26%	8%	15.4%
Deutsche Börse	102	8%	5%	5%	23%	2%	3%	4%	15.1%
Johannesburg Stock Exchange	51	5%	3%	3%	10%	2%	9%	6%	15.0%
New York Stock Exchange	940	20%	7%	12%	23%	0%	9%	10%	14.9%
Nasdaq	392	15%	12%	23%	32%	–1%	8%	6%	14.9%
BM&FBOVESPA	48	13%	2%	2%	19%	1%	9%	3%	14.9%
SIX Swiss Exchange	65	9%	1%	2%	32%	0%	4%	4%	14.5%
Helsinki Stock Exchange	17	6%	2%	3%	11%	3%	5%	2%	14.4%
Bursa Malaysia	40	3%	19%	24%	12%	1%	11%	0%	14.0%
Abu Dhabi Securities Exchange	10	19%	41%	57%	26%	0%	0%	41%	13.7%
BME Spanish Exchanges	47	10%	4%	5%	30%	3%	3%	–1%	13.6%
Moscow Exchange	49	3%	1%	39%	6%	6%	5%	–1%	13.3%
Borsa Italiana	55	1%	4%	8%	38%	2%	1%	0%	13.2%
Stockholm Stock Exchange	62	2%	1%	3%	32%	6%	7%	–2%	13.1%
Copenhagen Stock Exchange	25	14%	0%	1%	11%	1%	5%	6%	12.8%
Bombay Stock Exchange/National Stock Exchange	123	5%	–3%	8%	6%	2%	2%	10%	12.8%
London Stock Exchange	194	8%	2%	6%	17%	1%	0%	0%	12.7%
Tokyo Stock Exchange	412	12%	0%	0%	3%	1%	0%	1%	11.6%
Indonesia Stock Exchange	33	15%	0%	26%	14%	2%	0%	0%	10.0%
Wiener Börse	15	–16%	7%	0%	0%	5%	7%	7%	10.0%

Stock exchange	Number of large companies	Employee turnover	Energy	GHGs	Injuries	Payroll	Waste	Water	Disclosure Growth Score (maximum: 20%)
Philippine Stock Exchange	32	6%	15%	9%	0%	0%	0%	5%	9.4%
Euronext Brussels	28	35%	2%	−2%	3%	0%	−2%	4%	9.1%
Dubai Financial Market	15	100%	−18%	−29%	0%	2%	26%	0%	8.4%
Oslo Stock Exchange	12	19%	0%	0%	4%	0%	0%	11%	7.6%
Santiago Exchange	25	7%	−9%	−4%	9%	2%	0%	−7%	6.8%
Tel Aviv Stock Exchange	21	0%	0%	0%	100%	0%	19%	−10%	6.4%
Kuwait Stock Exchange	18	44%	−39%	−50%	0%	2%	0%	−47%	5.2%
New Zealand Exchange	12	0%	7%	5%	−16%	0%	0%	0%	5.2%
Shenzhen Stock Exchange	88	0%	0%	0%	0%	10%	0%	0%	3.8%
Saudi Stock Exchange	42	0%	−16%	11%	0%	−1%	0%	−16%	2.8%
Caracas Stock Exchange	12	0%	0%	0%	0%	−3%	0%	0%	1.1%
Lima Stock Exchange	10	0%	0%	0%	0%	−8%	0%	0%	1.0%
Warsaw Stock Exchange	18	0%	−4%	−33%	0%	0%	−10%	−24%	0.6%
Qatar Stock Exchange	26	−20%	−20%	−62%	0%	0%	0%	−62%	0.4%

Source: Bloomberg, Corporate Knights

Disclosure Timeliness Score

Disclosure timeliness measures how quickly companies report their sustainability-related performance information after the fiscal year-end. While the quantity and breadth of sustainability disclosure are important, the prompt availability of sustainability-related information is increasing in importance as more and more investors are integrating sustainability into their decision-making process; more specifically, many investors now integrate traditional financial information with sustainability-related information into their investment decision-making process, thus putting pressure on reporters to simultaneously release financial data and sustainability-related information.

The Australian Securities Exchange was found to be home to the fastest disclosers of corporate sustainability performance information in this year's study with 94% or 15 out of 16 of its qualifying companies having already released their sustainability performance data by April 1, 2016. The Australian Securities Exchange-listed large companies were already known to be fast disclosers because they were consistently among the top five in terms of disclosure timeliness over the past four rankings.

This year's top five by disclosure timeliness are completed by the Stockholm Stock Exchange (2015: 10th), the Euronext Amsterdam (2015: 2nd), Shanghai Stock Exchange (2015: 1st) and the London Stock Exchange (2015: 7th).

54%

The annualized increase in the disclosure of injury rate by large companies on the Taiwan Stock Exchange over the period 2010–14.

Ranking

Figure 9: Disclosure Timeliness Score

Stock exchange	Number of companies listed	Number of companies for timeliness	Percentage of qualifying companies that have disclosed sustainability data by April 1, 2016	Timeliness Score (maximum: 30%)	Average Bloomberg ESG Score
Australian Securities Exchange	91	16	94%	30.0%	38.8
Stockholm Stock Exchange	62	47	89%	29.5%	40.0
Euronext Amsterdam	39	29	86%	29.0%	43.0
Shanghai Stock Exchange	358	53	83%	28.5%	28.8
London Stock Exchange	194	109	83%	28.1%	36.5
Copenhagen Stock Exchange	25	17	82%	27.6%	37.3
Johannesburg Stock Exchange	51	10	80%	27.1%	39.4
Oslo Stock Exchange	12	9	78%	26.6%	45.2
Nasdaq	392	114	71%	26.1%	19.4
Bursa Malaysia	40	13	69%	25.6%	35.8
SIX Swiss Exchange	65	41	68%	25.1%	41.8
Deutsche Börse	102	57	61%	24.7%	38.8
Euronext Paris	130	98	61%	24.2%	47.1
Stock Exchange of Thailand	36	16	56%	23.2%	45.3
Singapore Exchange	48	16	56%	23.2%	33.2
Euronext Brussels	28	15	53%	22.2%	43.1
New York Stock Exchange	940	384	52%	21.8%	26.5
Hong Kong Stock Exchange	264	72	51%	21.3%	29.7
BME Spanish Exchanges	47	36	50%	20.8%	41.2
Indonesia Stock Exchange	33	11	45%	20.3%	28.8
Helsinki Stock Exchange	17	17	41%	19.8%	47.1
Mexican Stock Exchange	43	23	39%	19.4%	39.1
Toronto Stock Exchange	130	73	36%	18.9%	32.4
Borsa Italiana	55	36	31%	18.4%	47.7
Tokyo Stock Exchange	412	31	29%	17.9%	36.3
Santiago Exchange	25	12	17%	17.4%	23.6
BM&FBOVESPA	48	39	15%	16.9%	33.2
Moscow Exchange	49	31	13%	16.4%	29.0
Bolsa Colombia	16	13	8%	15.5%	28.6

Stock exchange	Number of companies listed	Number of companies for timeliness	Percentage of qualifying companies that have disclosed sustainability data by April 1, 2016	Timeliness Score (maximum: 30%)	Average Bloomberg ESG Score
Abu Dhabi Securities Exchange	10	6	0%	0.0%	5.8
Caracas Stock Exchange	12	1	0%	0.0%	–
Dubai Financial Market	15	2	0%	0.0%	–
Borsa Istanbul	27	17	0%	0.0%	–
Kuwait Stock Exchange	18	3	0%	0.0%	–
Lima Stock Exchange	10	N/A	N/A	0.0%	–
Bombay Stock Exchange/National Stock Exchange	123	4	0%	0.0%	38.4
New Zealand Exchange	12	N/A	N/A	0.0%	–
Philippine Stock Exchange	32	7	0%	0.0%	46.5
Qatar Stock Exchange	26	2	0%	0.0%	16.2
Saudi Stock Exchange	42	4	0%	0.0%	32.2
Shenzhen Stock Exchange	88	3	0%	0.0%	25.8
Taiwan Stock Exchange	60	50	0%	0.0%	–
Tel Aviv Stock Exchange	21	4	0%	0.0%	–
Wiener Börse	15	8	0%	0.0%	34.3
Warsaw Stock Exchange	18	5	0%	0.0%	16.5

Source: Bloomberg, Corporate Knights

Of the qualifying exchanges, the three with the poorest Disclosure Timeliness Score were the Tel Aviv Stock Exchange, Wiener Börse and the Warsaw Stock Exchange, where none of their qualifying large listings had disclosed any sustainability data within six months of their fiscal year-end.

On average, 53% of the 1,554 qualifying large companies included in our study had disclosed sustainability performance within six months of their fiscal year-end. As examples of good practice, companies such as Novartis and Novo Nordisk consistently publish sustainability-related information along with financial information within five weeks of their respective fiscal year-ends.

IT APPEARS THAT LARGE COMPANIES ARE PRIORITIZING THE DISCLOSURE OF ENVIRONMENTAL METRICS AT THE EXPENSE OF SOCIAL OR EMPLOYEE-RELATED PERFORMANCE METRICS.

Beyond Disclosure: Powering Decision-Making With Sustainability Performance Data

In the previous section, we have noted the slow progress made over the past five years by large companies around the world in the disclosure of sustainability-related performance data. We tracked seven of the most widely used such quantitative indicators – energy, GHGs, water, waste, employee turnover, injury rate and payroll. For instance, it was found that 47% of the 4,281 large companies included in this year's research disclosed GHGs for the year 2014. While this is not ideal it is still possible to conduct some robust analysis with the available set of sustainability data being made public by the reporting companies.

In this fifth edition of this research report, we are presenting a number of key performance indicators on a per-exchange basis based on publicly disclosed sustainability data that are intended mainly to inform investment decision-making. Such key performance indicators are useful not only for the responsible investor but also for all investors in general because corporate environmental and social performance – a reflection of risk mitigation strategies – is increasingly becoming a proxy for long-term financial sustainability. This section is also meant to serve as an illustration of how sustainability data can be turned into meaningful indicators of performance and made available in a user-friendly way to investors.[15]

Carbon intensity

The availability of publicly available GHGs data allowed us to assess the carbon intensity of the large listed companies for each of the 45 stock exchanges included in our research. Carbon intensity for a given company is defined as the scope 1 and 2 GHGs in metric tons divided by sales in millions of U.S. dollars. For a given exchange, the carbon intensity of each large listed company is weighted according to its market capitalization to arrive at the "weighted carbon intensity" of the stock exchange; the lower the carbon intensity, the less exposed the exchange is to risks associated with the ongoing shift to a low-carbon economy.

As shown in Figure 10 below, the Qatar Stock Exchange is, on a weighted basis, the most carbon-intensive stock exchange of the 45 exchanges studied, with 2,033 metric tons of GHGs per million of revenue in U.S. dollars in 2014. This may in part be due to the lack of industrial diversification whereby at least 10 of the 26 large listed Qatari companies are in the energy, chemicals and heavy industrial sectors.

The top three most carbon-intensive exchanges are completed by the Bursa Malaysia (1,375 metric tons of GHGs per million of revenue in U.S. dollars in 2014) and the Dubai Financial Market (751 metric tons of GHGs per million of revenue in U.S. dollars in 2014).

15. https://corporateknights.shinyapps.io/CarbonFootprintAnalyzer_Testing4/

Figure 10: Top 10 stock exchanges with the highest carbon intensity, 2014

Stock exchange	Number of large companies	Weighted carbon intensity (tCO_2e scope 1 & 2) per US$1 million of sales, 2014
Qatar Stock Exchange	26	2,033
Bursa Malaysia	40	1,375
Dubai Financial Market	15	751
Bolsa Colombia	16	710
Warsaw Stock Exchange	18	612
Lima Stock Exchange	10	549
Bombay Stock Exchange/ National Stock Exchange	123	460
Saudi Stock Exchange	42	421
Johannesburg Stock Exchange	51	405
Stock Exchange of Thailand	36	404

Fossil fuel reserves intensity

Fossil fuel reserves data allows us to calculate the potential carbon emissions should the developed and undeveloped fossil fuel reserves of the companies be extracted and consumed. The fossil fuel reserves intensity indicator is calculated by dividing the potential carbon emissions content of reported fossil fuel reserves of a given company by its market capitalization at the end of 2014. A high figure indicates that a higher proportion of the stock exchange market valuation is dependent on fossil fuel reserves. For a given exchange, the sum of the potential carbon emission from fossil fuel reserves is divided by the sum of market capitalization at the end of 2014.

This metric is especially crucial for long-term investment decision-making. With the ongoing effort to curb carbon emissions to prevent global temperatures from rising by more than two degrees Celsius and the rise of renewable energy sources, companies with substantial fossil fuel reserves run the risk that these reserves will never be exploited, with a potentially severe negative impact on their market valuation. The fossil fuel reserves intensity indicator therefore acts as a key long-term gauge of carbon-related financial risk.

Figure 11 below shows that the Moscow Exchange's potential carbon emissions in metric tons per US$1 million of market capitalization as at December 31, 2014, of 211,364 was the highest among the stock exchanges assessed in this research, followed by the Tokyo Stock Exchange (100,482 metric tons per US$1 million) and the Oslo Stock Exchange (11,242 metric tons per US$1 million).

Figure 11: Top 10 stock exchanges with the highest fossil fuel reserves intensity, 2014

Stock exchange	Number of large companies	Fossil fuel reserves intensity (tCO_2e potential emissions) per US$1 million of market capitalization
Moscow Exchange	49	211,364
Tokyo Stock Exchange	412	100,482
Oslo Stock Exchange	12	11,242
BM&FBOVESPA	48	7,716
Bolsa Colombia	16	6,467
Wiener Börse	15	6,104
Toronto Stock Exchange	130	5,860
Borsa Italiana	55	5,137
London Stock Exchange	194	3,760
Hong Kong Stock Exchange	264	2,802

Investing in the new economy

Sustainability performance disclosure permits the identification of companies that are involved in renewable energy, energy-smart technologies, carbon capture and storage, and carbon markets ("green revenues") and allows us to determine the extent to which their revenues are generated from these activities. By extension, it is also possible to determine which stock exchange is home to the large companies with the highest exposure to green revenues.

Based on Bloomberg New Energy Finance (BNEF)[16] data, companies are classified into four categories according to the percentage of their total revenues being derived from green revenues. Figure 12 below shows the number of large companies that are classified in any one of the four categories. Green revenue as a percentage of total revenue is also shown on an aggregated basis for each stock exchange. For instance, the analysis showed that the New Zealand Exchange has the highest percentage of total large company revenues coming from green sources (9.1%). It is followed by the Copenhagen Stock Exchange and the BME Spanish Exchanges.

Figure 12: Top 10 stock exchanges by green revenues, number of large companies and as a percentage of total revenue

Stock exchange	Number of large companies	Number of companies deriving green revenues as a percentage of total, 2014				Green revenue as a percentage of total revenue, 2014
		More than 0% and less than 10%	10–24%	25–49%	50% and above	
New Zealand Exchange	12	4	1	2	0	9.1%
Copenhagen Stock Exchange	25	7	1	0	2	9.0%
BME Spanish Exchanges	47	30	3	1	2	6.8%
Wiener Börse	15	8	0	2	0	6.8%
Euronext Brussels	28	16	0	1	0	6.0%
Singapore Exchange	48	13	3	0	0	5.7%
Tokyo Stock Exchange	412	203	17	2	0	5.4%
Borsa Italiana	55	31	3	0	0	5.3%
Deutsche Börse	102	51	6	2	1	5.3%
BM&FBOVESPA	48	34	3	1	2	4.9%

16. http://about.bnef.com/

Overlapping brown companies

Extending the above analysis, Figure 13 below adds the number of "brown" companies as well as the percentage of revenues from such brown companies out of total revenue for 2014. Brown companies are defined as all those companies that are involved in non-renewable energy and utility companies with at least 30% of generation capacity from thermal coal.

As the world economy is slowly transitioning toward a low-carbon one, companies with significant involvement in the production and use of high-carbon-emitting sources of energy may be exposed to considerable downside financial risk over the long term.

Warsaw Stock Exchange-traded large companies were found to derive 70.3% of their total revenue from brown activities, the highest among all 45 stock exchanges included in this research, followed by the Moscow Exchange and the Oslo Stock Exchange. It is important to note that in the cases of the Deutsche Börse, Euronext Amsterdam, the Nasdaq and the Stockholm Stock Exchange, the percentage of green revenues outpaced brown revenues in 2014.

Figure 13: Top 10 stock exchanges by brown revenues, 2014

Stock exchange	Number of large companies	Brown revenue as a percentage of total revenue, 2014	Number of brown companies	Green revenue as a percentage of total revenue, 2014
Warsaw Stock Exchange	18	70.3%	5	4.5%
Moscow Exchange	49	68.1%	14	4.1%
Oslo Stock Exchange	12	58.6%	2	4.7%
Stock Exchange of Thailand	36	47.9%	4	4.1%
Bombay Stock Exchange/ National Stock Exchange	123	37.5%	11	4.7%
Bolsa Colombia	16	37.3%	1	4.3%
Wiener Börse	15	32.0%	1	6.8%
London Stock Exchange	194	28.4%	6	4.7%
Hong Kong Stock Exchange	264	28.3%	13	4.1%
BM&FBOVESPA	48	24.2%	3	4.9%

Capital expenditure

While the distinction between green and brown companies was made in the previous sections, these assessments were made based on the current breakdown of the companies' activities and assets but offer no indication of the direction being taken by those companies. For instance, it is possible for an electric utility company that is currently producing electricity primarily from thermal coal to be making significant investments in wind and solar energy capacity such that, in a number of years, this company will be able to transition from being a brown company into a green company. Such investments are captured in part by the capital expenditures of a company, and Figure 14 below shows the top 10 exchanges by percentage of brown capital expenditure as a percentage of total in millions of U.S. dollars for 2014; to provide further context, green capital expenditure as a percentage of total is also shown.

Absent disclosure to the contrary, we assume that all capital expenditures by a brown company are toward investments in the extraction and use of fossil fuel sources, while a green company would primarily invest in renewable energy technologies and capacity. Based on such an assumption, Figure 14 reveals that, in most cases, capital expenditure by brown companies (presumably on the extraction and use of fossil fuel sources) outstrips that of green companies. Our analysis also revealed a few exceptions where the green capital expenditures were higher than brown capital expenditures, such as in the cases of the Euronext Amsterdam (4.6% versus 2.4%), the Indonesia Stock Exchange (11.3% versus 2.8%), the Philippine Stock Exchange (13.6% versus 9.2%), the BME Spanish Exchanges (10.2% versus 6.9%), the Tokyo Stock Exchange (9.3% versus 3.9%) and the Deutsche Börse (6.6% versus 3.7%).[17]

Unfortunately, as long as there are no standards requiring companies in relevant sectors to break down capital expenditure (for example, a green/brown rubric), it makes it difficult for investors to determine the direction being taken by companies. We therefore urge that the necessary action be taken to encourage companies to become more transparent and break down their capital expenditure amounts into the types of assets being funded.

Figure 14: Top 10 stock exchanges with highest brown capital expenditure as a percentage of total by type of companies

Stock exchange	Number of large companies	Total capital expenditure by green companies (US$ millions), 2014	As a percentage of total capital expenditure, 2014	Total capital expenditure by brown companies (US$ millions), 2014	As a percentage of total capital expenditure, 2014	Total capital expenditure (US$ millions)
Moscow Exchange	49	–	0.0%	145,689	81.6%	178,449
Oslo Stock Exchange	12	–	0.0%	20,367	77.0%	26,447
Warsaw Stock Exchange	18	–	0.0%	7,598	73.4%	10,354
Bolsa Colombia	16	–	0.0%	4,474	58.4%	7,666
Stock Exchange of Thailand	36	265	1.5%	8,634	50.4%	17,117
Toronto Stock Exchange	130	616	0.5%	60,778	49.1%	123,767
BM&FBOVESPA	48	234	0.3%	35,612	48.8%	72,947
Wiener Börse	15	753	7.1%	5,093	47.8%	10,653
Bombay Stock Exchange/ National Stock Exchange	123	–	0.0%	24,168	42.3%	57,164
New York Stock Exchange	940	27,420	3.3%	337,525	40.1%	842,702

17. Note that this analysis, as for all the analysis in this entire report, is based only on publicly traded entities; privately owned and state-owned non-listed enterprises are thus not included in this report.

Conclusion

While the disclosure of the seven indicators is rising on an absolute basis, still a minority – 47% of the world's large listed companies – reported GHGs for 2014; five years ago, the percentage stood at 33%. This means that in five years, the disclosure of GHGs, arguably the most heavily tracked sustainability-related indicator, rose by only 40%.

The persistently low reporting rates in sustainability information stand at odds with the transition toward a low-carbon world that is gaining momentum and with the increasing investor appetite for the integration of corporate sustainability information into investment decision-making. The concern is that a considerable portion of the world's economic activity remains unseen in terms of GHG emissions and sustainability performance in general.

As evidenced by the fact that a number of stock exchanges have remained persistently in the lower half of the ranking over the full five editions of this annual ranking, it appears that the large companies listed on those exchanges are continually resisting all calls to engage in sustainability reporting; targeted and customized efforts to address the factors that are the cause of such resistance in these exchanges may be beneficial. Smaller and GICS financial sector companies have the biggest disclosure gaps and may require additional targeted measures.

Bright spots in this year's ranking, however, include the encouraging progress made by the North American exchanges and, most importantly, four stock exchanges based in emerging countries – the Stock Exchange of Thailand, the Bursa Malaysia, the BM&FBOVESPA and the Mexican Stock Exchange. These are inspiring examples of good practice that can serve to educate policy-makers in other jurisdictions in terms of fostering corporate sustainability disclosure.

Carefully designed and targeted policies and initiatives as well as concerted effort by all market actors can therefore bring about the intended outcomes so as to strengthen and speed up the transition to the low-carbon world.

Appendix A. Detailed Methodology

Ranking model. Stock exchanges were ranked on three measures:

(i) The Disclosure Score (50% weight). The Disclosure Score measures the proportion of large listings that disclosed the seven first-generation indicators in 2014. First, the percentage of large companies trading on a given stock exchange that disclosed a given indicator in 2014 is determined. This is done for all 45 exchanges analyzed. Second, the 45 resulting percentages are percentage-rank scored, with the highest percentage receiving the highest score. This is repeated for each of the remaining six indicators. Finally, an exchange's Disclosure Score is a simple average of the seven percentage-rank scores. The indicators are equally weighted in terms of their contribution to the Disclosure Score.

(ii) The Disclosure Growth Score (20% weight). The Disclosure Growth Score measures the growth rate in the proportion of large listings that disclosed the seven first-generation indicators over the 2010–14 period (20% weight). First, the annualized compound growth rate in the disclosure of a given indicator is calculated for the period 2010–14. This is done for all 45 exchanges analyzed. Second, the resulting 45 annualized compound growth rates are percentage-rank scored, with the highest percentage receiving the highest score. This is repeated for each of the remaining six indicators. Finally, an exchange's Disclosure Growth Score is a simple average of the seven percentage-rank scores.

(iii) The Disclosure Timeliness Score (30% weight). The Disclosure Timeliness Score measures how quickly companies report sustainability data to the market after the end of their fiscal year. First, from our universe of 4,469 companies, we removed all the ones that had not disclosed any first-generation sustainability data in 2014. From the remaining companies, we considered the ones that had a fiscal year-end from September 30, 2015, to date. If a given stock exchange had fewer than 10 companies remaining after applying the above screens, it was discarded from the analysis. Second, for each of the remaining exchanges, we looked at the existence of publicly disclosed sustainability data as at April 1, 2016 (six months after year-end) on a per-exchange basis. Third, the percentage of companies that disclosed sustainability data was calculated. This is done for all eligible exchanges. Finally, the percentage values are percentage-rank scored; these are the Disclosure Scores. The Timeliness Score is arrived at by considering all large companies on a given exchange with a fiscal year-end of September 30, 2015, to date and after (the "qualifying companies"), then calculated the proportion that had disclosed at least one of the first-generation indicators (excluding payroll) by April 1, 2016. This process is repeated for all 45 stock exchanges included in the research universe. To maintain statistical significance, any stock exchange with fewer than 10 qualifying companies is not assessed on the timeliness indicator.

In the event the Disclosure Timeliness Score cannot be calculated for a given stock exchange, that stock exchange will be scored on the Disclosure Score (70%) and Disclosure Growth Score (30%).

Let's consider an illustrative example:

Assume that stock exchange ABC is one of the 45 exchanges included in our analysis. Stock exchange ABC had 100 large listings as of April 1, 2016. Sixteen of these listings disclosed their 2014 employee turnover rate, 61 disclosed their energy, 58 disclosed their GHG emissions, 11 disclosed their injury rate, 89 disclosed their payroll, 17 disclosed their waste and none disclosed their water. The exchange's disclosure rates are:

Indicator	Disclosure rate
Employee turnover	16%
Energy	61%
GHGs	58%
Injury rate	11%
Payroll	89%
Waste	17%
Water	0%

Assume that ABC was the best among all 45 exchanges in terms of the disclosure of energy, GHG, payroll and waste and the worst in terms of employee turnover, injury rate and water.

The resulting percentage-rank scores are:

Indicator	Percentage-rank scores
Employee turnover	0%
Energy	100%
GHGs	100%
Injury rate	0%
Payroll	100%
Waste	100%
Water	0%

ABC's Disclosure Score is therefore the simple average of the above percentage-rank scores times a weight of 50%; i.e., the Disclosure Score is 29%.

In terms of disclosure growth, assume that over the period 2010–14, the disclosure of each one of the seven indicators grew at an annualized compound rate as per the table below:

Indicator	Annualized compound growth rate
Employee turnover	12%
Energy	48%
GHGs	50%
Injury rate	–10%
Payroll	0%
Waste	5%
Water	0%

Assume further that ABC had the best growth rate among all 45 exchanges for energy and GHGs, the median growth rate for employee turnover and the worst growth rate for injury rate, payroll, waste and water. The resulting percentage-rank scores for disclosure growth are as follows:

Indicator	Percentage-rank scores
Employee turnover	50%
Energy	100%
GHGs	100%
Injury rate	0%
Payroll	0%
Waste	0%
Water	0%

The Disclosure Growth Score for ABC is the simple average of the above scores times a weight of 20%; i.e., the Disclosure Growth Score is 7%.

Finally, in terms of disclosure timeliness, assume that out of the 100 large companies that traded on ABC exchange on April 1, 2016, 70 had a September 30, 2015, to date inclusive year-end. Furthermore, as at April 1, 2016, five of these 70 companies (7%) had already disclosed their sustainability performance data.

Compared to the remaining 44 exchanges, ABC had the second lowest percentage of its large companies with a qualifying year-end that had disclosed sustainability data by April 1, 2016. This results in a percentage-rank score of 2%.

ABC's Disclosure Timeliness Score is therefore the above 2% times a weight of 30%; i.e., the Disclosure Timeliness Score is 1%.

The sum of ABC's Disclosure Score (29%), Disclosure Growth Score (7%) and Disclosure Timeliness Score (1%) is 37%, the Overall Score.

If 37% is the third lowest Overall Score among all 45 exchanges, ABC is placed 43rd out of 45 in the ranking.

Exchange size. While exchanges with fewer than 10 large company listings were eliminated from the ranking, exchanges that met this cut-off were treated equally.

Exchange characteristics. Exchange characteristics such as ownership structure or the degree of autonomy that exchanges have to implement listing requirements were not analyzed.

Sector composition. The sector composition of each exchange's large listings was not taken into account. Exchanges that are home to a disproportionately large share of companies in industries known to have strong disclosure practices, such as the mining industry, may have been advantaged in our ranking.

Bloomberg data conventions. All data is subject to the data collection methodologies employed by Bloomberg. For instance, Bloomberg discards a small but unspecified number of data points in its ESG database that do not meet quality control thresholds. While the merits of Bloomberg's quality control process are obvious, it means that Bloomberg's ESG database is not a complete representation of global reporting trends on the seven first-generation indicators.

Bloomberg data fields.

First-generation sustainability indicator	Global Reporting Initiative (GRI 3.1) indicator	Bloomberg ESG field	Disclosure rate, 2013	Reporting rationale
Employee turnover	LA2	(i) Percentage employee turnover	12%	Low employee turnover is often correlated with effective human capital management and talent retention, which are well-established returns drivers in many sectors.
Energy	EN3, EN4	(i) Total energy use; (ii) total electricity use; (iii) CDP fuel use; and (iv) CDP electricity use	37%	Energy use can be an important proxy for firm-wide resource use efficiency and an increasingly important cost centre for companies in many industries.
GHGs	EN16	(i) Total GHG emissions; (ii) total CO_2 emissions; (iii) scope 3 GHG emissions; (iv) CDP scope 1 emissions globally; (v) CDP scope 2 emissions globally; and (vi) CDP reported CO_2	37%	The prospect of carbon regulation is leading to a growing monetization of GHG externalities, with the concept of carbon shadow pricing an increasingly utilized accounting tool.
Injury rate	LA7	(i) Lost-time incident rate; and (ii) personal injury frequency rate	10%	Workplace health and safety can be a useful proxy for management quality.
Payroll	LA3	(i) Personnel expenses	60%	Pay equity is an increasingly visible sustainability theme, with tightening rules around workforce and CEO pay disclosure and greater vigilance about excessive CEO compensation. Payroll also provides insight to how well a company is positioned to retain and attract the best human talent.
Waste	EN22	(i) Total waste; (ii) waste recycled; and (iii) waste landfilled	20%	Waste generated per unit of revenue can be an insightful measure of operational efficiency.
Water	EN8	(i) Total water use; (ii) water withdrawal; (iii) surface water withdrawal; (iv) total water discharge; and (v) recycled water	22%	Water is an increasingly scarce global resource, and a firm's water use practices can reflect management foresight.

Source: The Global Reporting Initiative, Bloomberg, Corporate Knights

Disclosure timeliness. Exchanges that could not be assigned a Disclosure Timeliness Score were scored only on the Disclosure Score and Disclosure Growth Score with revised weights of 70% and 30%, respectively.

Notwithstanding these limitations, this year's ranking is based on a clear and objective set of criteria and allows for transparent benchmarking of sustainability disclosure across the world's stock exchanges.

Appendix B. Disclosure Rates (2010–14) by Stock Exchange and Indicator

Employee turnover

Stock exchange	Number of large companies – April 1, 2016	2010	2011	2012	2013	2014	CAGR
Abu Dhabi Securities Exchange	10	20%	30%	30%	30%	40%	19%
Australian Securities Exchange	91	19%	19%	19%	18%	20%	1%
BM&FBOVESPA	48	42%	46%	40%	42%	69%	13%
BME Spanish Exchanges	47	32%	45%	40%	38%	47%	10%
Bolsa Colombia	16	19%	13%	13%	25%	25%	7%
Bombay Stock Exchange/National Stock Exchange	123	11%	9%	9%	11%	13%	5%
Borsa Istanbul	27	19%	26%	11%	15%	30%	12%
Borsa Italiana	55	36%	38%	31%	35%	38%	1%
Bursa Malaysia	40	18%	18%	15%	20%	20%	3%
Caracas Stock Exchange	12	0%	0%	0%	0%	0%	0%
Copenhagen Stock Exchange	25	28%	36%	36%	40%	48%	14%
Deutsche Börse	102	34%	37%	36%	38%	46%	8%
Dubai Financial Market	15	0%	0%	0%	7%	13%	100%
Euronext Amsterdam	39	21%	23%	33%	26%	44%	21%
Euronext Brussels	28	11%	21%	14%	29%	36%	35%
Euronext Paris	130	34%	39%	39%	46%	60%	15%
Helsinki Stock Exchange	17	47%	53%	53%	53%	59%	6%
Hong Kong Stock Exchange	264	3%	5%	8%	8%	12%	40%
Indonesia Stock Exchange	33	12%	18%	30%	33%	21%	15%
Johannesburg Stock Exchange	51	39%	47%	49%	47%	47%	5%
Kuwait Stock Exchange	18	0%	6%	0%	6%	17%	44%
Lima Stock Exchange	10	10%	0%	0%	0%	0%	0%
London Stock Exchange	194	20%	23%	23%	23%	26%	8%
Mexican Stock Exchange	43	9%	12%	19%	16%	16%	15%
Moscow Exchange	49	29%	37%	31%	31%	33%	3%
Nasdaq	392	2%	3%	3%	3%	4%	15%
New York Stock Exchange	940	4%	4%	4%	5%	7%	20%

Appendix B. Disclosure Rates (2010–14) by Stock Exchange and Indicator

Employee turnover

Stock exchange	Number of large companies – April 1, 2016	2010	2011	2012	2013	2014	CAGR
New Zealand Exchange	12	0%	0%	8%	0%	0%	0%
Oslo Stock Exchange	12	25%	33%	33%	33%	50%	19%
Philippine Stock Exchange	32	13%	9%	9%	9%	16%	6%
Qatar Stock Exchange	26	0%	8%	0%	4%	4%	–20%
Santiago Exchange	25	24%	32%	20%	24%	32%	7%
Saudi Arabia Exchange	42	2%	2%	2%	0%	0%	0%
Shanghai Stock Exchange	358	3%	4%	3%	3%	4%	6%
Shenzhen Stock Exchange	88	0%	1%	1%	1%	0%	0%
Singapore Exchange	48	13%	15%	13%	21%	31%	26%
SIX Swiss Exchange	65	28%	29%	32%	38%	38%	9%
Stock Exchange of Thailand	36	8%	11%	14%	22%	33%	41%
Stockholm Stock Exchange	62	35%	37%	35%	32%	39%	2%
Taiwan Stock Exchange	60	18%	22%	27%	33%	53%	31%
Tel Aviv Stock Exchange	21	0%	0%	0%	10%	10%	0%
Tokyo Stock Exchange	412	1%	2%	2%	1%	2%	12%
Toronto Stock Exchange	130	11%	12%	13%	16%	24%	22%
Warsaw Stock Exchange	18	11%	11%	6%	11%	11%	0%
Wiener Börse	15	27%	13%	13%	20%	13%	–16%

Energy

Stock exchange	Number of large companies – April 1, 2016	2010	2011	2012	2013	2014	CAGR
Abu Dhabi Securities Exchange	10	10%	20%	30%	30%	40%	41%
Australian Securities Exchange	91	53%	57%	65%	63%	68%	7%
BM&FBOVESPA	48	75%	77%	79%	75%	81%	2%
BME Spanish Exchanges	47	68%	70%	72%	74%	79%	4%
Bolsa Colombia	16	25%	31%	56%	63%	81%	34%
Bombay Stock Exchange/National Stock Exchange	123	41%	41%	46%	46%	37%	–3%
Borsa Istanbul	27	37%	37%	44%	48%	59%	12%
Borsa Italiana	55	53%	58%	58%	62%	62%	4%
Bursa Malaysia	40	15%	18%	23%	25%	30%	19%
Caracas Stock Exchange	12	0%	0%	0%	0%	0%	0%
Copenhagen Stock Exchange	25	68%	68%	64%	64%	68%	0%
Deutsche Börse	102	50%	52%	55%	57%	60%	5%
Dubai Financial Market	15	0%	0%	20%	7%	13%	–18%
Euronext Amsterdam	39	62%	67%	74%	72%	69%	3%
Euronext Brussels	28	50%	54%	50%	46%	54%	2%
Euronext Paris	130	61%	63%	73%	71%	78%	7%
Helsinki Stock Exchange	17	94%	94%	88%	100%	100%	2%
Hong Kong Stock Exchange	264	11%	13%	20%	16%	20%	16%
Indonesia Stock Exchange	33	21%	18%	24%	21%	21%	0%
Johannesburg Stock Exchange	51	69%	67%	80%	75%	78%	3%
Kuwait Stock Exchange	18	0%	0%	44%	6%	17%	–39%
Lima Stock Exchange	10	20%	20%	20%	0%	0%	0%
London Stock Exchange	194	71%	74%	76%	73%	77%	2%
Mexican Stock Exchange	43	26%	35%	44%	40%	49%	18%
Moscow Exchange	49	35%	41%	59%	39%	37%	1%
Nasdaq	392	16%	17%	21%	21%	25%	12%
New York Stock Exchange	940	27%	29%	32%	35%	36%	7%

Appendix B. Disclosure Rates (2010–14) by Stock Exchange and Indicator

Energy

Stock exchange	Number of large companies – April 1, 2016	2010	2011	2012	2013	2014	CAGR
New Zealand Exchange	12	25%	33%	50%	42%	33%	7%
Oslo Stock Exchange	12	75%	75%	75%	75%	75%	0%
Philippine Stock Exchange	32	13%	13%	19%	22%	22%	15%
Qatar Stock Exchange	26	0%	8%	27%	4%	4%	–20%
Santiago Exchange	25	40%	32%	36%	24%	28%	–9%
Saudi Stock Exchange	42	5%	5%	17%	2%	2%	–16%
Shanghai Stock Exchange	358	7%	9%	14%	8%	8%	2%
Shenzhen Stock Exchange	88	3%	2%	2%	1%	3%	0%
Singapore Exchange	48	19%	27%	31%	33%	35%	17%
SIX Swiss Exchange	65	62%	68%	71%	71%	65%	1%
Stock Exchange of Thailand	36	19%	25%	25%	36%	44%	23%
Stockholm Stock Exchange	62	69%	68%	71%	68%	73%	1%
Taiwan Stock Exchange	60	35%	47%	52%	57%	73%	20%
Tel Aviv Stock Exchange	21	19%	24%	29%	19%	19%	0%
Tokyo Stock Exchange	412	62%	64%	66%	64%	63%	0%
Toronto Stock Exchange	130	44%	47%	52%	57%	57%	7%
Warsaw Stock Exchange	18	33%	33%	28%	28%	28%	–4%
Wiener Börse	15	40%	53%	53%	53%	53%	7%

GHGs

Stock exchange	Number of large companies – April 1, 2016	2010	2011	2012	2013	2014	CAGR
Abu Dhabi Securities Exchange	10	10%	20%	30%	30%	60%	57%
Australian Securities Exchange	91	57%	60%	67%	64%	70%	5%
BM&FBOVESPA	48	69%	69%	73%	75%	75%	2%
BME Spanish Exchanges	47	66%	68%	72%	74%	79%	5%
Bolsa Colombia	16	19%	25%	56%	63%	75%	41%
Bombay Stock Exchange/National Stock Exchange	123	24%	26%	32%	32%	33%	8%
Borsa Istanbul	27	30%	33%	41%	44%	56%	17%
Borsa Italiana	55	45%	51%	55%	62%	62%	8%
Bursa Malaysia	40	13%	15%	20%	23%	30%	24%
Caracas Stock Exchange	12	0%	0%	0%	0%	25%	0%
Copenhagen Stock Exchange	25	68%	68%	72%	68%	72%	1%
Deutsche Börse	102	51%	51%	51%	53%	62%	5%
Dubai Financial Market	15	0%	0%	27%	13%	13%	–29%
Euronext Amsterdam	39	64%	62%	74%	72%	74%	4%
Euronext Brussels	28	50%	54%	50%	43%	46%	–2%
Euronext Paris	130	58%	62%	72%	72%	80%	8%
Helsinki Stock Exchange	17	88%	88%	88%	100%	100%	3%
Hong Kong Stock Exchange	264	7%	8%	16%	13%	24%	35%
Indonesia Stock Exchange	33	6%	3%	15%	12%	15%	26%
Johannesburg Stock Exchange	51	71%	73%	80%	76%	80%	3%
Kuwait Stock Exchange	18	0%	0%	44%	6%	11%	–50%
Lima Stock Exchange	10	20%	10%	20%	0%	0%	0%
London Stock Exchange	194	75%	77%	83%	89%	95%	6%
Mexican Stock Exchange	43	21%	23%	35%	28%	47%	22%
Moscow Exchange	49	8%	16%	53%	22%	31%	39%
Nasdaq	392	17%	18%	21%	23%	39%	23%
New York Stock Exchange	940	31%	31%	35%	37%	48%	12%

Appendix B. Disclosure Rates (2010–14) by Stock Exchange and Indicator

GHGs

Stock exchange	Number of large companies – April 1, 2016	2010	2011	2012	2013	2014	CAGR
New Zealand Exchange	12	42%	33%	50%	42%	50%	5%
Oslo Stock Exchange	12	75%	75%	75%	75%	75%	0%
Philippine Stock Exchange	32	16%	16%	19%	22%	22%	9%
Qatar Stock Exchange	26	0%	0%	27%	0%	4%	–62%
Santiago Exchange	25	24%	24%	32%	20%	20%	–4%
Saudi Stock Exchange	42	5%	5%	17%	2%	7%	11%
Shanghai Stock Exchange	358	0%	1%	7%	1%	6%	117%
Shenzhen Stock Exchange	88	1%	1%	1%	0%	0%	0%
Singapore Exchange	48	19%	23%	31%	31%	42%	22%
SIX Swiss Exchange	65	62%	63%	71%	68%	68%	2%
Stock Exchange of Thailand	36	17%	19%	22%	33%	42%	26%
Stockholm Stock Exchange	62	68%	68%	73%	71%	76%	3%
Taiwan Stock Exchange	60	38%	45%	52%	57%	78%	20%
Tel Aviv Stock Exchange	21	19%	14%	29%	19%	19%	0%
Tokyo Stock Exchange	412	65%	66%	67%	66%	67%	0%
Toronto Stock Exchange	130	49%	50%	58%	61%	62%	6%
Warsaw Stock Exchange	18	28%	28%	22%	22%	6%	–33%
Wiener Börse	15	53%	53%	47%	47%	53%	0%

Injury rate

Stock exchange	Number of large companies – April 1, 2016	2010	2011	2012	2013	2014	CAGR
Abu Dhabi Securities Exchange	10	0%	10%	0%	10%	20%	26%
Australian Securities Exchange	91	35%	34%	33%	36%	53%	11%
BM&FBOVESPA	48	19%	19%	15%	19%	38%	19%
BME Spanish Exchanges	47	13%	17%	13%	17%	36%	30%
Bolsa Colombia	16	0%	0%	0%	19%	38%	100%
Bombay Stock Exchange/National Stock Exchange	123	10%	10%	7%	11%	12%	6%
Borsa Istanbul	27	4%	4%	7%	0%	22%	57%
Borsa Italiana	55	11%	11%	13%	11%	40%	38%
Bursa Malaysia	40	13%	13%	13%	20%	20%	12%
Caracas Stock Exchange	12	0%	0%	0%	0%	0%	0%
Copenhagen Stock Exchange	25	32%	28%	24%	28%	48%	11%
Deutsche Börse	102	18%	20%	21%	18%	40%	23%
Dubai Financial Market	15	0%	0%	0%	0%	13%	0%
Euronext Amsterdam	39	21%	21%	23%	33%	54%	27%
Euronext Brussels	28	25%	25%	25%	21%	29%	3%
Euronext Paris	130	27%	32%	32%	34%	50%	17%
Helsinki Stock Exchange	17	59%	59%	59%	53%	88%	11%
Hong Kong Stock Exchange	264	2%	2%	2%	3%	5%	19%
Indonesia Stock Exchange	33	0%	6%	6%	9%	9%	14%
Johannesburg Stock Exchange	51	18%	16%	18%	14%	25%	10%
Kuwait Stock Exchange	18	0%	0%	0%	0%	0%	0%
Lima Stock Exchange	10	0%	0%	0%	0%	0%	0%
London Stock Exchange	194	21%	22%	22%	23%	39%	17%
Mexican Stock Exchange	43	12%	12%	12%	7%	16%	9%
Moscow Exchange	49	16%	18%	20%	18%	20%	6%
Nasdaq	392	2%	2%	2%	3%	7%	32%
New York Stock Exchange	940	10%	11%	11%	12%	22%	23%

Appendix B. Disclosure Rates (2010–14) by Stock Exchange and Indicator

Injury rate

Stock exchange	Number of large companies – April 1, 2016	2010	2011	2012	2013	2014	CAGR
New Zealand Exchange	12	17%	0%	17%	17%	8%	–16%
Oslo Stock Exchange	12	50%	50%	50%	50%	58%	4%
Philippine Stock Exchange	32	3%	3%	0%	0%	3%	0%
Qatar Stock Exchange	26	0%	0%	0%	0%	0%	0%
Santiago Exchange	25	20%	20%	20%	4%	28%	9%
Saudi Stock Exchange	42	0%	0%	0%	0%	2%	0%
Shanghai Stock Exchange	358	0%	0%	0%	0%	1%	100%
Shenzhen Stock Exchange	88	0%	0%	0%	0%	0%	0%
Singapore Exchange	48	0%	0%	2%	0%	19%	200%
SIX Swiss Exchange	65	12%	12%	12%	15%	37%	32%
Stock Exchange of Thailand	36	14%	14%	8%	19%	25%	16%
Stockholm Stock Exchange	62	13%	13%	10%	13%	39%	32%
Taiwan Stock Exchange	60	10%	12%	10%	20%	57%	54%
Tel Aviv Stock Exchange	21	0%	0%	0%	5%	10%	100%
Tokyo Stock Exchange	412	9%	9%	8%	7%	10%	3%
Toronto Stock Exchange	130	15%	18%	17%	19%	30%	20%
Warsaw Stock Exchange	18	0%	0%	0%	0%	6%	0%
Wiener Börse	15	13%	13%	13%	7%	13%	0%

Payroll

Stock exchange	Number of large companies – April 1, 2016	2010	2011	2012	2013	2014	CAGR
Abu Dhabi Securities Exchange	10	90%	90%	90%	90%	90%	0%
Australian Securities Exchange	91	75%	77%	77%	81%	82%	2%
BM&FBOVESPA	48	94%	98%	96%	98%	98%	1%
BME Spanish Exchanges	47	85%	94%	91%	96%	96%	3%
Bolsa Colombia	16	75%	81%	88%	88%	81%	2%
Bombay Stock Exchange/National Stock Exchange	123	88%	89%	89%	94%	93%	2%
Borsa Istanbul	27	100%	96%	85%	100%	100%	0%
Borsa Italiana	55	84%	84%	80%	84%	89%	2%
Bursa Malaysia	40	93%	95%	98%	98%	95%	1%
Caracas Stock Exchange	12	67%	67%	50%	33%	58%	–3%
Copenhagen Stock Exchange	25	88%	92%	92%	92%	92%	1%
Deutsche Börse	102	82%	83%	85%	84%	89%	2%
Dubai Financial Market	15	80%	67%	73%	73%	87%	2%
Euronext Amsterdam	39	64%	67%	62%	77%	90%	9%
Euronext Brussels	28	89%	93%	89%	93%	89%	0%
Euronext Paris	130	85%	87%	88%	88%	95%	3%
Helsinki Stock Exchange	17	82%	88%	88%	88%	94%	3%
Hong Kong Stock Exchange	264	84%	88%	93%	93%	94%	3%
Indonesia Stock Exchange	33	94%	100%	100%	100%	100%	2%
Johannesburg Stock Exchange	51	67%	67%	63%	71%	73%	2%
Kuwait Stock Exchange	18	67%	72%	72%	72%	72%	2%
Lima Stock Exchange	10	70%	50%	40%	40%	50%	–8%
London Stock Exchange	194	86%	89%	86%	86%	89%	1%
Mexican Stock Exchange	43	7%	19%	19%	19%	33%	47%
Moscow Exchange	49	73%	78%	88%	90%	94%	6%
Nasdaq	392	17%	17%	17%	17%	17%	–1%
New York Stock Exchange	940	11%	11%	11%	11%	11%	0%

Appendix B. Disclosure Rates (2010–14) by Stock Exchange and Indicator

Payroll

Stock exchange	Number of large companies – April 1, 2016	2010	2011	2012	2013	2014	CAGR
New Zealand Exchange	12	100%	100%	100%	92%	100%	0%
Oslo Stock Exchange	12	75%	75%	67%	75%	75%	0%
Philippine Stock Exchange	32	97%	97%	94%	91%	97%	0%
Qatar Stock Exchange	26	77%	77%	77%	77%	77%	0%
Santiago Stock Exchange	25	84%	88%	92%	92%	92%	2%
Saudi Arabia Stock Exchange	42	83%	86%	83%	71%	79%	–1%
Shanghai Stock Exchange	358	70%	77%	92%	92%	96%	8%
Shenzhen Stock Exchange	88	67%	75%	95%	93%	99%	10%
Singapore Exchange	48	81%	79%	81%	79%	69%	–4%
SIX Swiss Exchange	65	82%	80%	82%	80%	83%	0%
Stock Exchange of Thailand	36	97%	97%	100%	100%	97%	0%
Stockholm Stock Exchange	62	71%	74%	77%	79%	90%	6%
Taiwan Stock Exchange	60	93%	93%	93%	93%	95%	0%
Tel Aviv Stock Exchange	21	43%	43%	43%	43%	43%	0%
Tokyo Stock Exchange	412	78%	79%	80%	81%	82%	1%
Toronto Stock Exchange	130	8%	8%	6%	13%	18%	23%
Warsaw Stock Exchange	18	94%	94%	94%	94%	94%	0%
Wiener Börse	15	67%	67%	67%	67%	80%	5%

Waste

Stock exchange	Number of large companies – April 1, 2016	2010	2011	2012	2013	2014	CAGR
Abu Dhabi Securities Exchange	10	0%	0%	10%	0%	10%	0%
Australian Securities Exchange	91	24%	26%	33%	26%	38%	12%
Stock Exchange of Thailand	36	17%	17%	17%	22%	33%	19%
BM&FBOVESPA	48	48%	54%	56%	50%	67%	9%
BME Spanish Stock Exchanges	47	53%	55%	64%	62%	60%	3%
Bolsa Colombia	16	19%	31%	50%	38%	31%	14%
Bombay Stock Exchange/National Stock Exchange	123	11%	11%	13%	15%	11%	2%
Borsa Istanbul	27	15%	22%	19%	15%	37%	26%
Borsa Italiana	55	45%	47%	45%	44%	47%	1%
Bursa Malaysia	40	10%	10%	13%	10%	15%	11%
Caracas Stock Exchange	12	0%	0%	0%	0%	0%	0%
Copenhagen Stock Exchange	25	40%	40%	44%	44%	48%	5%
Deutsche Börse	102	42%	42%	41%	41%	48%	3%
Dubai Financial Market	15	0%	7%	20%	13%	13%	26%
Euronext Amsterdam	39	44%	49%	49%	41%	51%	4%
Euronext Brussels	28	43%	50%	43%	43%	39%	–2%
Euronext Paris	130	39%	47%	52%	54%	57%	10%
Helsinki Stock Exchange	17	82%	88%	76%	88%	100%	5%
Hong Kong Stock Exchange	264	5%	5%	11%	6%	6%	7%
Indonesia Stock Exchange	33	0%	0%	6%	3%	0%	0%
Johannesburg Stock Exchange	51	20%	22%	27%	24%	27%	9%
Kuwait Stock Exchange	18	0%	0%	39%	0%	0%	0%
Lima Stock Exchange	10	10%	10%	20%	0%	0%	0%
London Stock Exchange	194	42%	44%	40%	36%	42%	0%
Mexican Stock Exchange	43	16%	19%	33%	26%	30%	17%
Moscow Exchange	49	35%	45%	63%	47%	43%	5%
Nasdaq	392	6%	6%	7%	5%	9%	8%
New York Stock Exchange	940	14%	15%	16%	17%	20%	9%

Appendix B. Disclosure Rates (2010–14) by Stock Exchange and Indicator

Waste

Stock exchange	Number of large companies – April 1, 2016	2010	2011	2012	2013	2014	CAGR
New Zealand Exchange	12	8%	8%	17%	8%	0%	0%
Oslo Stock Exchange	12	50%	50%	50%	50%	50%	0%
Philippine Stock Exchange	32	13%	13%	16%	16%	13%	0%
Qatar Stock Exchange	26	0%	0%	27%	0%	0%	0%
Santiago Exchange	25	24%	24%	28%	16%	24%	0%
Saudi Arabia Exchange	42	0%	0%	12%	0%	0%	0%
Shanghai Stock Exchange	358	1%	1%	8%	2%	2%	9%
Shenzhen Stock Exchange	88	0%	0%	0%	0%	0%	0%
Singapore Exchange	48	15%	15%	23%	17%	19%	6%
SIX Swiss Exchange	65	35%	37%	45%	37%	42%	4%
Stockholm Stock Exchange	62	29%	31%	35%	34%	39%	7%
Taiwan Stock Exchange	60	33%	37%	40%	40%	60%	16%
Tel Aviv Stock Exchange	21	5%	0%	14%	5%	10%	19%
Tokyo Stock Exchange	412	54%	56%	56%	54%	54%	0%
Toronto Stock Exchange	130	17%	19%	22%	21%	25%	11%
Warsaw Stock Exchange	18	17%	17%	17%	11%	11%	–10%
Wiener Börse	15	20%	20%	27%	27%	27%	7%

Water

Stock exchange	Number of large companies – April 1, 2016	2010	2011	2012	2013	2014	CAGR
Abu Dhabi Securities Exchange	10	10%	20%	30%	30%	40%	41%
Australian Securities Exchange	91	30%	29%	35%	31%	41%	8%
BM&FBOVESPA	48	60%	67%	56%	50%	69%	3%
BME Spanish Exchanges	47	62%	62%	68%	64%	60%	–1%
Bolsa Colombia	16	25%	31%	50%	50%	50%	19%
Bombay Stock Exchange/National Stock Exchange	123	15%	15%	20%	18%	21%	10%
Borsa Istanbul	27	30%	30%	30%	22%	41%	8%
Borsa Italiana	55	49%	51%	47%	51%	49%	0%
Bursa Malaysia	40	15%	13%	13%	15%	15%	0%
Caracas Stock Exchange	12	0%	0%	0%	0%	0%	0%
Copenhagen Stock Exchange	25	44%	48%	48%	48%	56%	6%
Deutsche Börse	102	39%	44%	44%	40%	45%	4%
Dubai Financial Market	15	0%	0%	20%	0%	0%	0%
Euronext Amsterdam	39	44%	46%	54%	44%	51%	4%
Euronext Brussels	28	39%	46%	43%	43%	46%	4%
Euronext Paris	130	45%	51%	60%	59%	64%	9%
Helsinki Stock Exchange	17	76%	88%	76%	82%	82%	2%
Hong Kong Stock Exchange	264	8%	8%	15%	11%	15%	15%
Indonesia Stock Exchange	33	15%	15%	15%	15%	15%	0%
Johannesburg Stock Exchange	51	37%	37%	39%	33%	47%	6%
Kuwait Stock Exchange	18	0%	0%	39%	0%	11%	–47%
Lima Stock Exchange	10	10%	10%	20%	0%	0%	0%
London Stock Exchange	194	38%	41%	40%	34%	38%	0%
Mexican Stock Exchange	43	16%	21%	35%	35%	42%	27%
Moscow Exchange	49	47%	57%	67%	47%	45%	–1%
Nasdaq	392	7%	6%	8%	6%	9%	6%
New York Stock Exchange	940	15%	15%	20%	18%	22%	10%

Appendix B. Disclosure Rates (2010–14) by Stock Exchange and Indicator

Water

Stock exchange	Number of large companies – April 1, 2016	2010	2011	2012	2013	2014	CAGR
New Zealand Exchange	12	0%	0%	8%	0%	8%	0%
Oslo Stock Exchange	12	33%	42%	42%	42%	50%	11%
Philippine Stock Exchange	32	16%	13%	16%	19%	19%	5%
Qatar Stock Exchange	26	0%	0%	27%	4%	4%	–62%
Santiago Exchange	25	32%	32%	32%	20%	24%	–7%
Saudi Stock Exchange	42	5%	5%	17%	2%	2%	–16%
Shanghai Stock Exchange	358	5%	6%	11%	6%	5%	3%
Shenzhen Stock Exchange	88	1%	0%	0%	0%	1%	0%
Singapore Exchange	48	17%	27%	29%	35%	35%	21%
SIX Swiss Exchange	65	38%	38%	46%	45%	45%	4%
Stock Exchange of Thailand	36	19%	19%	19%	31%	42%	21%
Stockholm Stock Exchange	62	39%	37%	40%	35%	35%	–2%
Taiwan Stock Exchange	60	27%	35%	28%	38%	62%	23%
Tel Aviv Stock Exchange	21	14%	10%	24%	14%	10%	–10%
Tokyo Stock Exchange	412	51%	53%	54%	53%	53%	1%
Toronto Stock Exchange	130	15%	17%	19%	22%	31%	20%
Warsaw Stock Exchange	18	17%	17%	17%	11%	6%	–24%
Wiener Börse	15	20%	27%	33%	27%	27%	7%

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