CHAPTER 4

Seeking Greener Pastures: Exploring the Impact for Investors of ESG Integration in the Infrastructure Asset Class

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4.1 Introduction

Achieving the UN Sustainable Development Goals (SDGs) by 2030 is estimated to cost $4.5 trillion a year. When much needed additional infrastructure investment is added, this figure rises to $7 trillion annually (Neto and Riva 2015). Governments alone do not have the capital required to make these investments. Private investment will be needed, particularly in infrastructure development. But what kind of investment and what type of infrastructure will private investors embrace?

In recent years the conditions for infrastructure investment, particularly sustainable infrastructure investments, have become especially favorable (Kaminker 2016). Investors are becoming increasingly interested in sustainable infrastructure projects which promote positive social and environmental impact together with long-term, stable financial returns. This growing movement of responsible investment in infrastructure was initially brought about by social and public interest concerns. In particular,

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researchers have identified a growing need for sustainable infrastructure which addresses current environmental concerns (Sims et al. 2015). Moreover, the potential for infrastructure to positively impact employment on a national and local level, as well as to improve quality of life in underserved communities, has served to highlight the major social impacts which infrastructure can have (Ibid.).

Responsible investment has, over the past few decades, proven to be a fast-growing movement in the field of investment decision-making. Growth rates in the field of responsible investment have been high, with the Global Sustainable Investment Alliance finding that assets under the management of sustainable investment funds enjoyed a growth rate of more than 33% between 2014 and 2016 (Global Sustainable Investment Alliance 2017). Responsible investments are long term in nature and seek to reduce risk and achieve positive financial return by taking environmental, social, and governance (ESG) factors into account. In the past, such considerations were applied primarily to public equity investments, but increasingly investors are applying this lens to other asset classes. One of the asset classes which is new to ESG scrutiny is infrastructure.

These long-term 'responsible investors' are most often pension funds (including many Canadian pension funds which pioneered investment in infrastructure assets, beginning in the 1990s) and sovereign wealth funds, who must match their long-term liabilities against the assets in their portfolio. Initially, these funds entered into investment in infrastructure through limited partnerships in private equity-like structures. They simply provided capital, took returns and left management decisions to the fund's general partner. But this structure proved costly to investors and by the early 2000s, these funds began to find greater opportunities by investing directly in the asset itself and maintaining a long-term interest in its operation (Clark et al. 2011). Canadian pension fund managers are increasingly finding that investment in infrastructure projects meet their investment criteria and asset characteristics and are excellent assets for inclusion in their portfolios. In most cases these assets are held for a long term, particularly as these infrastructure investment opportunities are increasingly structured as design/build/finance/operate (DBFO) projects.

As a result, infrastructure assets have become long-term holdings for these funds. Canada's trusteed pension funds currently hold assets in excess of $1.7 trillion (Statistics Canada 2016). The ten largest pension funds collectively managed approximately $1.1 trillion (CPP Investment Board 2016). Given the long-term nature of these holdings, taking ESG into

account in this asset class raises project standards and reduces risks over time. These risks may include the social and environmental risks posed by pipelines, water systems, transportation corridors, and energy systems, among others (United Nations Environmental Programme 2015). The long-term holding period required in infrastructure investment means that investors who incorporate ESG requirements into this asset class benefit from reduced risk over the life cycle of the infrastructure asset and may also see their infrastructure assets outperform those selected through traditional investment decision-making processes. Risks that may be mitigated through the application of ESG analyses to infrastructure investment includes environmental accidents, community and social backlash, workplace accidents, and inefficient management. All too often project delays that could be reduced through higher ESG standards add to project costs and reduce cash flows. By mitigating these risks through the evaluation of projects on environmental, social, and governance metrics, investors can ensure a more reliable cash flow from the asset. As investors move from short-term positions in the infrastructure asset class to longer term development and ownership of the asset, these considerations have taken on greater weight than in the past.

This chapter draws on a series of interviews with individuals involved with ESG integration in the infrastructure asset class, for insight into how this key component of the financial system is taking sustainability into account in investment selection and what is needed to strengthen this process. The chapter also looks at the growing need to focus on ESG issues when making long-term infrastructure investment decisions in order to derive both financial and socio-ecological benefits. The chapter opens with a review of the existing literature, followed by a more detailed examination of the Canadian infrastructure marketplace and insights drawn from our interviews. Given the role private investment in infrastructure will play in achieving the UN Sustainability Development Goals, the chapter concludes with implications for sustainable financial systems going forward.

4.2 Understanding the Infrastructure Asset Class

The failure to take ESG sufficiently into account in the infrastructure asset class is an example of the inefficient market hypothesis (Lo 2008; Shleifer 2000; Shiller 2003). This occurs because the life-time costs associated with low ESG standards have not been fully factored into the initial price of an asset, thus creating an information asymmetry[1] between the buyer and the

seller of the product (Akerlof 1970; Stiglitz 2000). In many cases, the investor must look to the overall life-cycle costs and benefits of the infrastructure investment, in order to see the full benefit of the ESG consideration that may have an initial higher cost than the alternative but saves money over time. Therefore, in order for investors to fully understand the value of taking long-term ESG factors into consideration, more information needs to be available to the investor about the investment opportunity.

Inefficient market theory is designed as a counter to the efficient market hypothesis (EMH), which suggests that current stock prices fully reflect all available information about a company or an investment, and therefore there is no way to improve profits through the use of data on the company or its investment performance (Clarke et al. 2001). An efficient market assumes that there are large numbers of rational investors actively competing with one another, with each attempting to garner as much information as possible (Fama 1965). These rational investors compete in a market in which relevant information is freely available to all participants, thereby providing the tools to allow them to make rational choices (Ibid.). Although there may be some random price fluctuations as a result of reasonable investors disagreeing on the value of a security, the rational competition of these investors will ensure that prices will not stray far from their intrinsic values (Ibid.).

And yet, there is now significant evidence to show that the current prices of many investments do not adequately account for all information. In particular, data regarding ESG metrics and risks is often unavailable, or if available, it is not reflected in the price of the investment (Van Dijk et al. 2012; Naumer et al. 2011). Failure to incorporate ESG factors into an investment can expose investors to significant risks (Van Dijk et al. 2012). These risks are varied, and can include environmental accidents, corruption and governance scandals, as well as potential labor and community unrest (Ibid.).

An example of the type of ESG risks to which investors can be exposed to is seen in the 2010 British Petroleum (BP) oil spill (Clark et al. 2015). This spill cost BP approximately $90 billion in cleanup costs and led to a 50 percent drop in BP's share price between April 20, 2010, and June 29, 2010, as well as continued stock underperformance in the years following the spill (Ibid.). What is significant about this incident is that organizations which monitored ESG performance in companies had expressed concerns regarding BP's performance on environmental safety and community relations issues as early as five years before the spill occurred. This means that investors who factor in ESG data would have been better able to anticipate

and proactively respond to the risks identified in BP's organizational and environmental practices (Ibid.).

Exposure to ESG risks can often be more acute in emerging markets, where limited regulation and poor ESG disclosure can lead to severe problems in company and project performance on ESG metrics (Van Dijk et al. 2012). In these markets, an increased up-front investment in sustainability measures, which leads to lower emissions and better climate change resiliency, can often pay off in the long run in the form of efficiency improvements and wider economic benefits (Bhattacharya et al. 2012). These benefits can include improved energy security, better safety, cleaner operating methods, and stronger environmental performance and pollution control in these nations (Ibid.). Despite the fact that ESG factors can have major impacts on investment performance across all classes (Naumer et al. 2011), historically, this category of risk has not been adequately included in traditional investment analysis (Responsible Investment Association 2012).

A 2012 study by Deutsche Bank group found that companies which account for ESG factors experience superior risk-adjusted returns in securities and stocks (Fulton et al. 2012). A 2015 review of over 200 academic sources and studies corroborated this finding, noting that 90 percent of companies with strong sustainability standards had experienced lower costs when accessing capital (Clark et al. 2015). Furthermore, 88 percent of these companies with strong ESG standards had also experienced improved operational performance, as compared to companies with weak ESG performance standards. The review also found that 80 percent of the studies documented a positive correlation between strong ESG performance and improved financial market performance (Ibid.).

In many cases, improved operational performance has been traced back to specific elements of the ESG paradigm. A 2010 study found that firms with better ecological efficiency standards and governance procedures experienced improved returns on assets (Guenster et al. 2010). Social aspects, such as racial diversity in a firm's workforce, have also been found to have positive impacts on operational performance (Richard et al. 2007). Notably, a 2013 study found that a portfolio consisting of firms which scored high on an aggregate sustainability index, which measured adoption of social and environmental CSR policies, tended to outperform a portfolio consisting of firms which scored low on this index (Eccles et al. 2013). All these factors point to improved financial and market performance by companies which adopt strict ESG standards. These studies show that in a firm, high ESG standard and strong financial returns are not mutually exclusive, but rather

mutually supportive. This would also suggest the possibility that high ESG standards in infrastructure could lead to improved financial returns, if the same principles continue to hold in the area of infrastructure. Furthermore, these findings indicate that short-term market pricing does not always reflect the true, long-term value of an investment, thereby suggesting that markets may not be fully rational in their assignment of prices.

Even if markets did take into account all relevant information, the human mental capacity is limited and is subject to a concept known as "bounded rationality" (Simon 1990). This constraint often prevents human beings from attaining full rationality due to a limited capacity to learn and remember information about the market (Mullainathan and Thaler 2000). Any prediction or statement regarding human behavior must therefore recognize this biological constraint (Simon 1990). The concept of bounded rationality suggests that in order to account for the limited human processing capacity of investors, ESG information and metrics must be simple enough for investors to meaningfully engage with them.

There is also likely a need to counter some existing biases and preconceptions held by investors which prevent them from adopting more rigorous ESG standards in their decision-making. A study by the CFA Institute found that one of the main reasons some investors decline to incorporate ESG analyses into their decision-making is due to their belief that ESG factors do not add value to investments and are therefore not material to investment decision, even though the US SEC now requires that ESG factors be included in filings, as material (CFA Institute 2015). Another important reason why ESG factors were not included in decision-making was the perception that there was a lack of demand from clients and investors for this type of analysis, and a belief that it was not possible to incorporate ESG factors into quantitative models (Ibid.). These biases and preconceptions are largely unfounded, as the materiality and value added of ESG factors are demonstrated not only by the superior performance of companies that account for ESG factors, as measured by their improved risk-adjusted returns in securities and stocks (Fulton et al. 2012), but also, in the infrastructure context, by the reduced owner operating costs of sustainable infrastructure over multiyear periods (Bouton et al. 2015). With regards to the perception that there is a lack of demand among investors and clients for ESG analyses, this assumption is refuted both by the growth in assets managed under ESG criteria (Global Sustainable Investment Alliance 2017), and by our interviews with members of the ESG infrastructure community, in which they indicated that demand for ESG infrastructure

measurements was increasing among investors in both the public and private sectors. Concerns over incorporating ESG factors into quantitative models are gradually being addressed by new products and tools on the market, such as GRESB, Envision,[2] and Autocase,[3] which attempt to provide a means to incorporate ESG factors into quantitative analyses of infrastructure. According to the model of Behavioral Economics, these biases and preconceptions will need to be addressed in order to ensure more widespread incorporation of ESG factors into investment decision-making.

Incorporating ESG factors into infrastructure investment decisions will require the adoption of a more long-term perspective than investors may be accustomed to. In most cases, initial costs for the creation of sustainable infrastructure, and sustainable neighborhoods, are higher than the costs incurred in the construction of traditional infrastructure (Bouton et al. 2015; Qureshi 2015). However, the financial benefits of these sustainable investments are generally spread out over a longer period of time and are accrued primarily as a result of monetary savings emanating from increased efficiency of operation, and decreased risk factors (Bouton et al. 2015). The increased efficiency of sustainable infrastructure can lead to savings in energy and water consumption (Ibid.). As a result of these efficiencies, the annual owner operating costs of sustainable infrastructure are often lower than that of traditional infrastructure, meaning that, within three to five years, the overall return on sustainable infrastructure will come to match or outperform the returns of traditional infrastructure (Ibid.).

Of course, the benefits of applying ESG metrics to infrastructure investment decisions go well beyond financial considerations alone. By accounting for ESG factors in their infrastructure investment decisions, investors can play a role in the crucial work of decoupling economic growth from environmental degradation, a process which the United Nations believes will be vital in ensuring sustainable economic growth in the future (Swilling et al. 2013). The reduced resource consumption of sustainable infrastructure projects provides not only financial benefits, but also ecological benefits, by helping to alleviate pressure on the finite resources of the earth (United Nations Environmental Programme 2015). Most infrastructure projects occur within the contexts of cities, which present their own challenges and opportunities. Poverty and social exclusion continue to be major urban problems, particularly in lesser developed nations, and urban areas which consume approximately 75 percent of the world's natural resources, and create 60–80 percent of global CO_2 emissions (United Nations

Environmental Programme 2012). With the rapid growth of cities, particularly in the developing world, there is a risk that these urban problems will continue to worsen without the mitigating effects of environmentally sustainable infrastructure design (Cities Climate Finance Leadership Alliance 2015).

In total, it is estimated that approximately $93 trillion worth of low-emission, climate-resilient infrastructure will need to be built over the next 15 years (Ibid.). Any sustainable infrastructure strategy for cities will require a plan for urban densification (United Nations Habitat for Humanity 2012). In the past, cities have all too often selected infrastructure which contributes to urban sprawl and congestion, as opposed to a more sustainable path of integrated, densely populated communities (Ibid.). In order to ensure that reproductive and ecologically buffering non-urban land is not negatively impacted by urban population growth, cities will need to begin to choose strategies of "building up" rather than "building out" (Ibid.).

Choosing sustainable infrastructure over "business as usual" infrastructure need not be an expensive proposition for these cities and may, according to The New Climate Economy Commission, cost only an extra $4 trillion over the next 15 years (2014). This up-front investment can be recouped over time in the form of risk dividends and efficiency savings (Bielenberg et al. 2016). By allowing cities to begin to transition to cleaner, more sustainable economies, sustainable infrastructure can have profound impacts on pressing global issues such as climate change (Swilling et al. 2013). One important consequence of infrastructure can be the influence it exerts on the consumption patterns and behaviors of a city's population (United Nations Habitat for Humanity 2011). By controlling urban sprawl through densification strategies, and by investing in infrastructure for mass transit, cities can help to mitigate climate change by discouraging environmentally unfriendly modes of transportation, such as driving cars, in favor of more sustainable modes of transportation, such as buses and rail (Ibid.).

The ecological benefits of sustainable infrastructure are important when we consider the pressing need for action to combat global climate change. There is a general scientific consensus that, in order to prevent catastrophic climate change, average global temperatures must not be allowed to rise more than 2 C above pre-industrial levels (World Wildlife Foundation 2012). In order to have a reasonable chance of preventing such a rise in temperature, global carbon emissions must not exceed 870 gigatons of CO_2 between 2009 and 2100 (Ibid.). However, without significant changes to increase the sustainability and environmental performance of cities, urban

areas will generate 460 gigatons of CO_2 in the next three decades alone, pushing global environmental targets off track (Ibid.). A particular contributor to these emissions will be, under a business-as-usual scenario, the construction and usage of urban residential and transportation infrastructure (Ibid.). The requirement for cities, particularly in the developing world, to expand their infrastructure, combined with the need to find solutions to prevent catastrophic climate change, a key UN SDG, means that there is a necessity to begin to guide capital investments toward environmentally sustainable infrastructure (Ibid.).

If sustainable infrastructure is to be treated as its own asset class, there is a need for standardized procedures and for stronger regulations in the infrastructure market (United Nations Environmental Programme 2015). There is also an increased recognition of the need for transparent monitoring and reporting of both the risk levels of infrastructure investments, and the distinct financial features of infrastructure as an asset class (Ibid.). Many potential institutional investors indicated that the lack of information about the performance expectations in the infrastructure asset class is a barrier to their further investment in this area (Standard & Poor's 2014).

4.3 Infrastructure Needs and Investment in Canada

Over the past 50 years, there has been a general decline in Canadian federal government ownership of public infrastructure, as well as a transfer of ownership and funding responsibility between the various levels of government (federal, provincial, and municipal). In 1955, the Canadian federal government owned 44 percent of public infrastructure, the Canadian provinces owned 34 percent and municipalities 22 percent (Mackenzie 2013). Today, provincial, territorial, and municipal governments own and maintain approximately 95 percent of Canada's infrastructure (Flaherty 2013). The federal government provides infrastructure development funding to provincial/territorial governments and municipalities across Canada through federal departments such as Infrastructure Canada. A recent study on the roles and responsibilities of the three levels of government for Infrastructure in Canada suggests "when it comes to Canada's physical infrastructure, the federal government has the money; the provincial governments have the constitutional authority; and local governments (municipalities) have the responsibility for making the actual investments" (Mackenzie 2013).

In the past 20 years, both federal and provincial governments have handed over infrastructure responsibilities to municipal governments

without a matching increase in funding. Municipalities in Canada are responsible for over 60 percent of the country's infrastructure but collect just 8 cents of every tax dollar paid in Canada, with the other 92 cents of tax revenue going to federal and provincial/territorial governments (Federation of Canadian Municipalities 2014). This has resulted in an ever-increasing infrastructure "gap" (or deficit) of $123 billion which is growing at a rate of $2 billion every year (Ibid.). A study by the Canada West Foundation estimated that while the accumulated infrastructure deficit in Canada stands at $123 billion for existing infrastructure, an additional $110 billion is needed for new infrastructure (Ibid.).

Today, municipalities are faced with a problem of aging infrastructure and declining investment in infrastructure. Simply put, Canadian municipalities lack the means to sustain their current infrastructure. It is worth noting that almost all current infrastructure funding is restricted to road improvements, public transit, water, and wastewater projects. There is a chronic underfunding for all other infrastructure needs. A 2013 study by the Canadian Chamber of Commerce estimated that the magnitude of investment needed to address Canada's infrastructure deficit could be as high as $570 billion (Friendship Bay Consulting 2013). This is in addition to a report by the Association of Consulting Engineers of Canada which estimated that 50 percent of public infrastructure in Canada will reach the end of its utility by 2027 (Broadhead et al. 2014). It is therefore evident that increased levels of private investments are needed to address this problem.

The federal government, in 2016, proposed a $186 billion investment over the next 12 years in Canadian infrastructure, including a $35 billion investment in an Infrastructure Bank that will try to leverage three to four times that amount from private investment. On the other side of the equation, Canadian pension fund managers are increasingly finding that investment in infrastructure projects meet their investment criteria and asset characteristics and are excellent assets for inclusion in their portfolios. In most cases these assets are held for the long term, particularly as these infrastructure investment opportunities are increasingly structured as design/build/finance/operate (DBFO) projects.

Canada's trusteed pension funds currently hold assets in excess of $1.7 trillion (Statistics Canada 2016). The ten largest pension funds collectively manage approximately $1.1 trillion (CPP Investment Board 2016). In recent years, Canadian pension funds have invested in some of the largest infrastructure deals in the world such as the operator of seven UK airports including Heathrow, one of the largest electricity transmission and

distribution companies in the USA, and three Chilean water utilities (Broadhead et al. 2014). In 2016, Quebec's Caisse de dépôt et placement du Québec announced its intention to invest $3 billion in a proposed $5 billion light rail system for Montreal. In 2011, a Canadian pension fund, OPSEU Pension Trust, invested $969 million in infrastructure (7.1 percent of the total fund value) and received a 29.6 percent return on investment (OPSEU Pension Trust 2012).

Sustainable infrastructure provides a good investment opportunity (see Appendix for list of international pension funds that invest in infrastructure). In addition to integrating ESG in this asset class, there are three other characteristics associated with sustainable infrastructure which makes it appealing to prospective investors. These are: (a) the strong reward-to-risk ratio,[4] (b) low volatility (cash flow), and (c) duration. Infrastructure is a good asset class for liability matching.

Since pension funds tend to have long-term and relatively stable excepted payments to beneficiaries, infrastructure investments can match inflation-linked stable returns with the liabilities they face in the future. Also, infrastructure has a low correlation with other markets and therefore adds diversification thereby reducing a portfolio's total risk. The expected return on investment for infrastructure investments, as with any investment, is directly correlated with the risk of the project. A recent study conducted by the Institute for Research on Public Policy found that the return on investment for infrastructure investments can be anywhere between 17 and 25 percent (Friendship Bay Consulting 2013). Given the infrastructure gap in Canada as detailed above, there are ample opportunities for infrastructure investments.

Similar to the Canadian federal government's attempts to encourage private investment in infrastructure, Australia too has adopted a novel approach to effectively leverage the domestic investment community and pension fund industry. In 2011 the Financial Services Council of Australia undertook a review of Australia's pension industry's appetite for investment in public infrastructure. The review suggested that the Australian government should adopt a formal policy of 'recycling' infrastructure assets. Under this policy the federal government would review operating assets held by the government, identify those that could be sold or recycled, and use the proceeds to build and finance infrastructure. The approach includes attracting pension funds to invest in core infrastructure projects, in particular brownfield projects with a strong operating history (Fenn 2014). In July 2014, the Australian government created the Asset Recycle Fund to

fund infrastructure projects (Infrastructure Growth Package—Asset Recycling Fund).

The United Kingdom introduced a National Infrastructure Plan in 2010. This plan sets out a broad vision for the United Kingdom's infrastructure needs. Under this plan, the government specifies the country's infrastructure needs, provides a comprehensive framework for evaluating and prioritizing infrastructure investments across the country, identifies barriers to investment, and mobilizes both public and private resources (Broadhead et al. 2014).

4.4 Stakeholder Perspectives

In the summer of 2016, structured key informant interviews were conducted with individuals who have been involved with ESG integration in infrastructure investment. Interviewees were sent the interview questions in advance and were invited to participate in one to one telephone interviews. The interview questions generally focused on the specific performance of various ESG products, as well as on broader questions regarding the future direction of the sustainable investment field and the sustainability performances of various discrete economic sectors. Our goal was to learn from the experiences of these individuals in the field and gain a better understanding of investors' reactions to, and the financial results of, infrastructure investments that included high ESG standards.

The overall picture that emerged from the interviews was a sense of cautious optimism regarding the future of ESG infrastructure investment. Although growth in both the uptake of ESG measurement products and ESG infrastructure investments more broadly has not always been quick, it has been steady. Increasingly, investors are recognizing the need for a paradigm shift in infrastructure investment, one that will account for environmental and social risk factors over the long term, thereby ensuring stronger long-term returns. As investors gradually begin to move from a short-term to a long-term focus, ESG factors are increasingly being accounted for. This shift is aided by various products, software, and rating systems, such as Autocase (2017) and Envision (2017), which help investors to visualize and calculate ESG factors and long-term returns. Nonetheless, obstacles continue to exist which serve to delay the full adoption of ESG standards in infrastructure investment decisions. The obstacles identified by interviewees reflect those found in the recent literature on this topic (United Nations Environmental Programme 2015). These include the lack of

standardization of ESG measurements, lack of a clear definition of sustainable infrastructure as an asset class, and the need to further educate investors on the implications of solutions such as private–public partnerships (P3s). Furthermore, established incentive structures often continue to prioritize short-term over long-term paradigms, meaning that investors may be encouraged to take only a short-term view of infrastructure returns. Changes to investment practices, and incorporating ESG priorities earlier into infrastructure construction, may also help to overcome these obstacles. Overall, however, the interviewees remained optimistic regarding the long-term outlook for ESG investment in infrastructure, believing that interest is growing in both the public and private sectors.

One of the most striking findings from the interviews was that all of the interviewees indicated that they believed that interest in ESG infrastructure initiation and investment is growing. Particular optimism was expressed with regards to the public sector, with many interviewees noting that the public sector was increasingly accounting for the broader community objectives which can be served by infrastructure construction. A number of public sector infrastructure strategies were singled out as being positive for their emphasis on ESG factors, including the US-based Prince George County Stormwater Initiative, and the biking strategies pioneered in many cities such as Vancouver, British Columbia, and Oakland, California. A number of interviewees also stated that the demand in the public sector for infrastructure investments with an ESG focus is greatly influenced by cost factors, in the sense that the public sector tends to prefer sustainable projects selected using ESG criteria, but only if it can be shown that there are no excessive costs accrued in the project as a result of the inclusion of ESG measures. In general, however, the public sector has, in recent years, expressed an increased willingness to solicit and utilize ESG data when making infrastructure-related decisions.

One area where there has been more limited public sector uptake has been in the area of P3 partnerships. The challenges experienced in using this investment model, according to certain interviewees, underscore the need to further educate the public sector about investment vehicles that can promote ESG objectives. Some interviewees noted that many government bodies were concerned about entering into P3 partnerships due to the uncertainty of project risk allocation. In particular, the public sector had concerns on whether infrastructure project risk would be allocated to the private or to the public sector, in such partnerships. Also there may be a lack of trust between the public and private sector partners, where public sector

project managers have concerns about private sector partners not upholding their commitments to the project. Ultimately, interviewees identified solutions such as greater education and clearer contract writing as potential solutions to these issues.

Uptake of ESG measurements by the private sector has been less steady than in the public sector, but nonetheless it is increasing and has been significant. Many infrastructure design companies now incorporate sustainability analyses into their design models, and certain business sectors, such as mining and energy, have been quicker to incorporate sustainability and ESG analyses into their project design plans. What emerges from the interviews is a picture of sectoral divergence with regards to ESG adoption. Certain sectors, such as storm water, wastewater, transit, and energy have proven more able to rapidly incorporate ESG analyses into their design models, whereas other sectors, such as highways, airports, and pipelines, have been more reluctant to do the same. Many interviewees noted that structural issues in infrastructure classes such as highways and pipelines can hinder the adoption of ESG criteria. A major uncertainty is whether infrastructure which utilizes non-renewable resources, or that promotes behavior and usage patterns that are unsustainable (such as highways, which promote increased car usage and therefore may serve to increase pollution, or pipelines, which often ship non-renewable resources), can be designed and built with ESG principles in mind. Thus far, many interviewees felt that these classes lagged behind others in terms of ESG incorporation, due to this fundamental dichotomy.

With regards to the private sector investors, interviewees generally agreed that certain measures needed to be taken in order to encourage a more long-range-oriented investment culture that could prove more receptive to incorporate ESG criteria. Interviewees also indicated that other actions will need to be taken by the public sector to encourage investor interest and confidence in the infrastructure sector more broadly. These include the need for the public sector to clearly define its objectives, define the added value which private investors can bring to the project, and structure the investment appropriately and collaboratively. Ultimately, governments are said to be more successful when they work collaboratively with private sector partners on long-term projects, as opposed to merely focusing on short-term collaborations. By building relationships of trust, the added value of private investors can be maximized by allowing the public sector to fully leverage on the strengths and expertise of the private sector partner. By searching for long-term private sector partners, the public sector can also

seek out partners who are interested in long-term investments and returns, as opposed to short-term partners who are merely interested in short-term profit making.

With growing demand in both the public and private sectors for ESG measurements in infrastructure projects, the commercial sector has responded with a diversity of products and measurement tools designed to aid project managers and designers in measuring ESG factors in infrastructure projects. Measurement tools and ratings systems have emerged to measure infrastructure ESG factors at both the portfolio and individual asset levels. These new tools include GRESB Infrastructure Assessment system, launched in 2016 by ten major asset owners and asset managers including several major pension funds, as well as Envision and Autocase. Similarly, new platforms are emerging to provide guidance and much needed information. These platforms include infrastructure exchanges such as the US-based West Coast Infrastructure Exchange[5] and the Canadian Impact Infrastructure Exchange.[6] These exchanges assist project designers and investors with designing, selecting, and executing sustainable infrastructure projects with strong ESG returns over the long term. As the desire to incorporate ESG factors into infrastructure design and investment has increased, so too has the demand for these tools.

Some interviewees, however, identified the need for both greater versatility and standardization of these tools. At present, multiple measurement tools exist for the purpose of measuring ESG factors on various types of infrastructure projects. Such a plethora of measurement tools can present problems in standardization since different measurement tools tend to emphasize or measure different factors. A standardization of measurement tools, according to some interviewees, may lend greater predictability and uniformity to ESG measurements in infrastructure.

There is a growing interest in infrastructure investments selected using ESG criteria and for ways to measure the ESG performance of the various infrastructure projects. The key question then, for many investors and project managers, is whether infrastructure projects that incorporate ESG criteria can provide sufficient financial returns, and whether these returns are comparable to infrastructure projects selected using traditional methods. Almost all interviewees thought that infrastructure projects which performed well on ESG metrics could provide similar financial returns to traditional infrastructure projects. Moreover, interviewees also felt that infrastructure projects which performed well on ESG measurements better fulfilled broader social and community objectives in relation to sustainability

and social license. To date there is limited data on the financial performance of infrastructure assets with high ESG standards, as we would find, for example, with publicly traded equities (Clark et al. 2015). Moving forward we would hope to test this assumption using data sources such as the performance of green bonds or the newly launched GRESB Infrastructure rating standard.[7]

Infrastructure investments that performed well on ESG metrics were noted to have a number of advantages as compared to traditional infrastructure. One advantage mentioned by interviewees was a greater degree of social license which high-performing ESG infrastructure projects have in comparison to traditional infrastructure projects. As a result of greater social and community support for sustainable infrastructure projects, these projects prove better able to mitigate one of the most significant risks in infrastructure development, namely, project delays. As a result of greater community buy in and consultation, infrastructure projects which perform well on ESG metrics are less likely to be subject to unexpected delays emanating from social and community opposition to the project. Although data continues to be developed on the financial performance of infrastructure projects selected using ESG criteria, all interviewees indicated that the vast majority of infrastructure projects performing well on ESG criteria were also providing competitive financial returns and that investors and clients appeared satisfied with the results of these infrastructure projects.

Some interviewees also noted the need for ESG factors to be incorporated early into the infrastructure development process in order to ensure that the short-term costs of incorporating ESG criteria are mitigated and reduced. These interviewees noted that it was more expensive to bring projects into ESG compliance later on during the project execution phase, rather than at the beginning during the feasibility and design phases. According to these interviewees, the cost of ESG integration is best mitigated by an early and consistent commitment by project designers to ensure a strong ESG performance in infrastructure projects.

When taken together, all interviewees expressed a great deal of confidence in the future of sustainable infrastructure projects and in the future utility of ESG measurements to ensure better performing infrastructure projects. Many interviewees did, however, identify a continued need for a paradigm shift in the realm of infrastructure investment, a move away from an emphasis on short-term returns toward more long-term projects which prioritize stability and a broad range of community returns. They also stressed that educational and advocacy work in this area needs to be

ongoing and will continue to be crucial as the transition toward a new model of infrastructure investment continues.

4.5 Implications and Conclusion

With the steady decline in public stock market returns and bond valuations, large institutional investors, particularly pension funds and sovereign wealth funds, are increasingly moving their investments into the infrastructure asset class. This shift is vitally important, as it is well recognized that governments alone do not have the necessary resources to meet our infrastructure needs either domestically or internationally and private investment will be required. As a result, the infrastructure asset class is becoming an important component of the global financial system. However, the question remains as to whether investors can embrace long-term social, environmental, and governance (ESG) considerations in their infrastructure investment decisions that will help to underpin a more sustainable financial system going forward.

Initially pension funds and sovereign wealth funds began their foray into infrastructure investment by outsourcing this asset class to fund managers with specialized knowledge. But many of the more sophisticated investors are now moving away from an outsourcing model for these investment decisions to an in-house infrastructure investment model (Clark et al. 2011). The result is that these investors now hold long-term investments in infrastructure that resemble project finance, with payouts over time based on the revenues generated by the asset itself. Given the long-term nature and risk exposure of infrastructure investments, investors need to take environmental, social, and governance (ESG) factors into consideration, not only at project inception but also over the full life cycle of the asset. In a way, the trajectory of embedded high ESG standards in infrastructure investments is following the path of real estate investment which began in the 1990s. As investors began to hold real estate assets over longer periods of time, high ESG standards, particularly in new construction, were demanded. This trend is particularly evident with the use of the Leadership in Energy and Environmental Design (LEED)[8] building standards at the 'gold' or 'platinum' level. We can expect a similar pattern to emerge in the infrastructure asset class.

Taking ESG into account in investment decision-making is core to the investment beliefs of 'responsible investors'. Currently asset owners and managers with over $60 trillion of assets under management have signed

the UN-backed Principles of Responsible Investment (PRI) pledging to integrate ESG into their portfolios (United Nations Principles of Responsible Investment 2016). As per our interviews, supporters of the PRI felt that such an approach, one that no longer views environmental, social, or governance impacts as externalities results in reduced project risks and has the potential to financially outperform more traditional projects that do not take ESG criteria into account, to create a more sustainable overall financial system.

In the past these investors were primarily concerned with lowest initial costs in infrastructure developments, believing that this approach would yield the highest possible returns. While they rigorously analyzed their public equity holdings for ESG factors that may prove material in the financial performance of a company, they did not apply the same principles to their infrastructure holdings. However, this is beginning to change with the advent of new platforms such as GRESB Infrastructure, the West Infrastructure Exchange, and the Canadian Impact Infrastructure Exchange, and new ESG infrastructure measurement tools such as Envision and Autocase. These platforms and tools have resulted in an increased ability to take ESG factors into consideration in infrastructure investment decision-making.

But much work remains to be done. Our research and that of others in the field (Kaminker 2016) suggest that there are barriers to both infrastructure investments broadly and ESG integration in infrastructure projects, specifically. These barriers include the lack of standardization of ESG measurements, no clear definition of sustainable infrastructure as an asset class, and the need to further educate investors on the implications of new and innovative ways to structure infrastructure investment opportunities. A further barrier (and one that also hinders ESG integration in other asset classes) is incentive structures that all too often prioritize short-term over long-term paradigms. This results in fund managers and asset owners continuing to take short-term views on infrastructure returns.

Investors also want to know the financial implications of raising ESG standards in their infrastructure portfolios. More specifically, they want to know if taking ESG into account will pay off over time with higher financial returns. While we have considerable research on the impact of ESG integration on public equity financial performance, currently no such data exists for the infrastructure asset class. Several factors contribute to this lack of data. Firstly, the asset class itself is not homogeneous, and it covers a wide range of hard assets from roads and airports to wastewater and power grids.

Secondly, infrastructure assets include both equity and a debt component which makes financial valuation difficult. Finally, much of the current investment in infrastructure is in private markets that are not required to disclose their financial returns to the general public. The lack of transparency in this asset class is often identified as a further barrier to investment (Institute of International Finance 2014).

Global Infrastructure Basel, a Swiss foundation which promotes the development of sustainable and resilient infrastructure internationally through sustainable infrastructure design and financing, identified three key elements necessary to transform sustainable infrastructure into a viable asset class. Firstly, sustainable infrastructure must be distinguishable from conventional infrastructure. Secondly, securitized investments in sustainable infrastructure must be able to demonstrate a distinct financial performance when compared with other asset classes. Finally, this performance needs to be transparently monitored and reported to the market (Kaminker 2016).

In order to finance the sustainable infrastructure needs of cities in the twenty-first century, the value of sustainability must be demonstrable and accessible to capital markets and institutional investors (Wiener 2014). Strategic asset allocators, such as large pension funds, sovereign wealth funds, private capital managers, family offices, grant making foundations, and insurers, are particularly well placed to create financial flows in the direction of sustainable infrastructure (Ibid.). These investors will be important to the future of infrastructure investment, as public funds continue to be limited in light of new economic and political realities (World Economic Forum 2013).

However, before these asset allocators decide to invest significant amounts into sustainable infrastructure, they must first come to view sustainable infrastructure as an attractive and lucrative asset class (Ibid.). Strong 'enabling environments' will be crucial in helping to build private sector investor confidence in infrastructure investment (Bielenberg et al. 2016). These enabling environments should consist of sound government policies, strong institutions, transparency, reliable contract enforcement, and other sector-specific factors (Ibid.). Taken together, these factors can aid in creating a strong investment environment that will help to encourage investment activity in sustainable infrastructure.

Notwithstanding these challenges both in the asset class generally and in ESG integration within it, investment in infrastructure with high

environmental, social, and governance (ESG) standards holds great promise for sustainable finance going forward. This will be crucial if we hope to achieve the UN Sustainable Development Goals by 2030.

International Pension Funds That Invest in Infrastructure

Fund	*Infrastructure investment (CAD)*	*% of total portfolio*
Australian Future Fund	$5.01 billion	6.4
BT Pension Scheme	$610.9 million	1
Folksam	$157.1 million	0.33
Pensioenfonds Zorg en Welzijn	$24.36 billion	14.5
Construction & Building Unions Superannuation	$744 million	4
National Pensions Reserve Fund	$461.33 million	2.25
New Zealand Superannuation Fund	$1.58 billion	9
VicSuper	$225 million	2.5

Source: Hakan Mustafa, Carleton Centre for Community Innovation, 2013

Notes

1. Information asymmetry occurs when one party in a transaction has more information than the other party. Informational asymmetry leads to modified market behavior on the part of both the advantaged and disadvantaged parties, as the advantaged party will attempt to exploit its informational advantage, and the disadvantaged party will aim to either seek more information, or, if this is impossible, engage in certain forms of risk mitigation to control for having less information than the other party. George Akerlof, in his paper *The Market for Lemons*, famously discussed the issue of information asymmetry as it pertains to the automobile market. He claimed that defective used cars had the potential to damage the entire used car market, as buyers are unable to distinguish between good and bad used cars, and therefore attempt to control for the risk of defective used cars by spending less on all used cars (Akerlof 1970). This means that used cars in good condition cannot attain the price which they deserve, because of the entire market being harmed by defective cars (Ibid.). As a result, owners of used cars in good conditions are less motivated to sell these cars on the market (Ibid.). This paper will argue that, through analyzing infrastructure investments using an ESG lens, investors will be more able to rationally control for risk in infrastructure. Rather than engaging in generalized risk controls as a result of lack of information, as

seen in Akerlof's example, investors will instead be able to engage in targeted risk control through the analysis of ESG factors.

2. Envision is a sustainable infrastructure rating system which uses 60 sustainable criteria to measure the performance of infrastructure projects. The criteria are arranged in five categories: quality of life, leadership, resource allocation, natural world and climate, and risk.
3. Autocase is a software designed to model the cost, benefit, and risk of green infrastructure features and low-impact development systems using the Triple Bottom Line (environmental, social, and governance) Cost Analysis.
4. The risk of impact infrastructure is divided according to the type of investment. For example, greenfield infrastructure investments are riskier than brownfield investments which are considered the least risky.
5. The West Coast Infrastructure Exchange is an infrastructure platform which is designed to help connect potential investors with sustainable infrastructure investments. It also aims to develop best practices in the sustainable infrastructure field and improve transparency in the infrastructure asset class by providing more information to investors regarding infrastructure performance.
6. The Canadian Impact Infrastructure Exchange aims to help connect private investors with public-private partnerships in the field of impact infrastructure. It also aims to provide high-quality information regarding both the financial and extra-financial returns of impact infrastructure projects.
7. GRESB Infrastructure is a tool which provides systematic assessment, objective scoring, and peer benchmarking for environmental, social, and governance (ESG) performance of infrastructure companies and funds. These evaluations take place around a variety of metrics, including metrics that measure management and leadership, communication, engagement strategies, and financial performance indicators. GRESB Infrastructure seeks to measure both the performance of infrastructure assets individually and at the portfolio level. It is a tool that was developed in close consultation with institutional investors including pension funds.
8. The LEED is a building evaluation and certification system that measures building performance based on several metrics, including indoor environmental quality, energy and water efficiency, environmental friendliness of materials, location and transport access, as well as innovation and regional environmental impacts, among other factors. Four ratings are assigned to a building based on performance in relation to the metrics. From lowest to highest, these ratings are: Certified, Silver, Gold, and Platinum.

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