



Long-term
Infrastructure
Investors
Association

Environmental, Social and Governance Handbook for Long Term Investors in Infrastructure

Second Edition

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Preface

The purpose of this Handbook is to provide a descriptive summary of practices, standards and tools that infrastructure investors apply today to realize better performance on environmental, social and governance dimensions (ESG), and to sustain that performance over a long term.

ESG has grown considerably in its importance to the investor community – in the context of global calls for reducing carbon footprint, combatting poverty, promoting healthy and safe labour, tightening corporate governance. Most of those calls are particularly relevant to investments in infrastructure assets, because infrastructure includes all those installations and services – transport, energy, utilities, telecommunication, social facilities, etc – that nearly everyone in the world uses and depends on, every day.

For *long term* investors in infrastructure, there are even more reasons to be serious about ESG. Probability of a downside ESG event that can trigger financial liabilities – from environmental pollution to a governance malpractice – grows with a longer hold, hence implementation of ESG prevention and mitigation measures becomes much more important for sustaining financial performance of the investment.

Yet, notwithstanding the broad agreement on the importance of ESG, still relatively few investors understand what it takes in practice to invest in infrastructure responsibly.

More than forty organizations – institutional investors, asset managers, development banks, advisers and not-for-profits – have been involved in compiling and reviewing the Handbook. Compared to the first edition, that was published in 2015 and presented at COP21, this second edition has benefited from twice as many contributors and a much wider set of functional and geographic perspectives. References to individual ESG practices of the contributing organizations have been identified as such in the text, where appropriate. We are particularly grateful for substantial contributions that came for this second edition from Allianz Global Investors, Beyond Ratings, Carbone 4, Global Infrastructure Basel Foundation, GRESB Infrastructure, InfraVia, Norton Rose Fulbright and Skandia Asset Management.

We sincerely hope that this Handbook will help readers take their ESG practices in infrastructure investing to the next level. Readers interested in translating some of the Handbook's concept into their investment practices are invited to check out **ESG Indicators Library**. Produced by LTIIA jointly with software provider eFront, the Library contains structured and harmonized definitions of indicators that infrastructure investors are using today to track their responsible investment performance.

At Long Term Infrastructure Investors Association, we will continue working with our members and the industry on raising the awareness as well as implementation standard of responsible investment in infrastructure.

ESG as a key success factor for infrastructure investment

The purpose of this ESG handbook is to provide stakeholders with an easy-to-use guideline that shall help incorporate an ESG approach in infrastructure investments. Such an approach may offer superior business models as well as long term performance advantages. However, to benefit from the ESG advantages, an appropriate incorporation of ESG factors into investment analysis and decision making is fundamental.

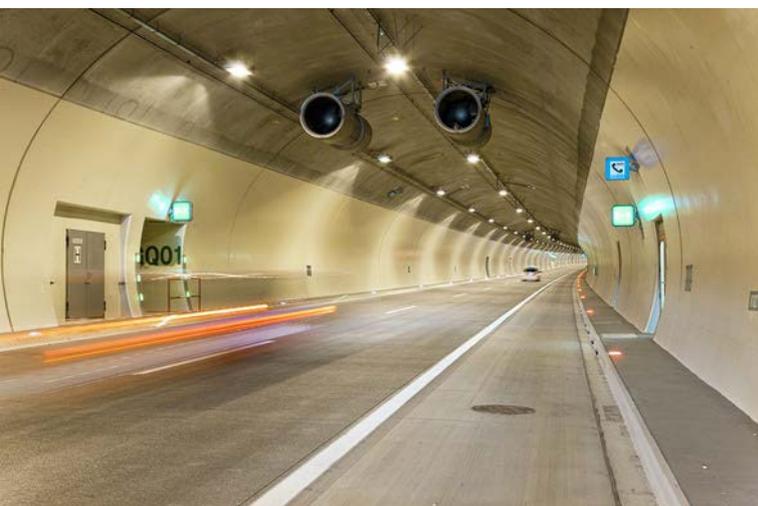


DEFINITIONS

Infrastructure, the organisational backbone of the economy

Although the definition encompasses various dimensions of infrastructure, this handbook will mainly deal with material infrastructure, “the sum of all physical assets, equipment and facilities” (Jochimsen 1966). Such material infrastructure includes water, sanitation, energy, housing, transport and information and communication technologies according to definition of the World DataBank of the World Bank Group.

Infrastructure plays a fundamental function in the development of societies. Since it connects capital and workers more efficiently, it increases Total Factor of Production (TFP), and therefore enhances economic growth while reducing the levels of inequality. Standard & Poor’s (2015) evaluated that an increase in infrastructure spending of 1 per cent of real GDP can have a multiplier effect of between 1.0 and 2.5 per cent for G20 countries over a three-year period. In addition to a potential boost of jobs and GDP, long term benefits from infrastructure can include improved efficiency and higher tax revenues.



In a conventional sense, infrastructure displays 8 specific characteristics (adapted from Weber and Alfen 2010).

In first instance, infrastructure represents a **key public service**. Infrastructure assets enhance the development of a nation as they deliver fundamental public services such as the provision of clean water or electricity, enable the mobility of persons and goods and offer efficient communication.

Infrastructure is also characterised by a **low elasticity of demand**. This means that the use of infrastructure is often independent from business cycles for it plays fundamental roles in the economy: indeed, the rail and road networks are used even during downturns. Hence demand for infrastructure services is expected to remain relatively constant.

A further dimension of infrastructure is its **quasi-monopoly situation** with high barriers to market entry: given that the upfront cost of new infrastructure can be tremendous - sometimes amounting to some US\$ billions- and that there are important returns to scale -once the network exists, connecting one more household for instance is relatively cheap-, competition appears limited or even inexistent.

As a direct consequence, infrastructure may witness specific **regulation**. In fact, in case of little or no competition, regulatory authorities do step in and correct the market by, for example, fixing prices while compensating the infrastructure holder through a set of guarantees.

Long service life is also a particularity of infrastructure. Some roads existing today in Europe were traced by the Romans some 2,000 years ago, illustrating the notion of infrastructure as the long term backbone of the economy. This example is certainly not representative, but infrastructure assets often have service lives of as much as a century. Of importance for investors is then to amortise their investment within the associated life span.

Infrastructure is also expected to provide **inflation protection**: revenues are likely to be combined with inflation adjustment mechanisms, be it through regulated income clauses, guaranteed yields or any other contractual guarantees. When revenues are generated by user charges,

prices follow the Consumer Price Index (CPI) or GDP growth.

Regular, stable, yet late cash flows are also a feature of infrastructure. Given the characteristics mentioned above, after an initial construction phase, infrastructure assets produce regular and stable cash flows. Thus, they generally represent safe investment opportunity for risk-averse institutional investors.

Greenfield vs. brownfield infrastructure

Greenfield projects are known as development or primary projects. They often start from “nothing”, i.e. they generally correspond to assets constructed for the first time in a specific location, the construction of a new highway for instance. Uncertainty may stem from cost and demand sides. On the cost side, these projects must pass the construction phase in particular. On the revenue side, and depending on the project framework, uncertainty may stem from the demand for the infrastructure and the associated price.

Brownfield projects are understood as operational or secondary projects. In contrast to greenfield projects, they are already operational or rely on existing infrastructure. For example, they may operate the reconstruction, renovation or expansion of an asset. As such, the risks associated with the early phases of greenfield projects are outdated; the remaining risks are operational, regulatory and market risks. Compare for instance the construction of a new Concentrated Solar Power plant with the addition of one more unit within the plant.

Therefore, the distinction between brownfield and greenfield infrastructure lies in their different level of

risk and ultimately, their maturity (Weber and Alfen 2010). The first will thus tend to attract risk averse investors while the latter is more appropriate for investors that will participate in shaping the project in the start-up phase so as to ensure its value grows and possibly generates higher returns.

Definition of Environmental, Social and Corporate Governance criteria

ESG stands for environmental, social and corporate governance. ESG criteria represent the three dimensions that directly and indirectly affect the financial performance of investments.

There is a growing recognition that an effective analysis of ESG risk and opportunities is a fundamental part of assessing a project's value. Investors also increasingly take into account the ESG issues impacting their own reputation in a society where sustainable development is becoming a major concern. Such concerns include - among other things:

- Environmental concerns such as climate change, hazardous waste, nuclear energy, biodiversity.
- Social concerns including diversity, human rights, consumer and worker protection, sin stocks, ageing population, animal welfare.
- Corporate governance concerns ranging from management structure, employee relations to executive compensation.

ESG requires investors to take a wider view, which provides insights into the long term prospects of projects. Therefore, an ESG approach may provide investors with a benchmark to judge the overall quality and spectrum of the project's opportunities and risks.

Primary sets of ESG criteria and elements are also related to international agreements such as the Rio Declaration on Environment and Development produced at the 1992 United Nations Conference on Environment and Development (UNCED), the International Labour Organization (ILO), a United Nations agency setting among others an international labour standard or the Convention on Biological Diversity, the United Nations Framework Convention on Climate Change and the Kyoto Protocol.

However, the great heterogeneity of views, motives and practices regarding the ESG approach impedes comparison between firms' claimed successes. A coordinated and effective responsible investing could be favourable and simplify investment decisions and would therefore lead to further investments and benefits. A uniform implementation would also be desirable to avoid "greenwashing", the deceptive promotion of an environmentally friendly image.

Nonetheless, there is currently no global commonly agreed ESG scale/standard. As a result, it is difficult to state whether or not a firm invests in a sustainable and responsible manner. A clear universal definition could address this first issue. Another step would be to create an ESG scale firms could refer to. In such case, instead of evaluating whether the investments are green or not, it is the quality of firms' engagement that would be assessed.

If one clear definition does not yet exist, there are however many examples of frameworks and tools providing practical guidance for investors to implement ESG in their investment decisions (see chapter 2. Existing frameworks and tools).

Definition of Sustainable Infrastructure

Sustainable infrastructure provides the same services as conventional infrastructure while bringing additional benefits flowing from the implementation of ESG criteria. Since any infrastructure facility is improved, or made more valuable, when incorporating the concerns of the triple bottom line, i.e. economic, social and environmental concerns, and since the ESG approach covers these triple concerns, adopting an ESG approach brings added value to the environment, civil society and investors.

Referring to a publication from the World Bank Group (2012), introducing ESG into infrastructure project is indispensable for a country to stay competitive: "Infrastructure can be a vector of change in addressing some of the most systemic development challenges of

today's world: social stability, rapid urbanization, climate change adaptation and mitigation and natural disasters. Without an infrastructure that supports green and inclusive growth, countries will not only find it harder to meet unmet basic needs, they will struggle to improve competitiveness."

Sustainable infrastructure is therefore not only a key component of a functioning economy; it also forms the basis of good livelihoods for billions of people, and can significantly contribute to achieving sustainability and addressing global climate challenge. Indeed, the UN Open Working Group includes the potential of infrastructure in their proposal for the Sustainable Development Goals (SDGs) by directly mentioning sustainable and resilient infrastructure in two of the seventeen SDGs. This underlines the potential power of infrastructure to drive sustainable development.

Climate and Infrastructure

Climate change affects all regions of the world and impact and consequences of global warming are truly intimidating: melting polar ice sheets are fueling rising sea-levels that will leave no shore unaffected. Other regions are likely to face extreme cold episodes and rainfall more often while others may suffer from extreme heat waves and droughts. In fact, many poor developing countries as well as a wide range of economic sectors that rely strongly on their natural environment (e.g. agriculture, forestry, energy and tourism) are particularly exposed to climate change. Other potential negative effects are the damages incurred to property and infrastructure by natural disasters, losses of productivity due to disruption in daily life and harmed trade related to climate change, mass migration of climate refugees- people who are forced to leave their homes because of hostile environments. Different quantifications regarding the costs of climate change were made by economists however, as Nicholas Stern, a former chief economist with the World Bank

Group, and his co-author Simon Dietz mentioned in their paper “Endogenous growth, convexity of damages and climate risk” (2014), the economic costs of global warming are still underestimated and governments have to tackle the continuously increasing emissions of human-induced greenhouse gases.

There exist several legally binding frameworks such as the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol to address the challenges posed by global climate change. The Kyoto Protocol is an international treaty, which extends the 1992 UNFCCC by which the signatory states commit to reducing greenhouse gas (GHG) emissions. The Kyoto Protocol claims that global warming is indeed occurring and that it is a change mainly induced by human activity. The primary sources of GHG are the burning of fossil fuels for electricity production, transportation, industry and agriculture. To comply with the reduction of GHG emissions, sustainable infrastructure can play a key role by providing infrastructure with higher energy efficiency or even decarbonised renewable energy for instance. However, not all countries are part of those legally binding frameworks.

Cities represent currently the major carbon emitters, with 66 per cent of global energy consumption to their name (C40 at the GIB Summit 2015). They are also most vulnerable to climate change effects, as mentioned by C40 - the cities leadership group of the world's megacities committed to addressing climate change. Furthermore, the estimation of the increase of the global population by 2 billion between 2010 and 2030 will further lead to more emissions and worsen the already tense situation. While it is estimated that most of this increase will occur in the developing world and in urban settlements, further specific infrastructure investments will be required to handle this increase. Barysch et al. (2014) estimate that 75 per cent of the global population will live in cities by 2050. Depending on the infrastructure appetite of cities and how they plan and structure their growth, cities can have a huge impact on paving the way for a sustainable future.

Biodiversity and infrastructure

As described by the World Wide Fund for Nature (WWF), biological diversity – or biodiversity – is the term given to the variety of life on Earth. It includes the variety within and between all species of plants, animals and micro-organisms and the ecosystems within which they live and interact. This diversity forms the natural capital that keeps our ecosystems resilient and economies productive. Indeed, only by preserving such diversity will our environments adapt to a changing climate and maintain human life in these particular locations. For example, drought-resistant crops will be of decisive importance to populations living on the border of the Sahara or other expanding deserts. However, the world is currently experiencing a dramatic loss of biodiversity mainly as a result of urbanisation, deforestation and overexploitation of natural stocks. A continuing pressure on ecosystems may lead to them becoming too small, depleted or isolated to further ensure human presence.

Referring to the United Nations (UN) Millennium Ecosystem Assessment (MA), Europe's territory is more fragmented than any other continent's. This is mainly due to the fact that vast areas have been transformed into urban zones or blended by transport infrastructure. This had decreased the resilience of once biodiversity-rich ecosystems. As an attempt to limit the trend, the Convention on Biological Diversity (CBD) has been agreed upon. It is a multilateral treaty with three main goals: 1) conservation of biological diversity (or biodiversity) 2) sustainable use of its components, 3) fair and equitable sharing of benefits arising from genetic resources.

Sustainable infrastructure can play - if biodiversity conservation is adequately implemented - a crucial role in protecting the functionality of urban and rural ecosystems and enhancing the quality of life (e.g. health, tourism, protecting historic and cultural heritage). As such, biodiversity conservation is often associated with the term of green infrastructure. Green infrastructure refers to a network of public and private areas that provide ecological, environmental, social and even economic services. Green infrastructure can include reforestation zones, parks, green bridges, fish migration channels, floodplain restoration or high-value farmland. Such connectivity encourages the mobility of organisms (e.g. plants and animals) and enables therewith ecological processes and flows to unfold undisturbed. Sustainable infrastructure needs to grasp the concept of green infrastructure in order to contribute to the conservation of biodiversity.

Specific ESG challenges and opportunities of infrastructure

Compared to other types of investments, infrastructure carries specific ESG challenges and opportunities. For instance, it is relatively capital-intensive and has a long term nature of assets. Many related benefits from an ESG approach to infrastructure will only reveal over a long term horizon. It is hence crucial that the full lifecycle – usually 20 to 30 years for infrastructure projects- be integrated into the evaluation of the project's performance. This long term consideration in investment implies a proactive risk management approach, where investors try to specify and mitigate upcoming risks and challenges before they actually occur.

Neglecting this, i.e. refusing to systematically adopt an ESG approach, can create a significant blind spot, likely to hurt performance and put reputation in jeopardy.

Challenges and Opportunities

A tremendous lack of investment is the foremost challenge that infrastructure must deal with. Global infrastructure investment gap is projected to reach US\$ 500 billion a year by 2030 (Wilkins et al. 2014) and even US\$ 700 billion a year in 2030 if the costs of tackling climate change are considered (WEF 2013). This gap simply mirrors the increasing need for well-conceived and long lasting infrastructure that is required by large parts of emerging markets as well as developed economies. About 75% of the infrastructure that will exist in 2050 has yet to be built (Wiener 2014). Therefore, whether to adopt an ESG approach or not can have crucial impacts on our common future.

A second challenge posed to the development of ESG infrastructure is the management of expanding cities. About the worlds' population is expected to reach 9 billion by 2050, the large majority of which is expected to live in urban areas. Transport infrastructure for example will have to offer everyone the same mobility opportunities -acknowledging that enhanced mobility results in a more dynamic economy. Similarly, energy infrastructure will need to generate and distribute unprecedented amounts of energy while endeavouring to alleviate the environmental impact in cities, typically reducing pollution. Due to high population and infrastructure density, urban infrastructure are also most vulnerable to natural disasters and climate change effects. Depending on how cities plan and structure their urban growth and infrastructure appetite, they can create a huge impact for a sustainable future

Infrastructure-specific ESG checklist

A non-exhaustive checklist below summarizes dimensions and factors relevant to assessing environmental, social and governance compliance of infrastructure projects.

General

- Policies and disclosure**
- Disclosure instruments and any external assurances of the disclosures (eg, a section in an Annual Report, separate Sustainability Report, etc).
 - Operational strategies and formal policies in place covering one or more of the following: Environmental Management, Bribery & Corruption and Employee Rights

Environmental factors

- Climate Change Response**
- Performance of climate change risk assessment and implementation of any adaptation measures.

- Utilization of natural resources**
- Identification of opportunities to reduce GHG emissions.
 - Presence of tracking instruments for the GHG emissions and the utilization of water and energy (including “like-for-like” uses).
 - Any generation, or consumption of, energy from renewable sources.
 - Any water efficiency / water conservation program.
 - Presence of any annual reduction targets for the GHG emissions and utilization of water and energy.
 - Presence of any long term targets / commitments with respect to the reductions above.

- Waste and pollution**
- Presence of a waste policy and waste minimization measures (including avoidance, reduction and/or recycling of waste).
 - Presence of tracking instruments with respect to hazardous waste, waste diverted from a landfill and/or waste recycled.
 - Presence of base-line assessment of water and air quality, noise and vibration impacts, light pollution and oil spill / chemical leakage.

- Land use and biodiversity**
- Presence of a biodiversity policy and a routine assessment of contamination.
 - Implementation of any measures to maintain and enhance biodiversity.

Social factors	
Employees	<ul style="list-style-type: none"> ▪ Presence of employee policies with respect to attraction, development and retention of staff; diversity; collective bargaining agreement; equal opportunities etc. ▪ Provision of training in any of the following categories: safety, career development and/or sustainability. ▪ Execution of an employee satisfaction and health&safety surveys. ▪ Production or receipt of any reports on occupation health and safety.
Supply chain	<ul style="list-style-type: none"> ▪ Presence of any sustainability requirements in the supply chain (such as a responsible contractor policy). ▪ Evaluation measures for compliance with the sustainability requirements per above (update reports, discussions /reviews, external audit checks etc).
Community	<ul style="list-style-type: none"> ▪ Presence of a community engagement program and any community and safety audits. ▪ Evaluation measures for compliance with the program. ▪ Assessment of potential impact on indigenous communities. Monitoring of community access to grievance mechanisms.
Engagement	<ul style="list-style-type: none"> ▪ Presence of stakeholder engagement strategy – per stakeholder category (local community, contractors, employees, etc) and/or per project stage (due diligence, implementation, monitoring etc)
Governance factors	
Policies	<ul style="list-style-type: none"> ▪ Presence of formal policies and implementation responsibilities. ▪ Specific sustainability objectives in the current period. ▪ Level of control and reporting over the ESG targets within the organization
Management Systems	<ul style="list-style-type: none"> ▪ Utilization of an EMS system. ▪ Accreditation of the EMS under relevant standards (ISO 9001 / 14000 / 26000; ISO / OHSAS 18001).

Stakeholder expectations for infrastructure

Compared to other types of investment, infrastructure involves a larger number of stakeholders whose expectations need to be identified and addressed. Managing only the expectations of the public grantor and the users is never enough to ensure long term success of the project.

Introduction

Infrastructure is a complex asset class, with each invested project requiring the constant assessment of many variables over a period of many years into the future, with such matters as geological issues, population changes, shifts in political priorities, climate change-related issues, oil price changes, demographic changes, inflation and deflation scenarios amongst many others having to be taken into consideration. The same complexity is mirrored in stakeholder expectations. A project that lives within a community will have a great range of stakeholders, and it is vital for the long term health of the investment that all of these stakeholders feel comfortable with a project. To attain the goal of every stakeholder being satisfied with a project, from an investor to a local contractor to a family who live near a project is a real challenge, but not one that should be shirked. With a realistic, comprehensive and sensitive ESG plan in place it is perfectly possible for a given project to manage and address expectations of a whole array of stakeholders. With dedication and persistence there is every chance that a road, rail, school or hospital project can bring benefits for decades not only to investors but to the communities that live around that project and depend on it for jobs and wealth creation.

This chapter will go through the type of expectations that might be encountered from a given project, and will show how those differing expectations can be dealt with a comprehensive and systematic way.

Granting authorities

Granting authorities are in many cases governments that would normally be held accountable to their citizens. They will also be beholden to a wide range of public policies that an infrastructure project will have to pay attention to. If, for instance, a government has a specific set of carbon guidelines or energy policy, the project will have to take those into consideration. The granting authority will also be interested in the 'bigger picture' of a project, in that it will be keen that the project contributes actively to the wealth of a county and its GDP. It may want the project, for instance a high-speed train, to carry the maximum possible number of passengers in the shortest possible time over the shortest possible distance. This may therefore bring it into conflict with a number of other stakeholders' interests, such as those of residents' groups and environmentalists. There is a conflict therefore at the heart of dealing with the ESG expectations of granting authorities, and the project managers would do well to realize this and make sure there is active and continuous engagement with those authorities.

Granting authorities, being governmental, will also be the stakeholder with whom a project will have to pay due regard to a supra-national or national regulator or other authorities such as health ministries, financial and taxation authorities, state firefighting control, health and safety executives, to name only a few.

To comply with these differing bodies a project will have to be assiduous in its issuing of data reports and other documents as required; failure to do so will result in a project potentially becoming illegal within the country it occupies.

Elected officials

Similarly to Granting Authorities, there are a number of issues that will have to be addressed with these stakeholders. Because of the swift turnover in electoral cycles, a project may, over the course of its lifetime, be operating under several political regimes, all of whom may have differing views on ESG issues. One elected official for instance, may have very different views on green matters or carbon matters than another, and for a project to be successful in that elected official's eyes it will have to pay constant attention to the political climate and prepare to adjust its ESG positioning accordingly.

Local authorities

Local authorities will also be a major stakeholder to engage with. Some local authorities may be relatively simple to engage with; a justice complex or hospital for instance will exist with only one local authority governing over it. However, a road or rail project may operate in the jurisdictions of several local authorities, each of which may have differing policies on noise and light pollution. Due regard will have to be paid to all of these, and effective liaison will have to be initiated and maintained between all of these over a project's lifetime.

Different local communities

This is where a project's ESG credentials will be the hardest to establish; how does a project inhabit and live alongside- and hopefully actually improve- the lives of the communities around it? In the age of social media it is especially important to maintain good relations with local communities; if they become disgruntled by a project they can bring it to global attention very rapidly. There are myriad examples of how a project can engage with these stakeholders. A motorway project that passes through a town can consult

with local people to identify the areas within it most exposed to traffic accidents, and can then implement recommendations by adding signal lighting and changing the structure of the pedestrian crossings and speed displays. A railway can have a newspaper about it distributed to schools that run alongside the project. Free site visits can be organized for local communities to see the work and feel as though they are taking ownership of a project themselves by increased familiarization with it. A stadium project contributed to a local initiative to finance a minibus for persons with disabilities or reduced mobility.

Regular community meetings can be held in locations like town halls, and community liaison officers can be appointed to make sure there is a reliable and frequent flow of information about the project available for local community groups. These channels of communication can be used for explaining on-site problems or delays, increased noise emissions throughout construction or maintenance, or changes in traffic levels and schedules for work programmes that may affect local life.

The bottom line here is that there is no 'off the shelf' answer as to how to make a project sit comfortably in a community. To do so requires a lot of research and investigation into local communities and their sensitivities, and constant engagement via liaison officers to work out the best methods to incorporate a project within the lives of those who surround it.

This is perhaps the stakeholder group who are the least 'corporate' in a financial sense and so the language necessary to engage with them and explain project details to them will need to be tailored accordingly. While they may not have a direct financial interest in a project these are the people whose daily lives are touched by a project the most and it is absolutely vital that their ESG interests are upheld.

Unions

This is another source of potential strife in a project if not handled delicately and sensitively. HR policies for employees will need to have attention paid to them, and many other employment matters such as grievance procedures, codes of conduct and health and safety in the workplace. Regular union meetings should be held, with supervisors kept up to date with project developments or any potential changes in staffing levels. Newsletters and

bulletin boards are an effective method of reaching out to employees and ensuring that unions are satisfied.

Users of the infrastructure

Users of infrastructure- as is human nature- tend to get very annoyed when there is a fault in a piece of infrastructure that causes them inconvenience or delay. However this annoyance can always be mitigated by timely and accurate information, such as well-planned warnings of potential repairs on a road project, or notification that a part of a hospital will be short staffed for a week due to industrial action. The key here is to avoid surprises for the end user. If the end user is neglected, or finds that they never get informed about likely delays on a toll road due to repairs they will switch to using either another infrastructure to travel or another mode of transport altogether. Regular and timely information dissemination is the key to engaging effectively with this stakeholder.

Taxpayers

Taxpayers are concerned with value for money and transparency with how money is used. Negative stories that even hint at corruption or profligacy on a project, meaning that- in an availability-based scheme for instance- the amount to be paid back by the procuring authority over a concession's life is larger than it needed to be or was forecast to be at the outset will be catastrophic for the reputation of a project. Employing therefore the most able CFO and making regular and publicly available accounts, and storing and saving correspondence of a project's operational finances will help to mitigate this particular ESG risk and to ensure this stakeholder is kept engaged in a project.

Investor clients

Investors do not want their reputation to be eroded, and some institutional investors, like pension funds for instance, may be mandated to abide by certain ethical and environmental standards such as not investing in projects that have a large carbon footprint. Investors will also want to know about usage or redundancy of beds in a hospital, about traffic volumes on demand-based toll roads, about accident rates, about construction delays or any unusual operational or maintenance issues. They may also have obligations to their own clients in terms of financial reporting, and again regular and reliable information is key here. The production of monthly- or at least quarterly- reporting is a great aid to this, and also the offer of special analysis upon request.

Accident reports should be required, and also environmental reports and any incident that may have substantial, identifiable consequences for financial performance, reputation, legal commitments or otherwise.

Potential local goods and service providers

This is a group of stakeholders who a project is capable of affecting either positively or negatively. They will want to be the suppliers or service providers of choice to a project, and may be angry if a large multi-national contractor brings in its own workforce from outside a country or locality or uses goods entirely from somewhere else. This is of course understandable in terms of financial concerns, but quick wins can be achieved by a project making an attempt to incorporate local workers and suppliers into a project.

There can be efforts made to increase the popularity of a project amongst this group of stakeholders if a project looks to ensure that an element of the workforce is mandated to be made up on local inhabitants, or to contract local SMEs in construction, operation and maintenance. In one notable example, a motorway project agreed in the contract that 12% of the workforce would consist of previously unemployed people. This pleases unions as well as local communities and service providers.

Main recommendations of the Task Force on Climate Finance Disclosure.

In December 2016, the Task Force on Climate Finance Disclosure, headed by Mr. Michael Bloomberg, presented its recommendations to the chairman of the Financial Stability Board, Mr. Mark Carney (Bank of International Settlements). The aim of this report is to set guidelines for a better integration in the finance industry of financial risks linked to climate change. In order for investors and credit institutions to better assess these risks, there is a need for a more comprehensive and consistent disclosure of the climate performance of their counterparts.

Key recommendations of the reports can be broken down into four main axes:

- Climate risk should encompass both transition and physical climate risks
- Disclosure of climate risk should be embedded in the financial communication of companies.
- A comprehensive disclosure framework should be articulated along the following themes: Governance, Strategy, Risk Management and Metrics. It should present details of the action undertaken for each of them.
- Last but not least the report strongly emphasizes the need for companies to conduct scenario analysis of the impact of climate change on their activities and to report the associated outcomes (2° scenario, Business as Usual scenario, Nationally Determined Contributions....). A specific Annex provides guidance on how to build a climate scenario.

The report includes some more detailed methodological references for specific sectors (Banks, Insurance companies, Asset Owners, Asset Managers, Energy, Transportation, Material and Buildings, Agriculture Food and Forest products).

This report is part of a globally evolving financial regulatory framework, whereby Central Banks (China, India) and Stock Exchanges requires increasing disclosure of climate risks. In February 2016 the European Risk Systemic Board published a report calling for the implementation of climate stress-test within credit institutions "Too late, too sudden: Transition to a low-carbon economy and systemic risk".

ESG impact on investment characteristics

“Companies that are considered leaders in ESG policies are also leading the pack in stock performance by an average of 25%”

Goldman Sachs Global Investment Research
(2007).

There exist a broad range of different research papers that analyse and describe the impact of ESG on the performance of a company. However, this handbook will provide the reader with an overview about the impact ESG can have on infrastructure projects.

The costs of adopting an ESG approach

Firstly, following a ESG approach may imply additional screening and expertise costs as more information has to be collected for an investment decision. Secondly, to the extent that ESG compliance of an investment has not been demonstrated, this may delay or cancel the development of a new product or service. Another cost comes with the forgone revenue of generating a positive externality. Indeed, the investor is not compensated for the additional positive contribution to the social good.

These disadvantages notwithstanding, there are significant reasons why adopting ESG-criteria makes sense both from social and economic perspective.

Advantage of adopting an ESG approach

Through its intrinsic long term approach, ESG can be seen as a proactive management tool. Such an approach can thus reduce a wide range of risk, e.g., non-compliance with laws and regulations and hence future litigations. Taxes and/or governmental directives and regulations which charge the causers of negative externalities and emissions are foreseeable and plausible against a background of climate change. But a wider implementation of eco-taxes, such as carbon regulation, could drastically reduce benefits from conventional infrastructure projects. Nonetheless, when incorporating ESG criteria, infrastructure projects tend to minimise their negative externalities and will therefore show less exposure to governmental action. In fact, as they become more competitive, they are likely to benefit from future carbon-reducing legislation.

Most long term investors are looking for real returns rather than nominal returns, so inflation can be seen as a major risk factor for long term investors. Infrastructure investments, though, may provide a desirable safety net against inflation, however the implementation of price escalation requires - in a way - the acceptance of civil society. In fact, since ESG infrastructure significantly contributes to societal development, the sometimes necessary decision to adjust prices to inflation is more likely to be accepted by the end-user. Also, those general societal perceptions often influence regulators who are empowered to rule on tariff increases. This is how ESG compliance may lead to a better mitigation of inflation risk. However, such compliance may also imply giving up the short-term focus in the investments.

Another positive effect derived from a sustainable and resilient approach is the lower energy and repair costs. Greener buildings, for example, seek not only to reduce emissions but also to improve the energy efficiency, leading to lower energy consumption and hence, lower energy costs. A resilient approach to infrastructure construction may result in fewer repairs, regardless of whether the result arises from its use or from external reasons such as natural disasters. Thus, lower running costs caused by a sustainable and resilient approach will directly lead to higher returns.

Lack of transparency, corruption and mismanagement possibly threaten the successfulness of infrastructure projects. In fact, on the one hand, they often have an extremely complex structure and delivery process; on the other hand, they imply interaction between a large array of stakeholders. Research has shown that a deficiency in transparency is prone to negatively affect results (Annamalai et al. 2012). Incorporating ESG criteria can importantly reduce these adverse effects. However, if benefits are likely to flow from transparent business, the extent of these benefits may be difficult to assess. An improved reputation constitutes a further advantage flowing from ESG implementation.

Adopting an ESG approach shall also ensure greater business stability. It seeks per se to mitigate risks by taking into account and dealing with the sources of environmental, social and corporate governance uncertainty. The social dimension of ESG signifies for instance that a water-pipe network is planned so as to adapt to a changing demand -as population increases or consumption rises. As a consequence, rather than creating a centralised network, an ESG approach would favour a decentralised pattern that would better cope with incidents. As a consequence, the network is more resilient, and stable. A less conventional example is given by Rodin (2014) who describes how an Ikea store gained social consideration after the superstorm Sandy. As one of the few resilient buildings in Brooklyn, the store remained little damaged and served as headquarter for FEMA (Federal Emergency Management Agency) and neighbourhood associations in the aftermath of the storm. In addition to an improved image in the neighbourhood, the Ikea shop has limited the blip in its turnover.

Higher residual value amounts to another advantage. Compared to conventional infrastructure, the value of sustainable infrastructure tends to be greater after any given time. For example, when building a cycling-path along a river, a conventional project might neglect, or downplay, the risk of floods (which ESG approach would not).

Consequently, the value of a conventional path is likely to be lower than that of an ESG-compliant path, because of the higher likelihood of future damages, plus exposure to any past damages that may require reparations.

In addition to the above, an increasing demand for responsible investments creates new business opportunities. As more clients wish their money be invested in a responsible manner, it is the fund's fiduciary duty to invest in compliance with the ESG-criteria. Recently, the investment sector has witnessed flourishing interest in ESG products: in fact, the volume of asset managed in compliance with the UN Principles for Responsible Investment has surged from \$4 trillion in 2006 to \$59 trillion in 2015, mirroring the booming demand for responsible investments.

Finally, enhanced productivity for the firm results from improved governance. As workers and managers are involved in the decision-making, the working conditions can better match the employees' skills and produce higher levels of output. Incorporating their needs or demands might indeed generate positive outcomes for both employer and employee. Swanberg et al. (2008) find a positive correlation between flexible working hours and the productivity of workers.

Researches on performance of ESG approach

Sustainability is not only expected to add and generate further value for investors, it should also potentially mitigate a wide range of risks due to its proactive risk management approach.

Under the assumption that a sustainable infrastructure project generates similar returns compared to a conventional infrastructure project, and that the sustainability approach helps mitigate risk, a sustainable project features lower risk for the same return, i.e. it should feature a comparatively higher return for the same unit of risk taken. Better performance and risk-return spectrum are therefore expected.

Companies that integrate ESG criteria in their business management "significantly outperform their counterparts over the long term, both in terms of stock market and accounting performance" (Eccles et al. 2011). LTIIA is going to contribute to this research as well, and has commissioned EDHEC-Risk institute to conduct comparative analysis of

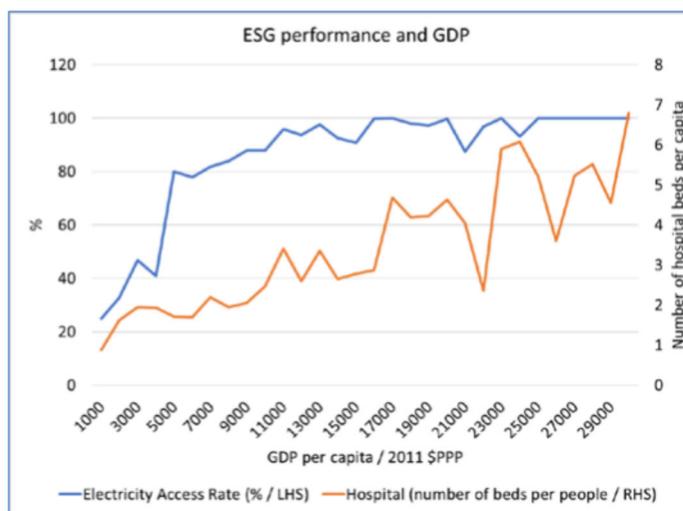
financial performance between infrastructure assets with various degrees of ESG compliance.

The national-level ESG performance

ESG factors are often seen as costly in terms of national legal and regulatory constraints. However, ESG national development indicators can be used to identify opportunities for investments in infrastructures.

Comparing sustainable development indicators with actual data for a country can highlight certain infrastructure needs.

Infrastructure projects are indeed key elements of a socio-economical ecosystem and increase systemic growth potential. Consequently, any infrastructure having a positive impact on ESG country factors would be favourably considered by national stakeholders. Added value can be identified where country data is below an ESG indicator standard.



This dual objective of systemic growth support and national ESG performance improvement is a major opportunity to be valued by investors.

Many ESG performance indicators are related to infrastructure needs. Here is a short list of infrastructure-oriented or related indicators the performance of which could be improved by new projects:

- Hospital/number of beds per inhabitant
- Electricity access (% of population with access)
- Power transmission and distribution losses (% of output)
- Gas transmission and distribution losses (% of output)
- GHG emissions per capita

- Gap to Nationally Determined Contributions target (NDCs)
- Improved sanitation facilities (% of population with access)
- Unemployment, total (% of total labor force) (modeled ILO estimate)
- Water productivity, total (constant 2010 US\$ GDP per cubic meter of total freshwater withdrawal).

Any project improving one (or more) of these aspects tends to improve local, regional and/or national well-being as well as investor's reputation.

The role of Green Bonds

Globally, investors are keen to explore opportunities to support projects that not only accelerate the transition to a low-carbon economy, but also enhance environmental issues such as biodiversity and the surrounding social and governance landscape. As a result of climate change and natural disasters, resilience has also become an increasingly important factor for investment decisions. Investors demand an increase in the scope of green bond certification to include a broader range of sustainability and resilience aspects. The latter are often missed by existing green bond schemes, which focus solely on low-carbon projects.

The green bond market has developed rapidly in recent years with total issued green bond of USD 42 billion in 2015. The majority of green bonds are issued for infrastructure projects. Given that the global demand for new infrastructure – a total of USD 93 trillion until 2030 – is almost double the volume of the world's existing infrastructure value, this represents a unique opportunity to create the backbone of our sustainable future. In this context, green bonds are an attractive tool with which to leverage the required finance and ensure that the right infrastructure investments are made. Due to their unique interaction with and effect on the environment, society, governance and economy, infrastructure projects require a more specific and targeted approach to green bond certification than other types of investment.

Green bonds offer investors the opportunity to allocate funds in an environmentally responsible way, mainly into infrastructure projects, thereby helping to accelerate the transition from traditional to sustainable development. Certification mechanisms play a key role in the green bond market by defining the significance of "green" and its credibility. Increasing questions are being raised about the bonds' credibility, the improper designation of "green bonds" and the rise of "greenwashing". Due to the lack of agreed

standards in defining green bonds, many cases exist where the latter have been issued despite their having little or no positive impacts on the environment. This also raises questions for the restructuring of existing debt. Under the umbrella of the International Capital Market Association (ICMA), the Green Bond Principles (GBP) are currently focusing on Green Projects Eligibility – an important step to enhance `greenness` in infrastructure and to combine available knowledge of diverse stakeholders in a powerful and reliable easy-to-apply tool.

Climate Change and Carbon-Related Considerations

Climate change and carbon-related issues are particularly important to factor in when considering infrastructure investment, both in terms of risk and opportunity. Climate change and carbon are increasingly discussed in the investor community with various approaches to this subject, all sharing one common premise though: “what can be measured can be managed”.

To simplify there are two main stances:

- some investors taking the more financially focused view that carbon should be monitored only because it entails additional risks and therefore needs to be included as any other risk factor;
- some investors taking the more socially responsible view that it is incumbent upon them to support decarbonisation and transition efforts.

There is therefore significant literature on the topic and an abundance of reports and handbooks which seek to help investors to deploy a carbon approach. However, there is limited material available specifically on infrastructure. This is all the more unfortunate when considering that infrastructure is of course a key sector for climate change / carbon analysis with outcomes which tend to be more readily measurable.

Indeed, infrastructure can have significant positive or negative impact in terms of carbon emissions. Conversely, infrastructure can itself be particularly exposed to the impacts of climate change.

Infrastructure, and particularly the “project finance” type of infrastructure where investors finance a clearly identified and ring-fenced object, allows for a more direct and meaningful measurement of impact than when considering that of a “black box” corporate investment.

This section aims at providing some resources and help, by presenting a holistic approach that is being used to monitor infrastructure investment. What follows should not be read as an approach that should be compulsorily mandated across the industry but as an example of how a responsible long term investor can approach carbon issues in a prudent manner. It is strongly recommended, however, that all long term investors take up at least some of these ideas and practices if they have not done so already.

Carbon-related risks

From a risk perspective, it is essential to engage on carbon-related issues and not leave this as a blind spot of how risk is approached. It is key to include an analysis of climate and energy risks as well as opportunities during the investment phases of projects. As an integrated part of the investment process, a qualitative assessment of the energy, carbon, and climate-related risks which have potentially negative financial, operational, commercial, or reputational impacts on the project should be undertaken on the basis of a systematic analysis framework.

For instance, one of the first risks to consider is the likely effects on a portfolio’s performance engendered by increased fuel prices and/or stricter regulation relating to carbon pricing. A second concern would be the significant reputational risk that is associated with carbon-heavy projects and which would deter responsible and ethical investors from otherwise valuable projects. This can ultimately leave certain types of projects “stranded”. On the other hand, carbon policy changes preparing for a lower carbon economy could also provide upside for low-carbon sectors (Mercer, 2015).

From a risk perspective, preparing for climate change and extreme weather events to which projects may be exposed is also crucial. In addition to the deterioration that can be

caused to such assets, factors such as the continuing usability of the infrastructure, increases to operational or maintenance costs or increase of insurance premia are factors that need to be considered.

Before making the decision to invest in a project, a detailed carbon, energy and climate change risk analysis should therefore be carried out, after which a project can be classified as low, medium or high risk to determine the subsequent level of monitoring of it that will be appropriate. This risk analysis should take into account matters such as how a project's energy supply will be managed throughout its life, how that project is exposed to energy pricing volatility, and how a project will react to climate change and extreme weather events. A rail project, for instance, in low-lying fields near to an area prone to flooding will obviously have to take into account the threat over the next decades of rising sea levels. A road in the Gulf of Mexico will have to forecast likely effects on the road of climate change-related increases in the frequency and severity of heavy storms that will damage the project's infrastructure.

On the carbon front, the analysis should examine a given project's plan to transition to a low-carbon economy. This will not just affect road projects, which might be expected to be the most 'carbon-exposed' projects in the layman's imagination, but every project. The analysis of the transition to a low-carbon economy should try to forecast the impact of increased costs driven by weightier requirements in the context of tightening carbon regulation, and also the impact of policy changes induced by potential collapse in carbon markets and changes in carbon taxes. It should also forecast the impact of greenhouse gas emissions from a given project. By doing these analyses and synthesizing them into one coherent one, it is possible that an investor

can make a helpful risk assessment of a project that will go some way towards whether to invest in it and if a 'Go' decision is subsequently made how these risks can be managed and mitigated over a project's lifetime.

These risks should be identified throughout the investment and asset management process and analysed at the earliest screening phase.

Carbon footprint

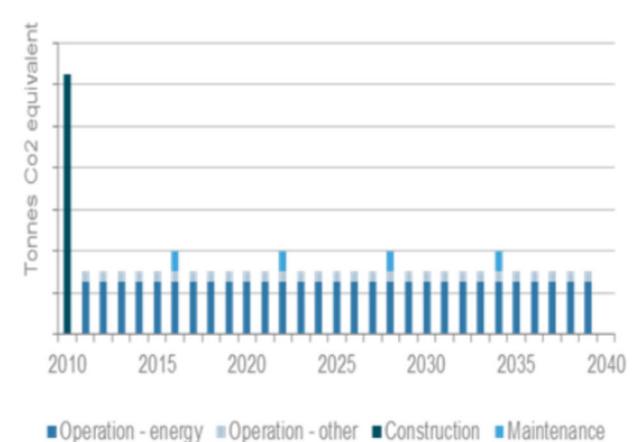
In addition to the approach mentioned above a number of investor initiatives refer to carbon footprinting of portfolios. Given the importance of infrastructure projects (especially when considering the full scope of impacts and including indirect emissions) and the ability to estimate with some accuracy future carbon footprints as the objects are well defined, this dimension should be included when considering infrastructure investment.

The carbon footprint of infrastructure projects will of course vary; in such a diverse asset class the footprint of projects like a road in America, a greenfield stadium in Europe and a greenfield hospital in an emerging market economy are of course going to be different and will have different emissions predicted throughout their life cycles. A hospital, for instance, will produce a lot of carbon emissions during construction, and then comparatively little as it settles into routine operations. A toll road for cars, however, will see a constantly high level of emissions throughout its lifecycle, due to the fact that its very *raison d'etre* is the carriage of carbon-emitting vehicles.

Carbon perimeter: direct and indirect emissions



Carbon footprint of the project over its lifetime

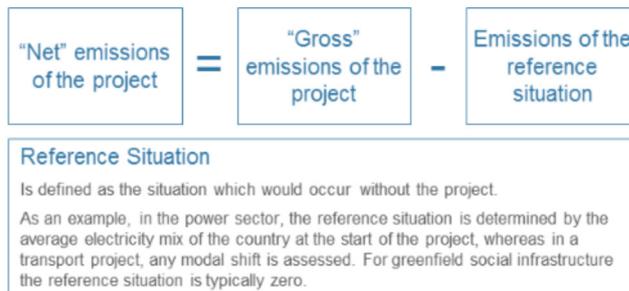


There are, however, ways and means whereby an investor can work with stakeholders in a project – procuring authority, contractors, local community groups to name only a few – to plan how to approach carbon matters in a systematic and easy-to-understand way, such as some well-developed and sophisticated carbon calculation tools.

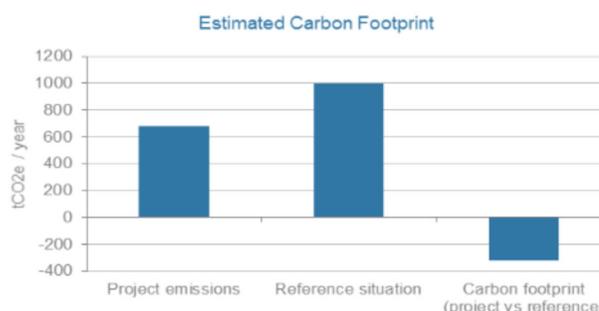
We advise implementing a system which can calculate the projected carbon footprint of any given infrastructure project, taking inputs of various technical data of a project such as the direct or indirect emissions that are expected to occur over a period of years.

Scope 1 emissions of greenhouse gases (GHG) are the most obvious; GHG emissions which are directly related to a project’s activity, such as combusted fuel used on a tunnel boring machine for instance. Scope 2 emissions are more indirect; GHG emissions from the generation of purchased electricity that is needed for a project’s activity (generators for contracted builders’ accommodation for example). Scope 3 emissions are yet more indirect, and are emissions that result from the production of materials purchased from other parties and used in the project’s activity such as the steel used to make a rail track or such as employee business travel or waste disposal. The prudent approach would be to take into account all three of these levels, which also is most appropriate from a risk analysis point of view. To illustrate, one investor in a social infrastructure project has found that despite the construction phase’s carbon footprint being relatively low, the forecasted footprint for the operational phase was very high. This was because the facility was built 20km away from a train station, meaning that the vast majority of its users travelled to it by car; an indirect emission that added greatly to the footprint. This kind of emission can of course be mitigated by the introduction of car sharing incentive systems and suchlike.

Once the relevant data has been compiled for a project, the next step is that it must then be compared to a reference situation, which is defined as the situation that would occur without the project. ‘Net’ emissions of the project are then assessed to be the ‘gross’ emissions of the project minus the emissions that would take place in the reference situation. Obviously a greenfield social infrastructure project will not have a reference situation, but for brownfield road projects this is a useful and simple aid to help determine if a project is likely to have a positive or negative net impact on carbon emissions.



Taking example of a greenfield rail project this time, actions that could be taken in the light of a carbon footprint forecast would include: optimizing earth movements to reduce external supplies; optimizing and streamlining concrete and supply transport distances; implementing eco-driving for passenger transport and freight; increasing the scalability of maintenance vehicles and thus lowering gross energy consumption to name but a few.



At the strategic level, too, certain lessons can be learned from deploying such approach. Firstly, carbon footprint assessment must be done as early as possible in the development of a project – and certainly before the construction phased – in order that an appropriate carbon action plan can be initiated. Next, for transport projects the validity of the analysis during the operation phase depends on the availability of solid and extensive traffic studies which are not always available or 100% accurate. However, the tool can still provide vital information on the construction phase and at least a guide to the operational phase.

By adopting and utilizing the approaches above – a carbon risk analysis and a carbon footprint impact assessment – a responsible investor can determine whether or not to invest in a project and, should the decision be made to do so, how best to deal with the challenge of dealing with the issues presented. It is recommended that any long term investor incorporates this into their investment strategy on a systematic basis and that all members of the investment team receive appropriate training in order that they are aware of carbon issues and so manage their portfolio investment decisions accordingly. In turn, once an asset has been acquired, the asset management team must be required to report at regular intervals on the carbon-related matters of a given project to investors. Not only is this a prudent strategy that will reward those who take it on in terms of excellent reputational risk management and mitigation, but also one that will improve the lives of communities globally, and will fit in very well with increasing demand for environmentally responsible infrastructure.

It is equally important that other key stakeholders of the infrastructure investment process – including the granting authorities – can benefit from regular training opportunities on the carbon issues.

Monitoring physical climate change risks

While the need to take into account the physical risks linked to climate change appears crucial for many investors, there are few methodologies for assessing the impacts of climate change on infrastructure.

A dedicated analysis of an infrastructure portfolio would include two steps:

- climate screening
- climate proofing

The first step, **climate screening**, is the assessment of a relative risk level for various pieces of infrastructure, for a given series of climatic hazards. This first step allows investors and managers to prioritize issues in their portfolio in order to concentrate on those assets with the highest levels of risk. The risk associated with the consequences of climate change is the combination of two distinct factors:

- the first is a climatic hazard, or a climatic event that is likely to occur and can cause damage to populations, economic activity, and the environment (e.g. drought, flooding, cyclones, etc.). It is necessary to know how a given climate hazard in a given region will change due to climate change (climate projections);

Recommendations of French Treasury for financial institutions

In February 2017, the French Treasury published a consultation report on the assessment of climate change-related risks in the banking sector. This report stated that climate change related risks (both physical and transition risks) do not stand for a new risk category, so they can be understood within the usual risk framework (ie framed as market, credit, liquidity or operational risks). It highlights the necessity for credit institutions to step up their efforts to develop adequate methodologies and collect all necessary data in order to get a better understanding of the risks they face. Scenario-based analysis seems to be an interesting tool to better seize these risks, considering as a priority a "bottom-up" approach, more consistent with each institution's profile:

- For physical risks: As a first step, banks could improve data collection and develop analytical capabilities to assess the impact at a local level of highly probable climate events (combining climate data provided by reinsurers or environment ministries with financial data from their portfolios). The second step would consist in conducting sensitivity tests, using the models and data previously developed, that could be part of financial disclosure regarding Basel II 3rd Pillar.

- For transition risks: At a macroeconomic level, an abrupt transition would have a substantial impact on macroeconomic variables. The stressed variables could be integrated in banks or supervisors' models to assess transition scenario impact on credit risk and to anticipate credit losses. However additional research is needed in the development of econometric models in order to convert climate policies projections into energy costs and macroeconomic indicators. At a portfolio level, banks should be able to determine, for specific sectors, their clients' exposures to transition risks by assessing the potential impact of climate policies on the financial determinants of credit/market risk (internal rating, default probability or loss given default for instance).

- the second is the vulnerability of a piece of infrastructure, i.e. the technical and geographical characteristics that will make it more or less vulnerable to a given climatic hazard (e.g. its sensitivity to heat waves...)

The combination of these two factors makes it possible to determine, for each category of climatic hazard, an associated risk level for different types of infrastructure. For example, offshore power generation infrastructure in an area with a high chance of marine submersion will present a high level of risk.

In the second step, a set of methodological principles can be followed in order to adopt a **climate proofing** action plan. It involves integrating adaptation measures to make a piece of infrastructure more resilient to climate change.

This two-step method can be applied either to a single piece of infrastructure or at the portfolio level. It can be done prior to or after investment.

The prerequisite for the success of such a project is the development of reliable databases on climate projections of all the hazards likely to be affected by climate change at the finest possible geographical scale. Investors can play a key role in supporting the development of these databases.

Encouraging the development of common methodological principles to measure the carbon footprint of infrastructure

Many of the current methodological issues relate to measuring the carbon footprint of infrastructure. It is possible, however, to make common recommendations in order to allow investors and managers to understand the carbon-related issues for infrastructure in the most appropriate way.

Carbon accounting pre / post investment

To the extent possible, it is strongly recommended to measure the carbon footprint of an infrastructure project before the construction phase in order to propose mitigation actions if necessary. In practice, many investors carry out this exercise in a post-investment context. Here are some suggested methodological principles for these different measures:

- When using a **pre-investment** logic, it is important to understand the project's emissions over its entire lifespan. It is therefore recommended to measure emissions over all phases, including construction, operation, usage and end-of-life GHG emissions. Operation and usage phases will be estimated.
- With a **post-investment** logic, it is recommended that the actual emissions of the project be reflected in the carbon budget exercise year after year. Operation and usage phases will be based on real values, enabling monitoring of infrastructure performance.
- In both cases, it is strongly recommended to amortize construction emissions over the lifetime of the project.

Measuring avoided GHG emissions

Measuring avoided emissions is crucial to understanding the appropriateness of an infrastructure in a given context and geography. The term avoided emissions is preferable to the term "net emissions" because avoided emissions are not real emissions. They are calculated only by comparison with a baseline situation and do not correspond directly to a reduction in total GHG emissions globally.

The definition of the reference situation is the most complicated stage of the calculation process because it varies according to the type of infrastructure and the particular context of project implementation. In order to understand this type of calculation objectively and compare the different published results, it is recommended to adopt common methodological frameworks. For example, a framework has been developed by the International Financial Institutions (IFI) for a Harmonised Approach to Greenhouse Gas Accounting to calculate the avoided emissions associated with specific sectors such as new renewable electricity generation projects.

Finally, it is essential to present the results of emissions generated by the piece of infrastructure and the emissions avoided by the piece of infrastructure in a completely separate way. Avoided emissions should not be subtracted from induced emissions for the reason described above.

Allocating emissions at the portfolio level

Many investors and fund managers now hope to measure the carbon footprint of infrastructure at the aggregate portfolio level. This exercise requires the work of allocating infrastructure emissions (generated and avoided) to the portfolio in order to take into account the investor's share of "responsibility" in total infrastructure-related GHG emissions. This allocation must be made in the following manner:

- If the induced and avoided emissions are measured on a large scope 1, 2 and 3 perimeter, it is necessary to prevent double counting and to attribute only part of the induced and avoided emissions to the piece of infrastructure in question. For example, a motorway is not 100% responsible for induced traffic. In the same way, a gas pipeline is not 100% responsible for the combustion of the transported gas by the end user. Sectoral allocation ratios can therefore be defined, for example by identifying the share of the cost linked to infrastructure in the final service or product costs.
- Once the emissions have been allocated to the piece of infrastructure, it is necessary to determine the investor's share of responsibility by using the investor's

holding share of the asset. For this exercise, it is recommended to calculate the holding share by dividing investment by the total asset value (equity plus debt).

This dual allocation thus makes it possible to consolidate the induced and avoided emissions at the portfolio level.

Aligning infrastructure portfolios with a 2°C climate scenario

While the measurement of induced emissions and avoided emissions is a highly recommended exercise in the development of greenfield or brownfield infrastructure, it is insufficient to align all economic actors with a global warming trajectory limited to 2°C.

The international mitigation objective validated under the Paris Agreement at COP21 cannot be achieved without substantial additional investments in energy efficiency and renewable energy, and without significant divestments from fossil fuel infrastructure (from extraction to electrical production). Numerous studies, notably that of the New Climate Economy, establish infrastructure investment trajectories that would pave the way for a 2°C compatible world.

It is essential that investors and infrastructure fund managers initiate in-depth reflection on this topic in order to adopt common methodological frameworks and investment strategies that allow them to align their portfolios with a 2°C trajectory.

Stranded assets

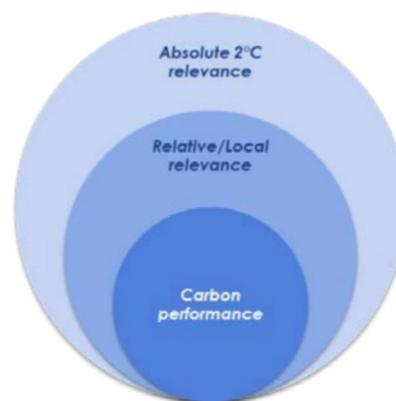
Stranded assets can be defined as “assets that have suffered from unanticipated or premature writedowns, devaluations, or conversion to liabilities” (Smith School 2015).

The causes of stranded assets can be numerous: stringent energy transition laws setting ambitious carbon prices, environmental activist campaigns, unexpected extreme climate events, etc. Both transition and physical climate risks can induce stranded assets within infrastructure portfolios and must be taken into account by investors and managers. Methodologies should be developed to highlight assets presenting a high probability of becoming stranded.

Conclusions

Three complementary and indispensable levels of analysis must be applied during the development of infrastructure assets:

- **Carbon performance:** will the infrastructure generate significant GHG emissions? How can these emissions be reduced on the project’s operational perimeter?
- **Relative / Local relevance:**
 - Is the infrastructure relevant in its context? Does it prevent emissions?
 - Is the infrastructure adapted to the present and future impacts of climate change?
- **Absolute relevance:** is the infrastructure portfolio compatible with a mitigation path aligned with the 2°C objective?



The three pillars of climate strategy adapted to infrastructure portfolios

Business and Human Rights Considerations

The identification and mitigation of actual and potential human rights impacts is inherent to effective ESG management in the context of any infrastructure project. The potential for human rights issues arising from construction, which can range from “land grabs” to on-site labour welfare issues, are well-known. Equally, an infrastructure project - once completed - can adversely affect the rights of workers (e.g. through health & safety and other labour standards issues), as well as those in close proximity to it through its day-to-day operation. Consider, for example, the implications of pollution, expatriate “fly-in / fly-out” workers and security forces (charged with protecting infrastructure assets) for local communities.

Although framing these issues in “human rights” language is perhaps a more recent phenomenon for investors, it has long been acknowledged that such “social impacts” can arise from the financing of infrastructure projects. Whilst certain soft law standards applicable to businesses have explicitly referenced human rights for some time (e.g. the UN Global Compact, founded in 2000), the shift towards human rights terminology is largely attributable to the UN Guiding Principles on Business and Human Rights and subsequent developments, which we discuss below.

UN Guiding Principles

The UN Guiding Principles emphasise that businesses need to ‘know and show’ that they respect human rights through policy commitment, human rights due diligence, the provision of remedy for those whose rights have been infringed (where appropriate) and external reporting on human rights impacts. A key tenet of the UN Guiding Principles is that businesses have a responsibility to respect human rights. This responsibility is discharged through

human rights due diligence, which is fundamental to the effective identification and management of human rights impacts associated with a businesses’ operations, supply chains or value chains.

Effective human rights due diligence pursuant to the UN Guiding Principles has several key defining characteristics. Firstly, the process must be targeted at assessing and mitigating impacts to the rights-holders (rather than risks to the business). Secondly, it must not be “company” or “group” specific; a business can cause, contribute or be linked to human rights impacts through any number of business relationships, such as with suppliers, customers or joint venture partners. Finally, due diligence is an ongoing process, as the potential for human rights issues can change over time. This final point is particularly relevant to long term investment projects.

The UN Guiding Principles were unanimously endorsed by the UN Human Rights Council in 2011 and garnered widespread support from governments, businesses and civil society. As is explained below, they remain the most authoritative voluntary standard for businesses in terms of ensuring respect for human rights. However, as the UN Guiding Principles are intended to apply to any business in any sector or operating context, they are - by design - high level principles.

For investors, specific additional standards or guidance documents - which draw from the UN Guiding Principles - may apply, depending on the nature of their investment, including the Principles for Responsible Investment, Equator Principles and OECD Guidelines for Multinational Enterprises (OECD Guidelines), which we discuss below. Investors are increasingly incorporating these standards into their decision-making and monitoring processes in response to the growing awareness that the value of an investment can be significantly impacted by the prevalence of human

rights issues. This is particularly true of infrastructure investments, where the potential for severe human rights issues is well-documented.

Project Specific Financing

The Equator Principles (**EPs**) is a risk management framework which signatory financial institutions (**EPFIs**) must adhere to when determining, assessing and managing environmental and social risks arising from project financing. The EPs were revised in 2013 to create new requirements for businesses to conduct human rights due diligence in order to qualify for financing from EPFIs, which include 79 of the largest financial institutions.

The EPs apply to all project financing with a value of over US\$10 million and to certain types of corporate loans, bridge loans and project finance advisory services (e.g. advice on the provision of equity and project management), and EPFIs are required to ensure clients comply with the detailed requirements of the International Finance Corporation Performance Standards on Environmental & Social Sustainability (**IFC Performance Standards**), upon which the EPs are based.

The IFC Performance Standards, which were first published in 2006, are addressed to parties responsible for implementing and operating projects financed by the IFC or the recipients of that financing. They cover a range of potential risk areas for infrastructure projects including environmental and social risks, labour and working conditions (including child and forced labour), pollution prevention, community health, safety and security, land acquisition and involuntary resettlement, biodiversity conservation, indigenous peoples and cultural heritage.

The principal aim of the IFC Performance Standards is to ensure that potential issues in these risk areas are properly identified, avoided, mitigated and managed, over and above the requirements of host country laws and regulations where necessary. In 2012, the IFC Performance Standards were updated to require “*specific human rights due diligence*” of the type endorsed by the UN Guiding Principles in “*high risk circumstances*”.

This is a narrower approach than the UN Guiding Principles, which envisages the performance of human rights due diligence to avoid actual or potential human rights impacts regardless of the operating context [in all circumstances]. In

that sense, some form of proportionate human rights due diligence is necessary precisely to inform the decision of what risks of adverse human rights impacts may be present which either need to be addressed or otherwise subjected to further due diligence.

In addition to any of the above soft-law standards, it is important to ensure in any infrastructure project that all applicable laws are complied with, throughout the construction (and subsequent operation of) infrastructure. An increasing number of countries are adopting laws which directly address human rights in the context of infrastructure projects. Most recently, Senegal passed a new Mining Code in 2016 which requires mining companies to respect, protect and implement human rights in the areas affected by their operations.

Institutional Investors

Beyond the pure project finance context, institutional investors including banks, pension funds and asset management firms are under growing pressure to perform human rights due diligence on their investee companies, on the basis that even a minority interest in a company can constitute a “*business relationship*” for the purposes of the UN Guiding Principles. In terms of infrastructure, an investor’s responsibilities under the UN Guiding Principles may be engaged where, for example, that investor acquires an interest in a company which works on construction projects.

The need for some form of human rights due diligence in such a scenario is well-highlighted by a 2012 determination by the Norwegian National Contact Point (**NCP**) that an investor violated the OECD Guidelines in part because it did not have a strategy to react to human rights risks related to the companies in which it invested, apart from in relation to child labour issues. This matter is of interest because the relevant investor held around a 1% share in a steel company which had been accused of human rights abuses in connection with the construction of a plant. For context, all member states of the OECD are required to establish NCPs to receive complaints from third parties about corporate conduct which is alleged to fall short of the expectations of the OECD Guidelines. Upon receiving a complaint, an NCP will determine whether or not the relevant business has complied with the OECD Guidelines, which are broadly aligned with the UN Guiding Principles in

terms of its human rights provisions following an update in 2011.

In response to this NCP decision and similar complaints against investors by NGOs, institutional investors are increasingly recognising the need to apply the UN Guiding Principles by incorporating human rights considerations into their decision-making processes, and by evaluating and monitoring existing and potential investees in this regard. Those in the infrastructure sector are usually categorised as presenting an inflated risk, particularly given high-profile issues such as labour welfare in connection with construction associated with large sporting events. What constitutes appropriate human rights due diligence by an investor requires clarification, and will vary depending on the circumstances. Moreover, investors face a number of challenges in ascertaining, managing and accounting for human rights impacts which might arise in connection with their investments.

Firstly, investors frequently struggle to acquire relevant information about how existing or potential investees manage human rights issues. Direct engagement with businesses can be problematic, particularly where due diligence inquiries may raise potential legal issues around the receipt of price sensitive information. Various steps have been taken to address this issue, however, including through the launch of ethical indices such as *FTSE4Good*. Most recently, the Corporate Human Rights Benchmark (**CHRB**) was launched in March 2017, with an initial focus on companies in three sectors: agriculture, apparel and extractives. The CHRB was established by a consortium of NGOs and investors with the aim of encouraging good corporate behaviour by incentivising companies to respond to competitive pressure by developing (and disclosing details of) their human rights management programmes. The idea is that better performing companies will begin to reap additional benefits, such as a lower weighted average cost of capital reflective of the fact that certain human rights issues can significantly jeopardise the value of an investment when they materialise.

Secondly, when faced with potential human rights (and other ESG) issues, institutional investors charged with managing funds on behalf of beneficiaries (e.g. pension funds managers) may find that their response is constrained by certain legal duties, depending on the jurisdiction and the nature of the human rights issues in question. Under English law, trustees need to bear in mind the overriding duty to promote the purpose of the trust. Some trusts give investors specific ethical mandates, but the majority of trusts are established solely for the accrual of profit on behalf of

beneficiaries. Although it is well-established that certain human rights issues can impact on the value of an investment (e.g. by causing an investee company's share price to underperform), it can be difficult to predict when such human rights-related risks may materialise. In an infrastructure context, for example, rights issues may lead to community protests. Until the protest which triggers a fall in the investee company's stock price, the underlying issues would not be quantified by an investor absent effective human rights due diligence.

Thirdly, investors can struggle to establish "leverage" over investee companies once a specific human rights issue has been identified. Largely, the degree to which an investor is positioned to exert leverage will depend on the size of its investment (e.g. its shareholding) and the extent to which it is represented on the board of the investee company (assuming its appointed board representatives have had appropriate human rights training). "Leverage" for these purposes is a UN Guiding Principles term; effectively the steps a company can take – as appropriate – to influence another person with which it has a relationship to cease or mitigate identified human rights impacts. It is distinct from the more traditional duty incumbent on institutional investors to undertake on-going monitoring of an investment's performance.

In grappling with these and other challenges, investors can have regard to the Principles of Responsible Investment (**PRIs**). The PRIs is a member-driven UN supported initiative aimed at helping institutional investors discharge their fiduciary duties by managing any ESG governance issues that could affect the performance of investment portfolios. The six principles which signatory investors commit to include the following:

- We will incorporate ESG issues into investment analysis and decision-making processes.
- We will be active owners and incorporate ESG issues into our ownership policies and practices.
- We will seek appropriate disclosure on ESG issues by the entities in which we invest.

On 23 February 2017, the PRI announced a new infrastructure work-stream that will focus mainly on private debt and equity investments in infrastructure, both direct and via funds. It will also ensure consideration of material ESG factors in investment decision making, and provide guidance on integrating responsible investment throughout the investment process from origination to exit. An Infrastructure Advisory Committee composed of 17 representatives from nine countries will share their expertise and guide the new infrastructure strategy.

External Reporting

As businesses (including investors) come under increasing scrutiny from stakeholders such as regulators, NGOs, shareholders, customers and employees to demonstrate their respect for human rights, notions of moral and ethical responsibility (as set out in soft-law instruments such as the UN Guiding Principles, Equator Principles and PRIs) are transforming into harder edged legal duties through legislative and regulatory developments.

This is most evident in disclosure requirements which, like the CHRB, seek to encourage competition between businesses. This emphasis on transparency is reflected in the UN Guiding Principles, which advocate that businesses report publicly on their human rights impacts and responses. Examples of specific “disclosure” laws include the following:

- The UK Modern Slavery Act 2015 requires certain companies to report on the steps they are taking to eradicate slavery and human trafficking in their own operations and in their supply chains, by publishing a statement in a prominent place on the business’ website. An amendment is currently proceeding through Parliament that would oblige UK authorities to exclude any economic operator from participating in procurement processes unless they have produced a slavery and human trafficking statement: this could be significant in terms of UK-funded infrastructure projects. In February 2017 the Australian government commenced an inquiry into whether Australia should adopt similar legislation to combat modern slavery which would be comparable to the Modern Slavery Act.
- In early 2017, the French Parliament voted to pass a new French “duty of vigilance” law which will require certain French multinational companies to implement (and publish) due diligence plans identifying risks of adverse human rights impacts, assuming it survives a pending constitutional challenge.
- From 2017, pursuant to amendments to the EU Directive on the disclosure of non-financial and diversity information, large listed companies and other public interest entities across the EU will be required to publish a non-financial statement containing information on, amongst other things, human rights matters necessary to understand the “*impact*” of the company’s activity.

Reflecting the demand for increased reporting by companies on their human rights performance, the UN Guiding Principles Reporting Framework was launched in 2015. The

aim of the Reporting Framework is to provide guidance for “adopting” companies regarding how to report meaningfully on their respect for human rights, to facilitate their engagement with investors and other stakeholders.

Human Rights Due Diligence

Although there is a growing consensus that human rights due diligence is centrally important to the effective identification and management of human rights issues, there remains a lack of clarity amongst businesses about what it requires. International law firm Norton Rose Fulbright and the British Institute of International and Comparative Law (BIICL) conducted a joint research project with the aim of helping businesses understand the scope, meaning and consequences of human rights due diligence as described in the Guiding Principles.

The results, published in October 2016, showed that due diligence with a specific focus on human rights proved to be more effective: 77% of the survey respondents that conducted specific human rights due diligence identified actual or potential human rights impacts in their operations through the process. By contrast, only 19% of companies who did not conduct due diligence with an express focus on human rights identified these impacts.

The project further concluded that where companies undertook specific human rights due diligence:

- most did so with reference to the UN Guiding Principles;
- actual or potential human rights issues were more likely to be detected;
- impacts linked to the activities of third parties were more likely to be identified (74% identified actual or potential human rights impacts linked to the activities of their third party business relationships vs. 29% in the cohort which did not undertake specific human rights due diligence);
- findings were more likely to be reported both internally and externally;
- the CSR function, which has a company-wide mandate, would most often have responsibility for the identification, response to and monitoring of human rights impacts often in co-operation with other functions, particularly the legal department;
- human rights experts were more likely to be engaged; and
- the effectiveness of actions taken in response to identified issues were more likely to be monitored.

Conversely, where companies did not undertake specific human rights due diligence, but incorporated human rights issues into other processes:

- the exercise was more likely to result in identifying mainly highly regulated human rights issues, such as health and safety and labour related rights being considered, most likely in response to the prevailing legal imperatives;
- issues which are connected to unregulated or less regulated areas (including the impacts of third party relationships) were unlikely to be identified or monitored at all;
- the human resources function would usually be responsible for human rights-related work, which is likely correlated to focus on regulated issues highlighted above with special emphasis on labour rights only; and
- the effectiveness of the company's human rights-related actions were unlikely to be monitored.

<http://human-rights-due-diligence.nortonrosefulbright.online/>

Existing frameworks and tools



Review of existing globally recognized tools and frameworks

There are already a number of existing ESG frameworks which are available and globally recognised. It may make sense for an institution seeking to define an ESG policy to refer to these. Such policy statements have to include concrete investments standards from an ESG perspective including a list of businesses and activities that are non-compliant with the ESG criteria (negative approach).

The handbook will present some of the key reference documents that can contribute to defining an ESG policy.

Many of the following frameworks and initiatives display strong similarities, thereby demonstrating the coherence of the ESG definition and approach (full compliance with all local environmental, social and governance integrity, disclosure and other laws is always the minimum standard of such frameworks). But if similarities are obvious, differences arise nonetheless. Since some of the frameworks and tools have been set by several major international organisations such as the World Bank and the United Nations, they will reflect their specific concerns. As a more general result, some aspects of the ESG definition are more or less demanding, depending on the standards.

International Finance Corporation (IFC) Performance Standard (2012)

The IFC represents the private arm of the WB. The aim of its Performance Standard is to introduce managers to the ESG concerns. To raise awareness of these issues, 8 pillars have been set:

- Assessment and management of social and environmental risks and impacts
- Labour and working conditions
- Resource efficiency and pollution prevention
- Community health, safety and security
- Land acquisition and involuntary resettlement
- Biodiversity conservation and sustainable management of living natural resources
- Indigenous peoples
- Cultural heritage

<http://www.ifc.org/>

Equator Principles

The Equator Principles are based on the IFC Performance Standards but are specially tailored for emerging economies. They intend to “provide a minimum standard for due diligence to support responsible risk decision-making” (Equator Principles website). When projects are considered risky, they must comply with the principles: ESG commitment compensates for the higher risk. Currently, 80 financial institutions in 35 countries have signed the Equator Principles, representing over 70% of international project finance debt in emerging countries.

<http://www.equator-principles.com>

ESG Indicators Library

In 2016, eFront and the Long Term Infrastructure Investors Association launched a dedicated library of ESG indicators for infrastructure investors. The purpose of the library is (1) to share best practices; informing the industry on what indicators other leading investors are monitoring and (2) providing a consistent way of phrasing indicators in order to reduce reporting burden for both LPs and GPs.

eFront ESG is a portal that enables LPs and GPs to collect and analyse ESG information. Investees can report once to multiple investors, reducing their reporting burden, increasing efficiency and response rate. eFront ESG offers access to a library of industry standards and best practices, allowing investors to custom build ESG data requests from industry standards such as the PRI, SASB, and as well as, the new eFront-LTIIA library – overall helping inform investors of best practices, industry trends and overall increasing efficiency.

The eFront-LTIIA library consists of indicators at the fund and project level. The eFront-LTIIA library, on the fund level has nine sections covering topics such as communication, environmental practices and health & safety. Example indicators include:

- Does the company report on ESG issues?
- How often are ESG issues reported? and
- To whom are ESG issues reported?

These three indicators are grouped together under the section communication.

Other fund level indicators include:

- Does the management company have an ESG policy?

- Has the company set an ESG risk matrix analysis?
- Is the management company a member of a collaborative organisation/ initiatives of which the management company is a member?
- Indicate the number of women on the board.
- What is the fund's exclusion criteria?
- Does the manager have a formal engagement strategy?
- Has the management company ever carried out a carbon assessment? and
- Has the management company developed any relationships with local communities?

On the project level, the library has 39 sections covering topics such as employment policy, occupational health & safety and stakeholder identification and engagement planning. Example indicators include:

- Does the company have a health & safety policy in place?
- If yes, what programs or procedures are in place?
- Does the company review or audit its H&S policy?
- If yes, what is the procedure to review and audit the H&S policy?
- Does the company have regular health & safety external audits?

These all focus on indicators relating to the health & safety policy of the project/company, and are included within the Occupational health & safety section.

Other indicators across the project level include:

- Indicate the number of members on the board.
- Indicator the percentage split of female/male full time employees.
- What have been the key ESG challenges that the company has met since the beginning of the project?
- What are the ESG priorities / action plan for the coming year?
- Does the company have a working conditions policy in place?
- Does the company have an anti-bribery policy in place? And
- What type of issues have been raised by stakeholders in relation to the asset?

The eFront-LTIIA library was developed in close collaboration with LTIIA members who contributed commonly asked infrastructure ESG indicators used in their investment processes. eFront and LTIIA collected these indicators, identified and grouped similar indicators together

in order to rephrase, to reduce duplication, whilst also providing consistent phrasing of indicators within the library. As the library develops, eFront will continue to work with LTIIA and its members to build a reliable library of ESG indicators for infrastructure investors.

ISO 14007

Translating information on an organization's aspects, impacts and dependencies into economic values can facilitate engagement with the organization's finance function and, in particular, with the Chief Financial Officer. This type of information can enable the material environmental issues and their implications for the organization to be understood in commercial terms. This can prioritize action on environmental management by key decision makers, especially at the board level.

Overall, measuring both "non-financial" and "financial" information will better inform an organization's decision-making on sustainability. This is consistent with the recent revisions to ISO 14001 where involvement of the senior leadership team is a key focus.

This International Standard offers organizations guidance on determining, and communicating, the environmental costs and benefits associated with their environmental aspects, impacts and dependencies on natural resources and ecosystem services. Information on aspects and impacts can come from ISO 14001 or from other sources. This standard will provide direction on decisions that organizations make with regard to the identifying and setting the boundaries of their environmental costs and benefits to be considered and also to selecting the type of data to use in order for them to effectively start the process of determining costs and benefits.

The standard is designed to be used in a range of applications that inform environmental Management and is applicable to any organization regardless of size, type and nature, and applies to the environmental aspects, impacts and dependencies of its activities, products and services that the organization determines are to be included among its environmental costs and benefits.

UN Global Compact (2000)

The UN Global Compact has a fourfold basis:

- the Universal Human Rights Declaration
- the International Labour Organisation's Declaration on Fundamental Principles and Rights at Work

- the Rio Declaration on Environment and Development
- the United Nations Convention against Corruption

Following from these pillars, the UN Global Compact comprises 10 Principles that cover human rights, labour standards, environmental protection and fight against corruption. So far 8,320 companies in 170 countries have committed to this initiative
<https://www.unglobalcompact.org>

UN Global Reporting Initiative (2006)

The UN Global Initiative is a leading international sustainability reporting framework for businesses.

It offers specific indices to cover economic aspects, environment, human rights, labor practices, products responsibility and impact on society.

It largely builds upon the UN Global Compact but aims at further encouraging firms to display their efforts. In fact, the GRI provides a framework that allows businesses to transparently and accurately disclose information about their sustainability. Moreover, this framework can be used to benchmark different organisations with respect to laws, norms, performance standards, initiatives etc.
<https://www.globalreporting.org>

UN Principles for Responsible Investment (2006)

The United Nations-supported Principles for Responsible Investment (PRI) Initiative is an international network of investors working together to put the six Principles into practice. The Principles themselves are aspirational and cover:

- Incorporating ESG issues into investment decision making;
- Active ownership of investee companies and assets;
- Promoting transparency of ESG issues by investee companies;
- Promoting acceptance and implementation of the Principles;
- Working collaboratively to enhance effectiveness on implementing the Principles;
- Reporting on activities and progress towards implementing the Principles.

<http://www.unpri.org>

US Private Equity Council Responsible Investment Guidelines (2009)

The USPEC Responsible Investment Guidelines are widely inspired by the UN PRI. They encompass 9 Principles that cover environmental, social, governance, health, safety and labour issues. The USPEC claims signatory of a group of the world's major institutional investors.
<http://www.privateequitycouncil.org>

European Development Finance Institutions (EDFIs) Principles for Responsible Financing (2009)

The EDFIs are an association of 15 bilateral institutions operating in developing and reforming economies. The aim of their Principles for Responsible Financing is to

- 1) foster growth in sustainable businesses
- 2) help reduce poverty and improve people's lives
- 3) contribute to achieving the Millennium Development Goals (outdated!!).

Promoting economically, environmentally and socially sustainable development through financing and investing in profitable sector enterprises are therefore seen as the means to achieve these goals. In 2014, the consolidated portfolio including un-disbursed commitments amounted to € 32.9 billion invested in 4,006 projects.
<http://www.edfi.eu>

Review of selected investors' approach to ESG

California State Teachers' Retirement System

CalSTRS invests a multi-billion dollar fund in a unique and complex social-economic milieu and recognizes it can neither operate nor invest in a vacuum. The System's investment activities impact other facets of the economy and the globe. As a significant investor with a very long term investment horizon and expected life, the success of CalSTRS is linked to global economic growth and prosperity. Actions and activities that detract from the likelihood and potential of global growth are not in the long term interests of the Fund.

Since CalSTRS is a long term investor and may hold an investment in a corporation or entity for decade after decade, short-term gains at the expense of long term gains

are not in the best interest of the Fund. Sustainable returns over long periods are in the economic interest of the Fund. Conversely, unsustainable practices that hurt long term profits are risks to the System's investment.

CalSTRS expects all investment managers, both internal and external to assess the risk of each of the following factors when making an investment. The manager needs to balance the rate of return with all the risks including consideration of the specific investments exposure to each factor in each country in which that investment or company operates

CALSTRS 21 RISK FACTORS	
Monetary Transparency	Data Dissemination
Accounting	Payment System: Central Bank
Securities Regulation	Auditing
Fiscal Transparency	Corporate Governance
Banking Supervision	Payment System: Principles
Insolvency Framework	Money Laundering
Insurance Supervision	Respect for Human Rights
Respect for Civil Liberties	Respect for Political Rights
Discrimination Based on Race, Sex, Disability, Language, or Social Status	Worker Rights
Environmental	War/Conflicts/Acts of Terrorism
Human Health	

More information about the 21 risk factors policy and its application can be found at <http://www.calstrs.com/>.

InfraVia

InfraVia Capital Partners is an independent investment company specialised in the infrastructure sector, currently managing EUR 1.7bn across three infrastructure funds.

InfraVia Capital Partners invests in assets with a lifecycle typically spanning over several decades with the objective to deliver stable and long-term returns to its investors. The very nature of the services provided by infrastructure assets, as well as their environmental and social impacts make sustainable development considerations a priority for infrastructure investment.

InfraVia Capital Partners believes that striving to improve on environmental, social, societal and governance criteria not only deals with responsible investment considerations but also improves the lifetime of the assets, their resilience to project risks, and their long-term profitability.

In 2017 InfraVia Capital Partners has performed a carbon assessment with Carbone 4 using the following methodology :

Taking GHG emissions into account

The common metric used for accounting Greenhouse Gas Emissions is the tCO2e (tonne of CO2 equivalent). To do the calculation, all the activities must be described by activity data and these data are multiplied by an emission factor which quantifies the amount of GHG emissions associated with the data (amount of tCO2e in one kWh of electricity, amount of tCO2e in one km traveled by a car).

Perimeter

As the assessment of carbon emissions is a measure of dependency on fossil fuels, it is important to measure the emissions occurring over the entire value chain. For a piece of infrastructure, that means that all phases of the project should be taken into account: (i) Construction, (ii) Operation and maintenance and (iii) Use of infrastructure.

Avoided emissions

If induced emissions are the real amount of GHGs emitted in the atmosphere, there is another indicator which enables us to understand the appropriateness of a piece of infrastructure in a given context and geography. The term avoided emissions is preferable to the term "net emissions" because avoided emissions are not real emissions. They are calculated only through comparison with a baseline

situation and do not correspond directly to a reduction in total GHG emissions globally.

Portfolio allocation

InfraVia has measured the carbon footprint of infrastructure at the aggregate portfolio level. This exercise has required the work of allocating infrastructure emissions (generated and avoided) to the portfolio in order to take into account the investor's share of "responsibility" in total infrastructure-related GHG emissions. This allocation has been made in the following manner.

- (i) If the induced and avoided emissions are measured on a large scope 1, 2 and 3 perimeter, it is necessary to prevent double counting and to attribute only part of the induced and avoided emissions to the piece of infrastructure in question. For example, a motorway is not 100% responsible for induced traffic. In the same way, a gas pipeline is not 100% responsible for the combustion of the transported gas by the end user. Sectoral allocation ratios are defined, for example by identifying the share of the cost linked to infrastructure in the final service or product costs.
- (ii) Once the emissions have been allocated to the piece of infrastructure, it is necessary to determine the investor's share of responsibility by using the investor's holding share of the asset.

This dual allocation thus makes it possible to consolidate the induced and avoided emissions at the portfolio level.

Global analysis v ersus in-depth analysis

As the perimeter of a carbon footprint is wide, a way to simplify the analysis can be to use ratios that will estimate some of the activity data, based on industry averages. It is then possible to assess the GHG emissions based on the type of infrastructure and one or two values that describe its size. The global approach allows one to quickly measure the carbon impact of a portfolio.

However, a more in-depth analysis is required to accurately assess infrastructure performance, assess avoided emissions, and to identify levers for GHG emissions reduction. This analysis requires collecting a small amount of activity data from the infrastructure operator. In 2017 InfraVia has selected 4 major portfolio companies to conduct such in-depth analysis.

Meridiam Infrastructure

Meridiam was founded on the principle that infrastructure investment should be on a long term, responsible and sustainable basis, with clear benefits to local communities.

Meridiam has developed environmental, social and governance ("ESG") principles to include not only global standards such as the UN Principles for Responsible Investing and the Equator Principles, but also to take into account ESG criteria of leading institutions such as the EIB or the EBRD. These principles are outlined in Meridiam's sustainable development charter.

ESG constitutes a key element of Meridiam's risk management approach and is integrated throughout the investment and asset management processes, as is the necessity of developing and analysing ESG considerations as a project progresses. Each internal project milestone will include a specific focus on ESG.

Meridiam's ESG screening and monitoring procedures begin with the initial identification of a project. Meridiam will specifically target those projects which the members of the Team believe will have a positive impact on the local community. Before considering a project, Meridiam will carry out an assessment of the environmental and socioeconomic impact of the project. During the development phase of a project all activities will be subject to ESG due diligence including site visits for instance. The findings of Meridiam's Environmental and Social Due Diligence will be contractually captured in the financial agreement of a project.

Over the life of a project Meridiam will seek to ensure that ESG standards are maintained through careful monitoring. This will be done through the creation of a series of qualitative and quantitative ESG indicators to be monitored throughout the life of each investment and through specific ESG related obligations which will be implemented in each project's documentation.

As an active investor with systematic representation on the board of each project company, Meridiam pays particular care to governance issues and promoting a best-in-class approach.

Meridiam's ESG approach benefits from a continuous improvement process. The latest enhancement to the approach has been the integration of a systematic analysis of climate change and carbon issues which include a carbon footprint assessment for each closed project.

SWEN Capital Partners

With more than 3.4 billion euros asset under management, SWEN CP is specialized in Infrastructure, Private Debt and Private Equity, managing essentially multi-management and co-investment vehicles, and so, behaves as a GP and a LP.

SWEN CP is convinced that including environmental, social and governance (ESG) criteria in investment processes enables:

- **better risk management** as investors become more aware of ESG challenges,
- identification and **generation of new sources of competitive opportunities** for the underlying assets,
- improvement on the image of the private asset class, particularly by making it possible to **measure its positive contributions in terms of ESG** to the civil society.

SWEN CP commits to act as a responsible investor. The company formalised its approach in a responsible investment charter and policy. The integration of ESG criteria is taken into account in the whole investment process regarding its institutional funds.

During the due diligence process, SWEN CP will apply its ESG approach in different ways, depending on the context of the transaction.

- **For primary transactions**, SWEN CP will deploy a full and deep ESG review (for more details see section *At the level of the fund* below).
- **For secondary transactions**, given their specifics (confidentiality, time limits), the team will be unable to carry out a full analysis of the ESG risks of the underlying portfolio before the closing of the deal. First, a light ESG review of the underlying assets is undertaken to ensure no SWEN CP's exclusion commitments are broken. Then, the dialogue with the GP will be initiated post-acquisition.
- **For co-investments**, the SWEN CP's ESG analysis relies on the information provided by the fund that proposes this investment opportunity, and on the own due diligence by SWEN CP's ESG Research team. The SWEN CP's materiality matrix summarises the main risks and opportunities of the asset.

During the holding period and once the investment has been made, the team monitors it on a permanent basis staying alert to any events or sudden controversies

concerning any GP or main underlying holdings in SWEN CP's portfolio, that could bring about a substantial ESG risk, including any reputational risk.

The team monitors controversies internally thanks to public data providers and checks these ESG considerations with the GPs on an on-going basis.

Once a year, the team will question GPs concerning their ESG strategy both at the level of the management company and their underlying portfolio companies / assets. SWEN CP uses the eFront ESG tool in order to gather all these ESG KPI (key performance indicators) and study them.

With now 4 years track record, SWEN CP has gathered more than 75 000 ESG data on private assets, essentially in Europe. This annual ESG review allows SWEN CP to realize its own Annual ESG report for its institutional investors and helps SWEN CP's team to reinforce the monitoring of its investments, covering by this way all the aspects.

Moreover, facing such interesting results, SWEN CP publishes, in partnership with the *Magazine des Affaires*, two ESG studies (one about the private equity and the other one about infrastructure), in order to share the main results and the progress made over the years on ESG integration by our industry.

SWEN CP is very active at the level of the profession on promoting the integration of ESG criteria into investment decision making and monitoring processes. Every June, SWEN CP organizes the "ESG Best Practices Honours, by SWEN" in order to share the outstanding ESG practices of private equity and private infrastructure GPs and communicate on the positive impacts recorded by underlying private backed companies. This annual event draws more than 200 participants: institutional investors, international GPs, professional associations and high level organizations such as OECD and PRI.

Finally, in early 2016, SWEN CP joined the Initiative Carbone 2020 (IC20). In line with the COP 21 objectives of limiting global warming, IC20 signatories commit to consider the issue of climate change in their investment process. Since, SWEN CP commissioned several external providers to assess the carbon footprint of its funds. The results will serve as a basis on which to define SWEN CP's climate strategy.

Implementing ESG policy

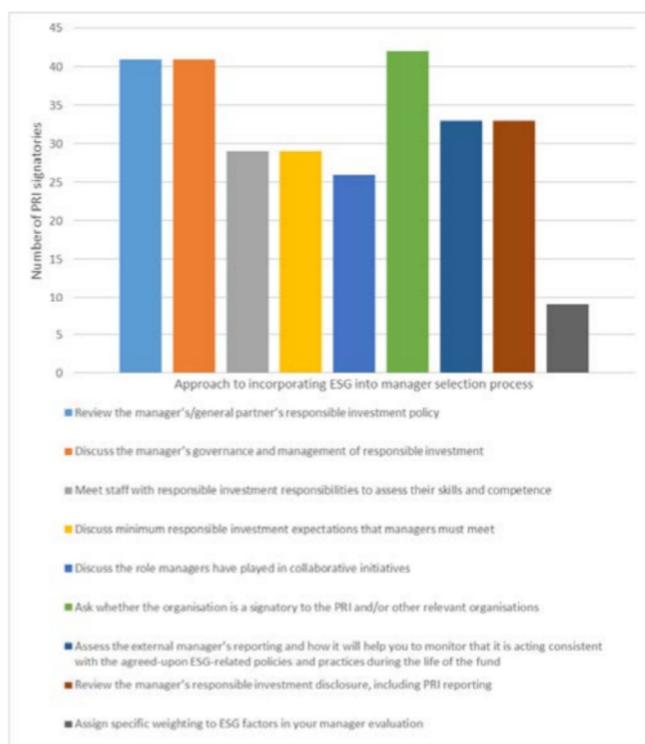


A snapshot of implementation policies

Investor signatories to the UN-supported Principles for Responsible Investment (PRI) are required to report annually on their responsible investment activities¹. This chapter is based on information from the voluntary infrastructure module within the PRI's Reporting Framework. Of 44 investors choosing to complete the module, the majority were specialist infrastructure investors with exposure via private equity, debt or a combination of the two.

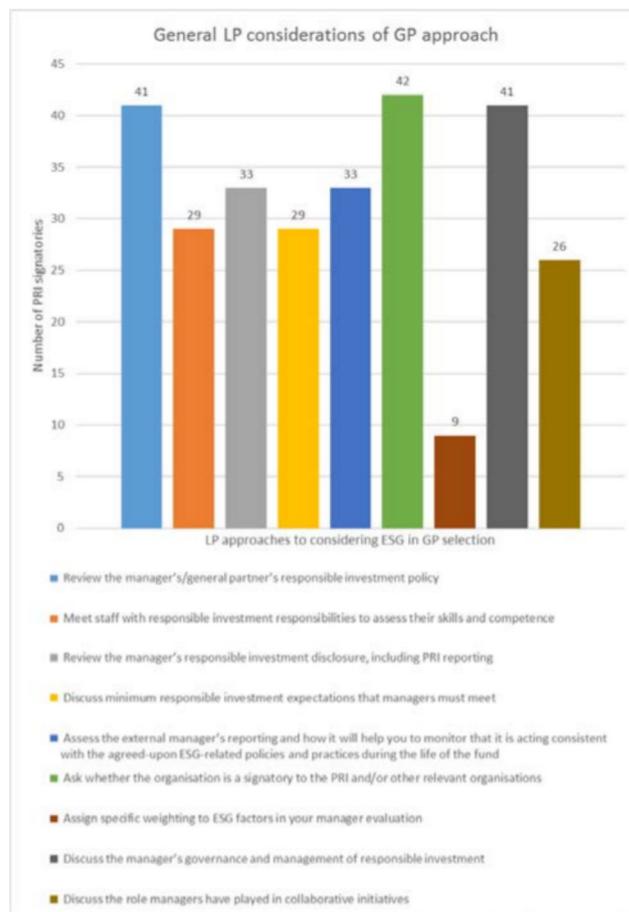
ESG considerations of LPs

Many LPs and institutional investors include environmental, social and governance (ESG) considerations when selecting, appointing and monitoring external investment managers. The figure below shows the different strategies they use to do this and the popularity of each approach.



The following figure illustrates the range of aspects that asset owners consider in their external manager selection process in general, as well as during pre- and post-investment stages

¹ Please refer to chapter below "Reporting on ESG Policy" for further information on the PRI Reporting Framework.



ESG considerations of direct investors

As part of the infrastructure module in the Framework, GPs were asked to indicate how they consider ESG factors during deal origination, the due diligence process, valuation and ownership of infrastructure assets. Below we have paraphrased examples from the responses given.

- We apply a framework to identify material ESG issues which we then analyse on a project by project basis.
- A summary of ESG issues is presented to our investment committee in investment files pre-selection.
- ESG factors are incorporated into risk-return analysis, DCF models or similar.
- Potential financial impacts from ESG-related events are quantified.
- ESG is analysed in country risk during early stage due diligence.
- ESG is included in key risks section of investment summaries.

- Deal flow documents must include resources required to consider ESG.
- Insure against ESG-related issues that are hard to predict or mitigate.
- Commit investee senior management to overseeing ESG-related standards and compliance.
- ESG screening conducted for: forced child labour, environmental impacts, poor governance.

Environmental	Social	Governance
Pollution / contamination (air, water, solid waste, noise)	Stakeholder relations (community, employees etc.)	Board skills / independence / diversity
Climate change (carbon emissions)	Community development & employment opportunities	Corruption / bribery / anti-competitive behaviour
Biodiversity	Affordability of services	Audit
Natural resource scarcity	Health & safety	Regulatory compliance
Energy efficiency	Cultural heritage	Remuneration structure
Water efficiency	Energy & resource security	Business integrity
Environmental regulation compliance	Land use & resettlement	Transparency & accountability
Exposure to natural disaster	Political lobbying	Shareholder rights
Landscape		Business ethics / corporate culture

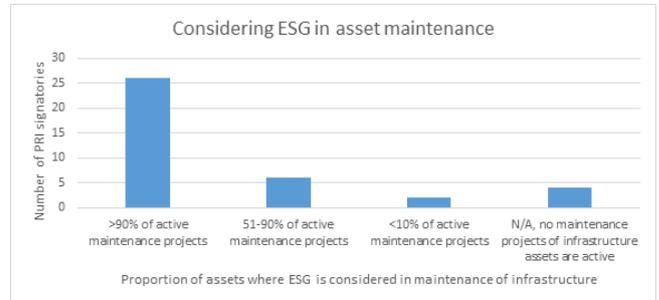
84% of those who completed the infrastructure module consider all three categories of issues – environmental, social and governance – while others only consider one or two. Examples of issues considered in infrastructure investing ESG analysis are listed below.

Incorporating ESG into on-going management of infrastructure assets

Infrastructure assets typically require considerable ongoing management and maintenance which may be conducted by an investee company, government entity, corporate 3rd party operator or maintenance partner. Responses suggest ESG issues are predominantly seen as the responsibility of the investor rather than external partners. Seventy four percent of those responding to the LP module indicated that they actively monitor ESG issues across their infrastructure portfolios.

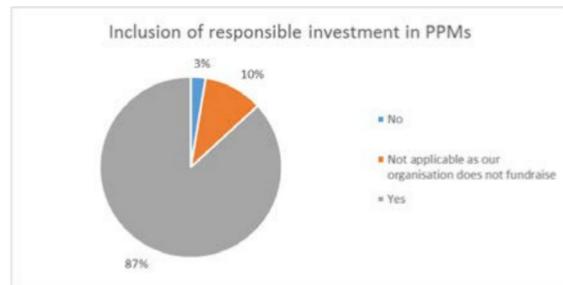


From the figure below it is clear that infrastructure investor RI practices extend beyond the purchase of assets to include ongoing maintenance projects.

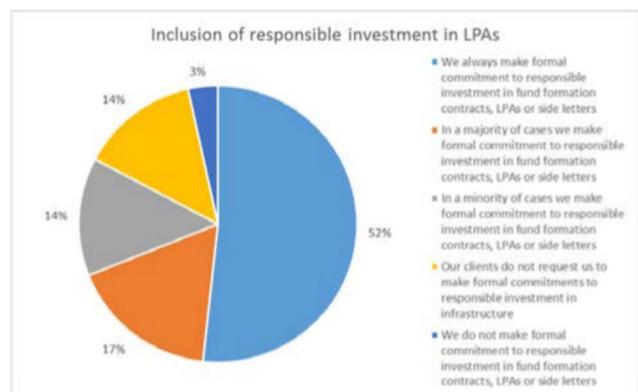


Responsible investment in fundraising and LP/GP agreements

General Partners were asked to indicate whether their fund placement documents (private placement memorandums or similar material) refer to the RI activities and commitments of their organisations. A clear majority of investors completing the module indicated that they do.



GPs are also asked whether they made formal commitments in fund formation contracts, Limited Partnership Agreements (LPAs) or in side letters relating to responsible investment in infrastructure when requested by clients.



At a project level: ESG due diligence and compliance

Next to the traditional financial and business requirements, ESG compliance is a critical workstream for responsible investors both during the investment development and asset monitoring. The scope of the workstream can vary significantly between acquiring existing (“brownfield”) assets and developing new (“greenfield”) ones.

This chapter offers insights for assessing project-level ESG compliance for greenfield and brownfield assets and also discusses the issues of enforcing ESG in the investee companies, within project partnerships or with subcontractors.

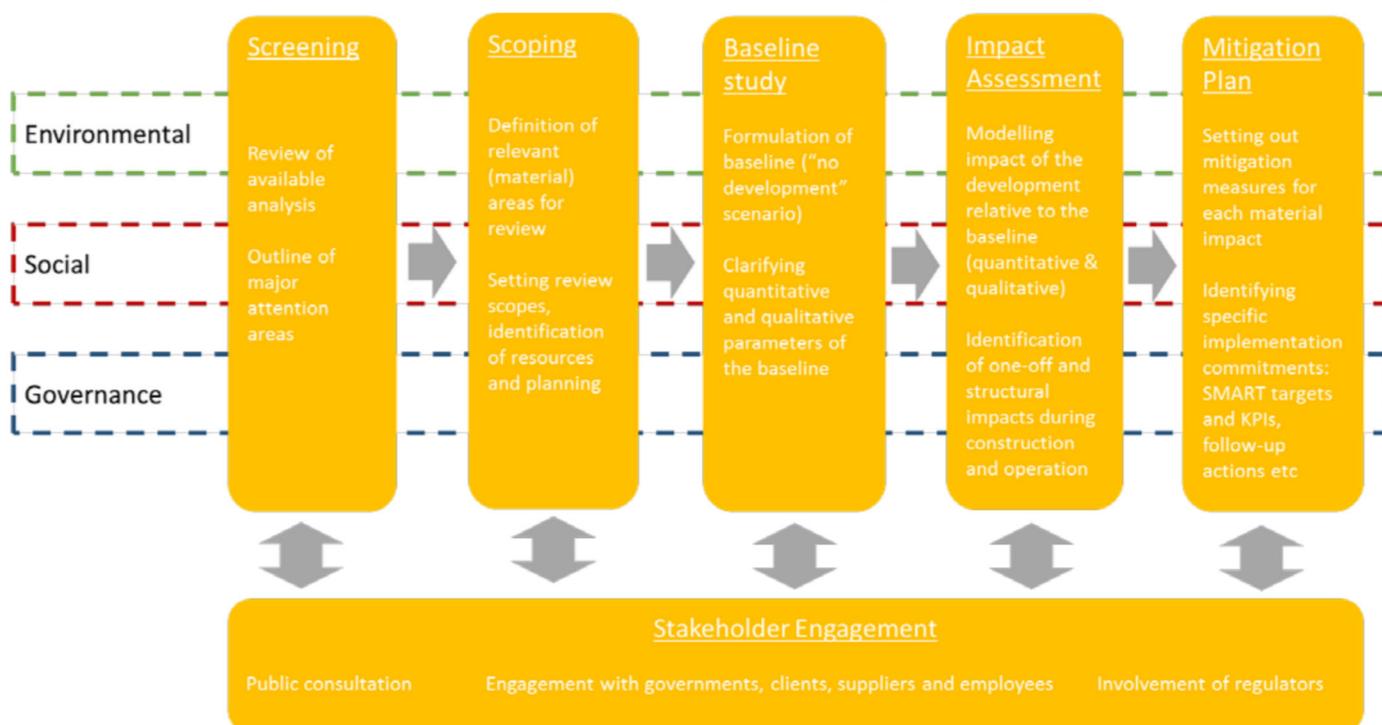
In addition, the chapter includes an overview of rating systems that help investors choose the most appropriate rating tool for the assessment of an existing or potential investment.

For greenfield projects

During the greenfield phase of a project, investors conduct an ESG analysis as part of their due diligence. The key source information comes from the project documentation and in-depth dialogues with project developers. External experts and consultants are often hired to review the ESG characteristics of a project in full detail.

Chart below introduces key steps of ESG due diligence for greenfield projects. Not only are those steps important for understanding the ESG implications of project under development, but they also help developers ensure adequate integration of those implications into the development plan.

Although the chart shows a sequential process, in practice the process is iterative with most steps being repeated at an increasingly deeper level of detail throughout the development cycle.



Stakeholder engagement spans across full due diligence scope and also provides an important feedback mechanism for refining outputs of the various other steps.

For brownfield projects

In acquisition of existing assets, the ESG work streams are focused on reviewing the degree of on-going compliance with legislation and other applicable standards, as well as understanding corresponding liabilities.

Again, the process may involve several iterations alongside principal steps summarized below. The outputs of "Management planning" form a basis for on-going monitoring of ESG compliance in acquired assets.

of the most pressing issues identified in the ESG assessment when acquiring the asset or during a regular asset review. Targets could include, e.g., noise levels in relation to a new highway or the number of local jobs created by a project. The investor is then able to analyse the indicators' evolution, compare annual performance, report on compliance with the target and take mitigating action if necessary.

- **Monitor the carbon footprint of each project** using specialised tools and processes that allow initial measurement of the baseline, recording the actual emissions and footprint, etc.

In addition to investor's internal controls, an external independent technical advisor should preferably monitor the technical performance of the project, and include ESG issues as part of its assessment.



Enforcement of ESG in the investee company, with project partner and/or subcontractors

Continuous monitoring of key ESG issues in an investee company should be an integral part of investor's Asset Management function. For instance, the AM team should:

- **Identify a series of Key Performance Indicators ("KPIs")** for each project at the outset, with a prescribed quantitative measurement and a target to be achieved. The KPIs are selected on the basis

Framework example - bcIMC

British Columbia Investment Management Corporation, a Canadian institutional investor with a significant focus on direct investing in infrastructure and nearly \$10 billion invested and committed to real assets, has developed proprietary screening framework for responsible investing and ensuring good governance.

The following exhibit presents a summary of the framework.

General

Does the target maintain an ESG policy?

What are the major ESG issues confronting this industry and specific investment?

Are there any major ESG concerns?

What is the frequency and depth of the target's ESG's disclosures to shareholders as well as to the public?

What is the state of the current relationship between the target and the community (consider publicized contentious issues in the past or present, community awards/recognition)?

What accreditations / standards does the target adhere to?

Health & safety

What is the target's health and safety track-record (with focus on fatalities and lost-time incident rates)?

What is the frequency and depth of health and safety reporting?

Anti-corruption and bribery (ABC)

Describe steps taken to investigate and mitigate ABC.

Governance

What representation will we have at the Board and its Committees (including observer rights)?

What rights and protections exist for minority investors? Consider what issues should be subject to super-majorities and/or veto including major capex / contracts, leverage changes, equity issuance, change of control transactions, and board constitution / mandate.

What is the protocol for transfers, including specific provisions for change of control scenarios (as relevant)? Consider ROFO, ROFR, and other constructs.

Who will effectively be the lead shareholder and how well aligned are their interests with ours? Who is expected to initially serve as Chairman?

Does the company have an internal audit function or risk management group? How do they interface with the Board? What are some key findings or issues encountered in the past and remedies?

At macro level: national integrated framework for ESG analysis and decision-making

Systemic ESG factors

In ESG analysis, a distinction appears between systemic and non-systemic factors.

Governance factors are largely non-systemic as they relate to practices subject to regulation enforcement and changes. However, some governance factors, such as rule of law, voice and accountability, business ethics and corporate culture develop over the long term and shape economic relations at a structural, macro, level.

Some Social factors, such as land use, energy and resource security, feature a systemic nature. Others, such as cultural heritage, echo and are linked to the above-mentioned Governance factors that show a strong stability over long periods of time.

Environmental factors are, by nature, systemic. First, they capture and measure the very conditions of any economic activity and social life. Resource availability and quality, encompassing energy, minerals, water and land determine in the first degree the strengths and weaknesses a country may benefit or suffer from. Second, the feedback loop from all economic models, characterized by production, consumption and trade patterns, results in undesirable effects including waste, local and global pollution and emissions of greenhouse gases. Those effects affect in return the conditions of economic activity and social life, thereby acting as a permanent, systemic factor. By extension, the legal corpus dealing with the exploitation of resources and the resulting effects, such as waste and pollution, also acquire this systemic nature in the ESG analysis framework.

Overall, the majority of ESG factors demonstrate a systemic feature. As infrastructures developed add to and become part of the systemic features of any given territory, this calls for implementing infrastructures-related ESG policies in integrated frameworks at a macro level.

Multi-dimensional ESG analysis

The systemic nature of most ESG factors crosses with the three dimensions required in ESG analysis at the project level.

The first dimension, which applies only to greenfield projects, is derived from scenario-based decision-making. ESG implications from the development of an infrastructure project are assessed against a reference scenario excluding the project considered.

The second dimension, which applies to both greenfield and brownfield projects, relates to the evolving features of the reference scenario over the projection period consistent with the exploitation of the infrastructures considered: opportunities and threats as measured by ESG factors are not set in stone but should be reassessed over time, leading to commitments and objectives being unavoidably updated.

The third dimension focuses specifically on carbon analysis which aims at identifying climate change related risks of the project, whether mitigation or adaptation. This dimension is gaining increasing importance following the introduction of INDCs (Intended Nationally Determined Contribution) at COP21 and in the subsequent 2016 Paris agreement. INDCs provide the necessary but insufficient basis for carbon risks analysis at both the national and project levels. More in-depth diagnosis must be provided, particularly in order to assess mitigation risks associated with greenhouse gases emissions trajectories allowing to keep global temperature below 2°C.

National level most appropriate for ESG macro analysis

The combination of the systemic features of most ESG factors and the needs to explore and update different scenarios over time and to integrate the widest and most accurate range of climate-related risks, leads to the conclusion that, in most cases, a national integrated framework provides the most appropriate macro level for ESG analysis and decision-making. In specific cases, the geographical perimeter may be reduced at the regional level.

Such a framework provides common ground shared by all stakeholders: investors, asset managers and infrastructures granting authorities. This ensures the efficient monitoring and implementing of ESG policy at all levels, project, corporate and fund, aligned with evolving national issues and targets.

Project rating systems

This chapter provides an overview of ESG related infrastructure project rating systems. However, most of the rating systems that will be introduced are not specific to assess infrastructure at project level. But also rating systems that assess listed or unlisted construction companies may illustrate how infrastructure is implemented at the project level.

Beyond Ratings

Since 2014 Beyond Ratings offers its clients an augmented analysis of Sovereign risks to overcome the shortcomings of existing financial ratings and an expertise to design climate related financial products (investment funds, insurance schemes, indices). Initially specialized on the sensitivity of Sovereign solvency to energy and climate issues, this expertise progressively expands to Natural and Human capital. Beyond Ratings answers the needs of leading financial institutions: development banks (AFD, World Bank, Caisse des Dépôts), Corporate Investment Bank (BNP Paribas), Pension funds (ERAFP and USS), Meridiam, Asset Managers (Covéa, Mirova), Insurance Companies and Mutual (CNP, MNRA). Beyond Ratings invests over 25% of its annual budget in R&D. Beyond Ratings services include: country and Sovereign risk scorings, ESG country scores, and climate footprint of Sovereign assets.

<http://www.beyond-ratings.com>

CDC Group

CDC group is the oldest Development Finance Institution (DFI) and wholly owned by the British government. Since 2006, CDC provides a free-to-use toolkit aimed at private equity fund managers in emerging markets of developing countries. The toolkit aims to assess and manage ESG risks and opportunities, to integrate ESG analysis into investment decisions, to consider how to do ESG reports and to provide guidance on how to apply international ESG frameworks. The toolkit includes 14 tools that can be used in different investment lifecycles. The toolkit is interactively available as a website but also as a download.

<http://toolkit.cdcgroup.com>

Envision Rating system

Envision Sustainable Infrastructure Rating System is a joint collaboration between the Zofnass Program for Sustainable

Infrastructure at the Harvard University Graduate School of Design and the Institute for Sustainable Infrastructure. Envision provides a framework to evaluate and rate the community, environmental, and economic costs and benefits of infrastructure projects. Envision helps furthermore projects to meet sustainability goals, to reach higher levels of sustainability, to publicise the achievement in sustainability and also to evaluate environmental benefits.

<http://www.sustainableinfrastructure.org>

GIB SuRe® Standard

Global infrastructure Basel (GIB) Foundation, together with NATIXIS, a French corporate and investment bank, have developed SuRe® – The Standard for Sustainable and Resilient (SuRe) Infrastructure. The SuRe® Standard follows the guidelines of ISEAL Alliance (the umbrella organization of private sustainability standards), and aims at providing a standardized approach in order to facilitate the implementation of sustainability and resilience criteria into infrastructure projects with a transformative character. The SuRe Standard offers 65 criteria and represents a holistic, inclusive and voluntary approach, which covers all aspects of sustainability and includes existing standards and best practices.

As it is a multi-stakeholder based standard the development process of the SuRe Standard is steered by a Standard Committee and a Stakeholder Council, which consist of representatives from public sector, financial players, developers, academia and civil society. Since launched at COP21, Paris December 2015, SuRe® Standard is at pilot phase for various infrastructure projects. Meanwhile, GIB has been also developing Credit Sure to support credit rating agency and Sure Underwriting to support insurers. The SmartScan has been developed as simplified approach to support the implementation of SuRe Standard. This due diligence tool provides fast and easy assessment of infrastructure projects to identify risks and opportunities to improve the attractiveness for project investments.

<http://www.gib-foundation.org/smartsan/>

GRESB Infrastructure

GRESB, established in 2009, is an industry-driven organization committed to assessing the ESG performance of real assets globally, including real estate portfolios (public, private and direct), real estate debt portfolios, and infrastructure. More than 250 members, including some 60 pension funds and their fiduciaries, use GRESB data in their investment management and engagement process, with a

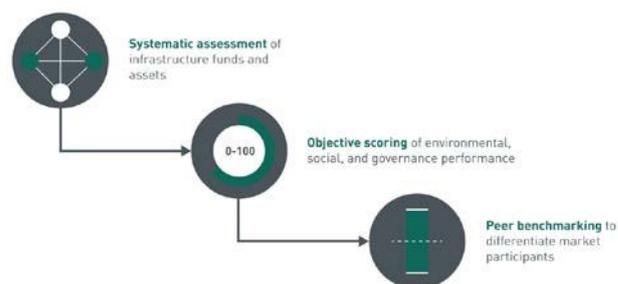
clear goal to optimize the risk/return profile of their investments. In 2014, a group of 10 global institutional infrastructure investors, came together to address the critical question of how to develop a global sustainability benchmarking tool for infrastructure assets and funds. Their objective was to develop a framework for systematic assessment, objective scoring, and peer benchmarking of the ESG performance of infrastructure investments. This group of investors recognized the lack of such a global standard and became the founding members of GRESB Infrastructure.

In 2016, the first GRESB Infrastructure Assessment was launched, systematic assessment and peer benchmarking of infrastructure funds and assets. GRESB Infrastructure covers a wide range of infrastructure sectors and sub-sectors including renewable energy generation, conventional energy generation, energy transmission, distribution and storage, transportation including airports, ports and toll roads, water resource management, telecommunications and social infrastructure. GRESB Infrastructure Investor Members and participants can use the data and information provided by GRESB to better understand immediate sustainability risks, to engage with the management of their investments, to take advantage of ESG-related investment opportunities and to report to stakeholders.

The GRESB Infrastructure Assessment is split into a separate assessment for infrastructure funds and an Assessment for infrastructure assets or operating companies. The Fund Assessment contains ten indicators focused on management and investment processes. These indicators address foundational ESG plans and policies, leadership and accountability, engagement strategies, communications processes and other factors. The Asset Assessment is organized around eight core Aspects, including Management, Policy & Disclosure, Risks & Opportunities, Implementation, Monitoring & Environmental Management Systems, Stakeholder Engagement, Performance Indicators, and Certifications & Awards. These Aspects include 33 indicators addressing asset-level plans and policies, implementation actions and operational performance. The Asset Assessment provides the information needed to understand efforts to maximize beneficial outputs, such as energy production, mobility, or access to clean water, while minimizing social and environmental impacts.

GRESB conducts annual assessments, guided by what investors consider to be key issues in ESG integration in infrastructure investments. The assessments take place

from April until July. Fund participants complete Entity and Reporting Characteristics, 10 indicators and an Asset table. Asset participants complete Entity and Reporting Characteristics and 33 indicators. Participants are required to answer a question with a basic yes/no answer for each indicator. Participants can optionally provide additional information and evidence. After a rigorous data quality control process, the data is scored with each company, fund and asset receiving a GRESB Score. The overall GRESB Fund score is based on a combination of the Fund Assessment score and the weighted average of GRESB Asset Assessment scores. The overall GRESB Asset score combines weighted scores of the 8 Aspects and is expressed as a percentage – from 0 to 100. The scoring is calculated using an automated system without manual intervention after data validation is completed. Each entity is then compared against peers in the same geographic region and (sub-)sector.



GRESB released the results of the inaugural GRESB Infrastructure Assessment in October 2016. A total of 185 infrastructure entities, including 51 infrastructure funds and 134 infrastructure assets reported to GRESB on their sustainability performance. The data cover 53 countries across six continents.

<http://www.gresb.com>

S&P Global

Among the many categories of risk S&P Global's Ratings Services examines within its ratings framework are environmental, social, and governance (ESG) risks. Since all rated entities operate in the natural and social worlds, we regard these risks as ubiquitous across the ratings spectrum.

The *Management and Governance Credit Factors for Corporate Entities and Insurers* (M&G) include the assessment of managements' and directors' oversight of environmental and social factors at the companies they lead. This includes the impact of - and their contribution to -

matters like climate change, pollution, and resource depletion; their effectiveness in terms of maintaining employee and community relations; and their adherence to legal and regulatory requirements. In the S&P ratings methodology, we allow for positive, neutral, and negative evaluations of management's capabilities in those areas.

However, regarding governance, the M&G criteria only permit neutral or negative evaluations. Positive or "good governance" – however that might be defined - does not in and of itself constitute credit enhancement in our view. For investors, ESG risk and measures are now a key focus for their investment decisions. In our corporate ratings framework we differentiate between the incidence of environmental and social impacts associated with all entrepreneurial activities, and their management and oversight - the "G" in ESG.

<https://www.spglobal.com/>

Vigeo

Vigeo is a global leader in the assessment of the ESG performance of companies and countries and provides investors with a perspective on the key risk factors and competitive advantages of ESG. Vigeo offers products and services such as a rating that measures the performance and risks of a company in 6 predefined domains of corporate social responsibility. Vigeo enterprise is the audit and consultancy department of Vigeo and is in charge of delivering services to companies and local authorities.

<http://www.vigeo.com>

At a fund level: analysing asset managers' ESG approach

Palladio Partners

Palladio Partners advises institutional investors on their real asset investment allocations. In this capacity it is critical to analyse if the ESG approach of an (infrastructure) asset manager is in line with each investor's ESG approach. Such analysis is then incorporated as one part of the manager selection process.

The evaluation of an asset manager's ESG approach can amongst other include:

- a review of the manager's general ESG principles and commitments to certain sustainability standards (e.g. being a PRI signatory);
- a review of negative lists/ individual exclusion criteria to ensure that the asset manager may not invest in sectors and/ or countries the investor excludes from its investment universe;
- a focus on sectors/ topics that are perceived favourably from an ESG point of view – e.g., renewable energy, energy efficiency, or social infrastructure.

Each analysis has to be performed individually to properly reflect a) each investor's requirements; b) the nature of each investment (e.g. blind pool/ primary fund investment versus secondary fund investment, portfolio acquisition or co-investment) and c) other idiosyncratic aspects. In addition, ESG topics may be integrated in the negotiations of the legal documentation of an investment. Some investors ask for a general ESG statement of the manager.

Skandia Asset Management

Skandia Asset Management's (SAM's) mission is to generate long term superior returns for its life insurance policy holders. SAM invests directly and indirectly (i.e., through funds). For its indirect investments, Skandia believes that a responsible fund manager can generate higher long term investment returns compared to a manager that is not responsible due to the facts below:

- Responsible investing (including environmental, social and governance considerations) can improve investment returns by identifying new revenue streams and/or by reducing costs. It can also help avoiding/reducing potential future risks that could negatively impact the return on the investment.
- Responsible investing can be central in increasing the value of the brands of portfolio companies as well as the brand of the fund manager. For the fund manager, a strong brand name associated with responsible investing can be key in winning certain deals (for example when acquiring businesses from entrepreneurs) as well as a mean to attract the most talented investment professionals. To constantly address and improve responsible investing is also important in minimizing the reputational risks of the fund manager and its portfolio companies.

For these reasons, while remaining resolutely commercial, Skandia would prefer that the fund managers we invest with always aim to be responsible investors.

Skandia's expectations from its fund managers

Skandia is convinced that our own best interests are aligned with those of the portfolio companies (in the funds we invest in), their customers, their employees and the communities in which they operate.

In order to achieve this alignment of interest, Skandia expects its fund managers to:

- Act at all times as a responsible owners promoting appropriate environmental, labor & human rights and ethical standards in its portfolio companies.
- When assessing potential investments, to consider environment, labor & human rights and ethical issues, as part of its due diligence, taking both the product and the conduct perspective into account.
- Work with continuous improvements in terms of responsible investing.

Skandia's recommendations to fund managers

In order to achieve an acceptable level on responsible investing, Skandia recommends fund managers to:

- Have a responsible investment policy expressing their approach towards responsible investing, including environmental, social and governance considerations.
- Maintain strict policies prohibiting anti-money laundering, bribery and other improper payments, consistent with UN Convention Against Corruption and OECD Anti-Bribery Convention as well as laws, rules and regulations.
- Consider their investments' alignment with relevant international conventions and standards, such as the UN Global Compact.
- Not only work to mitigate ESG related risks, but also promote and seek to grow opportunities to support a sustainable business, society and environment.
- Provide comprehensive and regular ESG training to investment professionals in order to understand how ESG issues can impact investments.
- Provide timely information to limited partners and promote transparency about their activities, as well as about the activities of the portfolio companies.

In addition, Skandia welcomes fund managers to adhere to and become signatories of the UN Principles for Responsible Investments (UN PRI) as a way of demonstrating their commitment to high standards.

SAM strongly encourages fund managers to refrain from investments in controversial sectors such as tobacco production, cluster munitions, anti-personnel mines and thermal coal, in line with Skandia's ownership policy.

For more information on Skandia's approach and expectations on companies in terms of responsible investing, please refer to Skandia's ownership policy and position papers available on Skandia's website <http://www.skandia.se>

SWEN Capital Partners

When SWEN CP makes primary investment in a fund, the asset manager's ESG approach is deeply reviewed. For primary transactions, SWEN CP ensures first that the fund's management company agrees to exclude from its investment universe any company involved directly or substantially in the production of weapons in general, and in particular any that is involved in the production of anti-personnel landmines and cluster bombs, whereby such involvement shall cover entities whose activity is to produce or supply key components of these anti-personnel landmines or cluster bombs.

Since 2011, ESG due diligence has been included in SWEN CP's investment memos on the basis of:

- an ESG questionnaire concerning the management company and the investment policy of the fund analysed,
- discussions with the management team on this topic.
- Sound analysis of past ESG incidents that have potentially affected the managing company and the underlying assets already in portfolio.

This ESG due diligence makes it possible to question, challenge and assess the planned or actual inclusion of ESG criteria in the investment process of the funds under review.

It is important to make it clear that non-inclusion on the due diligence date of the ESG criteria by the management company is not a deal breaker. This is because we wish to raise awareness and make progress we encourage the management company to gradually implement an ESG policy. In this case, if the management company wishes, we make ourselves available to assist and advise it in this approach. All the undertakings to include ESG criteria get formalised in writing between the management company and the team.

Reporting on ESG policy



Country ESG factors: global approach

Numerous academic and empirical works seek to assess sustainable development such as the Human Development Index (HDI, inequality-adjusted or not), the Inclusive Wealth Indicators (IWI) and the Sustainable Development Goals (SDG) proposed by the United Nations, complementary indicators to GDP Calculated by the European Statistics Office (Sustainable Development Indicators, SDI) and many other national statistical bodies (the Netherlands, Bhutan, France, etc.) or the Social Progress Index (SPI) proposed by Harvard University and Strategic Management Professor Michael Porter. Each of these approaches defines a set of indicators (aggregated or distinct) that composes a sustainable development model based on ESG factors (Environment, Social and Governance). These indicators provide an "absolute" view of the magnitude of ESG development reached at country level and allow for an international ranking.

As previously mentioned, ESG performance can't be evaluated without taking into account specific development pathways and income levels and a multi-criteria approach is often useful for operational processes. An expected GDP based on ESG KPIs can be computed as the theoretical GDP that is compatible with the level of ESG performance achieved by a country. Such GDP is called "sustainable" GDP and reflects the actual level of ESG development. If it is equal to actual GDP, the sustainable and economic developments are coherent, if it is higher (or lower), the wealth produced has made it possible to develop a higher standard of ESG environment (or, respectively lower standard) compared to the peer countries.

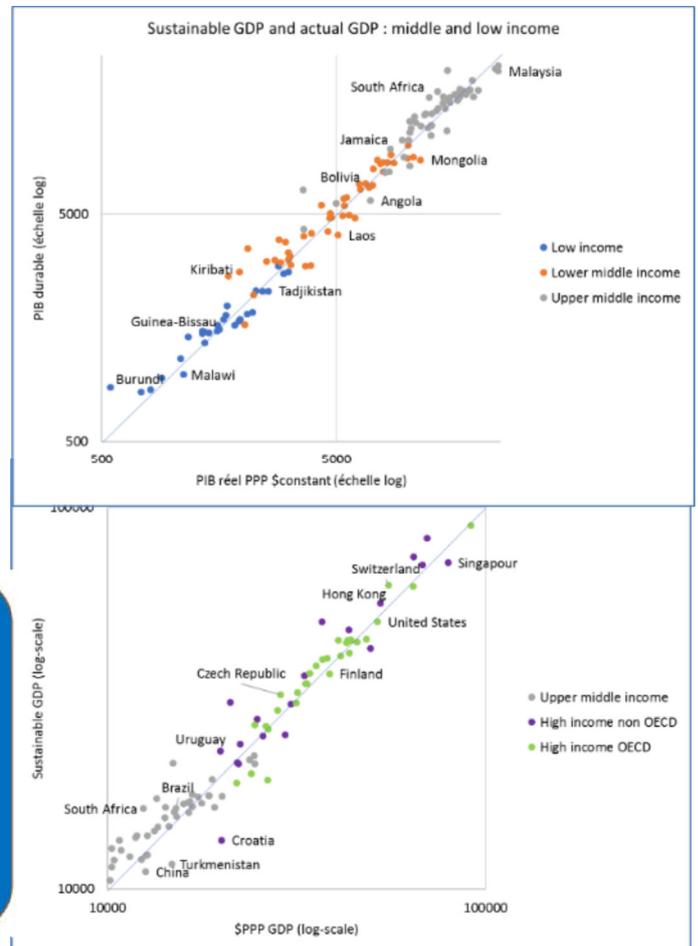
The larger and wider the input scope is, the more accurate the ESG evaluation is. ESG indicators are usually split in 36 major domains to consider:

Environment	Social	Governance
E01. Climate Change	S01. Demographics – Life cond	G01. Democratic Life
E02. Energy Efficiency	S02. Demographics – Dynamic	G02. Political Stability
E03. Energy Security	S03. Economic Inequality	G03. Corruption
E04. Energy Infrastructure	S04. Gender Inequality	G04. Political Effectiveness
E05. Pollution	S05. Employment	G05. Security
E06. Biodiversity	S06. Labor & Social Protection	G06. Financial Stability
E07. Resource & Deplet	S07. Education	G07. Rent Dependency
E08. Water Scarcity	S08. Innovation & Human Cap	G08. Business rights
E09. Water Infrastructure	S09. Health Issues	G09. Economic Attractiveness
E10. Land Resources	S10. Health Infrastructure	G10. Economic Openness
E11. Agriculture & Food	S11. Vulnerability	G11. Economic Investment
E12. Transport Infrastru	S12. Lifestyle Risks	G12. Industrial Strength

The main challenge is estimating the most accurate weights for the ESG indicators while keeping the overall GDP structure. It gives a financial valuation of every criteria.

Such statistical econometric approach can be differentially applied based on countries development levels. It allows for better consideration of ESG priorities according to a country's current economic development path.

This methodology provides an assessment of a country's ESG development based on its level of economic development. This approach makes it possible to refine the relative weight of ESG development indicators per stage of economic development of a given country. One of the significant benefits is not to systematically penalize the less developed countries to the profits of the most advanced countries in terms of ESG criteria. This is an additional tool for assessment.



Selected Reporting Frameworks

PRI

The PRI Initiative is a global network of over 1,400 investment organisations working together to put the six Principles into practice. The Principles themselves are high-level and aspirational. They cover different aspects of responsible investment (RI) including consideration of environmental, social and governance (ESG) factors in decision making, active ownership of assets and investor transparency on RI activity.

At least 120 PRI signatories have some allocation to infrastructure either directly invested or managed by a third party investment manager. The PRI sees infrastructure as a driver of environmental and social benefit in the form of renewable energy and energy efficiency projects, mass transit systems or health and education facilities. However, if managed poorly infrastructure can also have a negative impact on the environment and the communities in which assets are operated. Furthermore infrastructure investments are subject to ESG-related financial risks and opportunities (e.g. regulatory or capital costs) as any other asset class might be. This is one of the many reasons why PRI signatories commit to reporting on their progress towards implementing the Principles to ensure transparency and accountability around their RI activities.

The PRI Reporting Framework for Infrastructure Investors

The PRI Reporting Framework is a transparency tool that enables investors to report on their RI activities to clients, beneficiaries or other stakeholders. It relates to direct (i.e. General Partner) and indirect (i.e. Limited Partner) investments. Infrastructure investors are able to report on ESG considerations with regards to both types of investment as highlighted in in the exhibit below. The LP –

or indirect – module focuses on how LPs consider ESG capabilities in their selection, appointment and monitoring of external managers. The GP – or direct – module explores how investors integrate ESG factors in their investment policies, investment decision making, ownership practices and communications to LPs.

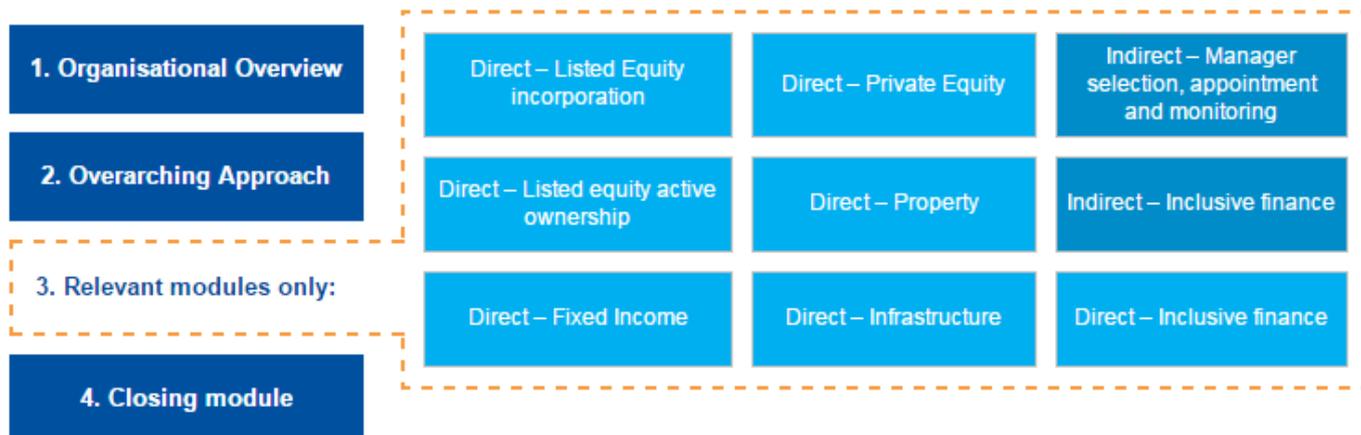
Reporting on responsible investment activity is critical for investment managers. It allows their clients, whether they are pension funds, insurers or foundations, to get a better sense of their ability to measure and incorporate ESG factors, and promotes greater alignment of interests throughout the investment chain. It has been designed to complement, rather than duplicate, existing investment industry responsibility standards and codes.

Aside from transparency, the framework also facilitates accountability and promotes ongoing learning among PRI signatories. By asking investors to report on their responsible investment activities in infrastructure and assessing those activities, the PRI hopes investors will aim to continuously improve their approach, in healthy competition with their peers, as part of an annual cycle of responsible investment implementation.

Overview of the Direct (GP) Infrastructure Reporting Module

The Direct Infrastructure Reporting Module is a voluntary requirement of the Reporting Framework while it remains in pilot phase however the PRI does plan to make it a mandatory requirement in future years. The module looks at the following areas of RI practice:²

- Proportional breakdown of infrastructure investments into equity and debt;
- Breakdown of infrastructure investments into sectors;
- Description of overarching approach to RI in infrastructure;
- Focus on infrastructure-related RI policies;
- Consideration of ESG in origination or deal



- selection including examples;
- Types of ESG information considered in investment selection;
- Consideration of ESG factors when selecting and appointing third-party operators of infrastructure assets, in maintenance contracts and stakeholder engagement;
- ESG performance targets within GP and/or within investee companies;
- Examples of outputs and outcomes of RI activities (ESG or financial);
- Disclosure of ESG information to clients and the public.

- Inclusion of ESG criteria into the investment strategy of each underlying GPs and evolution year-to-year,
- Aggregated ESG KPI at the level of the assets portfolio and qualitative explanations for abnormal KPI.
- Assessment of the carbon footprint of the underlying assets
- ESG incidents that have affected the main underlying assets over the reporting period

SWEN Capital Partners

As an LP in several funds (more than 200 tracked funds mainly in Europe), SWEN CP needs to ensure that all the aspects, including non-financial issues, are actively and responsibly managed in its whole portfolio, whatever the GP is.

SWEN CP aims at getting all the relevant information from its GPs using both the GPs' financial reports and also external financial reports, when available. However, many GPs do not produce a separate ESG report.

For that reason, in 2012, SWEN CP decided to invest in its own proprietary tool in order to gather the information needed to monitor its investments on non-financial criteria. SWEN CP developed a web secured platform to ask all its GPs to fill in ESG questionnaires at the level of themselves and at the level of each of their underlying assets.

In 2015, SWEN CP used the eFront ESG platform, developed on the model of their proprietary tool. It allowed SWEN CP to complete efficiently its financial monitoring and to know better its portfolio, its non-financial risks and opportunities, and to assess better the understanding of these issues by its GPs.

As a GP strongly committed to the Responsible Investment, SWEN CP wants to report on non-financial considerations to its own clients, either at the level of the funds, or at the level of the segregated accounts. So, once a year SWEN CP publishes annual ESG report for each of its funds and mandates it manages.

This annual ESG report provides evaluation on the following points:

- compliance with SWEN CP Responsible Investment approach during the past year,

That way SWEN CP contributes to the ESG performance measurement of investments in private assets, by **measuring the social/societal and environmental impact of its positive contribution to the economic sphere.**

These quantitative and qualitative elements provide strategic information for SWEN CP's Investment team and for institutional investors wishing to communicate in this way.

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