ICLEI Local Governments for Sustainability

7th Global Forum on Urban Resilience & Adaptation
Bonn, Germany 6 - 8 July 2016

Resilient Cities 2016

Proceedings of the Resilient Cities 2016 congress

Financing Sustainable Infrastructure

By creating a new Asset Class for institutional investors

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Abstract:

Whether the Sustainable Development Goals (SDGs) will be successful or not heavily depends upon the extent of worldwide investments in sustainable infrastructure, a backbone of the economy and a key social fabric. In addition, incorporating sustainability into infrastructure can help alleviate ad-verse environmental effects and mitigate climate change so as to contribute to the safe and resilient development of nations. Current figures unfortunately hint at a tremendous gap: USD 1.0-1.33 tril-lion will be missing globally every year through 2030 according to G20 (2014). Because governments endeavour to reduce the debt/GDP ratio, they are unlikely to sufficiently contribute to bridging this gap. Thus, private investors need to step in. But their efforts will inevitably stumble over the rigidity of their asset allocation: infrastructure equity and debt are dissociated in mainstream portfolio, while their respective shares are technically and legally required to remain marginal. Hence, only the emergence of a new Hybrid Sustainable Infrastructure Asset Class can help fill the investment gap. Associating infrastructure equity and debt in the same pocket of investment, it will indeed synchro-nise the conventionally opposite interests of equity and debt providers by merging their incomes over the entire life span of an infrastructure, securing sustainable cash flows with a risk/return pro-file between debt and equity. Holistic Sustainability Standards such as GIB's SuRe® Standard will help secure the long-term performance of infrastructure. They are thus fundamental to this financial in-novation: the creation of Sustainable Infrastructure, a new hybrid asset class in accordance with the terminology of the SDGs that contributes to their success.

Keywords: Infrastructure Asset Class, Institutional Investors, SDGs , SuRe® Standard

1 Introduction

Infrastructure represents the backbone of our economies. It creates networks that connect people, help transport goods and services. They shape our environments and largely determine our livelihoods today and in the future, reason why infrastructure lies at the core of the Sustainable Development Goals. Conventional infrastructure will not suit them best; instead, policy-makers as well as strategic asset allocators shall acknowledge the irreplaceable contribution of sustainable infrastructure to achieving the SDGs.

1.1 Definition of conventional infrastructure

Infrastructure has no single universally agreed definition. Nevertheless, over time, it has come close to describing the organisational backbone of the economy. Even though infrastructure is multi-faceted, only the material aspect of infrastructure is conventionally considered, which includes water, sanitation, energy, housing, transport, information and communication technologies (World DataBank, World Bank Group). But instead of focusing on what infrastructure may be, it is worthwhile considering its specificities.

Infrastructure can be better grasped by looking at its specific characteristics. Adapting from Weber and Alfen (2010), they encompass 8 dimensions (see Annexe 1). Even though this list seems extensive, no comprehensiveness will be claimed here.

1.2 The explicit reliance of Sustainable Development Goals on infrastructure

1.2.1 The Sustainable Development Goals

In September 2015, about 190 countries are to endorse the Sustainable Development Goals (SDGs) replacing the Millennium Development Goals whose prerogatives have come to an end. The SDGs will set the new development agenda for 2030 amid global trends that see government expenditures shrink (see 2.5 The gap's causes), putting the financial soundness of the SDGs into jeopardy. They do indeed rely on heavy investments, notably in infrastructure.

The achievement of at least 5 out of 17 Sustainable Development Goals does directly or indirectly hinge upon the expansion and improvement of infrastructure (see Annex 2).

1.2.2 The drawbacks of conventional infrastructure

Although the United Nations (2005) have long stressed the needs for expanding and improving existing infrastructure[1], doing it in a conventional way will inevitably entail some drawbacks. Indeed, conventional infrastructure tends not to seek optimal social benefit. This is partly due to civil society being hardly involved in the decision-making process. Moreover, conventional infrastructure is likely to underestimate both its impact on the environment and its exposure to environmental variation. Such planning can have adverse consequences not only on the environment, but also on the profitability of the project.

The Grand Inga dams in Democratic Republic of Congo substantiate to some extent the adverse effects flowing from conventional infrastructure. According to Brunn (2011), "Grand Inga's power has never been considered for rural electrification and domestic use", showing that the social benefits are questionable, at least for some local populations. Furthermore, since the river Congo feeds deep oceanic currents in the Atlantic Ocean, any disruption of flow is likely to have dramatic consequences on the regional –and potentially even global- hydrological cycle. Finally, there would be economic drawbacks for both the owners of the dams and the businesses around: indeed, substantial sediment loads have been recorded that would represent a major threat during the operational phase of the dams. At the same time, agriculture downstream would undergo painful and irreversible change as salt water would intrude upstream for 50km (Brunn 2011).

Even though Sustainable Infrastructure cannot address all of these issues, it does at least mitigate a large part of them.

1.3 Definition of sustainable infrastructure

1.3.1 Definition

Sustainable infrastructure, as compared to conventional infrastructure, minimises unintended social, environmental and economic risks and offers additional benefits, which are related to achieving the Sustainable Development Goals, e.g. in the field of job creation, poverty alleviation, participation, gender, climate change, biodiversity, or financial benefits for the public. The added value of Sustainability is made

[1] "Investments in infrastructure – transport, irrigation, energy and information and communication technology – are crucial to achieving sustainable development and empowering communities in many countries. It has long been recognized that growth in productivity and incomes, and improvements in health and education outcomes require investment in infrastructure." (United Nations 2015b)

accessible to capital markets through mechanisms and business models (see 4.5 The financial characteristics of Sustainable Infrastructure).

1.3.2 Risk-minimisation

Sustainable infrastructure minimises specific adverse social, economic and environmental risks. For instance, sustainable infrastructure will endeavour to have local stakeholders involved at the board. It will take their opinions and needs into account during all phases of the infrastructure life. Moreover, it will have a sound economic management, be accountable and transparent, and respect the highest work condition standards. From an environmental perspective, sustainable infrastructure will avoid harming biodiversity on site and try to drastically reduce its carbon and carbon-equivalent emissions.

1.3.3 Contribution to the Sustainable Development Goals

The Sustainable Development Goals are based on three pillars: the resilient and sustainable extension of the economy, the cultural, political and educational development of societies and the preservation and protection of the environment and its biodiversity.

Sustainable infrastructure attempts to incorporate these three aspects. In fact, since it does diminish a wide range of risks, it shall make the economy more resilient. Moreover, it is certainly contributing to societies' cohesion since it ensures better access to energy, water and information while increasing stakeholder participation in decision-making. Finally, sustainable infrastructure helps mitigate climate change by improving energy efficiency and reducing overall energy consumption. It also participates in conserving biodiversity. (see Annexe 3)

1.3.4 Contextualisation

Sustainable infrastructure is a contextualised infrastructure, i.e. an infrastructure that smoothly integrates in its milieu. Adopting a holistic perspective, this means that it will fit into the existing fluxes in this particular environment without dramatically altering them, be they natural, social or economic. On the contrary, it will benefit from these connections and dynamise the exchanges. As a result, the benefits from such infrastructure will be multiplied: systemic benefits will be delivered that outreach the sum of local specific benefits. For example, not only aims the Silk Road Fund at connecting two particular towns together, but also will it establish an entire rail, road, air and maritime network that shall boost economic development across Eurasia and enrich cultural exchanges. This is the "added value" of sustainability.

The achievements of the medieval House of Zähringer offer a model of integrated development: they founded number of Swiss and German Black Forest cities that represent crucial knots in today's regional fabric. Thanks to the high efficiency of the initial administration, Bern's economy soared and it became an autonomous city – *Freie Reichsstadt* – in 1218, only 27 years after the first buildings were constructed.

Such rapid development could not have occurred without an integrated planning: it is only because the Zähringer settlements fit into a structured network that they could benefit from each other and initiate the cultural and economic dynamics that saw them blooming. Similarly, sustainable infrastructure exploits all the available resources to deliver the best service while ensuring that its operation is sustainable, i.e. it does not damage the network it relies on.

2 The investment gap

Despite tremendous investments in the development of infrastructure, the infrastructure investment gap remains enormous: USD 1.0-1.33 trillion will be missing globally every year through 2030 according to G20 (2014).

2.1 Public infrastructure investment in decline

According to G20 (2014), USD 45 trillion will have been invested by 2030, equivalent to USD 3 trillion in average annual spending. Of this amount, the vast majority is currently expected to come from the public sector. Indeed, there has been a long tradition of states planning, financing and developing their infrastructure. To Adam Smith (1776), it was the state's duty to construct and maintain the main infrastructure that would benefit the entire society. At that time, it was unrealistic for a private business to bear the initial cost of these heavy investments such as the construction of a bridge or the dig of a canal. Today, privately developed infrastructure as well as the infrastructure created by expanding public private partnerships add to public funds.

2.2 Spatial infrastructure needs

The considerable needs for funding infrastructure vary spatially across the world. According to Mainelli and von Guten (2015) the total infrastructure financing needs equal to USD 2.256 trillion every year. The annual regional infrastructure financing needs in Africa amount to USD 93 billion while they are as high as USD 750 billion in Asia per year between 2010 and 2020 and USD 560 billion in Europe annually until 2030. Moreover, they find that the needs reach USD 23 billion in Australasia, USD 320 billion in Latin America and USD 510 billion in North America.

2.3 Sectorial infrastructure needs

The financing needs also depend on the infrastructure sector. In the transport sector, the Organisation for Economic Co-operation and Development (OECD) (2011) states that aggregate investment in airports, ports, rail (inclusive maintenance) and oil & gas transport and distribution over the period 2010-2030 sum up to USD 8,815 billion. By 2030, the annual global road and rail new construction requirements are

predicted to reach respectively USD 292.3 billion and USD 58.1 billion (OECD 2011). The energy sector faces global electricity investment needs of about USD 9.789 trillion for the period from 2003 to 2030 while the annual water infrastructure in OECD countries and BRIC 5 will be tantamount to USD 1 trillion by 2025 (OECD 2006). These figures do not claim comprehensiveness but highlight the extraordinary and specific needs for infrastructure across several sectors. Infrastructure financing needs are dramatic and concern all parts of the world as well as all sectors.

2.4 The missing investments – the gap

However, despite already large public and private funds allocated to infrastructure construction and maintenance, a tremendous investment gap threatens the world development in general, the Sustainable Development Goals in particular. In fact, G20 (2014) predicts that the equivalent of USD 1.0-1.33 trillion will be missing globally every year through 2030.

2.5 The gap's causes

The reasons for this gap are plenty, but some, such as insufficient funds, are more prominent. Public support is not likely to increase in the developed world as governments are put under strain by their efforts to alleviate their indebtedness. And apart from few exceptions such as the nascent Asian Infrastructure Investment Bank (AIIB), multilateral development banks are not expected to dramatically increase their expenditure either during the next decade.

The cause extends from lacking funds to the inefficiency and ineffectiveness of investments that discourage future allocation. G20 (2015) first blames poor project selection and planning. Since Public Private Partnerships (PPPs) are relatively recent in most countries, governments may be lacking the expertise to present bankable projects likely to attract private investors. G20 also ascribes among others the investment gap to inefficient delivery due to time-consuming regulatory approvals and the absence of design-to-cost and design-to-value principles. Indeed, according to Albino-War *et al.* (2014), strong institutions and better management are crucial to improve the efficiency of oil exporters in Mideast, Caucasus, and Central Asia. Eventually, G20 sees in the systematic preference for greenfield projects instead of the updating and optimisation of existing assets the reason of unnecessary increases in overall infrastructure costs.

3 The Portfolio Bottleneck

Because governments endeavour to reduce the debt/GDP ratio, they are unlikely to sufficiently contribute to bridging this gap. Thus, private investors need to step in. But their efforts will inevitably stumble over

the rigidity of their asset allocation: infrastructure debt and equity are dissociated in mainstream portfolios while their respective shares are technically and legally required to remain marginal.

3.1 The necessary private contribution

Not enough money is invested into infrastructure. But the necessary capital will not come from governments. Neither will substantial funds come from Multilateral Development Banks (MDBs) or other not-for-profit development institutions. Sufficient capital must therefore flow from private institutional investors such as large pension funds, sovereign wealth funds, private capital managers, family offices, grant-making foundations and insurances.

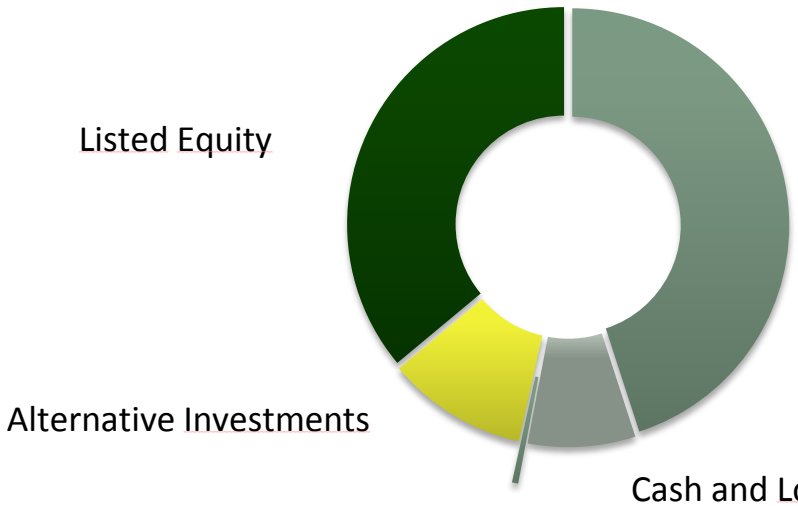
3.2 The allocation potential of Sustainable Infrastructure

These strategic asset allocators, managing phenomenal wealth, seek to invest in robust projects that offer significant returns while entailing reasonable risks. According to Duvall *et al.* (2015), “the pool of capital available is deep. Across infrastructure funds, institutional investors, public treasuries, development banks, commercial banks, corporations, and even retail investors, we estimate that more than USD 5 trillion a year is available for infrastructure investment.” Since governments in developed countries have reacted to the slowdown of the financial crisis with expansionary monetary policies, interest rates have lowered as a consequence of Central Banks increasing the demand for bonds, thereby lowering public interest rates, i.e. the benchmark for other interest rates. As a result, institutional investors which face short term payments –monthly pensions for example- track the opportunities that offer better return than structured debt and less risk than listed equity. Since sustainable infrastructure normally meets such expectations, large amounts of capital should flow in the investment gap and help narrow it.

3.3 The portfolio bottleneck

However, the tremendous capital pool faces a dramatic portfolio bottleneck. Infrastructure assets currently only make 0.46% of total Assets under Management (AuM). In fact, infrastructure assets represent USD 296 billion (Moylan *et al.* 2015), while total AuM are estimated to have reached USD 63.9 trillion in 2012 according to PwC (2014). Since the annual infrastructure investment gap amounts to USD 1,000-1,330 billion (G20, 2014), Infrastructure Equity within Alternative Investments would have to scale up at least 33 times in order to cover it. Such expansion in portfolio allocation to infrastructure equity or debt is very unlikely because of technical constraints and legal requirements.

Figure 1. Current share of Infrastructure Equity in total Assets



0.46% Infrastructure Equity

(Moylan et al. 2015, PwC 2014)

Figure 2. Current Investments vs. Infrastructure Gap (USD billion)

Current annual non-public infrastructure equity investment

Annual Infrastructure Investment expected from institutional investors

(G20 2014, Preqin 2015)

3.4 The technical constraints

The technical constraints are featured by the conventional dissociation of infrastructure debt and equity management in the institutional investor's portfolio. In fact, infrastructure debt often belongs to the "Structured Debt" Asset Class while infrastructure equity constitutes a small share of "Alternative Investments". Such hermetic separation can be explained by the discrepancy of time horizons for equity providers and debt holders. While the first seek to maximise the cash flows over comparatively shorter periods, the latter try to minimise risks in the longer term, sometimes holding debt over the entire life span of the infrastructure. These two objectives are often antithetic and hamper therefore the mutual management of infrastructure debt and equity. As a result, within conventional asset management, infrastructure allocation is doomed to remain divided and to forgo the benefits from a common management.

3.5 The legal requirements

Legal requirements substantiate a second hurdle. Quantitative portfolio restrictions in several countries restrict indeed the share of total assets an institutional investor such as a pension fund can allocate to infrastructure investments. For example, BVV 2 in Switzerland compels the domestic pension funds not to allocate more than 15% of their assets to alternative investments, which include infrastructure equity (BVV 2 Art. 55).

Moreover, the absence of legal requirement does not mean there is no hurdle. In fact, such absence only tells that infrastructure allocation is currently too minuscule to represent an immediate threat to portfolio performance. Often, only equities and foreign assets are indeed considered worth the regulation effort (Leape and Thomas 2011). Hence, regulation authorities hardly take Alternative Investments into account, and infrastructure equity to an even lesser extent. However, that there is currently no quantitative portfolio restriction on infrastructure equity does not mean there will not be one in the future. Such perspective can only threat the necessary increase of funds allocated to sustainable infrastructure.

3.6 Urgently looking for innovation

Innovative financial mechanisms are therefore urgently required to liberate the portfolio allocation to infrastructure. Both infrastructure equity and debt face too tight technical and legal constraints to effectively achieve this goal. Thus, "we need to juggle out infrastructure from that crazy box called 'Alternative Investments' and establish it as a new Asset Class, somewhere between debt and equity" (Laurence Fink, CEO of BlackRock, September 2013).

Case Study 1.

Natixis manages the first European project bond for digital infrastructure in 2014

In support of France's superfast broadband plan (France Très Haut Débit), which is "the Government's biggest infrastructure programme", Axione Infrastructures was helped by Natixis in conducting the very first issue in Europe of "project bonds" in digital infrastructure, an innovative form of finance launched by the European Commission and the European Investment Bank (EIB) in 2012, the aim of which is to speed up the mobilisation of private capital for European infrastructure projects, in particular the roll-out of fibre optics in sparsely populated areas ("public initiative areas").

Acting as financial advisor, rating advisor and market access advisor for Axione, Natixis structured the operation and managed the rating process with Moody's. As sole bookrunner, lead manager, agent and account bank, Natixis arranged and successfully placed, with institutional investors, these project bonds, which aim at refunding Axione Infrastructures' existing senior debt. The operation provided Axione Infrastructures with €189.1 million in bond finance (European Investment Bank 2014). The success of the bond issue shows investor attraction for this new asset class. It also confirms Natixis' leadership in advising and structuring infrastructure finance and its ability to set up innovative operations.

"We need to juggle out infrastructure from that crazy box called 'Alternative Investments' and establish it as a new Asset Class, somewhere between debt and equity."

Laurence Fink, CEO of BlackRock, September 2013

4 The emergence of a new Asset Class: Sustainable Infrastructure

Only the emergence of a Hybrid Sustainable Infrastructure as a new Asset Class can help fill the investment gap. Sustainable Infrastructure must become more profitable for investors; in practice, an integrated long-term management of Sustainable Infrastructure maximises the overall cash flows. But the traditional opposition between debt holders and equity providers renders such approach impractical. Hence, the new Sustainable Infrastructure Hybrid Investment Vehicle will synchronise the interests of both equity and debt investors by securing the higher long term returns with risk-return profiles between debt and equity.

4.1 Bridging the conflict between Equity and Debt

4.1.1 The conventional debt-equity antithesis

The risk-return model of Infrastructure in “Alternative Investments” naturally prioritises equity holders’ profits over debt providers’ returns, resulting in a very limited risk appetite.

Conventionally, it is considered a financial aberration for strategic asset allocators to possess equity and debt in the same infrastructure project, the first reason being the opposing views on the level of debt return the infrastructure shall offer. Debt holders of course desire the highest levels; the equity providers, though, want them to be as low as possible as they directly reduce the volume of dividends. Indeed, dividends correspond to the remaining turnover that is left once all charges, including returns, are paid. Hence, the larger the returns, the lower the dividends; there is a clear trade-off between the debt holders’ interest and the equity providers’.

Moreover, financial hardships may oppose the views of debt and equity holders. “If a company should come under financial strain then equity and debt interests cease to be aligned” (Mark Gilligan, UBS Head of Infrastructure Europe). In other words, equity holders look at maximizing the cash flow even if it means the infrastructure goes bankrupt, situation that debt holders want to prevent by all means – they look at the default rate and endeavour to keep the business afloat. Here again, the perspectives diverge, and it makes little sense for a traditional asset allocator to invest in the debt and equity of a single infrastructure project.

4.1.2 The merger of debt and equity incomes

The equity-debt antagonism can only be overcome by solving the debt return conflict. In practice, this means gathering Sustainable Infrastructure debt and equity into one product, Sustainable Infrastructure Hybrid Investment Vehicle (SIHIV).

This Hybrid Investment Vehicle connects the financial needs of the sustainable infrastructure with the money investors wish to allocate. The infrastructure developers and managers would still need to finance their activities through issuing debt and offering equity, but the investors would not choose between them. In fact, the SIHIV would pool these financial needs into one product whose mix of debt and equity is not necessary known to asset allocators who would only be concerned about the risk-return profiles of the different SIHIVs – derived from the Holistic Sustainable Standards (see 4.2.1. Holistic Sustainable Standards).

The level of debt return opposes infrastructure debt and equity holders

Strategic asset allocators do not possess equity and debt in the same infrastructure project. In fact, infrastructure equity investors can be seen as debtors while infrastructure debt holders correspond to creditors. However, since debtors seek low interest rates and creditors the opposite, i.e. high interests, infrastructure equity investors and debt holders will have potentially opposite interests.

Such a situation is far from optimal because overall returns are not maximised. Indeed, since infrastructure projects and the associated investment cycles stretch over the long term, it particularly needs a coherent and integrated approach to yield maximum returns. But since strategic asset allocators have divergent interests when investing in infrastructure debt and equity, they should accord their strategies to fit the infrastructure management. As a result, it appears that the only way to attract massive investments from strategic asset allocators is to combine infrastructure equity investor interests and debt holder interests.

"If a company should come under financial strain then equity and debt interests cease to be aligned."

Mark Gilligan, UBS Head of Infrastructure Europe, July 2015

Regarding the performance, Sustainable Infrastructure is a hybrid Asset Class. Since the SIHIVs combine debt and equity, they are less risky and yield lower returns than equity, but they offer higher returns than debt for they are more risky. Compared to risks and returns of equity and debt investments, Sustainable

Infrastructure therefore represents a middle ground. Investing in SIHIVs is a long-term engagement. Indeed, there is little interest in owning the asset for a short time. The financial benefits only substantiate over the longer run.

Case Study 2.

Meridiam's integrated development of residential facilities at University of Hertfordshire

The Project is a £214m transfer of the University's existing residences and comprises the design, build, finance and operation by Meridiam of 2,511 new student accommodation bedrooms and the associated social spaces and infrastructure works once the project is completed in September 2016 (Bouygues Development 2014).

The scheme will obtain from BREEAM, a world leader in design and assessment method for sustainable building, outstanding and True Zero Carbon ratings, making it among the first student accommodation schemes in the UK to achieve such accreditation.

The innovative long term bond financing of this project is a first-of-its kind in Europe for infrastructure. Funding has been arranged by Meridiam Europe II through an index linked unwrapped private bond placement (Meridiam . This innovative project bond financing maximizes the financial efficiency of the project for the benefit of the University.

The concession period being 50 years, Meridiam, will have covered all of the social infrastructure's phases, from the identification of infrastructure needs and project design to the operation and management of the infrastructure asset over the long term, working jointly with the University. This integrated approach not only benefits the infrastructure whose good construction and perennial operation are contractually guaranteed but also Meridiam, the investor, who can best anticipate the cash flows. The project therewith becomes both useful for the University's students and profitable for asset allocators.

4.1.3 The profitability of an integrated approach

An integrated approach yields the highest returns. Indeed, when strategic asset allocators superimpose their investment time horizon over the life span of the infrastructure, this infrastructure's potential is best fulfilled while the gains collected by the investors are at their apex. The reason is that maximising the overall levels of dividend and return should be greater than the sum of their short-term maximisation.

Mark Wiseman, CEO of Canada Pension Plan Investment Board, strengthened such assumption during an interview with McKinsey in 2012 : „we don't actually build in exit assumptions. Literally, when we buy an asset, we assume that we will hold it indefinitely or until the end of the concession" (Kirkland 2013). The existence of sustainable infrastructure stretches over the long term by nature. Hence, it needs a long-lasting and comprehensive management so as exploit its entire potential and deliver the maximum benefits. In fact, many would agree that a clear and long-term vision enhances the efficiency of resource allocation and the effectiveness of any business operation.

"When we buy an asset, we assume that we will hold it indefinitely or until the end of the concession."

Mark Wiseman, CEO of Canada Pension Plan Investment Board, November 2012

4.2 Future Proofing with Sustainability

4.2.1 The Holistic Sustainable Standards

Such long-term analysis can only be trustworthy if based on the Future Proofing of holistic Sustainable Standards. In its Outcome document of the Third International Conference on Financing for Development: Addis Ababa Action Agenda in July 2015, the UN clearly stresses the importance of establishing such standard: "We call on standard-setting bodies to identify adjustments that could encourage long-term investments within a framework of prudent risk-taking and robust risk control." One of these bodies, Global Infrastructure Basel (GIB), developed the Sustainable and Resilient (SuRe®) Standard for Infrastructure under ISEAL-methodologies.

4.2.2 Securing performance

Sustainable Standards enable and secure the long-term performance of sustainable infrastructure. The clear dashboard provided by the standards gives managers the necessary information to lift the infrastructure to the highest performance level. The more accurate the data, the lower the uncertainty regarding the expected evolution and hence, the better the allocation of internal resources. The overall result is a better understanding of the infrastructure particularities and an enhanced management.

4.2.3 The SuRe® standard as building the necessary trust

The SuRe® standard is designed to build trust between asset allocators, investment agencies, NGOs and governments by evaluating environmental, socioeconomic and (financial) corporate governance criteria. Within corporate governance, it assesses the bankability and management quality, the level of transparency and accountability, the stakeholder engagement and the sustainability and resilience management of the firm. When looking at the socioeconomic impact of infrastructure, several themes are taken into account such as human rights, working conditions and labour rights, job creation, customer focus or community impact. The SuRe® standard also evaluates the environmental effects of the infrastructure project, including biodiversity, environmental protection, impacts on the climate and the availability of natural resources, modification of land use and landscape. The SuRe® standard and other standards thus represent the tools needed to synchronise infrastructure debt and equity interests.

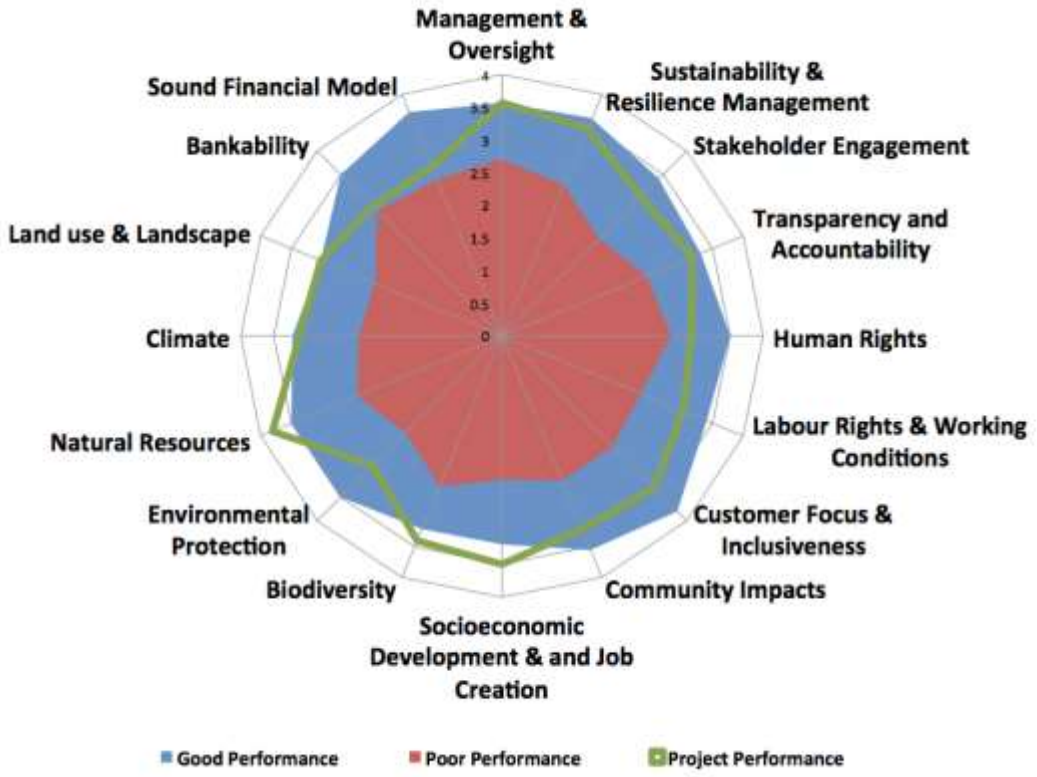
Dimension	Theme
1. FINANCES	1.1. Bankability
	1.2. Sound Financing Model
2. GOVERNANCE	2.1. Management and Oversight
	2.2. Sustainability and Resilience Management
	2.3. Stakeholder Engagement
	2.4. Transparency and Accountability
3. SOCIETY	3.1. Human Rights
	3.2. Labour Rights and Working Conditions
	3.3. Customer Focus and Inclusiveness
	3.4. Community Impacts

	3.5. Socioeconomic Development and Job Creation
4. ENVIRONMENT	4.1. Biodiversity
	4.2. Environmental Protection
	4.3. Natural Resources
	4.4. Climate
	4.5. Land Use and Landscape

Table 1. GIB Standard for Sustainable and Resilient Infrastructure – Categories of Assessment Criteria

In practice, the SuRe® standard offers two services: during the initial planning phase, it can be used as an early stage assessment while it later serves as a rating system. Unfortunately, the rating part of the SuRe® standard still being in the development phase, it is too early to illustrate it appropriately. Sufficient information and data exist for the early stage assessment, though. The objective is to display the project's predicted performance with respect to all themes of the standard and to indicate how well the project does at this initial point. The project developers can either subsequently modify their plans or be satisfied with the deeper awareness gained through the standard. The Following diagram is a random example; it indicates that the standard is less demanding regarding Environmental Protection or Land Use and Landscape since it is harder to achieve than Customer Focus and Inclusiveness, and not as essential as respecting the Human Rights.

Figure 3. The Sure® early stage assessment



4.2.4 The creation of a new Asset Class: Sustainable Infrastructure

By associating **sustainable infrastructure equity and debt in the same pocket** of investment, over the long term, a new Hybrid Sustainable Infrastructure Asset Class is created. It represents a strategic allocation because of several financial advantages.

4.3 The financial characteristics of Sustainable Infrastructure

4.3.1 Non-correlation

Sustainable Infrastructure enjoys only limited correlation with other bonds and equity, with market performance and with business cycles. It is hardly or not correlated with bonds and equity since

infrastructure cash flows are generated by tariffs from end-users or public funding such as service agreements or taxes – that are not affected by the aforementioned bonds and equity. For instance, revenues from the Santander Cycles in London are generated by the users who either "pay as they pedal" or have subscribed to a yearly membership. Additional revenues come from the advertisement fee that Santander pays Transport of London. Highways under concession are predominantly financed by the road-tolls. Similarly, cars, lorries, motorbikes etc. are charged to cross the viaduct of Milau in France. In Uganda, universities and other education institutions finance the academic classrooms, the student hostels and other faculty housing constructed by the Christie Company. In Turkey, rental fee paid for 25 years by the Health Ministry will finance the Adana Integrated Healthcare Campus, a Public Private Partnership.

Sustainable Infrastructure is not correlated with stock market performance. The reason is that infrastructure debt has fixed interest rates; no matter how volatile the stock market may turn out, sustainable infrastructure will pay a fixed return. Sustainable Infrastructure thus offers a first-choice diversification opportunity to stockholders.

Neither is Sustainable Infrastructure correlated with business cycles. Infrastructure is a central piece of the economy – some even argue it is its backbone –, which means that infrastructure will be the last business sector to shut down. Infrastructure is indeed irreplaceable in many ways: even if the economic flows shrink, there will still be lorries on the roads. Schools will hopefully continue to teach pupils regardless of the conjecture. Information will continue to transit through the communication networks even if the country is heavily indebted. Infrastructure shall therefore be a safe investment opportunity, with limited risk.

4.3.2 Inflation-hedged

Sustainable Infrastructure is relatively inflation-hedged thanks to a "licence to operate": it can readily proceed to price adjustment to cover inflation losses for it enjoys higher acceptance by stakeholders. In particular, end users who actively participate in the infrastructure management acknowledge the necessity of such measures if the wish the service to persist.

4.3.3 Liquidity premium or greater liquidity

Infrastructure investors receive a liquidity premium, i.e. the premium that is paid to infrastructure debt or equity holders as a compensation for bearing higher risks – the very notion of illiquidity means that the asset is not readily tradable on the market, resulting in greater exposure to market fluctuations, thus higher risks. The premium may take the form of higher returns paid to debt holders as they can expect to lend money at higher interest rates. In case of equity holders, the liquidity premium may be incorporated in higher profits than for other equities.

But given that an option exists for Sustainable Infrastructure investors to securitise their assets (see 4.5.4 Securitisation Option), the liquidity premium might fall. This drawback would not come without a benefit though; investors would enjoy an enhanced capacity to exchange infrastructure assets, meaning that the risk associated with infrastructure diminishes. Sustainable Infrastructure may thus reveal less risky, potentially helping this financial product attract more investors.

4.3.4 Low operational cost

Sustainable Infrastructure has low operational costs when compared to conventional infrastructure. Because it has been built with material of better quality, it will incur fewer maintenance costs. For instance, a bridge will not need to be renovated that often. A sustainable infrastructure is therefore expected to quickly offset its higher upfront costs through the savings made on maintenance. There are also savings to be made on the energy consumption: since sustainable buildings meet high environmental standards, their levels of insulation – such buildings are sometimes even energetically passive – dramatically reduces the heating and cooling costs.

4.3.5 Higher residual value

Furthermore, at the end of its lifecycle, a sustainable infrastructure typically has a higher residual value than a conventional infrastructure. This means that society as a whole particularly values this infrastructure for the diverse services that survive at the end of the operation phase such as initially planned. It may be that a school's structure is still solid enough to be refreshed and turned into social housing. It may also be that the foundations of former railways are so stable that a cycling path can be constructed on them such as the path that connects Bristol to Bath in England.

4.3.6 Increased management efficiency

Sustainable Infrastructure enables higher resource-efficient management. In fact, since transparency and accountability lie at its very core, the internal management as well as the wider public will scrutinise all revenues and expenses so as to crack down on corruption and resource-wasting work. As a result, savings are made, business is run quicker and fairer, and the infrastructure's value increases. The reputational benefit from transparent and accountable management is proportional to the drawbacks of a project burdened by corruption. Not only did ABB have to pay USD 58 million in 2010 to settle the bribery case in Mexico and in Iraq but also had it to invest in cleaning its image, by updating and strengthening its anti-corruption policy for instance.

4.3.7 Enhanced worker productivity

Superior worker productivity can be expected in sustainable infrastructure. Managing a sustainable infrastructure implies that managers closer listen to the workers demands. They can then integrate these comments so that working conditions better match the employees` skills and produce higher levels of output, thereby generating Positive outcomes for both employer and employee. Swanberg *et al.* (2008) find a positive correlation between flexible working hours and the productivity of workers.

On top of the financial advantages, Sustainable Infrastructure helps minimise a various array of risks so as to build resilient and diversified portfolios. Here it is important to notice that financial advantages and lower risks are two distinct points.

4.4 De-risking with Sustainability

4.4.1 Mitigation of political and social risks

Exposure to political and social risks is lower with Sustainable Infrastructure than with the conventional. A significant part of sustainability focuses on the acceptance of the project by social and political groups. By involving the local communities and stakeholders during the entire lifetime of the infrastructure, the clear goal is to limit opposition or address it as soon as possible in case it should arise nonetheless. Sustainable infrastructure will seek to obtain guarantees from the political sphere not to break or renegotiate the infrastructure projects. It aims to mitigate the changes on the governmental agenda that inevitably occur in case of political cycles. It even anticipates some changes in the law. In the coming decade, the legislation is expected to raise the environmental standards all business need to comply with, including the construction and operation of infrastructure; Sustainable Infrastructure will hardly be affected, though, since this risk was incorporated from the beginning of the planning phase.

4.4.2 Alleviation of environmental risks

Sustainable Infrastructure endeavours to render environment variations a lesser threat to the project. In fact, unlike conventional infrastructure, the range of environmental changes and potential impacts is much more comprehensive. When constructing a new road, not only will the engineers look at the local topography but also will they model the future flows that will alter the infrastructure, including the predicted hydrological cycles and the wind patterns. This special attention to all environmental factors significantly limits the environmental risks the infrastructure is exposed to.

4.4.3 Greater predictability

Backtracking and benchmarking will allow strategic asset allocators to generate predictable returns from a new source. The widespread use of holistic sustainable standards will soon offer investors considerable data to analyse. They will draw more accurate risk profiles so that uncertainty can be better gripped.

Sustainable Infrastructure may be a new product in the financial universe; it will doubtless prove attractive very soon.

4.5 The ternary development of Sustainable Infrastructure

4.5.1 Three steps for an Asset Class

The development of Sustainable Infrastructure as an Asset Class requires that three steps be made.

3. Securitisation Option	Liquidity of infrastructure investments
2. Hybrid Investment Vehicles	Investment grade infrastructure bundles
1. Sustainability Standard	Project level, views complete life cycle

4.5.2 Sustainability Standard

The initial step will witness the broadcast and establishment of the SuRe® standard –or similar standard. The standard will provide the comprehensive tool to assess infrastructure at the project level. It shall give limpid understanding of the widest range of features while remaining synthetic. It is also meant to grasp the entire life span, predict the costs, anticipate the revenues and assess the wider impact on the communities that the infrastructure serves. Notably, the standard should clarify its different externalities and their nature – whether they improve employment for example, or if they dynamise the touristic economy by protecting this threatened and precious species. The standard should comprehensively analyse the infrastructure in project level and over its entire life.

4.5.3 Hybrid Investment Vehicle

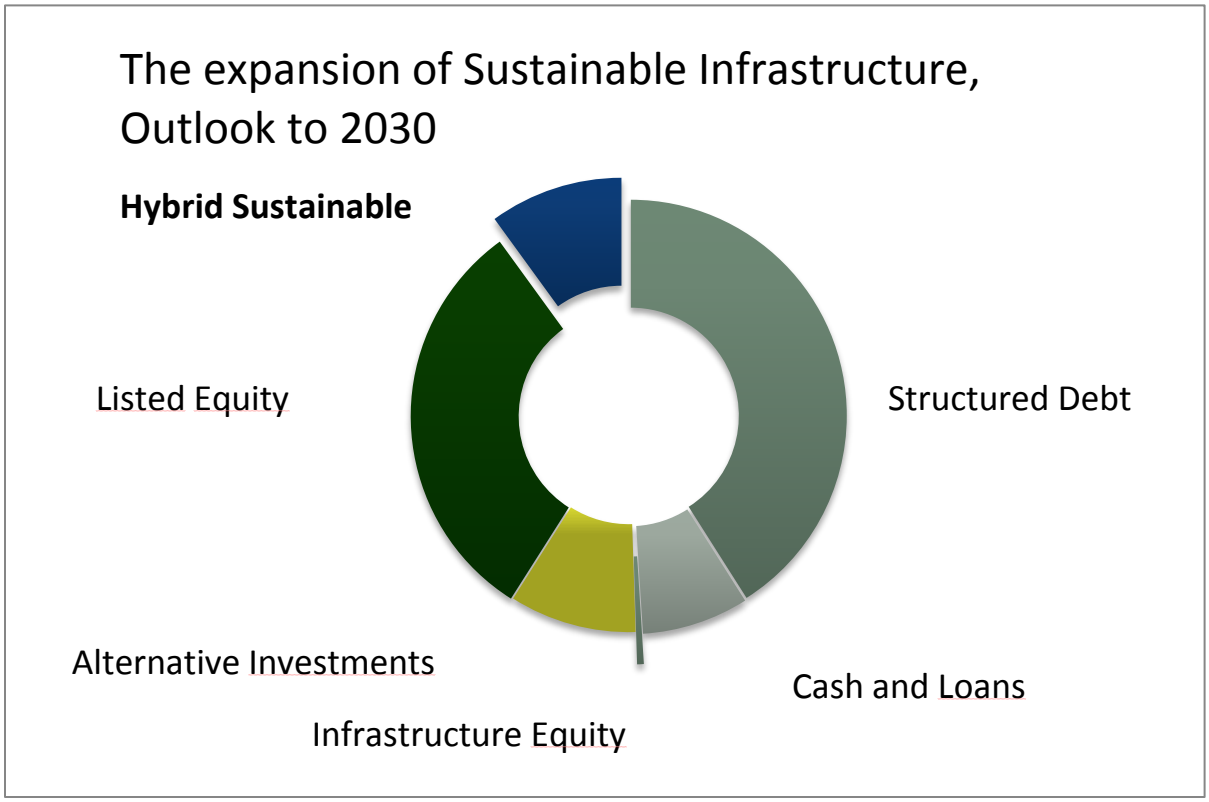
The infrastructure projects shall be graded against all the criteria gathered in the SuRe® standard – or any other homogeneous and solid standard. This meticulous process will produce profiles with similar risk/return characteristics, allowing investors to create homogeneous bundles of projects, facilitating investment in Sustainable Infrastructure. Given these details, asset allocators will be given the tools to tailor their Sustainable Infrastructure Investments to their risk appetite. The emerging Asset Class will enjoy increased clarity, and then trust, both of which can only attract new strategic investors.

4.5.4 Securitisation Option

Using the standardisation of the infrastructure assessment and the project bundles subsequently created, the financial sector has the possibility to increase the liquidity of Sustainable Infrastructure by securitising

the bundles. Such achievement will help contradict one of the infrastructure characteristics, i.e. its illiquidity. If the liquidity premium shall diminish as a result, this drawback is likely to be largely offset by the expansion of the sector and the entailed business opportunities.

This process shall make sure that sustainability doesn't come at an additional cost; in this case it is even the actual enabler of investments and the provider of returns. At the same time, Sustainable Infrastructure contributes to achieving the Sustainable Development Goals. Hence, the implementation and development of this new Asset Class will not only reveal highly profitable for institutional investors but also will it enhance the common good. There is an efficient and profitable way to help develop and protect the world; it is called “Sustainable Infrastructure”.



5 Policy recommendations

Corporate and government policy makers on all levels should not only acknowledge the tremendous infrastructure gap. We recommend that they take serious action for harmonising and standardising the **infrastructure sector so as to improve project comparability. This would attract massive additional**

funding and. For the success of this harmonization, it is crucial that standards for infrastructure project evaluation are created. While the idea of project finance as the backbone for a new infrastructure asset class is well on its way, the standardization of documentation and disclosure requirements, which is currently under discussion, needs to be complemented with additional sustainability criteria.

Several sustainability standards for infrastructure debt and equity (namely project finance) will probably emerge, but we recommend that only standards developed under the **ISEAL methodology** – a non-governmental organization whose mission is to strengthen sustainability standards systems for the benefit of people and the environment – should be applied. The independent Sure® Standard, for example, provides a generic and transparent measurement of the relevant resilience and sustainability criteria. These are of particular importance for investors, because infrastructure projects are **by nature asset heavy and long term.**

The "future proofing", standardization and bundling of such projects with the help of an independent and credible sustainability and resilience standard provides the **groundwork for the creation of a sustainable and resilient infrastructure asset class**, which is particularly attractive to institutional investments with long-term liabilities, such as pension funds, insurances or family offices. The sustainable and resilient infrastructure asset class also speaks to the needs of impact investors.

Creating trust in equity as well as debt investment in sustainable and resilient infrastructure for this broad variety of potential funders will allow for a significant contribution of applied sustainability criteria in bridging the global infrastructure investment gap. Certified, high-quality infrastructure projects represent large-scale, main-stream investment opportunities with attractive returns, while helping to achieve the Sustainable Development Goals.

6 Annexes

Annex 1

The 8 characteristics of infrastructure (adapted from Weber and Alfen 2010)

(1) In first instance, infrastructure represents a **key public service**. Infrastructure assets support the development of societies since they deliver fundamental public services such as the provision of clean water or electricity, improve mobility of persons and goods, enhance people's health and education, and offer efficient communication.

(2) Infrastructure is also characterised by a **low elasticity of demand**. This means that the use of infrastructure is often independent from business cycles. Indeed, as it plays fundamental roles in the economy, it will be the last sector affected by economic fluctuations: for example, the rail and road networks are used even during downturns. Hence demand for infrastructure services is expected to remain relatively constant.

(3) 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 is relatively cheap –, incumbent firms will seek to cover the entire market. Competition is therefore limited or even inexistent.

(4) As a direct consequence, infrastructure may be subject to **regulation**. In fact, in case of little or no competition, regulatory authorities do correct the market. Taking the example of the European electricity market, since French electricity provider Électricité de France (EDF) enjoyed a nuclear rent that prevented firms to enter the market, it had to share part of this rent (Percebois, 2013). Alternatively, authorities can fixe prices while compensating the infrastructure holder through a set of guarantees.

(5) **Long service life** is another particularity of infrastructure. The current road network in Europe is still partly based on patterns laid out by the Romans some 2,000 years ago, alluding to the long term lenses through which to look at infrastructure. This millennium 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.

(6) In addition to the features mentioned above, infrastructure provides a degree of **inflation protection**: revenues are likely to be tied to inflation adjustment mechanisms, be it through regulated income clauses,

guaranteed yields or any other contractual guarantees. When revenues are generated by user charges, prices typically follow the Consumer Price Index (CPI) or GDP growth.

(7) **Regular, stable, yet late cash flows** also characterise infrastructure. After an initial construction phase, infrastructure assets are likely to produce regular and stable cash flows during their operational phase. Thus, they are generally perceived as relatively safe investment opportunity for risk-averse institutional investors.

(8) Infrastructure is often characterised by relative **illiquidity**. Indeed, infrastructure projects used to be too dissimilar to allow the creation of homogeneous products bearing analogous risk. As a consequence, there is either a non-existing or under-developed market on which to exchange ownership participations. The legal framework may also be a hurdle that makes infrastructure illiquid.

Annex 2

The achievement of the Sustainable Development Goals (SDGs) hinges upon the development of infrastructure

"Goal 6: Ensure availability and sustainable management of water and sanitation for all" highlights the need for better water networks. In particular, it requires further development of water cleaning stations, replacement of leaking old lead pipes and construction of new tubes, and the introduction of smart tools that would reduce water waste while increasing consumption efficiency.

"Goal 7: Ensure access to affordable, resilient, sustainable, and modern energy for all" stresses the urge for both larger and cleaner power generation. Aiming to use modern forms of energy and simultaneously decrease the energy sector's environmental footprint implies the expansion of electricity. In practice, small-scale power plants shall be constructed for instance, smart electricity networks too.

"Goal 8: Promote sustained, inclusive and sustainable growth, full and productive employment and decent work for all" can hardly be achieved without the development of a dense infrastructure network, ranging from freight railways to airports increasing workforce mobility, from fibre-optic cables to new geostationary satellites, both boosting the transmission of information. Infrastructure does indeed facilitate the mobility of humans, goods and services, improving economic productivity and human wellbeing alike.

"Goal 9: Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation" unambiguously stresses the necessity to further develop infrastructure. It would benefit from the technological discoveries to adapt to a changing environment; simultaneously, it would improve the

state of the industrial production system so as to secure resilient and innovative outputs that contribute to increasing people's quality of life.

"Goal 11: Make cities and human settlements inclusive, safe, resilient and sustainable" is a goal infrastructure can contribute to. Indeed, enhanced public transports will ameliorate the connectivity of different areas, reducing spatial inequalities. Moreover, adequate and well-thought infrastructure that includes flooding areas for example helps mitigate the effects of severe storms. The Thames Barrier incarnates the resilience-advantage for a megalopolis such as London.

Annex 3

Benefits from Sustainable Infrastructure for achieving the Sustainable Development Goals (SDGs) with respect to the three pillars of sustainability

	Economy	Society	Environment
Goal 2 – agriculture	Increased efficiency and resilience as small-scale farms knit a dense network	Local production results in higher employment and diminishing migration in urban areas, better cohesion	Increased efficiency implies lower ecological footprint
Goal 6 – water	Better management of scarce resource benefits industry production and supply to household	Prevention of severe humanitarian catastrophes and droughts (cf. California)	Better management of groundwater, reduction in surface run-off
Goal 7 – energy	Idem	Possible empowerment of people, improvement in literacy rates when household possesses electricity and light	Reduction in GHG emissions, smaller impact by power plants (as they are of smaller scale)
Goal 8 – growth & employment	Solow model: infrastructure = capital, hence growth Sustainable infrastructure enables sustained and resilient growth with employment Green jobs shall also be linked to improved work conditions.	Integration of "new" population while maintaining/improving living standards	Aims at decoupling economic growth from environmental impact
Goal 9 – infrastructure	Increases resilience and efficiency of economic activity	Improve mobility and connectivity	Chanel fluxes more effectively, with lower spill over

	Economy	Society	Environment
Goal 11 – cities	Greater availability of labour force –better transports/denser cities Kremerian model: the larger the population, the more ideas to increase TFP	Multi-cosmopolitanism, cooperation	Smart cities reduce their ecological footprint

7 Glossary

Debt-to-GDP ratio: the ratio between a country's government debt and its Gross Domestic Product. The lower the ratio, the more wealth a country's economy is able to produce in a year without significantly adding to the existing debt level.

GDP: The Gross Domestic Product measures the wealth created within a country over one year. Using the expenditure definition, GDP (Y, i.e. production) is the sum of consumption (C), investment (I), government spending (G) and net exports (X – M):

$Y = C + I + G + X - M$

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