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Infrastructure Renewal and Investment

Bridging $1 trillion infrastructure gap needs multi-pronged approach

Making up the shortfall between global infrastructure investment needs and actual spending, estimated at over $1 trillion annually, is high on the agenda for policy makers and investors alike. With public sector balance sheets and resources under strain across the globe, bridging this gap will require new and existing sources of private sector capital across a range of procurement approaches. Technical assistance and credit enhancement from multilateral development banks (MDBs), as well as regulatory incentives for insurers to invest in infrastructure, will likely play a growing role going forward.

» **Infrastructure investment is a priority for policy makers.** The International Monetary Fund (IMF) estimates that for advanced economies, every dollar of infrastructure investment during periods of low growth can increase output over the medium term by $3. The benefits to emerging market and developing economies from addressing infrastructure bottlenecks can also be significant.

» **Investor interest in infrastructure is growing.** Many institutional investors see value in infrastructure debt as it allows them to match long-dated liabilities with long-term assets, while also offering attractive risk-adjusted yields and portfolio diversification. Substantial private sector debt capacity is available for infrastructure investment in stable, creditworthy countries, but remains scarce in developing economies.

» **A variety of models has evolved to deliver infrastructure assets.** Governments are responsible for the policy framework and overarching strategy for infrastructure procurement, shaping the environment in which market participants operate. Capital expenditure by infrastructure corporates far exceeds that delivered by infrastructure project finance transactions, including public private partnerships (PPPs). We estimate that the relevant multiple was more than 4x in Europe, and more than 6x in North America over 2012-14.

» **New initiatives aim to increase investable opportunities, attract fresh capital**. MDBs have established project preparation facilities to improve the quality of infrastructure projects, and are exploring forms of credit enhancement to tap new sources of private capital. Recent amendments to Solvency II, the European regulatory framework for insurers that took effect on 1 January 2016, reduce capital charges for qualifying infrastructure investments.

Infrastructure investment is a priority for policy makers

Infrastructure investment is of critical importance to society, providing and maintaining capital-intensive assets that underpin economic activity. However, the need for infrastructure investment across the globe is not being met.

The World Economic Forum (WEF) estimates the infrastructure gap, i.e. the shortfall between global infrastructure investment needs and actual spending, to be about $1 trillion per year until 2030.[1] The infrastructure gap as a percentage of GDP in emerging markets is above the global average. Other studies quoted by the World Bank estimate an infrastructure gap of $1 trillion for developing countries alone.[2]

Exhibit 1
The World Economic Forum estimates the global infrastructure gap at about $1 trillion per year.

Source: World Economic Forum

Investment in economic infrastructure can be particularly effective in boosting economic activity in the short term, and growth in the long term. The IMF has estimated that for advanced economies, every dollar of infrastructure investment during periods of low growth can increase output over the medium term by $3. The WEF has estimated that every dollar spent on regular road maintenance can save $5 of refurbishment and reconstruction costs.

Analysis by the IMF[3] has shown that the benefits of infrastructure investment are greatest when an economy is operating below capacity, when investment efficiency is high, and when public investment is debt-financed. The benefits to emerging market and developing economies from addressing infrastructure bottlenecks can be particularly significant.

We emphasise the importance of investing in assets that enhance productive capacity. This requires transparent criteria and processes for the appraisal and selection of infrastructure enhancements, rigorous analysis of costs and benefits, effective asset procurement and delivery, and effective on-going asset operation and capital maintenance.

Countries at different stages of economic development have different priorities for infrastructure investment. Lower income countries often lack the basic infrastructure needed to provide electricity, clean water and sanitation.

As countries develop, their investment priorities tend to switch to the expansion and improvement of economic infrastructure, such as transportation networks. In advanced economies, there is a greater need to focus on the maintenance and renewal of existing infrastructure assets, alongside selective investment in new infrastructure.

What is infrastructure?

There is no commonly accepted definition of Infrastructure. The term is typically used in a broad sense to refer to economically and socially important assets such as:

- Power generation facilities, electric and natural gas transmission and distribution networks, clean water and sanitation facilities.
- Transport systems such as roads, bridges, ports, airports, and rail networks.
- Facilities such as hospitals, schools, prisons and social housing.

The term "economic infrastructure" is often used to describe assets that directly support economic activity, as distinct from "social infrastructure," which refers to assets that support the provision of public services.

There is no clear distinction between infrastructure and non-infrastructure assets. For example, while a strategically important highway would be regarded as core infrastructure, service stations along the highway could be described as non-core infrastructure. Although some assets that blend infrastructure risks with commodity risks are regarded as infrastructure, such as merchant power projects, the label is less likely to apply when commodity risk predominates, as in the case of oil and gas production assets.

In our report "Infrastructure Default and Recovery Rates, 1983-2014", March 2015, we discuss the attributes of infrastructure and compare the historical credit performance of Moody's-rated infrastructure debt securities against that of Moody's-rated non-financial corporates.

Investor interest in infrastructure is growing

With public sector balance sheets and resources under strain across the globe, policy makers see the mobilisation of private sector capital for infrastructure investment as an imperative.

Many institutional investors see relative value in creditworthy infrastructure debt, as its long tenor makes it a suitable matching asset for long-dated liabilities. Infrastructure debt also offers attractive risk-adjusted yields and portfolio diversification benefits.

Institutional investors across the OECD held assets of over $90 trillion as at December 2013 (see Exhibit 2), underlining their critical importance as a potential source of infrastructure investment.

Exhibit 2

As at December 2013, institutional investors across the OECD held assets worth $92.6 trillion in aggregate

Investor type	Assets under management, December 2013 ($ trillion)
Investment funds	34.9
Insurance companies	26.1
Pension funds	24.7
Public pension reserve funds	5.1
Other	1.8
Total	92.6

Source: OECD

However, the challenge of mobilising private sector debt capacity for long-term infrastructure investment is greater in developing countries than in advanced economies.

Substantial private debt capacity available in creditworthy countries

Exceptionally low interest rates in a number of advanced economies has created substantial liquidity across global financial markets. In stable, creditworthy countries, this has encouraged banks and institutions to provide long-term debt capacity for infrastructure corporates and well-structured infrastructure projects.

The global financial crisis inflicted significant credit losses on the commercial banking sector, forcing it to deleverage and raise risk capital. This has restricted its ability to lend long-term. Incremental increases in the regulatory cost of long-term lending under Basel III are a further headwind for the sector.

However, many banks that had curtailed long-term infrastructure lending in response to the global financial crisis are now once again pursuing opportunities in the sector. These lenders are drawn by attractive loan margins against a backdrop of persistently low interest rates in advanced economies, as well as the characteristic credit strength of infrastructure debt.

These banks see lending to the infrastructure sector, and providing associated hedging products, advisory and agency services, as an attractive use of capital despite the increased regulatory cost of long-term lending under Basel III.

Increased competition between banks and investors, together with a relative dearth of new investment opportunities, has led to a fall in loan margins and credit spreads (see "A wave of capital for infrastructure, but mismatched with investment opportunities", May 2015).

In advanced economies, infrastructure investors are particularly sensitive to (1) policy risk arising from unforeseen adverse changes in the legal and regulatory environment, (2) revenue risk arising from uncertainty over future demand and user tariffs for demand-risk assets such as toll roads, and (3) exposure to construction or technology risk.

Long-term private sector debt for investment scarce in developing economies

Infrastructure financing in emerging markets tends to be dominated by commercial banks, national development banks, MDBs and other international development finance institutions (DFIs).

This high reliance on bank lending often reflects underdeveloped domestic capital markets and limited access to international markets. Moreover, debt tenors, typically ten years or less, are often shorter than the optimum economic life of the underlying infrastructure assets, giving rise to refinancing risk.

New sources of long-term debt will therefore need to be developed to address the infrastructure gap in emerging market and developing countries. One obstacle to increased participation by international investment managers is their restrictive mandates, which often include geographical constraints and minimum credit quality criteria.

International investors are particularly sensitive to country-specific risks, including (1) political risk, (2) the credit strength of key counterparties, which may include the host government and sub-sovereign entities, (3) untested and evolving legal and regulatory frameworks, (4) potential forex risk arising from a mismatch between local currency revenues and dollar or euro-denominated debt, and (5) any concerns regarding transparency and global consistency.

Key risks that concern infrastructure investors in advanced economies, such as policy risk, demand risk, construction risk, and technology risk are also relevant in emerging market and developing economies.

Local institutional investors often have a better understanding of, and greater tolerance for, country-specific risks.

Within emerging market and developing economies, the government's limited capacity to select, appraise and procure new infrastructure can be a further constraining factor.

A variety of models has evolved to deliver infrastructure assets

Governments set policy framework and overarching strategy

There are many different approaches to delivering infrastructure assets. Policy makers, who control the strategic context and policy framework for infrastructure investment, as well as the flow of procurement opportunities, shape the environment in which market participants operate.

In developing a national infrastructure strategy, governments must assess the current condition of their infrastructure assets, and identify the improvements needed to meet the country's needs. They must then decide how to achieve their objectives, and over what time period. Governments will also need to consider the economic, environmental and social impact of competing investment options, and develop a coherent policy framework for prioritising them.

The government's policy framework must address how new infrastructure assets are procured and paid for. There are two principal sources of funds for infrastructure projects, tax-payers or the end-users of the asset. The infrastructure provider's approach to financing the investment will depend on whether it receives revenues in the form of user tariffs or government transfers.

A government can procure infrastructure development in a number of ways:

» Direct procurement by a central government or sub-sovereign entity.

» By setting service coverage and performance standards for regulated utilities that necessitate infrastructure investment to meet those standards.

» By tendering specific infrastructure assets and services via a concession or project agreement, e.g. the development of a new road as a PPP project.

» By creating markets with appropriate incentive mechanisms to achieve desired infrastructure outcomes, e.g. the development of new generation capacity by power producers competing in a power generation market.

With the exception of direct procurement by the public sector, these approaches all create opportunities for the private sector to invest in infrastructure.

Project finance debt used to finance economic and social infrastructure

Project finance refers to the financing of infrastructure, industrial or public assets using limited recourse long-term debt, typically raised by a special purpose vehicle (SPV) created solely to complete the project. Principal and interest payments are funded entirely from cash flows generated by the SPV, while the scope and duration of the project is defined in the SPV's contractual arrangements.

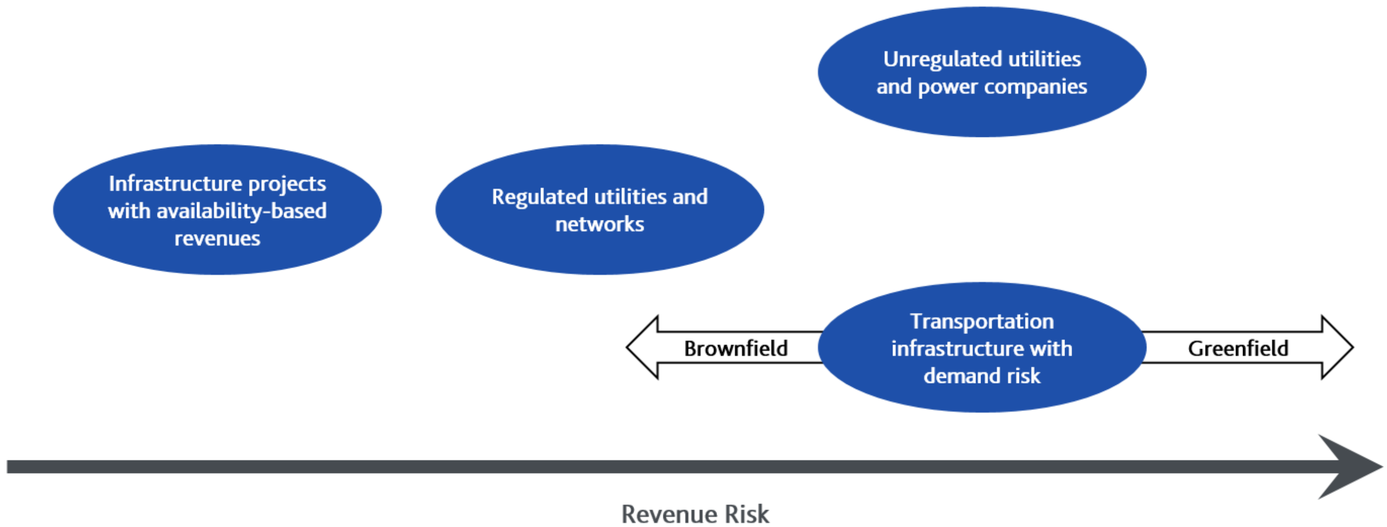
Project finance debt can be an efficient way to fund long-term capital-intensive projects where underlying revenues are relatively stable and predictable. It is therefore often used to fund economic infrastructure and social infrastructure.

Project finance is of particular relevance in emerging market and developing economies. This is because it provides a framework within which key risks can be identified and mitigated, helping attract long-term debt from international lenders.

Distinct infrastructure sub-sectors have emerged

Infrastructure assets tend to be capital-intensive, and have a long economic life. Infrastructure corporates typically have a strong market position, and are often dominant or monopoly providers of utility services. They also typically generate predictable long-term cashflows, and have low correlation with other asset classes, particularly where demand risk is absent or substantially mitigated. Over time, distinct sub-sectors of infrastructure corporate and project finance entities have emerged, as illustrated in Exhibit 3 below.

Exhibit 3
Examples of infrastructure sub-sectors differentiated by revenue risk



Source: Moody's

Exhibit 4
Commentary on revenue risk

Example	PPP projects with availability-based revenues	Regulated utilities and networks	Unregulated utilities and power companies	Privately managed toll roads
Commentary on revenue risk	Once the asset is completed and commissioned, the private sector project company will receive an availability payment, typically sized to cover operating, maintenance, and lifecycle costs, as well as debt service and equity returns. These availability payments are not subject to demand risk and are only reduced for lack of performance or availability.	As monopoly providers of essential transmission and distribution services, electric and gas networks are regulated, i.e. their revenues (or tariffs) are subject to price control limits that are typically reset periodically. Price-setting mechanisms are generally structured to limit volatility and tend to be highly predictable.	Unregulated utilities engage in the production and/or procurement and supply to end-users of electricity, gas and other energy-related utility services/products in unregulated or lightly regulated markets. Unregulated power companies engage in the production and/or procurement and sale of electricity and, to a lesser extent, natural gas, in unregulated markets. For both subsectors, the selling price of the commodity is determined by market forces or is a negotiated contractual price agreed between the buyer and seller.	The principal source of revenue is derived from tolls charged directly to users of the asset. Privately managed toll roads are typically operated under a concession agreement with the relevant government or other concession-granting authority. Among other things, demand risk is dependent on the essentiality of the road, the availability of competing routes, the profile of road users (e.g. commuter, freight or leisure traffic).

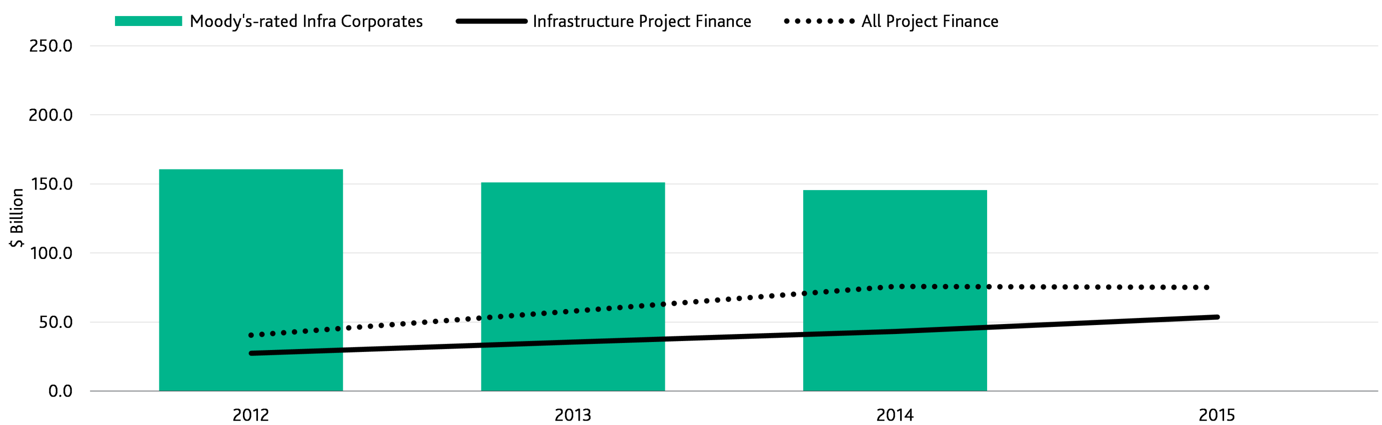
Infrastructure corporates' capex in Europe and North America far exceeds regional infrastructure project finance investment

In Europe over the period 2012-14, we estimate that total capex by Moody's-rated infrastructure corporates was more than 4x the combined capital value of the infrastructure project finance transactions (whether rated or not) that reached financial close during the period.[4] The gap was wider still in North America, where we estimate that total capex by Moody's-rated infrastructure corporates was more than 6x the combined capital value of infrastructure project finance transactions (see Exhibits 5 and 6).

In the appendix below, we provide further analysis of capex by Moody's-rated infrastructure corporates in Europe and North America, grouped by principal infrastructure sub-sectors.

Exhibit 5

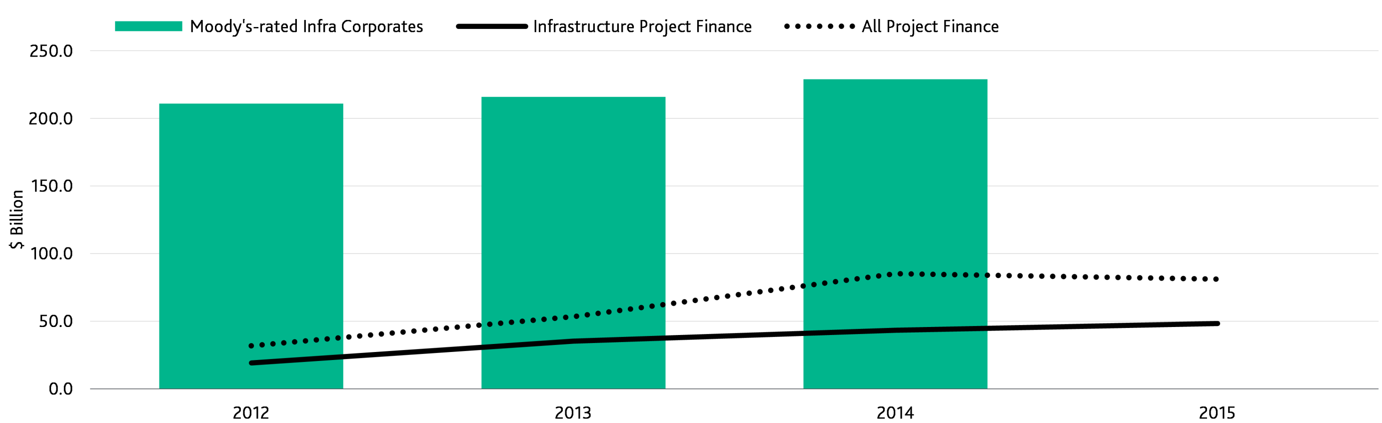
Infrastructure Capital Expenditure in Europe: Infrastructure Corporates compared with Infrastructure Project Finance



Note: Infrastructure project finance excludes oil & gas, mining, petrochemical and industrial projects
Source: Moody's, Thomson Reuters Project Finance International

Exhibit 6

Infrastructure Capital Expenditure in North America: Infrastructure Corporates compared with Infrastructure Project Finance



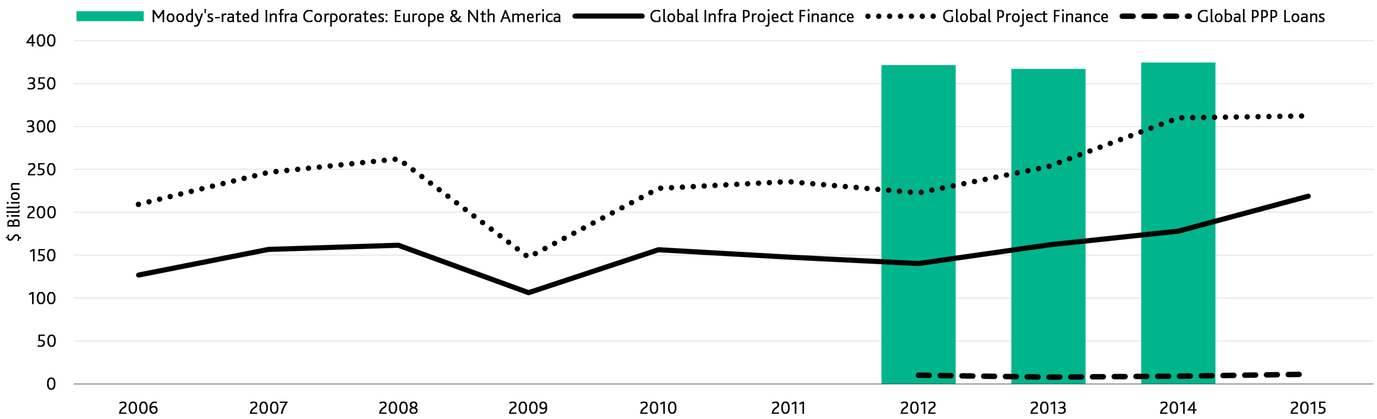
Note: Infrastructure project finance excludes oil & gas, mining, petrochemical and industrial projects
Source: Moody's, Thomson Reuters Project Finance International

Infrastructure corporates' capex in Europe, North America also surpasses global infrastructure project finance investment

Over the period 2012-14, aggregate capital expenditure by Moody's-rated infrastructure corporates in Europe and North America alone averaged $371 billion per annum. This far exceeded the $160 billion average annual capital value of global infrastructure project finance transactions that reached financial close during the period (see Exhibit 7).

Exhibit 7

Infrastructure Capital Expenditure: Infrastructure Corporates in Europe & North America compared with Global Infrastructure Project Finance



Note: Infrastructure project finance excludes oil & gas, mining, petrochemical and industrial projects

Source: Moody's, Thomson Reuters Project Finance International

Infrastructure corporates invest significant sums in infrastructure assets every year. Their business models are generally well-understood by investors, and they are typically among the economy's most creditworthy entities. In advanced economies, infrastructure corporates have ready access to debt facilities from banks and capital market investors.

However, the investor appeal of infrastructure corporates based in developing economies is more limited, as country-specific risks can undermine their creditworthiness.

Project finance techniques provide a framework within which key risks, including country-specific risks, can be identified and mitigated. Procurement approaches based on project finance, such as PPPs, therefore offer a promising way forward in emerging market and developing economies.

Bridging the global infrastructure gap will likely require a range of different delivery mechanisms and financing approaches, spanning both the corporate and project finance models.

Recent initiatives aim to increase investable opportunities, attract fresh capital

In September 2015, world leaders attending the United Nations Sustainable Development Summit in New York adopted a range of goals designed to promote sustainable development across the globe over the next 15 years.

MDBs have been given a central role in achieving those goals, which will require transformative changes in finance, infrastructure investment and capacity development in developing countries. They will also require an increase in private sector funding, creating pressure for a step-change in the scope and scale of engagement between public and private sector entities. Policy makers have called on other DFIs to support that effort.

To meet these challenges, MDBs and DFIs will need to optimise the use of their balance sheets, encourage long-term private investors to channel more capital into infrastructure, and develop innovative policy instruments for infrastructure investment. Steps taken so far include:

» The principal MDBs have all established project preparation facilities to increase infrastructure investment, improve the quality of infrastructure development, strengthen regulatory frameworks, and build capacity in developing countries.

» Many MDBs and DFIs are actively exploring forms of credit enhancement to mitigate key risks of concern to investors.

Efforts to build project pipelines are under way

In October 2015, the G20 launched the Global Infrastructure Hub to address critical choke points in the preparation and procurement of infrastructure projects. The Hub is mandated to deliver a comprehensive, open-access global pipeline of infrastructure projects.

Unveiled in November 2014, the European Commission's (EC) Investment Plan for Europe has three complementary strands:

1. The provision of risk capital by the newly-formed European Fund for Strategic Investments to mobilise €315 billion of additional private sector investment in strategic sectors, including infrastructure, over 2015-17.
2. The establishment of an investment advisory hub to facilitate project development, and the creation of a pipeline of investable projects across the European Union. This pipeline, known as the European Infrastructure Investment Project Portal, will be launched in February 2016.
3. Measures to provide greater regulatory predictability and remove barriers to investment.

Solvency II amendments aim to boost insurers' investment in infrastructure

Solvency II, the European capital adequacy regime for insurers that became effective on 1 January 2016, exemplifies international efforts to strengthen the prudential regulation of the insurance industry. Recent amendments to the rules, adopted by the EC, but still subject to scrutiny by the European Parliament, are designed to give insurers an incentive to invest in infrastructure projects.

Under Solvency II, the risk charge for insurers' infrastructure investments was initially on a par with that for their other corporate exposures. The amendments adopted by the EC in September 2015 reduce the capital charge for qualifying investments in infrastructure project entities.[5] These amendments were based on technical advice from the European Insurance and Occupational Pensions Authority (EIOPA, the European insurance regulator) following a market consultation exercise.

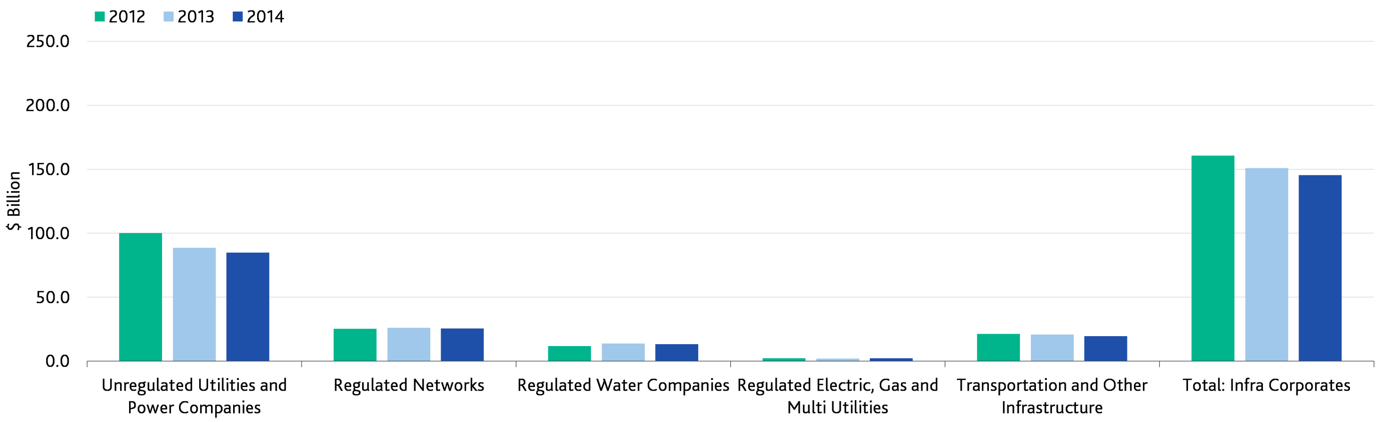
In October 2015, the EC asked EIOPA to provide further technical advice on the risk calibration of infrastructure corporates. EIOPA's work stream on infrastructure corporates is on-going.[6]

Appendix: Further analysis of capital expenditure by Moody's-rated infrastructure corporates

Exhibit 8 shows capital expenditure over the period 2012-14 by European infrastructure corporates that are publicly rated by Moody's.

Exhibit 8

Capital expenditure 2012-14, by infrastructure corporates in Europe publicly rated by Moody's

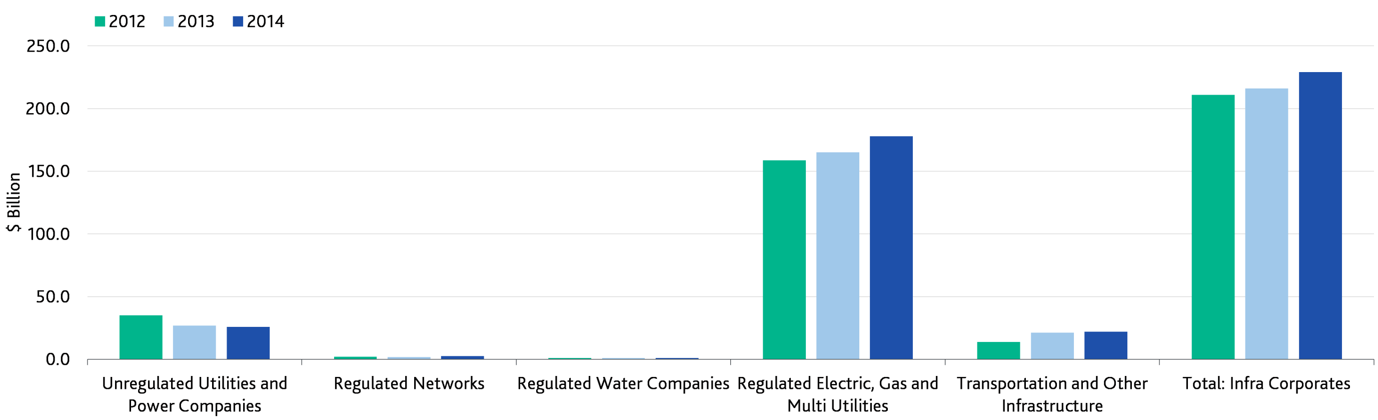


Source: Moody's

Exhibit 9 shows capital expenditure over the period 2012-14 by North American infrastructure corporates that are publicly rated by Moody's.

Exhibit 9

Capital expenditure 2012-14, by infrastructure corporates in North America publicly rated by Moody's



Source: Moody's

Moody's Related Research

Sector Outlooks:

- 2016 Outlook: Global Transportation Infrastructure and Project Finance, December 2015
- 2016 Outlook: Global Utilities and Power, December 2015

Sector In-depth:

- Asian Infrastructure: Institutional Debt to Enhance Funding Diversity for Asian Infrastructure, November 2015 (1009906)
- Supranationals - Global: Global Funding From Multilateral Development Banks Will Continue To Increase, September 2015 (1008025)
- Infrastructure Renewal and Investment: A wave of capital for infrastructure, but mismatched with investment opportunities, May 2015 (1001712)

Default Studies:

- Default and Recovery Rates for Project Finance Bank Loans, 1983-2013, March 2015 (179524)
- Default and Recovery Rates for Project Finance Bank Loans, 1983-2013 - Addendum, September 2015 (1006895)
- Infrastructure Default and Recovery Rates, 1983-2014, March 2015 (1003691)

Special Comments:

- Pilot phase of the Project Bond Initiative demonstrates early proof of concept, November 2014 (1001255)
- Insights on Global Infrastructure Expansion: Global P3 Landscape, September 2014 (174672)
- Insights on Global Infrastructure Expansion: Not All Government Infrastructure Funding Mechanisms Are Created Equal, June 2014 (171101)

Sector Comments:

- Juncker Plan: Europe's €315 Billion Investment Plan Is Credit Positive for Infrastructure Projects, December 2014 (1001826)

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Endnotes

1 World Economic Forum. Strategic Infrastructure: Steps to Prepare and Accelerate Public-Private Partnerships, May 2013.

2 World Bank Public-Private Infrastructure Advisory Facility. Institutional Investment in Infrastructure in Emerging Markets and Developing Economies March 2014.

3 IMF World Economic Outlook, October 2014

4 In estimating the capital value of infrastructure project finance transactions, we have excluded oil & gas, mining, petrochemical and industrial projects

5 See http://ec.europa.eu/finance/insurance/solvency/solvency2/index_en.htm.

6 See https://eiopa.europa.eu/regulation-supervision/insurance/investment-in-infrastructure-projects.

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