



G20/OECD Policy Note on Pension Fund Financing for Green Infrastructure and Initiatives

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This policy note has been developed by the OECD at the initiative of the G20 Mexican Presidency. It builds on extensive research. An outline was circulated at the April meeting of the G20 Finance Ministers and Central Bank Governors and the content of the note was presented at the G20 Seminar on Green Growth, co-organised by the Mexican Presidency and the OECD in Paris in May 2012. This note was finalised in consultation with the OECD's Working Party on Private Pensions and the International Organisation of Pension Supervisors (IOPS). It is submitted for the consideration by the G20 Leaders at the Los Cabos Summit.

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G20/OECD POLICY NOTE ON PENSION FUND FINANCING FOR GREEN INFRASTRUCTURE AND INITIATIVES

Introduction

1. Mexico has established as one of the five priorities for the G-20 Presidency *promoting sustainable development, green growth and the fight against climate change*. In its conceptual paper on green growth (March 2012), the Presidency announced that it will pursue a deliverable related to private and public financing for green growth strategies. Alternative sources of financing will be analyzed for projects that are consistent and promote green growth investments. Among them, pension funds represent a potential source of financing for long-term, green growth infrastructure.

2. The Presidency asked the OECD to prepare a policy note discussing these latter issues for consideration at the Los Cabos Summit. An outline was circulated at the April meeting of the G20 Finance Ministers and Central Bank Governors and the content of the note was presented at the G20 Seminar on Green Growth, co-organised by the Mexican Presidency and the OECD in Paris in May 2012. A previous version of this note was circulated for comments to the OECD's Working Party on Private Pensions.

3. This note is part of the OECD project on *Long-term Investment* and builds on extensive work already undertaken by the OECD on pension funds and infrastructure and pension funds and green growth.¹

I. Potential Role of Pension Funds in Financing Green Infrastructure

4. It is estimated that transitioning to a climate resilient economy, and more broadly 'greening growth'² over the next 20 years will require significant investment. Achieving this economy-wide transformation will require cumulative investment in green infrastructure in the range of USD 40 trillion between 2012 and 2030, *i.e.* approximately USD 2 trillion or 2% of global GDP per year, which implies a doubling from current levels.³ At issue is the fact that new capacity brought online will be around for a very long time, which means, if it is not 'clean', that polluting emissions and intensive use of resources will be locked in for decades.

¹ See www.oecd.org/finance/lti and the following papers: Della Croce, R., Stewart, F., Yermo, Y. (2011), 'Promoting Longer-Term Investment by Institutional Investors: Selected Issues and Policies' OECD Financial Market Trends, Volume 2011- Issue 1 <http://www.oecd.org/dataoecd/51/21/48616812.pdf>, OECD(2011), 'Pension Funds Investment in Infrastructure: A Survey'. <http://www.oecd.org/dataoecd/59/33/48634596.pdf> Croce, R. D. (2011), "Pension Funds Investment in Infrastructure: Policy Actions", *OECD Working Papers on Finance, Insurance and Private Pensions*, No. 13, <http://www.oecd.org/dataoecd/42/50/49049712.pdf> Della Croce, R., C. Kaminker and F. Stewart (2011). "The Role of Pension Funds in Financing Green Growth Initiatives", <http://www.oecd.org/dataoecd/17/30/49016671.pdf>

² Green growth can be seen as a way to pursue economic growth and development while preventing environmental degradation, biodiversity and unsustainable natural resource use. It aims at maximizing the chances of exploiting cleaner sources of energy, thereby leading to a more environmentally sustainable growth model. See OECD (2011), 'Towards Green Growth.'

³ B20 Task Force on Green Growth Recommendations to the G20 Los Cabos Summit (2012); Calculation based on World Economic Forum Analysis; HSBC, Sizing the climate economy, 2010; HSBC, A Climate for Recovery, 2009; BCG, The Global Infrastructure Challenge, 2010.

5. There is agreement at the international level on the need to increase financing for climate change mitigation and adaptation. Indeed, governments have already made international financing commitments, including the UNFCCC's commitment of USD 100 billion per annum by 2020. In addition, the 2010 Seoul G20 summit recognized the importance of green growth for building a sustainable economy and creating jobs. However, given strained public finances in many developed countries, financing options from governments are increasingly limited and further recourse to private capital will be required. In the 2011 Communiqué from the Cannes Summit, the G20 leaders recognised the role of public finance and public policy in supporting green infrastructure investments in developing countries, as well as the need to encourage the scaling up of private sector investments in the green space through market-based mechanisms.

6. Corporate lending by infrastructure developers, along with bank lending, has been the primary source of capital for green infrastructure to date. Indeed, the main exposure of pension funds to green infrastructure projects is via holdings of the equity and debt instruments of these companies (including listed utility companies). However, the scope for this source of funding to grow is dependent on the willingness of institutional investors to purchase such instruments, which depends in part on the state of the balance sheets of these corporations and their consequent credit rating.

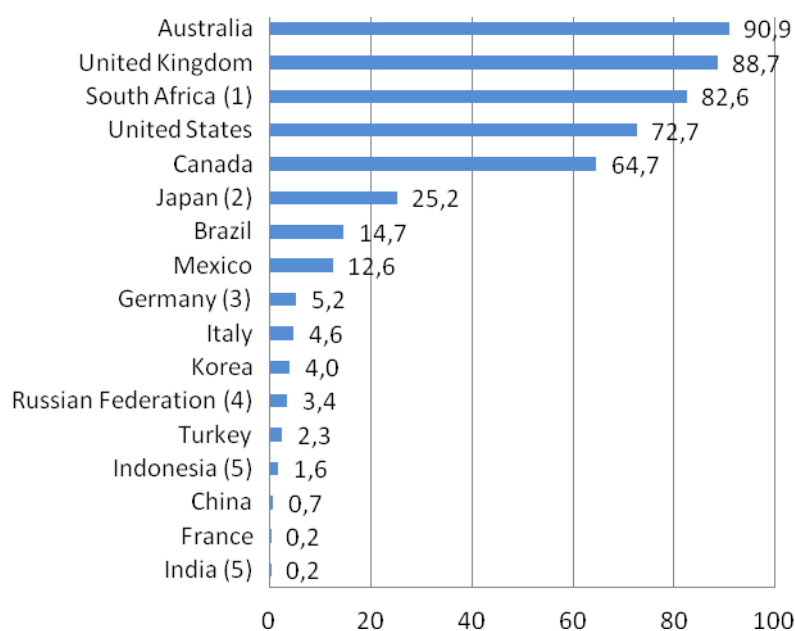
7. At the same time, it is becoming increasingly more difficult to obtain capital from the financial sector, in particular from the banking sector. The new Basel III banking regulations are expected to have a negative impact on project financing with long maturities, the type required to fund green infrastructure. In addition, the demise of monoline insurance companies⁴ has hampered the role of capital markets in financing infrastructure more broadly. On the plus side, multilateral development banks have increased their support to the infrastructure sector during the crisis, but they by themselves lack sufficient capacity to offer a solution to the 'infrastructure gap' more broadly or to provide all the funds required for green infrastructure investments in particular.

8. But pension funds, with their USD 28 trillion in assets⁵, have the potential to play an important role as a source of direct financing for green infrastructure projects.

⁴ Monolines are specialised insurance companies that provide guarantees and thereby credit enhancement to bond issuers.

⁵ This USD 28 trillion includes the USD 19 trillion of autonomous pension assets as well as other types of pension funds, such as pension insurance contracts.

**Figure 1: Importance of pension funds relative to the size of the economy in selected G20 countries, 2010
(Assets under Management % GDP)**



Source: OECD Global Pension Statistics⁶

9. In theory at least, this is a potentially ‘win win’ situation as, given the current low interest rate environment and weak economic growth prospects in many G20 countries, pension funds are increasingly looking for large scale, “real” asset classes which can deliver steady, preferably inflation-adjusted, income streams with a low correlation to the returns of other asset classes. Green infrastructure projects may provide pension funds with investments which combine these sought-after characteristics. They can normally offer stable and predictable cash flows (when backed by long-term contracts with investment grade counterparties), often with inflation protection (e.g. with indexed tariffs). These projects also have an estimated 25-year lifespan, meaning they fit well with the long-term nature of pension funds’ liabilities and can potentially deliver an ‘illiquidity premium’.

10. Yet, despite the potentially ‘win win’ situation, the OECD estimates that less than 1% of pension funds’ assets globally are *directly* allocated to infrastructure investment, let alone to ‘green’ projects.

11. Defining and measuring ‘green investing’ is no simple task.⁷ As noted, most pension fund exposure to infrastructure comes via investments in the corporate sector (via listed equity and market traded corporate bonds – as shown in Figure 2). Pension funds may be increasing their exposure to green infrastructure and other ‘green’ assets by adopting ‘socially responsible investing’ (SRI) or ‘environmental, social and governance’ (ESG) investment approaches. However, when ‘green investing’ is made in the

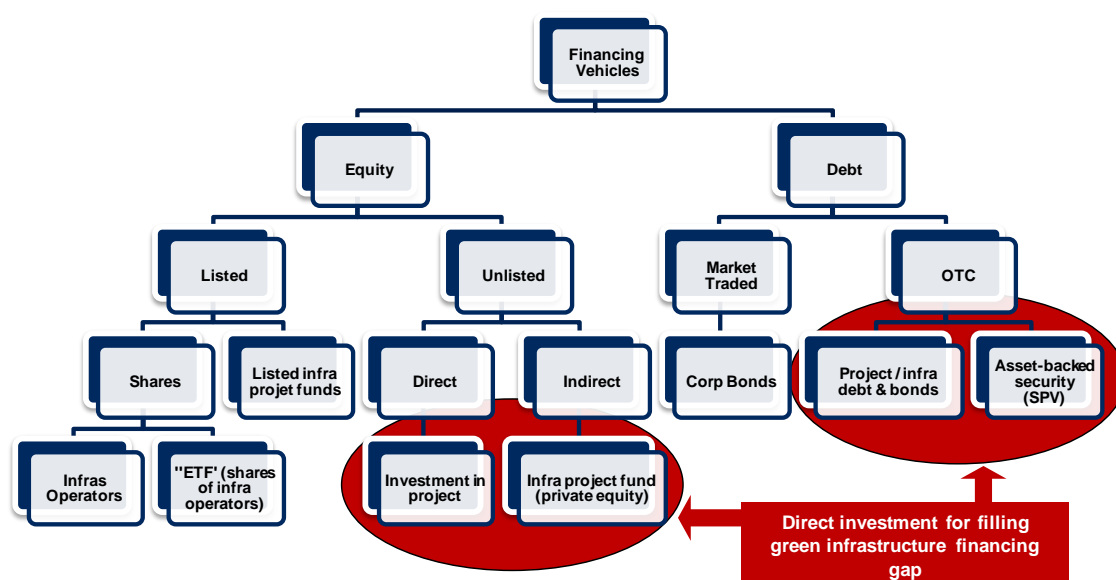
⁶ Notes: 1. Data include the Government Employees Pension fund as well as pension funds not regulated under the Pension Funds Act supervised by the Financial Services Board. 2. Source: Bank of Japan 3. OECD estimate German data includes only Pensionskassen and Pensionsfonds. 4. Source: Investfonds (<http://npf.investfonds.ru/indicators>) 5. OECD estimate

⁷ For an in-depth discussion of the topic see (OECD 2012 forthcoming) ‘*Defining and Measuring Institutional Green Investments: Institutional Investors’ Asset Allocations*’

name of SRI or ESG, it may not be directly linked to green investments, as these approaches tend to look at all assets in terms of their environmental impact on a *relative* basis, without necessarily targeting particular green assets in absolute terms.

12. The key to identifying how much finance from institutional investors is really reaching green infrastructure is by tracking the capital that institutional investors can provide via *direct* investment in these projects. These investments are typically made through financing vehicles such as green bonds or private equity-style investments (see sections highlighted in red in Figure 2). Yet, beyond the largest pension funds, asset allocation to the types of direct investment that can provide needed financing for green infrastructure projects remains very limited.

Figure 2: Main Financing Vehicles for Infrastructure Investment



Source: OECD analysis

13. That said, pension funds have begun to show increased interest in green infrastructure investment, most notably since the financial crisis.⁸ In particular, pension funds are starting to be attracted to climate change-related financial products (such as green bonds) that help finance projects with a positive environmental impact and remain appealing from a financial return perspective. Moreover, pension funds and other institutional investors have formed groups to raise awareness of the issue.⁹

14. A recent OECD survey on infrastructure investment, asked pension funds about their involvement in green projects.¹⁰ Although ‘green’ investment is not specifically addressed in the investment policies of the pension funds surveyed, nor is a target allocation specified, some of the world’s major pension funds have invested in green infrastructure, such as renewable energy projects. An example

⁸ See OECD(2011), ‘*Pension Funds Investment in Infrastructure: A Survey*’.

⁹ Including IIGCC in Europe, INCR in USA, IGCC in Australia and New Zealand, and AIGCC in Asia.

¹⁰ OECD Largest Pension Funds Survey 2011, based on 27 pension funds representing USD1.6 trillion of assets under management. (See OECD 2012 forthcoming – *Largest Pension Funds Survey 2011*).

is ATP in Denmark which has set up its own clean energy fund and is inviting other pension funds to participate. Others (such as PPGM in the Netherlands) are investing in clean tech funds run by third parties and a few, like PensionDanmark, are investing directly in the equity or debt of renewable energy projects.

15. Likewise, countries with developing pension systems (such as India, Indonesia, Kenya, Nigeria and South Africa) are also looking for ways for their local pension funds to invest in infrastructure and green investments (see example of GEPF in South Africa in Box 1).¹¹

Box 1. Government Employees Pension Fund South Africa: Approach to Infrastructure

The Government Employees Pension Fund (GEPF) is Africa's largest pension fund, with over USD 138 billion in assets under management (AUM). The GEPF is also the single largest investor in the Johannesburg Stock Exchange (JSE)-listed companies.

The GEPF has recently launched its Developmental Investment Policy (DI Policy) which outlines the GEPF's approach to developmental infrastructure investments through the Isibaya fund managed by the Public Investment Corporation. The GEPF has, in its strategic asset allocation, set aside 5 percent of the Fund's portfolio for investing in developmental projects – mostly infrastructure projects in South Africa, to be achieved over time. This allocation for both social and economic infrastructure falls under the unlisted alternative assets allocation/developmental investments allocation, which currently equates to approximately 5% of the total AUM. At 31 December 2010, the GEPF had invested USD 421 million in infrastructure, representing 0.3 percent of total GEPF assets. Direct investments through unlisted equity represented 0.05% of total assets (USD 74 million), loans 0.04% (USD 60 million) and investment through fund of funds was 0.2% (USD 287 million)

Isibaya Fund: The Isibaya Fund provides finance for projects capable of generating good financial returns, while supporting positive economic, social and environmental outcomes for South Africa over the long term. The focus on developmental investments demonstrates the GEPF's commitment to its obligations as a signatory to the PRI, which ultimately benefits South Africa. During 2010/11, the Isibaya Fund accelerated investments in developmental projects in four areas:

- Economic infrastructure, including projects in energy, telecommunications, logistics, commuter transport and water infrastructure;
- Social infrastructure, including projects in education, affordable housing and healthcare;
- Economic growth and transformation, investments in sectors that foster growth, job creation and broad based black economic empowerment, particularly in priority sectors identified by government's Industrial Policy Action Plan, including agriculture, agro-processing, alternative energy and environmental projects;
- Environmental sustainability, with a focus on renewable energy generation and clean technology, as well as firms, funds and projects active in the environmental goods and services sector.

In each area, the Isibaya Fund will maintain a balance between social impact and financial returns. The GEPF has developed an ESG framework to measure the impact of Isibaya's unlisted investments on issues such as job creation, job retention, poverty alleviation, black economic empowerment and regional upliftment.

Pan-African Infrastructure Development Fund: The PAIDF seeks to play a critical role in helping African economies meet the capital requirements in financing infrastructure investments to enable the continent to achieve sustainable growth. The fund's sector targets are energy, telecommunication, transport and water (such as Aldwych Holdings Ltd., an Africa-focused independent power producer with investments in Kenya, South Africa, Zambia and Senegal, and Community Investment Ventures Holdings, a sub-Saharan inter-terrestrial broadband telecommunications investor). Source GEPF and Annual Report 2011

¹¹ For further details see (OECD 2012, forthcoming) 'Infrastructure Investment in New Markets: Challenges and Opportunities for Pension Funds'

II. Barriers to Green Investing

16. Given the potential and growing appetite from pension funds for green investments, it is reasonable to ask what barriers are preventing the scaling up of these investments to the size needed to meet increasing financing needs.

17. It appears that one of the biggest barriers to pension funds moving into green investments is the broad absence of policies to address market failures¹², which in turn causes the mispricing of green investments in relation to more polluting or resource-intensive alternatives. This problem is compounded by a lack of clarity and consistency in government commitments to environmental policies over time. Aside from the pool of socially responsible investment assets, the broader universe of pension funds will not invest in projects or assets just because they are green. These investments must deliver risk-adjusted returns that are commercially competitive with existing investments that are more pollution and resource-intensive. Part of the challenge is that investors in infrastructure are working across fragile and fragmented environmental policy frameworks.

18. Pension funds will not be encouraged to move into sector investments without consistency in the policy backdrop as the long time frames required for infrastructure project development make businesses and investors particularly vulnerable to regulatory changes. This calls for a consistent, long-term policy commitment to support green growth initiatives that pension funds and other institutional investors can finance.

19. But even if governments were to improve the coherence stability and ambition of their environmental policies, they cannot assume that capital will flow in the quantities needed and in the timeframe required. There are aspects of the investment environment that also need to be improved if green infrastructure is going to be an attractive proposition for some of the large pools of capital managed by pension funds.

1. Problems with Infrastructure Investments

20. Pension funds' investments that provide direct financing for green projects can basically be seen as a sub-section of infrastructure investment. Therefore, the reason why pension funds have only limited allocations to the infrastructure space in general first needs to be considered. Through its '*Institutional Investors and Long-term Investment*' project,¹³ the OECD has been undertaking work to identify and understand the barriers to these investments. Some of the key issues outlined in Table 1 are discussed below.

¹² See OECD, World Bank and UN (2012, forthcoming), "*Incorporating Green Growth and Sustainable Development Policies into the Structural Reform Agenda*" A draft report to the G20 by the OECD, the World Bank and the United Nations; and Corfee-Morlot, Marchal et al. 2012 (forthcoming) '*Towards a Green Investment Policy Framework: the Case of Low-Carbon, Climate-Resilient Infrastructure*', OECD Green Growth Working Paper.

¹³ For project details see www.oecd.org/finance/ti

Table 1. Selected Barriers to Pension Funds' Allocation to Infrastructure

Problems with Government Support for Infrastructure Projects	<ul style="list-style-type: none"> • Lack of political commitment over the long term • Lack of infrastructure project pipeline • Fragmentation of the market among different levels of government • Regulatory instability • High bidding costs
Lack of Investor Capability	<ul style="list-style-type: none"> • Lack of expertise in the infrastructure sector • Problem of scale of pension funds • Regulatory barriers • Short-termism of investors
Problems with Investment Conditions	<ul style="list-style-type: none"> • Negative perception of the value of infrastructure investments • Lack of transparency in the infrastructure sector • Mis-alignment of interests between infrastructure funds and pension funds • Shortage of data on infrastructure projects

Source: Adapted from (OECD, 2011) Largest Pension Funds Survey 2011

Lack of Infrastructure Roadmap

21. One issue is that investors perceive a lack of suitable infrastructure investment opportunities. Pension funds need a clearer understanding of a government's infrastructure plans beyond the political cycle. A long-term plan for infrastructure (over 10-20 years) that sets out firm government commitments in the sector is essential to provide greater transparency and increased certainty for the private sector. If political support is undefined and procurement policy lacks clarity then investors will not establish a presence in the market. The experience of countries such as Australia and Canada has shown how national infrastructure plans are an important signal to investors – including pension funds – of political commitments to infrastructure over the long term. Coordination between different levels of government is also key, as is regional cooperation.¹⁴ Governments can also create an on-going supply of investment opportunities through well-structured public-private partnerships (PPPs) and the opportunity exists to adapt PPP to include performance specifications for green infrastructure.¹⁵

Lack of Investor Capability

22. In addition, there is a lack of investor capability. Infrastructure investing is different from other asset classes as the nature and risks of these investments, such as high up-front costs and the scale of the projects, require dedicated resources to understand – resources that many smaller pension funds lack and which take years to build up (as has been the case at the Canadian public pension funds, for example, which are some of the most experienced infrastructure investors in the world).

23. An additional issue for pension funds is the lack of objective, high-quality data on infrastructure investments. This makes it difficult to assess the risks of these investments and to understand correlations

¹⁴ See Corfee-Morlot et al. 2012, op. cit.

¹⁵ See Kennedy et al. 2012, 'Mobilising Private Investment in Green Infrastructure', OECD Green Growth Working Paper, forthcoming.

with the investment returns of other assets. Without such information, pension funds are reluctant to make such allocations.

24. A related issue is that, whilst some countries collect data which matches the needs of the relevant authorities, there is no international, official, accurate data on the asset allocation of pension funds in alternative asset classes, which include, inter alia, hedge funds, private equity, real estate, infrastructure, and commodities. Infrastructure investing also typically involves the use of alternative investment products. Definitions of alternative assets which ensure that the data collected and reported is comparable across pension funds is required in order to monitor the flows into different types of alternative assets and their respective cost and performance – which is vital not only for investors but also for regulators and other policymakers in order to help them better understand the exposure of pension funds in different countries and produce appropriate regulation. The OECD has begun to collect such data and to make such comparisons (see Table 2).

Table 2: Large Pension Funds Infrastructure Investments

Name of the fund	Country	Tot Assets USD million	Infrastructure Investment % of total assets			
			Unlisted Equity	Listed Equity	Fixed Income	Total
ABP	Netherlands	312,257	0.3	n.a.	n.a.	0.3
GEPF	South Africa	138,572	0.1	n.a.	0.2	0.3
CPPIB	Canada	136,039	6.0	0.8	na	6.8
PFZW	Netherlands	131,780	2.0	0.0	0.0	2.0
OTPP	Canada	101,655	7.0	0.7	1.6	9.3
Previ	Brasil	88,847	0.0	13.5	n.a.	13.5
Future Fund	Australia	65,824	4.1	na	na	4.1
OMERS	Canada	52,385	15.5	0.0	0.0	15.5
PMT	Netherlands	49,426	0.6	n.a.	0.0	0.6
Pension Reserve Fund	France	49,033	0.0	na	na	0.0
USS	UK	48,889	2.9	n.a.	n.a.	2.9
PFA	Denmark	45,962	0.7	n.a.	0.0	0.7
AFP Provida Chile	Chile	40,474	0.0	0.2	1.4	1.5
AustralianSuper	Australia	33,800	11.5	0.2	0.1	11.8
AP-3	Sweden	30,661	0.5	na	na	0.5
AP-4	Sweden	29,560	0.0	9.0	na	9.0
UniSuper	Australia	25,676	4.4	n.a.	0.0	4.4
Afore Bancomer Mexico	Mexico	16,430	0.0	2.1	0.5	2.6
Sunsuper	Australia	15,782	4.3	n.a.	0.2	4.5
Superannuation Fund	New Zealand	11,162	3.3	6.6	na	9.9
AFP Horizonte-Col	Colombia	7,930	1.7	7.5	2.4	11.5
COMETA	Italy	7,484	0.0	2.2	1.5	3.7
Fonditel	Spain	7,328	0.0	n.a.	n.a.	0.0
AFP Horizonte-Perú	Perú	7,162	0.3	3.0	7.4	10.7
CAJA MADRID	Spain	5,400	0.0	0.7	0.2	0.9
Fonchim	Italy	3,915	0.0	n.a.	n.a.	0.0
Banco BPI	Portugal	3,114	0.0	10.2	10.6	20.0
Endesa	Spain	2,082	0.0	8.7	4.7	13.4
Total		1,468,630				

Source: (OECD 2011) Largest Pension Funds Survey 2011

25. The long-term nature of infrastructure investments may also run up against short-term incentives driving pension funds. Though theoretically long-term investors, they often face short-term performance pressures which may be preventing them from investing in long-term assets such as infrastructure.¹⁶

Regulatory Barriers

26. Finally, in addition to knowledge and information barriers to infrastructure investing, there may be regulatory barriers in some countries preventing pension funds from investing in such assets. Though investment restrictions are important to protect pension fund members, there may be unintended consequences preventing investment in infrastructure through bans on unlisted or direct investments (for example carbon is sometimes viewed as a commodity which is subject to investment restrictions in some

¹⁶ For further details see Della Croce, R., Stewart, F., Yermo, Y. (2011)

countries). The OECD generally supports the use of the ‘prudent person rule’ for pension fund investing.¹⁷ The OECD does not recommend the use of ‘investment floors’ which require pension funds to invest in a particular asset class, and therefore would not support measures compelling pension funds to invest a certain percentage of their assets in infrastructure or green projects.

Table 3: Quantitative Limits on Pension Fund Alternative Investments in Selected Countries (at 2011)

	Total	Hedge Funds	Private Equity	Infrastructure	Real Estate	Currency	Commodities	Structured Products	Others
Australia	No limits ¹								
Belgium	No limits								
Canada					25%				
Chile ²									
Colombia			40%						
Costa Rica			10%					5%	
Czech Republic ³		5%	5%	5%		5%	5%	70%	70%
Germany Pensionskassen		5%	15%		25% REITS	30%	5%		
Hong Kong						30% ⁴			10% REITS
Israel	No limits								
Mexico			15%	15%				10%	
Netherlands	No limits								
Norway	7%								
Poland		10%	10%	10%	10%	10%	10%	10%	10%
Portugal	10%								
Romania ⁵			2%				3%		
Slovak Republic (voluntary funds)					30%				
South Africa ⁶		10%	10%		25%				
Swaziland	15%				25%		10%	Look through principle applies	
Switzerland	15%					30%		10%	
Turkey	No limits								15% warrant 20% venture capital
UK	No limits								

Source: (IOPS 2011 Working Paper No. 13)¹⁸

¹⁷ See ‘OECD Guidelines on Pension Fund Asset Management’ <http://www.oecd.org/dataoecd/59/53/36316399.pdf>

¹⁸(IOPS 2011) ‘Pension Fund Use of Alternative Investments and Derivatives: Regulation, Industry Practice and Implementation Issues’, IOPS Working Paper No. 13 <http://www.iopsweb.org/dataoecd/47/22/48773865.pdf>

27. In addition, international accounting and funding rules may also be inadvertently discouraging pension funds from investing in longer-term, illiquid or riskier assets such as infrastructure projects. Recent developments in accounting rules, in particular the introduction of fair value or market-based principles, have brought greater transparency and consistency to financial statements. However, the move towards fair value has also brought a greater focus on short-term market fluctuations, and some would argue that this has been to the detriment of the long-term investment horizon. For example, it has been suggested that the way in which asset and liability valuations can be smoothed in some countries enables pension funds to hold a far larger proportion of their assets in illiquid investments such as property, private equity and infrastructure than funds in other countries.

28. Fair valuation is also at the heart of risk-based funding and solvency regulations as applied in certain countries to pension funds and as envisaged in the Solvency II framework for European insurers.¹⁹ The impact of solvency rules depends on how pension funds gain exposure to infrastructure projects - and the OECD has examined the mechanism used by pension funds in different countries. Given pension funds may invest via equity structures rather than debt, and via unlisted, private equity type instrument, concern has been expressed on the impact of risk-based solvency rules on further allocation by pension funds to infrastructure assets due to the higher solvency charges that the type of financing vehicles used by pension funds often entail.

29. There is some anecdotal evidence suggesting that such capital requirements have discouraged some investors from investing in infrastructure projects via equity assets.²⁰ However, it is interesting to note that in countries where similar risk-based solvency regulation has been introduced (such as in Denmark and the Netherlands), its impact on institutional investors' asset allocation is inconclusive.²¹ Where pension funds see sufficient, steady, diversified risk-adjusted returns from green infrastructure projects they will still invest. However, the accounting and solvency rules are sometimes perceived as discouraging pension funds from acting in their long-term capacity. Further analysis into the potential impacts of such rules on investment in infrastructure in general and green projects in particular is required – as is being undertaken by the OECD.

Notes 1. No limits (in all countries) - does not refer to single investment limits 2. The general limit ranging between 10 to 20% of AUM depending on the type of pension fund applies for all restricted investments that include investment vehicles with alternatives as underlying assets. 3. Structured Products and Others limit if listed in OECD, 5% if not. 4. Minimum exposure to Hong Kong dollar investments 5. Limits apply to mandatory pension funds, whereas a limit of 5% is fixed for voluntary pension funds investing in private equity and commodities. Commodities limit is overall with a sub-limit of 10% for gold and 5% for other commodities. 6. South Africa Real estate limit is overall with additional limits depending on the issuer.

¹⁹The proposed Solvency II regulation would likely require a stress test (i.e. assessing whether funding levels can still be achieved even after declines in assets) of 49% for infrastructure equity and private equity (compared to a capital charge of 39% for listed equity) and 25% for real estate and infrastructure debt. Additional capital buffers would have to be held for these assets to ensure funding levels would be met in these conditions – vs. a 0% capital charge for European government bonds, whatever their credit rating. See (OECD 2012 forthcoming – *The Effect of Solvency Regulations and Accounting Standards on Long-term Investing*).

²⁰ For example, Storebrand and Vital, two of Norway's largest insurance companies have invested in long-term bonds issued by Gassled, a joint venture between oil and gas companies that transports gas from the North Sea to continental Europe and the United Kingdom. The insurers have shelved plans to invest in the equity part of the joint venture because of the perceived high capital charge. See 'Solvency II hampers attractive infrastructure investments', NRPN Nordic Region Pensions and Investment News Oct/ Nov 2011

²¹ For details see (OECD 2012b – forthcoming, *The Effect of Solvency Regulations and Accounting Standards on Long-term Investing*).

30. The unintended consequences of ownership regulation also need to be considered. For example, ‘unbundling’ policies²² preventing ownership of both energy production and distribution companies could require pension funds to divest some of their holdings.

2. *Problems with Financing Vehicles*

Lack of Collective Investment Vehicles at Scale

31. As discussed, only the largest pension funds have the capacity to invest directly in infrastructure projects. Smaller pension funds in particular require pooled investment vehicles. Collective investment vehicles have been available, such as infrastructure funds, but problems with high fees and extensive leverage mean that these have become less popular since the financial crisis. Interesting vehicles to assist pension funds to invest in the infrastructure sector have been developed in some Latin American countries (such as Chile via infrastructure bonds with insurance guarantees, in Mexico via structured products, in Peru via a collective trust structure and in Brazil via a joint-owned infrastructure company - see Box 2).

Box 2. Latin American Pension Fund Investment in Infrastructure²³

Chile: Two types of infrastructure bond issuance contracts have been developed: **Pre-operative bonds** which are issued once construction of the public work has begun and before it is finished. These bonds have been irrevocable and unconditionally guaranteed by international insurance companies, which guarantee full payment of the principal and interests outlined in the insurance contract; **Operative bonds** which are issued during public work’s operational stage. These are pure revenue bonds, as the debt is issued to fund a finished projects and the debt repayment is exclusively backed by the project’s future revenues. Investment has mostly been in the transport sector (predominantly roads), with some projects in the energy sector (including hydro power).

Mexico: Since 2008, pension funds have been able to invest up to 15% of their assets (for the highest risk fund options) in structured securities known as “CKDs” (*Certificados de Capital de Desarrollo*) and another 15% in Real Estate Investment Trusts (known as “FIBRAS”). The income depends on the performance of the underlying project. These securities are quoted on listed exchanges. The FIBRAS are securities issued by trusts dedicated to investments in real estate and infrastructure. The structure is consequently an investment vehicle which due to its design allows pension funds to participate in infrastructure projects from their initial stage, offering in principle greater clarity on possible cash flows given the principal is protected by a debt instrument. Pension funds’ participation in the Holders Assembly of the trust under which the instrument is structured strengthens the protection of their rights as investors, improving their ability to supervise the investment of assets and to evaluate the performance of, and indeed to replace if necessary the project manager. Investment has predominantly been in roads and housing.

Peru: In 2009, the Pension Fund Association created an Infrastructure Investment Trust with contributions from the four pension fund administrators (PFA) operating in the pension system. The fund invests only in infrastructure project debt (CRPAOs) which are held to maturity, so far in two water projects. The fund is managed by a company authorized by the supervisory authority, with representatives of the 4 PFAs sitting on the investment committee of the fund – so that they have control over the investment process, the selection of the most adequate projects and the designation of shared sums as well as monitoring and supervisory tasks. The trust structure is believed to overcome some of the difficulties pension funds encounter in making infrastructure projects (including delays and problems relating to concession contracts; lack of external financial advice; better information flow between pension funds and investment agencies; lack of structured instruments adequately sharing risk). This cooperative structure between funds is also important due to the competitive nature of the pension system in Peru, where members can switch pension provider, the performance of the funds is usually compared on a short-term basis, and significant relative underperformance has to be made up by the provider.

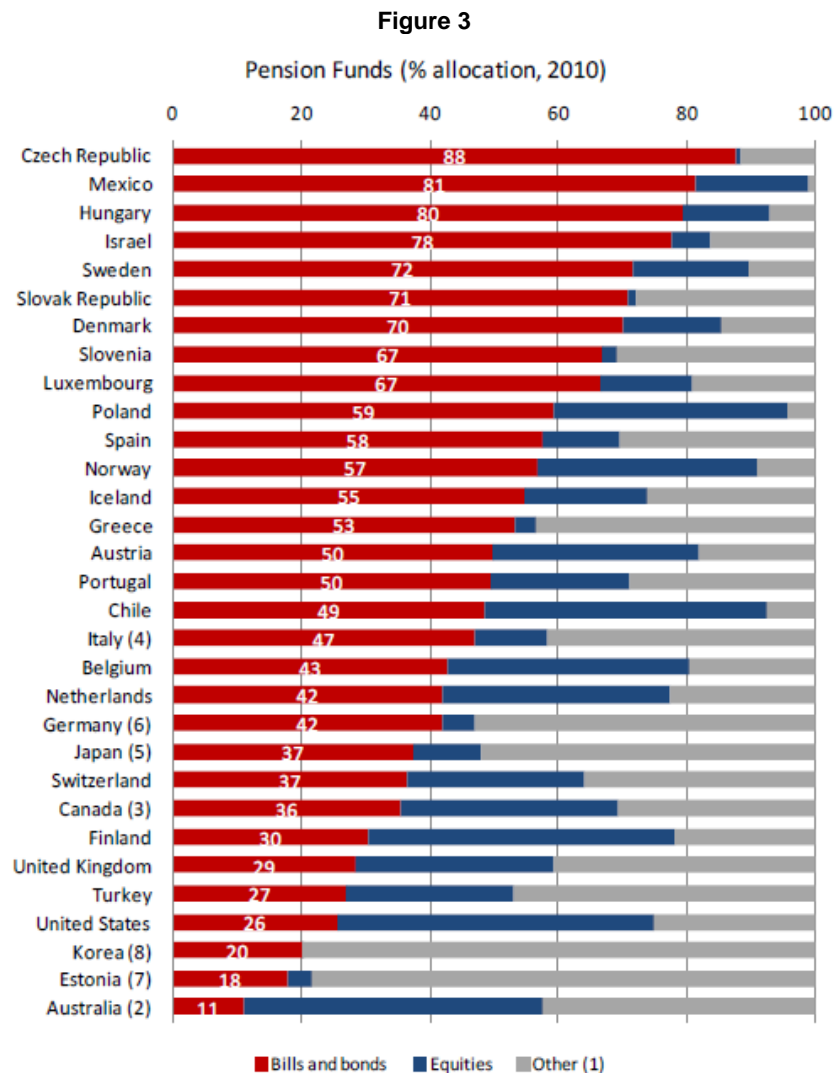
Brazil: Most infrastructure investment is channeled through private equity investment funds (*fundos de investimento em participações* – FIPs), through investments conducted by subsidiary companies (*empresas participadas*) or through

²² Contained in Chapters IV and V of Directive 2009/72/EC on electricity, Chapters III and IV of Directive 2009/73/EC on gas and Article 3 of Regulation 714 of 2009 on electricity (“Third Energy Package”).

²³ See (OECD 2012 forthcoming – ‘*Pension Fund Investment in Emerging Market Infrastructure*’) and (BBVA, 2011) ‘*A Balance and Projections of the Experience in Infrastructure of Pension Funds in Latin America*’.

shares, such as the investment of Invepar, an infrastructure company owned and controlled by the three largest pension funds in the country, PREVI, Petros and FUNCEF. Brazilian pension funds invest around in unlisted infrastructure through FIP's and subsidiaries.

32. There is also a lack of debt instruments such as bonds for institutional investors to access infrastructure projects. This is notable since bonds remain the dominant asset class on average in portfolio allocations of pension funds (50%) across OECD countries (see figure 3).



Source: OECD²⁴

²⁴ Notes: 1. 'Other' category includes cash and deposits, loans, land and buildings, unallocated insurance 2. Source Australian Bureau of Statistics. The high value for the other category is mainly driven by net equity 3. The high value for the other category is mainly driven by other mutual funds (16% of total investment) 4. The high value of the other category is mainly driven by unallocated insurance contracts (22% of total investment) 5. Source Bank of Japan. The high value of the other category is mainly driven by payable and receivable accounts (24% of total investment). 6. Data applies to pensionskassen and pensionsfonds only. The high value of other category is mainly driven by loans (29% of total investment) and other mutual funds (17% of total investment). 7. The high value for the other category is mainly driven by private

33. This is particularly a problem when it comes to green infrastructure. The OECD estimates the issuance of green bonds to be around USD 16 billion – a mere drop in the ocean, given the scale of the USD 95 trillion global bond markets in 2010.²⁵ Such green bonds have been issued by the World Bank and its regional peers, which use the AAA rating of these institutions to raise capital specifically for climate change and green growth related projects. There is, however, room for expansion in the government and asset-backed markets, and the ‘covered bond’ market also has potential.²⁶

34. An additional hinderance is that the size of individual issuance remains small (i.e. below USD 500 million). Barclays (2011)²⁷ points out that the absence of secondary markets for green project finance debt (allowing assets to be traded and resold) has restricted capital provision from private investors and institutions. For example, asset backed securities or bonds, which allow investors to access secondary markets, make up less than 3% of green asset financing.²⁸

35. Government policies in this area will therefore need to address market barriers in private capital markets (see below). Governments and International Finance Institutions can work to improve deal flow, ensuring that adequate, investment-grade deals at sufficient scale come to market (for example with public sector finance investing alongside private sector and institutional investors or taking subordinated equity positions in funds).

Lack of Instruments with Suitable Risk-Return Profile

36. To attract institutional investments into green infrastructure projects, the projects have to be structured as attractive investment opportunities for investors, providing risk return profiles that match their expectations (which, as mentioned previously, is for steady income flows) and liability structures. Despite some growth, an OECD study²⁹ concludes that the market for green investments remains small and illiquid. The OECD notes a common mismatch between the long-term, relatively low risk needs of institutional investors and the financing vehicles that are available to them.

37. Many of the factors that weigh against institutional investors taking more interest in green infrastructure can be broadly described as different species of risk.³⁰ As explained, most pension funds are looking to make green investments via well known debt instruments, such as bonds. Most require that these bonds carry at least investment grade ratings. Institutional investors such as pension funds have historically relied on agencies’ ratings to give them guidance and comfort especially in new, fast-moving

investment funds (65% of total investment). 8. The high value for the other category is mainly driven by unallocated insurance contracts (20% of total investment).

²⁵ See Della Croce, R., Kaminker, C., Stewart, F. (OECD 2011)

²⁶ An asset-backed security is a [security](#) whose value and income payments are derived from and collateralized (or "backed") by a specified pool of underlying [assets](#). The pool of assets is typically a group of small and illiquid assets that are unable to be sold individually. Pooling the assets into financial instruments allows them to be sold to general investors, a process called [securitization](#), and allows the risk of investing in the underlying assets to be diversified because each security will represent a fraction of the total value of the diverse pool of underlying assets. Covered bonds are bonds issued by corporations which in addition to having the usual, general corporate backing, are also backed by specific assets.

²⁷ Barclays and Accenture (2011), *Carbon Capital: Financing the Low Carbon Economy*, Barclays PLC, London.

²⁸ (EU 25) only between 2004 and 2009, Source: Barclays and Accenture (2011) based on B

²⁹ Della Croce et al (OECD 2011).

³⁰ For a comprehensive risk mapping report see Standard & Poor’s and Parhelion Underwriting Ltd. who identify the barriers that prevent investment by institutional investors, and categorize perceived risks http://www.parhelion.co.uk/pdf/Parhelion_Climate_Financing_Risk_Mapping_Report_2010.pdf

areas. However, risks specific to green infrastructure projects make this vital investment grade rating difficult to secure. Ratings agencies are (naturally) conservative, particularly when trying to assess very long-term projects or contracts, and especially if there is a limited long-term performance history on which to draw.

38. Although green infrastructure tends towards becoming less and less policy dependent as the costs continue to decrease and technologies therefore become commercially viable without support, green investments are often still riskier than established carbon intensive technologies. *Technology risk* – i.e. the risk that the system being installed will not work as specified - is one of the main barriers for large pension funds to finance green infrastructure. In many cases there is little data about the long-term performance of green projects; they are often not large in scale; their value is uncertain and therefore perceived to be risky. The result is a requirement for much higher returns and financing costs compared with, say, a conventional energy plant. This is particularly a problem for technologies (such as wave power) at the pre-commercialisation phase. Existing infrastructure facilities can be swiftly superseded both financially and technologically through innovation.

39. While the least mature technologies may require public support for research, development and demonstration, technologies that are technically proven, but still more expensive than existing alternatives, may require support to lower capital costs. Many countries have opted to provide tax and other financial incentives to directly lower capital costs of green infrastructure investment options.³¹

40. Other risks specific to green infrastructure, particularly clean energy projects, include *buyer risk* – i.e. the risk that there will not be a buyer for the electricity. This is a major barrier to green infrastructure investing as it creates a lack of certainty. Currency and political risks may also be involved.

41. Linked to this, and of particular concern for some types of green infrastructure, is *volumetric risk*. Often the risk from onshore wind and solar plants comes after the project is operational and is tied to production volatility. Compared to a conventional power plant, where the production is typically of a known quantity, the variables for green infrastructure projects and the lack of historical data on them can make it difficult to assess production output.³²

42. Governments and/or multinational agencies can use so-called “public financing mechanisms” to provide cover for risks which are new to investors or cannot be covered in existing markets. These include devices such as loan guarantees and insurance options, which improve deal flow and ensure that adequate, investment-grade deals at scale come to the market for as potential investments for institutional investors. For example, some form of public / private partnership will be needed to mitigate regulatory risk.³³ Addressing market barriers in private capital markets by shaping transitional financial instruments enables investors to deploy their capital where commercial (or near-commercial) opportunities exist. One example of the use of such leveraging mechanisms is the Project Bond Initiative launched by the European Union.³⁴ Such mitigation will be essential to encourage investment in green infrastructure projects in developing

³¹ Recent OECD analysis examines this cluster of policies aiming to reduce the capital cost of investment in physical infrastructure – see Kalamova, M., Kaminker, C., and Johnstone, N., (2011), ‘*Sources of Finance, Investment Policies and Plant Entry in the Renewable Energy Sector*’.

³² Firelake Capital (2012), ‘*Financing Low-Carbon Energy Infrastructure: Scaling Capital and Mitigating Risk for Renewable Energy Deployment*’.

³³ See Parhelion (2012), ‘*The Role of Insurance in Climate Policy*’.

³⁴ The principal idea behind the Europe 2020 Project Bond Initiative is to provide EU support to companies issuing bonds to finance large-scale infrastructure projects, mainly in the transport, energy and telecommunication sectors.

countries, where additional country and currency risks may need to be covered. Understanding the effects of such mechanisms and how to make the best use of public funds to leverage private sector investment into green projects deserves further analysis.

43. In addition to governments and other international organizations providing such risk mitigation and credit enhancement tools, it will be necessary to revive this role for the insurance industry (in particular the monoline insurers) and for other financial sector players. Direct corporate funding is another relatively untapped market that could grow in future (for example, DONG Energy took responsibility for the construction risk of an offshore wind farm in which Danish and Dutch pension funds then invested).

44. In addition to these risk mitigation efforts, some sort of standard mechanisms to ‘approve’ green projects (such as green bonds or green funds) may help to ensure that funds are used for green investments (and that there is a common understanding of green) and that insurance and guarantees can be reliably offered. International harmonisation, performance measurement and rating approaches for green investments could help to deliver transparency for investors and market liquidity alongside of environmentally sound outcomes.³⁵

III. Selected Policy Conclusions

45. Given the need and potential for, but also the barriers to, pension funds investing in green infrastructure projects, what can the G20 governments do to encourage this goal? There is obviously potential but several barriers still exist to sound investment by pension funds in green infrastructure and initiatives.

46. The following provides some directions that the G20 and other policymakers may wish to consider when addressing the financing of green initiatives.

1. *The promotion of international infrastructure data collection:* governments could, where appropriate and needed, strengthen formal requirements to provide information on investments by pension funds in infrastructure and green projects, following internationally agreed definitions. This would allow for future monitoring on an international basis. This is necessary for pension funds themselves to have the necessary data to analyse the performance of these investments and the confidence to then make allocations. It is also necessary for policy makers to be able to understand and monitor such allocations in order to be able to make appropriate policy responses.
2. *The provision of a national infrastructure road map:* this is essential to give investors confidence in governments’ commitments to the sector and to show them that a pipeline of investable projects will be forthcoming. This will reassure investors that it is worth building up their investment capability.
3. *The development of appropriate financing vehicles:* governments can issue or support instruments with appropriate risk-return profiles (such as green infrastructure bonds), and can provide risk mitigation and credit enhancement tools, whilst further analysis of the most efficient ways to use public funds to leverage private sector finance should be encouraged. This will allow a liquid, investable market in green infrastructure investments to develop.
4. *The investigation of regulatory barriers:* governments may encourage further investigation to ascertain whether regulatory and other instruments (such as some accounting and solvency

³⁵ (OECD 2012 forthcoming) ‘*Defining and Measuring Institutional Green Investments: Institutional Investors’ Asset Allocations*’

rules) are unintentionally and unnecessarily preventing pension fund investment in infrastructure and green projects. Though regulation is important for protecting pension fund members, unintended consequences preventing such long-term investments may need to be addressed.

5. *The fostering of collaborative mechanisms between investors:* governments can facilitate the establishment of joint ventures between public and private pension funds to pool their resources and facilitate investments in infrastructure and green projects. This will allow for capacity sharing and provide the scale necessary for smaller funds to participate in these projects.
6. *The promotion of public-private dialogue on green investments:* governments may create or support existing platforms for dialogue between pension funds, the financial industry and the public sector to understand the barriers to pension funds and other institutional investors allocating to green projects and to better understand their needs. Pension funds require support and encouragement to invest in new asset areas. Learning from leading investors and the experience of peers could assist in building their confidence.
7. *The provision of consistent environmental policies and support:* without such consistency, green infrastructure may not be able to provide the risk-return profile investors require and they will not have the confidence to invest in these long-term assets for which regulatory stability is key.
8. *The development of evidence-based international approaches:* The OECD³⁶, together with the IOPS³⁷ and other relevant international bodies, could be asked to develop further data collection and evidence based analysis to identify effective approaches to promote pension funds and institutional investors financing of green initiatives, as well as long-term investment more generally, and to assess their implementation.

³⁶ The OECD has already accumulated expertise through its project on long term investment which includes the specific issues covered by this paper.

³⁷ International Organisation of Pension Supervisors – www.iopsweb.org