Washington DC, 21st March 2013

Meeting the Infrastructure Challenge:
The Case for a New Development Bank

Prepared for the G-24 Technical Group Meeting

Amar Bhattacharya & Mattia Romani

Agenda

- **Infrastructure needs assessment**
- Global development financing architecture
- Potential role for a New Development Bank

Many emerging markets and all low-income countries require a major step increase in infrastructure investment

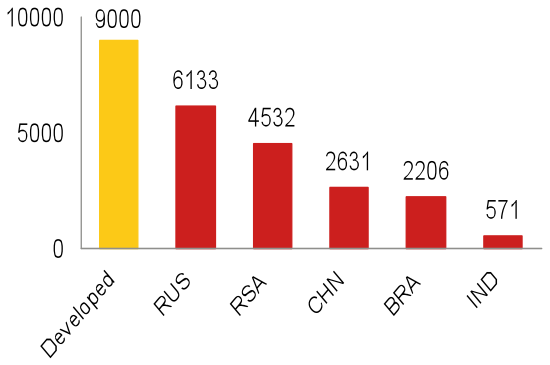
Driver	Description
Growth	• Emerging and developing countries (EMDCs) have **high growth potential** (~5-7% in non-OECD compared to 2% in OECD between 2010 and 2030) • Even adjusting for higher productivity, this period of rapid growth will have **strong capital intensity**, and hence infrastructure needs • Evidence shows that **lack of infrastructure** can be a significant constraint to economic growth
Structural change	• An increasing percentage of growth in EMDCs is coming from **industry and services, requiring substantial new infrastructure** • With 2 billion people moving to urban centres in the coming three decades, there is a rapidly **growing need to expand and upgrade urban infrastructure**
Inclusion	• Infrastructure investment required to meet crucial **development, inclusion and environmental** goals • Existing deficits are large: 1.4 billion have no access to electricity, 0.9 billion have no access to safe drinking water and 2.6 billion no access to basic sanitation
Sustainability and resilience	• Ensuring the environmental sustainability and climate resilience is **crucial for growth and development and requires new infrastructure** and related networks

Source: OECD, Romani, Bhattacharya and Stern (2012)

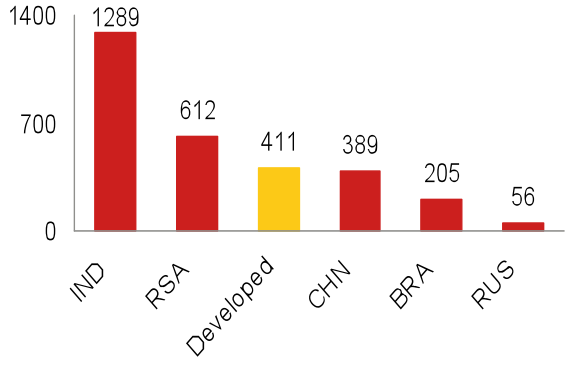
Large infrastructure deficits existing in many developing countries that are slowing growth and development

- Infrastructure needs vary across regions, but are **particularly high in South Asia and Sub-Saharan Africa**
  - Estimates of the total infrastructure spending need for Sub-Saharan Africa range between $75-100bn a year, **more than 12% of the region's GDP**
  - The needs **differ significantly** across the sub-continent:
    - South Africa and oil-exporting countries could meet infrastructure requirements by investing ~10% of their GDP every year
    - Lower-income countries (such as Ethiopia) will need to invest 20+% of their GDP every year
- Evidence indicates that unless these needs are met, it is **unlikely countries will meet their aspirations for growth and development**

Power
Electricity consumption (Kw h per capita)



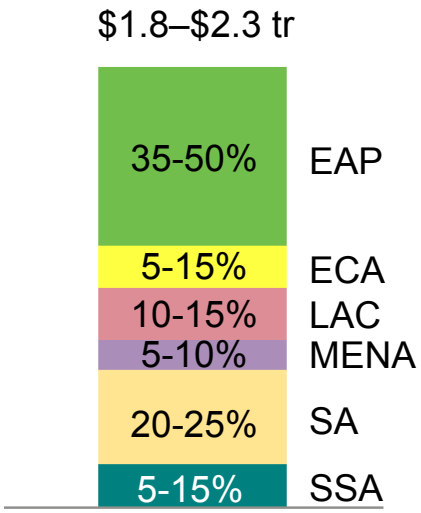
Transportation
Roads (km per 1000 square km of surface area)



Source: World Bank, GS Global ECS Research; G24, LSE and Global Green Growth Institute (GGGI) analysis

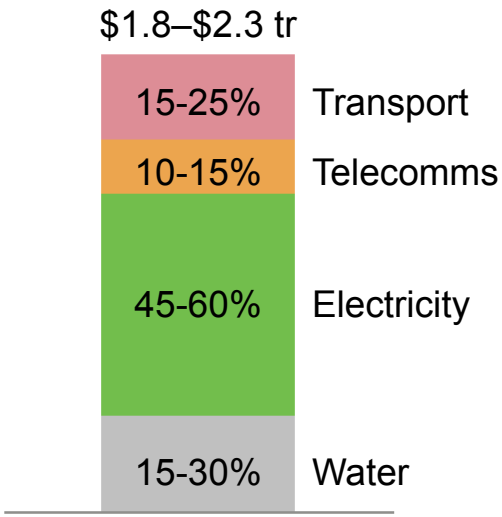
Need for investment across developing and emerging markets over the next decade is estimated to be around $2 trillion a year, ~$1 trillion more than what is currently spent

Annual needs by region



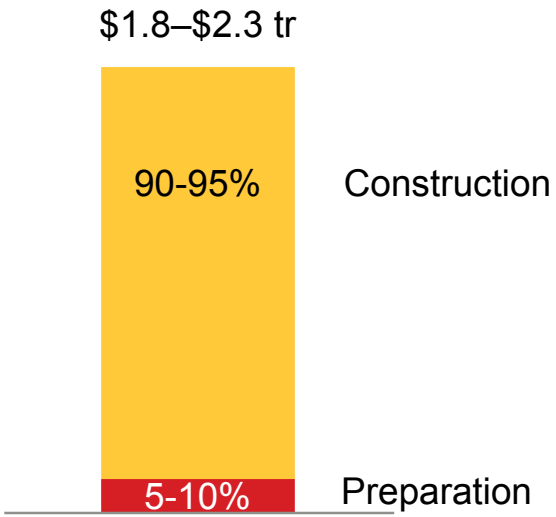
- East Asia (including China) will require the majority of investment
- Relative to its GDP, Africa will constitute a substantial share

Annual needs by sector



- 45-60% of investment requirement will be in the electricity sector, including generation capacity, transmission and distribution networks

Annual needs by phase



- Preparation costs, including costs of design and arranging financial support, can constitute up to 10% of overall costs

NOTE: $ trillion per year, (2008 real prices), capital investments only (excl. operation and maintenance costs); note the $200-300 billion annual requirement for sustainability is assumed split in the same ratio as the other investments across regions, sectors and phases

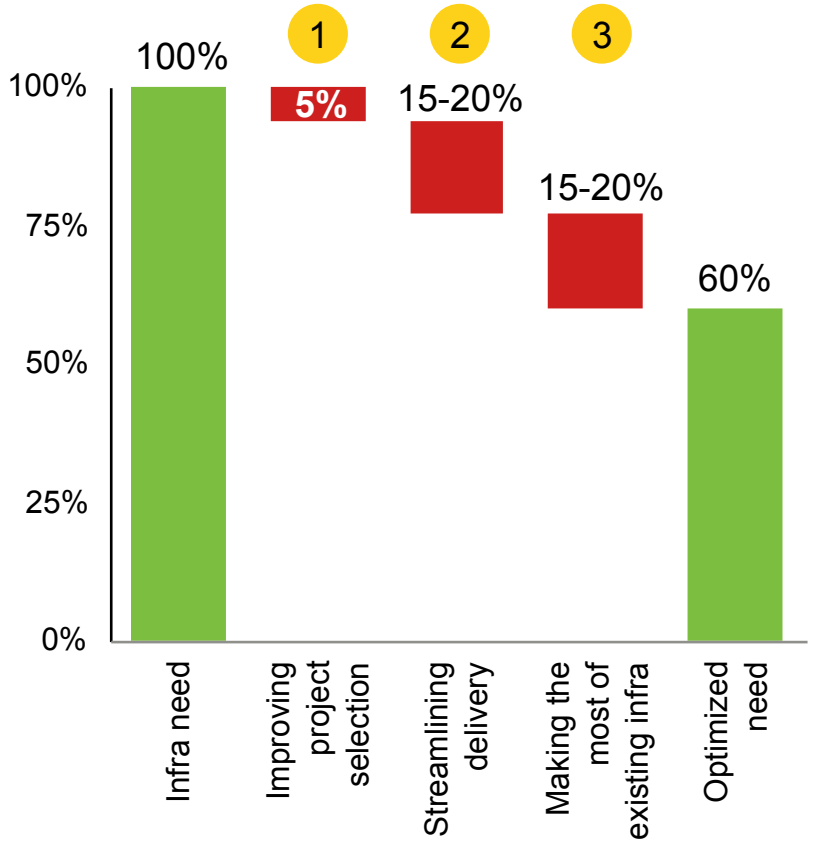
SOURCE: G-24 & GGGI analysis, based on Yepes (2008), MDB G20 working group on infrastructure (2011), and Foster and Briceño-Garmendia (2010);

Though sources of uncertainty regarding infrastructure requirement estimates remain

1. Scope for efficiency gains
2. Information on infrastructure requirements from the country and regional level (bottom-up analysis)
3. The role of project preparation in constraining infrastructure investment, relative to the role of project financing
4. The requirements for environmental sustainability
5. Operations and maintenance requirements

1 If infrastructure planners were to adopt best practice, productivity of infrastructure investment could achieve savings of 30-40%

Infrastructure investment and how it could be reduced (100% represents total cost)*



1 ***Improving project selection***

- Use precise selection criteria, develop sophisticated evaluation methods to determine costs and benefits; prioritize projects at a system level

2 ***Streamlining design***

- Speeding up approvals and land acquisition
- Investing heavily in early stage project planning and design

3 ***Making the most of existing infrastructure***

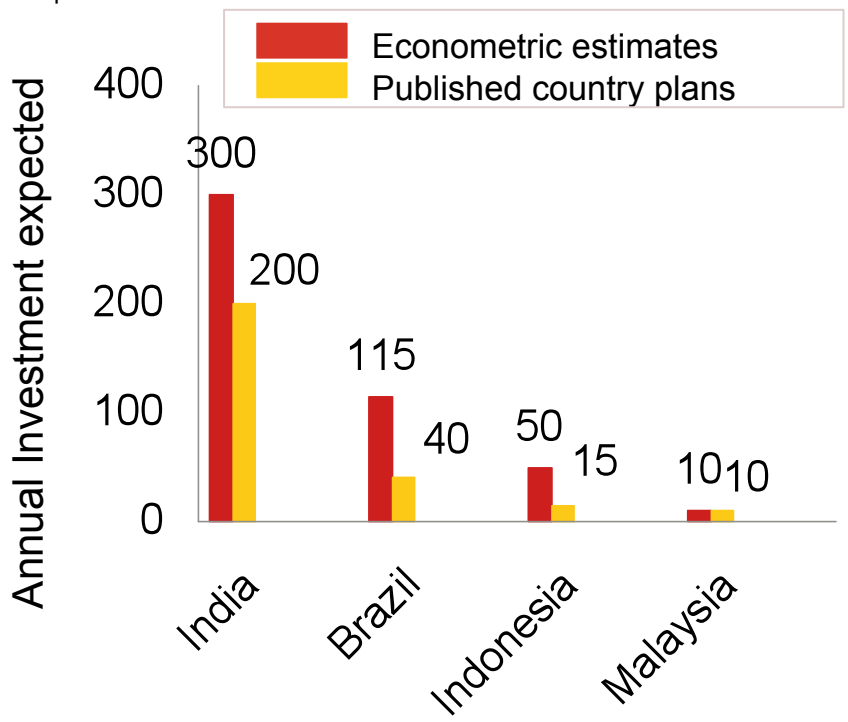
- Boosting asset utilization, optimizing maintenance planning and expanding the use of demand management measures

➢ Empirical evidence on Africa indicates that the **infrastructure gap could be reduced by a third through efficiency gains** (Foster et al 2010)

Note*: Estimates exclude teleccommunications sector
Source: McKinsey Global Institute, Foster et al (2010)

2 Bottom-up analysis: Comparison of these top-down estimates to planning documents suggests countries are more cautious in their infrastructure plans

Infrastructure investment projections[1]
$ bn



- Bottom-up estimates from planning documents suggests that econometric modelling of infra **demand may be overestimated**
- However, the **lack of private spending in government reports** make data comparison difficult
- Current work program looks to continue **to develop estimates from a wider set of the largest developing economies**: e.g. China, India, Indonesia, Brazil,

Bottoms-up assessment of needs continued to refine the estimates of the expected annual infrastructure requirements

Source: Brazil "The 2nd Growth Acceleration Programme", India's "12TH 5-Year Plan", Indonesia "Master Plan: Acceleration and Expansion of Indonesia: Economic Development" and Malaysia's "10th Malaysia Plan"

3 The role of project preparation: Failure to implement adequate project preparation facilities will hold back supply of financing for infrastructure investment

Infrastructure project pipeline is currently weak

- The pipeline of bankable infrastructure projects is weak
- Opportunities are mostly in greenfield investments, and are likely to be even more skewed towards new construction projects in the future[1]
- Lack of properly structured, bankable projects is stymieing supply of financing, especially from the private sector

Funding source and mechanisms are by and large responsive to the depth and quality of the project pipeline

Obstacles to a strong pipeline of infrastructure projects

- The pipeline of infrastructure projects is lacking due to:
  - ***Quantity:*** Demand for infrastructure is not being translated into projects
  - ***Quality:*** For projects originated, the fundamentals drive too high a risk premium or insufficient preparation is conducted for them to be considered bankable
  - ***Efficiency / speed:*** Projects take too long to prepare

Specific challenges include those of a political, policy, and regulatory nature, and other planning, preparation and execution challenges

Project Preparation Facilities

- Project preparation encompasses the work required to take projects from a concept to contract award, including project definition, feasibility analysis, deal structuring, and transaction support.
- Preparation costs, in developing countries, typically range between 5-10% of total project investment[2]

The objective of project preparation is to translate demand for infrastructure into bankable projects

PPFs are one of several actors involved in this process

Source: 1) Preqin, Infrastructure Journal, Public Works Financing, Infrastructure Investor 2) NEPAD-IPPF Strategic Business Plan 2011-15; PIDA

3 The role of project preparation: Several PPFs are in operation, but not at a scale sufficient to support the development of a strong pipeline of projects

Not exhaustive

Key function of PPF Not a key function of PPF

	World Bank		PIDG	African Development Bank	
	Public Private Infrastructure Advisory Facility (PPIAF)	DevCo	Technical Assistance Facility (TAF)	NEPAD IPPF	African Water Facility (AWF)
Objective	Focus on enabling environment and concept development	• Funds advisory work on PPPs; largely captive to IFC	• Supports technical assistance and capital grants	• Focuses on preparing regional infrastructure projects	• Established to attract investment to meet water sector targets
Stages					
Enabling environment	■				■
Project definition	■	■	■	■	■
Project feasibility		■	■	■	■
Project structuring		■		■	
Transaction		■		■	
Post-implementation					■
Grants					
Founded	1999	2003	2003	2004	2004
Total funding	$260 m	$82 m	$30 m	$46 m	$178 m
Projects supported	1,000	Not known	50	48	72
Avg. grant size	$0.20 m	Not known	$0.23 m	$1.0 m	$1.5 m

Source: PPIAF, DevCo, TAF, NEPAD IPPF, AWF

4 The requirements for environmental sustainability: Additional climate change mitigation and adaptation will potentially contribute ~$0.3tr - $0.5tr to annual spending requirements by 2030

Adaptation[1]

- Effect of climate change on adaptation is complex - additional investment requirements vary significantly by sector
- Estimates of climate change adaptation cost vary widely; total cost of infrastructure investment may be increased by 50-100 billion USD over the next decades
- The World Bank has estimated that 5 to 20% of additional funding will be required to 'climate-change-proof' projects, whilst *The Impact of Climate Change Index* (Wheeler, 2011), varied the premium from 0-20%

Additional ~$100~200bn annually (5-10%)

Mitigation[1]

- Capital intensity of different abatement measures varies by sector, indicating that different mitigation interventions will require different levels of investment
- The *Stern Review* suggested that 1% of global GDP may be required to mitigate climate change, although these results are derived from overall economic impact assessments
- *Project Catalyst* analysis takes a more explicit look at the trade-offs between costs and carbon abatement for different mitigation approaches – estimated at USD $290 billion a year

Additional ~$200~300bn annually (5-10%)

Source: Project Catalyst (2010,) Stern Review (2007), An Investment Framework for Clean Energy and Development (World Bank, 2007), HDR2007 (UNDP, 2007), G24, LSE and Global Green Growth Institute (GGGI) analysis

5 Operations and maintenance requirements: Renewing aging infrastructure could amount to an additional ~$1.5tr annual investment

- Developing and emerging markets have **under-invested in maintenance of current infrastructure** over recent last decades
- Most current research into infrastructure requirements includes estimates only of capital spending (new investments)
- Operation and **maintenance (O&M) would add substantially to the numbers shown**.

Method 1: Based on percentage of GDP

- Yepes (2008) estimated **infrastructure maintenance needs to be around 4 percent of developing countries' GDP**, using a well-accepted ratio of current to capital expenditures for the various infrastructure sectors.
- Governments data is limited on actual O&M spend, except in Africa where Foster and Briceño-Garmendia (2010**) estimated it to be 3.2 percent of GDP**

Additional ~$1-$1.5tr[1]

Method 2: Comparison to New Investment

- Renewing aging infrastructure could amount to 40% of total investment (keeping infrastructure stock at approximately 70% of GDP, per MGI's estimate). Excluding the costs of climate change mitigation and adaptation, this proportion may be even higher
- Preliminary econometric modeling suggests maintenance could amount up to 45% of total investment requirements

Additional ~$1.3-$1.8tr[2]

Source: McKinsey Global Institute (2013), Yepes (2008), Foster and Briceño-Garmendia (2010)
1) Based on 3-4.5% of estimated 2020 GDP in Developing World (assuming average growth of 4%: $33bn) 2) Based on assumption that maintenance would be 40-45% of total requirements given new investment requirements are $1.8bn-$2.3bn

Both top-down and bottom-up forecasts are important to realistically assess overall needs

'Top-down' forecasts

- **Econometric modeling** estimating correlation between per capita GDP and level of infrastructure required (as used in Fay and Yepes, 2003)
  - Update includes an additional decade of data and a focus on internet connections, a critical new form of infrastructure
- **Needs assessment** estimating the level of investment required to meet certain economic and social development goals, (e.g. access to clean water)
  - Includes literature review of current studies

Investment needs – by region, country, sector

'Bottom up' forecasts

- **Forecasts obtained from country planning documents**
  - Includes consideration of the economic, social and political realities of the countries in question
- Case studies currently completed on key emerging markets
- On-going process to develop bottoms-up projections for a wider set of EMDCs (e.g. China, India, Indonesia, Brazil) results to be available by June

This work is ongoing, and is the first attempt to compare econometric estimates with the political and budgetary reality of infrastructure planning (to be completed June 2013)

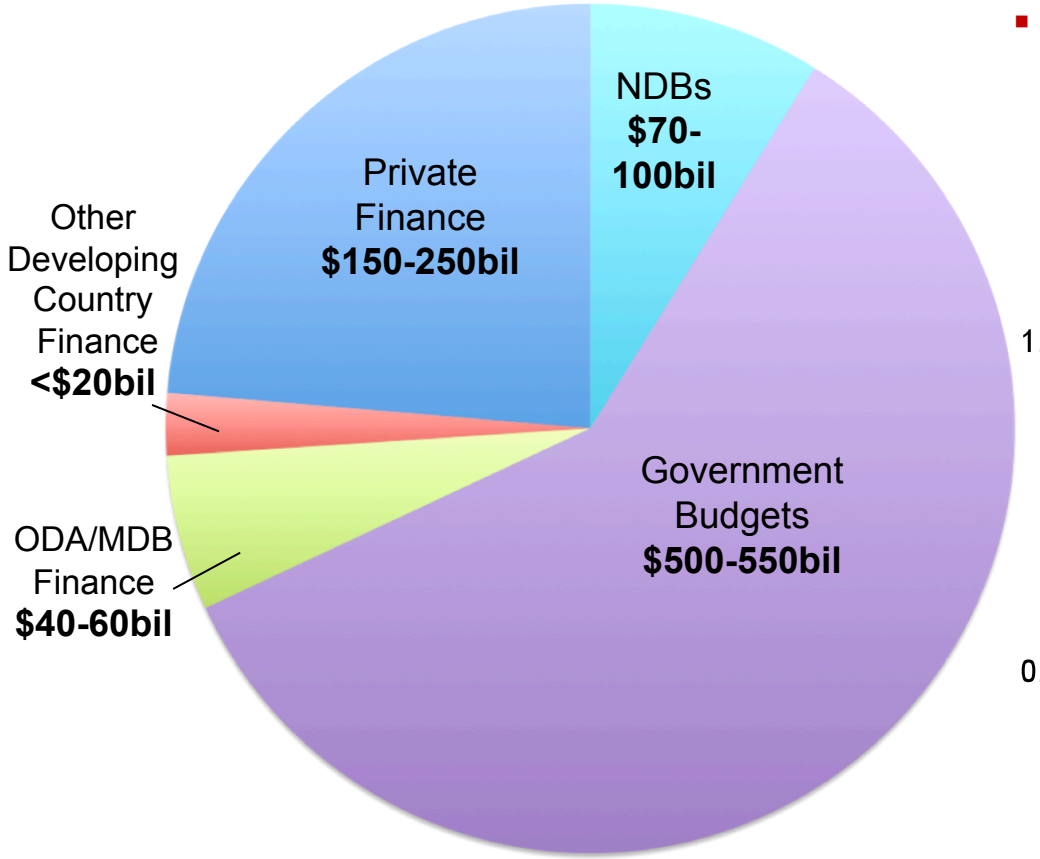
Source: G24, LSE and Global Green Growth Institute (GGGI) analysis, Fay (2000), Fay and Yepes (2003), country planning documents

Agenda

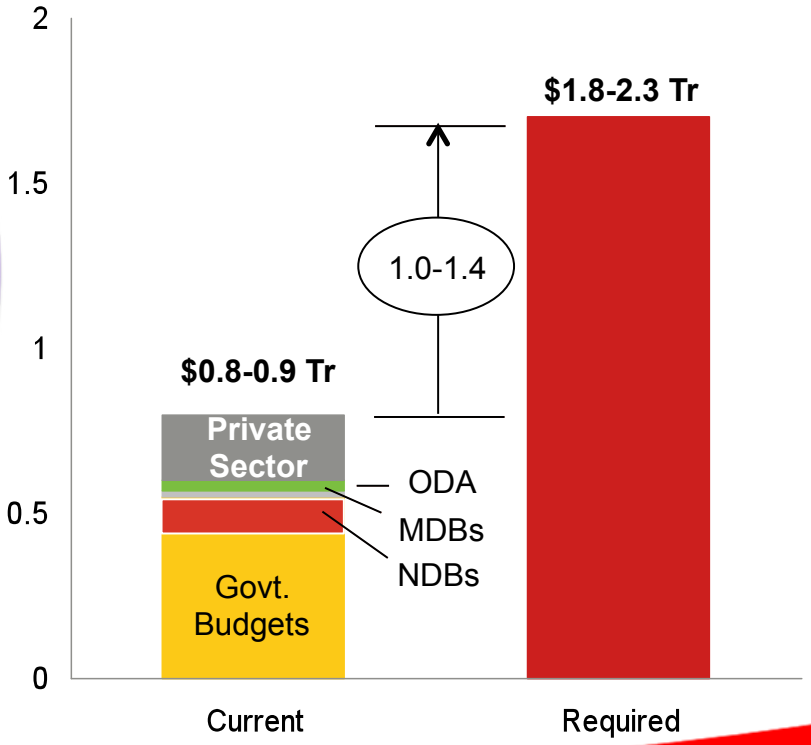
- Infrastructure needs assessment
- **Global development financing architecture**
- Potential role for a New Development Bank

The existing global development financing architecture does not provide finance at a sufficient scale to meet infrastructure development needs

Current Annual Spending: $0.8-0.9 trillion



- Currently, an estimated $0.8-0.9 trillion is invested in infrastructure annually in EMDCs.
- This equates to a gap of approximately $1trillion annually in meeting infrastructure needs



Source: Split of current sources of finance own assessment based on various estimates including Estache (2010); MDB working group paper on infrastructure (2011); Macquarie (2009)

Public finance is important, but will be constrained going forward

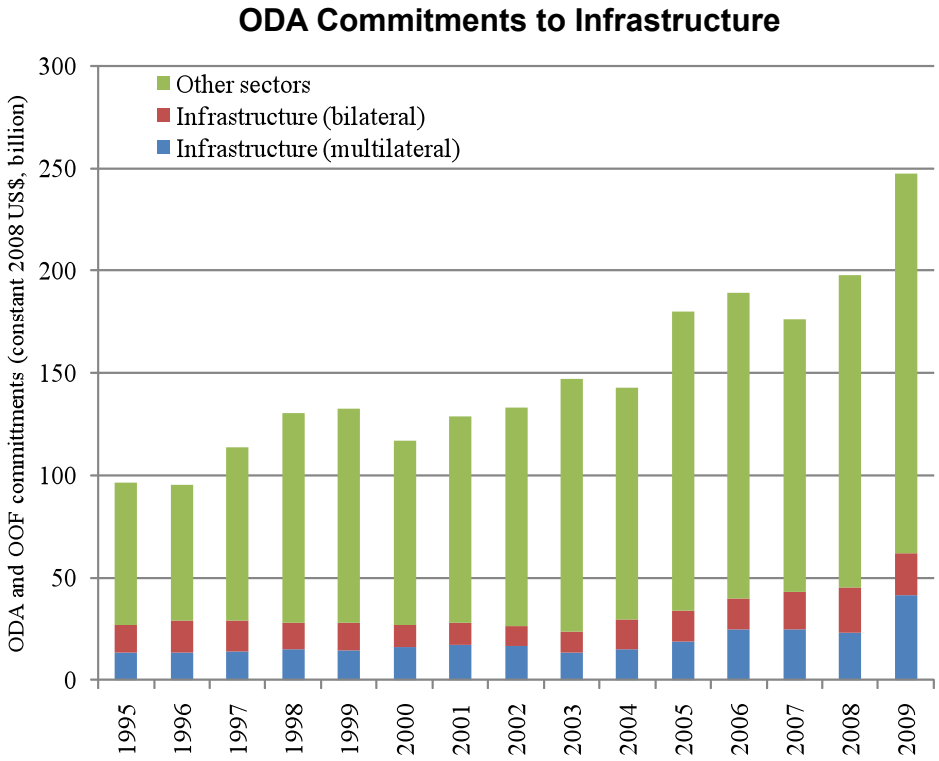
- Infrastructure spending provided through **public sector** budgets accounts for **~$0.5tr** annually**, up to 70% of the total**
- Public spending will remain a significant part of future infrastructure financing
- However, the share of public spending cannot continue at such a high level as the total investment grows:
  - The current financial crisis will put further pressure on public budgets
  - Debt sustainability will also constrain public spending, especially in low-income countries
- The key role for public finance will be to "facilitate" private sector investment—by signaling policy commitment and covering shortfalls in revenues due to pricing and social constraints

Note*: Estimates based on data from Brazil, China, France, Germany, India, Japan, Mexico, the United Kingdom, and the US
Source: G24, LSE and Global Green Growth Institute (GGGI) analysis

ODA plays an important role, but is a small proportion of total spending

- **Aid and concessional funding** constitute very small proportions of total infrastructure spending, **$40-60bn, 5-7% of total**
  - Infrastructure very small proportion of traditional ODA
  - Donor preferences limit the role of ODA in infrastructure financing

- Going forward, ODA will play **a limited but important role** relative to the scale of needs :
  - Relevant for a subset of countries
  - Relevant for climate finance, especially adaptation
  - May have a role in locations where affordability if an issue
  - Quantity should be increased
  - Aid effectiveness crucial

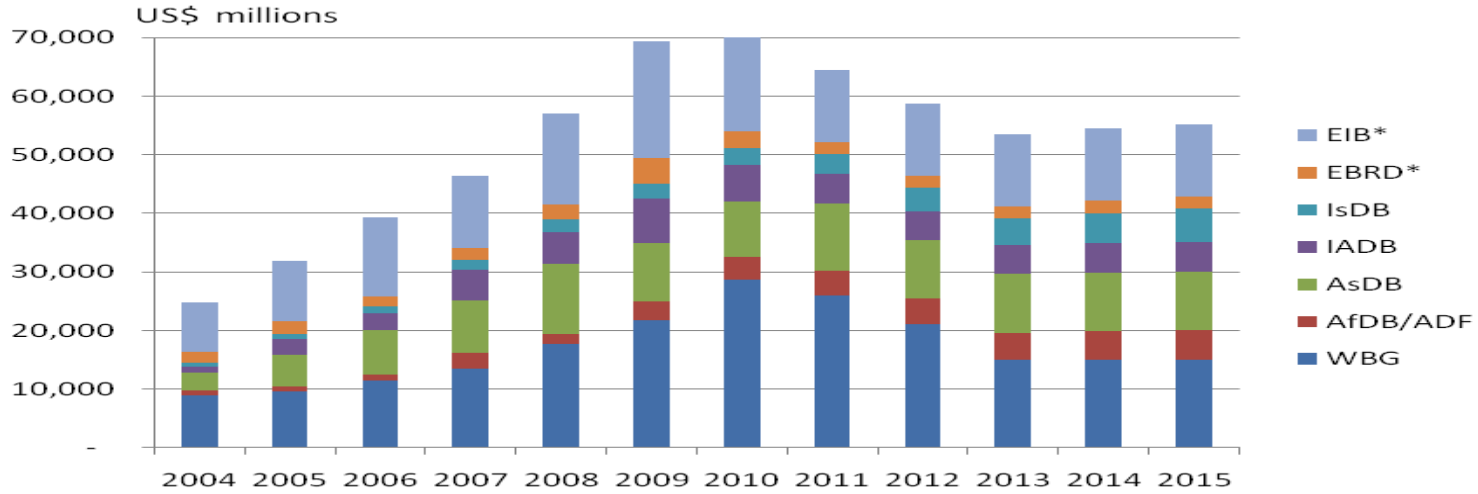


Source: OECD Stat Extracts, accessed in March 2011 in G20 MDB working Group on Infrastructure Report

MDB financing is modest and faces limitations

- **MDB** funding for infrastructure **is limited compared to the total needs** (~$50bn)
- Countercyclical investment by MDBs helped in the post-crisis period, but focused on replacement financing rather than Greenfield projects
- MDB lending is expected to level off in the coming years given capital constraints
- Risk-aversion and cumbersome project preparation requirements have limited the scale and impact
- There are a lack of **adequate financing instruments (e.g. long-term debt and equity)** to crowd-in private investment or address project risks

Recent and projected MDB lending for infrastructure



Source: G20 MDB Working Group on Infrastructure, 2011

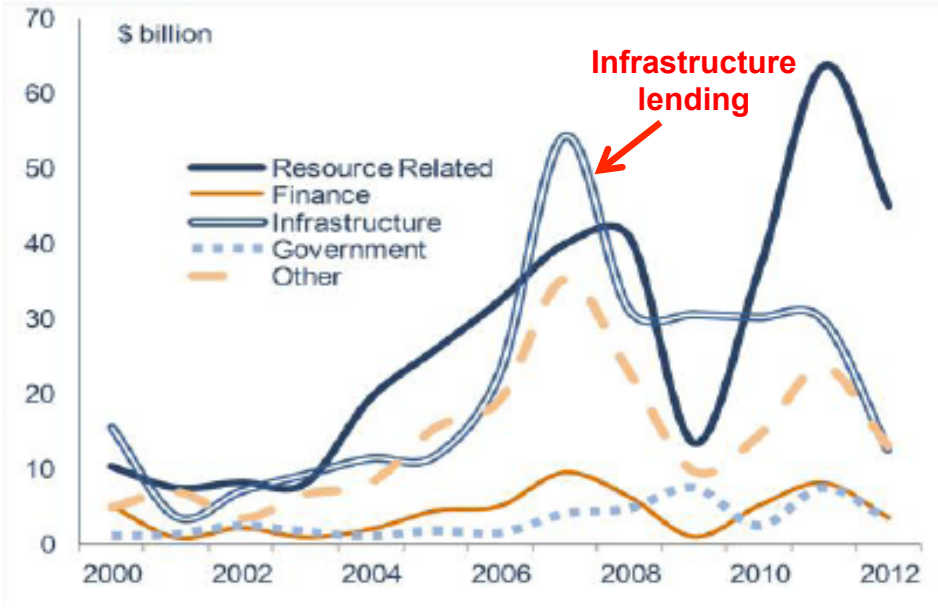
Note: EIB and EBRD projections assume reversion to 2007 levels, as no data was provided*

Private finance is profoundly under-utilized, and has decreased since the financial crisis

- **Private financing** constitutes 20-30% of spending, **~$150-250billion p.a.**
- Private sector investment is heavily **concentrated in the energy and transport sectors**
- 95% of financed concentrated **in middle-income countries**
- Public-Private partnerships are **concentrated in ICT**, with PPPs in other sectors drying up during the crisis

- **Traditional forms of private financing** (particularly bank finance) have **declined very rapidly** since 2008
  - de-leveraging
  - Regulatory (Basel III)
- New sources of **long-term finance** are available and will need to be tapped, including **private equity funds, pension funds and SWFs**

Long Term Syndicated Bank Lending ($bn)



Source: Estache, 2010; World Bank DEC Prospects Group (based on World Bank and Dealogic data)

Financing of infrastructure is also often constrained by the nature of risks

Risk makes infrastructure a complex investment….

- **The nature of risk** for infrastructure makes it a complex proposition for investment.
- **Significant commercial and physical risks**
- **Large risk capital for upfront investment** associated with the development and construction phase
- **Long-term exposure to risk**, given the long lead times before revenue creation.

… which implies it is hard to attract finance…

- **Nature of projects**, with high costs in early phases, requiring upfront, long-term equity stakes to take on substantial risks
- **Refinancing of projects,** requiring deep and liquid debt markets
- **Risks around revenue streams,** associated with policy uncertainties, project costs, technology, and affordability (e.g. ability to pay fees for infrastructure-related services).

…with significant constraints to investment

- **National policy and institutional frameworks** constrain appetite to invest due to uncertainty
- **Lack of instruments** that suit the risks of infrastructure and are attractive to investors is an impediment to the flow of funds
- **Lack of project preparation facilities** at scale inhibits the identification and development of a prioritized and viable pipeline of projects

Source: Research, interviews

There is a large variation in the provision of financing for infrastructure across developing and emerging countries

✓ = Yes, ● = Partial, X = No

Region	Provisioning of Financing	Adequacy
Latin America	• Public and private investment in infrastructure has been facilitated by **deeper domestic financial markets**, an active private sector, and a strong **network of national and multilateral development banks**	●
Asia	• Flows of private finance, often on the back of **public-private partnerships** or other forms of public co-investment, have increased significantly • **Large gaps** persist, especially in poorer countries	●
MENA	• **Oil-rich countries are well positioned** to finance ambitious programs of infrastructure spending through their SWFs and large reserves • Non oil-rich countries face **large infrastructure deficits**	●
Sub-Saharan Africa	• Combination of infrastructure **project risks and macroeconomic/policy risks** has stifled investment • **Public budgets are stretched** with limited potential to support large projects • Regional, sub-regional and national **financing architecture is weak**	X

BRICS and other emerging countries have played a role in investing in other regions. Going forward, these flows could play a significant role in closing the financing gap for infrastructure.

Source: Research, interviews

Agenda

- Infrastructure needs assessment
- Global development financing architecture
- **Potential role for a New Development Bank**

Improving the infrastructure financing architecture is necessary to meet the investment need

Challenges with existing financial architecture

- **Limited lending capacity** (MDBs, ODA, etc)
- **Risk-aversion** due to internal constraints
- Lack of flexibility with **lending instruments**, particularly in order to **crowd-in private investment** or address project risks
- Limited **project preparation facilities** - nationally, regionally, globally - impeding creation of viable project pipeline
- **Governance structures** that impede decision-making flexibility

Opportunities for a new Institution

- Specific **focus on sustainable infrastructure** investment and deep understanding of project risk
- Augmented **lending capacity** through utilization of global savings
- **Increased flexibility and wider scope for finance provision**, tailored for infrastructure
- **Appropriate financing instruments** to address complex nature of investment risk in infrastructure financing
- **Know-how to assist with project preparation at scale**
- **Modern governance structures** that provide for equity of membership and strong borrower buy-in

The advantages of a new, modern infrastructure development bank would be substantial. A new, innovative development bank could:

1. Significantly **augment the amount of long-term financing** available for sustainable infrastructure in emerging markets and developing countries
    a) By directly financing new investments
    b) By catalyzing private and other sources of finance
2. **Reduce perceived policy and transactions risks through** strong collaboration with governments, borrowers and lenders
3. **Stretch and augment the frontier of financing instruments** to ensure stable, predictable and appropriately-scaled long-term supply of finance, particularly in early development phases
4. Promote **flexible and cost effective approaches** in addressing environmental and social impacts
5. Develop ad-hoc facilities and support capacity building in **project preparation** at scale in order to contribute to building a strong pipeline of investable infrastructure projects
6. In addition to focusing on projects**, it could also support policy and institutional strengthening** including through South-South cooperation**.**

By being modern in its mandate, in its instruments and approaches and in its governance, a new institution could be a catalyst for change

1. **A modern mandate** with an emphasis on **sustainable infrastructure** and sufficient flexibility to involve existing national, regional and multinational development banks, as well as the private sector and other stakeholders (such as sovereign wealth funds and philanthropic organizations)

2. **Modern financing instruments that suit the diverse range of project needs** (examples include equity participation, insurance and credit enhancement, loan-guarantees, debt instruments, first-loss equity, challenge funds, grants and so on), **operational policies and practices that ensure flexibility and low transactions costs**, and support for **project preparation facilities at scale**

3. **A modern governance structure** and board competencies, which could help provide an example for the **reform of the governance structures of existing IFIs** as they struggle to adapt themselves to the profoundly changing reality of a new global order

Thank you