



UNIVERSITY OF
OXFORD

OXIIC

OXFORD INTERNATIONAL INFRASTRUCTURE CONSORTIUM

Oxford International Infrastructure Consortium



Global Infrastructure Conference Report 2015



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Oxford International Infrastructure Consortium (OXIIC)

Smith School of Enterprise and the Environment (SSEE)

Infrastructure Transition Research Centre (ITRC)

Environmental Change Institute (ECI)

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This report is intended to summarise the proceedings of the Oxford International Infrastructure Consortium (OXIIC) 2015 Conference on “Infrastructure Investment in Emerging Markets and Developing Economies: Systems-Thinking for New Institutions and Global Challenges”, organised by the OXIIC, with co-sponsorship from the Smith School of Enterprise and the Environment (SSEE) and the UK Infrastructure Transition Research Consortium (ITRC). Presentation materials presented during the conference can be downloaded from our website: <http://www.oxfordiemde.org/>.¹ The report was prepared by Yin Yang, Xi Hu, Michael Dangerfield and Christopher Kaminker. Please note that some of the sources cited in this report may not be commercially available and requests for such text should be directed to the aforementioned directors.

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Yin Yang: yin.yang@ouce.ox.ac.uk

Xi Hu: xi.hu@ouce.ox.ac.uk

Michael Dangerfield: michael.dangerfield@ouce.ox.ac.uk

Christopher Kaminker: christopher.kaminker@ouce.ox.ac.uk

¹ All materials in the OXIIC website have been uploaded with the consent of the presenters.

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Foreword

Professor Gordon Clark

Director, Smith School of Enterprise and the Environment, University of Oxford

The challenges that face investors in the infrastructure space in emerging markets are real. The regulatory environment is yet somewhat immature and must both learn from global best practice and match the expectations of institutional investors. The integrity of the investment process itself poses further challenges, and it is imperative to find the instruments, vehicles and individuals to overcome these challenges.



Emerging markets also offer a greater premium on any investment, which is missing in developed economies. As an investor, one can make investments of significant size in emerging markets, as they can absorb them. For the most sophisticated institutional investors, able to build business models that can be extended across a range of sectors in different emerging markets, investing in emerging markets is a valuable long-term investment proposition.

Closely collaborating with Saïd Business School at Oxford University and the Global Projects Centre at Stanford University, the Long-Term Investment Programme at the Smith School of Enterprise and the Environment (SSEE) aims to deliver outstanding academic research that needs global collaboration on topics such as climate change, environment and infrastructure.

This Oxford Infrastructure Conference intends to bring together leading experts from international organisations, academia and financial institutions to discuss the challenges and solutions to mobilising infrastructure investment in EMDEs. I hope this significant opportunity that gathers this diverse range of individuals and institutions will help us to learn from each other.

Professor Jim Hall

Director, Environmental Change Institute, University of Oxford

Despite the on-going and significant investment in infrastructure in developing economies, a considerable deficit still remains. The significant concern with regard to this level of investment is the commitment being locked into infrastructure systems that may not be fit for purpose in the future. Commitments in terms of carbon intensive energy and transportation infrastructure, for example, have significant impacts upon the environment and may be very difficult to reverse in the future.



Avoiding the costly commitments mentioned above means that we have to look to the long-term needs and impacts of infrastructure. This requires us to take a systems-thinking approach, in contrast to the conventional approach based on individual projects. Yet the tools needed to inform long-term decision making do not yet exist, least of all for the complex and highly dynamic situations that exist in emerging economies. There is a major mismatch between project-based finance and the performance that infrastructure systems actually provide for economies and societies. Filling that gap is work in progress, in Oxford and in collaboration with our partners in the UK and around the world. I hope this Oxford Infrastructure Conference will provide an introduction to this kind of thinking to investors and am interested in exploring how it can be applied.

Acknowledgement

The directors of the consortium would first and foremost like to extend our sincerest thanks to Professor Gordon Clark and Professor Jim Hall for their most generous support, without which the conference would never have come to fruition. We would also like to express sincerest gratitude to the chairs and speakers who participated in the conference.

Session 1

Marjory-Anne Bromhead (Chair)

Natural Resources and Climate Change Adviser; Former Sector Manager, World Bank

Hülya Paşaoğulları (Speaker)

Head, Public Private Partnership Department, G20 Investment and Infrastructure Working Group, Turkish Treasury

Bernard Sheahan (Speaker)

Director, Infrastructure & Natural Resources, International Finance Corporation

Hisaka Kimura (Speaker)

Unit Head, Private Sector Infrastructure Finance, East Asia, Asian Development Bank

Jean-Marc Aboussouan (Speaker)

Chief, Infrastructure & Energy Division, Inter-American Development Bank

Alex Wong (Speaker)

Head of Global Challenge Partnerships and Member of the Executive Committee, World Economic Forum

Session 2

Professor Gordon Clark (Chair)

Director, Smith School of Enterprise and the Environment, University of Oxford

Huan Chen (Speaker)

Deputy Head of Working Group for establishment of Asian Infrastructure Investment Bank; Chief Officer and Team Coordinator of THE MULTILATERAL INTERIM SECRETARIAT OF AIIB

Session 3

John Bromley (Chair)

Investment Manager, L&G Capital

Reyaz A. Ahmad (Speaker)

Head and Chief Investment Officer, IFC Catalyst Fund

Fiona Stewart (Speaker)

Senior Financial Sector Specialist, World Bank

Raj Kannan (Speaker)

President & Managing Director, Tusk Advisory Pte Ltd

Session 4

Simon Upton (Chair)

The Rt. Hon., Director, Environment Directorate, OECD

Professor Jim Hall (Speaker)

Director, Environmental Change Institute, University of Oxford

Jonathan Maxwell (Speaker)

Co-Founder & CEO, Sustainable Development Capital LLP

Atif Ansar (Speaker)

Programme Director of the MSc in Major Programme Management (MMPM), Saïd Business School, University of Oxford

Christopher Kaminker (Speaker)

Economist/Project Manager, Long Term Investment, Environment Directorate, OECD

The committee would also like to thank the conference volunteers and note-takers:

Patrizia Ferrari

Emma Weisbord

Ashley Kingsborough

Pablo Astudillo

Mike Simpson

Xiawei Liao

Mo Li

Yingqi Liu

Shali Lu

Qiong Lu

Liwen Wang

Xiaoyang Wang

Zichen Zhang

Raghav Pant

The committee is very grateful to the talented photographer and cinematographer Ben Johnston, for his expert filming and editing of the conference film, available at the link below. The committee also extends thanks to photographer Mateusz Tarkowski and artistic director Izabella Bryzek for additional photos taken and for their attention to detail; and to David Ball, Valerie Bevan, Seth Collins and Angelika Kaiser for proofreading the report.

<https://www.youtube.com/watch?v=IA53eiTwc1Y>

Finally, the committee is indebted to the technical and substantive support provided by the Smith School of Enterprise and the Environment (SSEE), the Infrastructure Transition Research Consortium (ITRC), the University of Oxford and St Catherine's College, Oxford.

EXECUTIVE SUMMARY

Emerging Markets and Developing Economies (EMDEs) are facing an immense infrastructure deficit. This infrastructure deficit in EMDEs also offers a greater premium on any investment than comparable ones in developed economies. The real challenge faced is not a fundamental lack of capital, but rather a shortage of bankable infrastructure projects in EMDEs for investors. Simply increasing the amount invested in infrastructure may not deliver the potential to foster strong, sustainable and balanced growth. What is needed is an innovative approach in order to mobilise other sources of private financing such as institutional investors – a major source of long-term capital for sustainable infrastructure investment. New multilateral financial institutions – such as the World Bank’s Global Infrastructure Facility (GIF), the Global Infrastructure Hub (GIH), the New Development Bank (NDB) and the Asian Infrastructure Investment Bank (AIIB) – have been created successively to mobilise the private sector and institutional investors for sustainable infrastructure investment.

The conference “Infrastructure Investment in Emerging Markets and Developing Economies: Systems-Thinking for New Institutions and Global Challenges” – held in St Catherine’s College, Oxford on 2 July 2015 – brought together leading experts from international organisations, academia and financial institutions to discuss challenges and solutions to mobilising infrastructure investment in EMDEs. The conference covered four sessions, which were themed “Infrastructure Investment in Emerging Markets and Developing Economies”, “Infrastructure Investment by Multilateral Financial Institutions”, “Public-Private Partnership in Infrastructure – Engaging Institutional Investors”, and “Long-term Planning and Systems Thinking in Infrastructure Investment”.

In Session One, Hülya Paşaoğulları, Head of the Public Private Partnership Department, G20 Investment and Infrastructure Working Group, introduced G20’s “three I” approach – Implementation, Inclusiveness and Investment – to ensure inclusive and robust growth. The Investment & Infrastructure Working Group continues to work on G20 multiyear investment agenda, specifically focusing on the investment strategies for infrastructure. Bernard Sheahan, the Director for Infrastructure & Natural Resources at the International Finance Corporation (IFC), pointed out that the policy environment, which has been one of the traditional impediments to improving infrastructure in emerging markets, is changing to show strong support of infrastructure development for the first time; the real challenges now in infrastructure development lie in failures in design and the unrealistic expectations by governments. Hisaka Kimura, Unit Head, Private Sector Infrastructure Finance, East Asia at the Asian Development Bank discussed the typical challenges in private sector infrastructure finance and presented a case study in the Chinese waste sector where they overcome some of those challenges. Jean-Marc Aboussouan, Chief of the Infrastructure & Energy Division at the Inter-American Development Bank (IDB), highlighted broad-level challenges in infrastructure investment and IDB’s

portfolio in infrastructure. He noted that the renewable legacy of Latin America may be threatened by the increasing installed capacity needs of the region. Alex Wong, Head of Global Challenge Partnerships and Member of the Executive Committee, World Economic Forum, showcased a new model of public-private partnership (PPP) collaboration to accelerate infrastructure development. A neutral business platform was established to bring together the public and the private sectors at the highest levels in a precompetitive environment to identify the priority projects for acceleration and conduct the preliminary project analysis.

In Session Two, Huan Chen, Chief Officer of the Multilateral Interim Secretariat of Asian Infrastructure Investment Bank (AIIB), introduced the key milestones for the establishment of AIIB. He also mentioned that AIIB will offer: Investment through global best practice; Innovation through partnership with other MDBs, governments and civil society to develop bankable projects; Integration of environmental and social sustainability; Integrity through operating AIIB in a transparent manner and Insight on emerging and key trends that will drive infrastructure investment and interconnectivity in Asia. In addition, Mr Chen introduced the initial priority of investment areas: energy, transport and urban development and its three principles – “lean, green and clean” – that will guide investment. In terms of the proposed governance structure of AIIB, it will have a Board of Governors, a Board of Directors, a President and one or more Vice-Presidents. Each member of AIIB will appoint a Governor to represent it on the Board of Governors. All powers of AIIB will be vested in the Board of Governors. The Board of Governors can delegate any of its powers to the Board of Directors except certain reserved powers. AIIB will have twelve Directors, nine elected by regional members and three elected by non-regional members. The Board of Directors will be responsible for the direction of AIIB's general operations. Following the keynote lecture, Mr Chen forthrightly answered all questions raised by the audience, including how AIIB differed from other MDBs, how AIIB would cooperate with existing MDBs and whether AIIB support investment in coal extraction and coal-fired power plants. The lecture and Q&A section gave the audience a better understanding of this new multilateral financial institution.

In Session Three, Reyaz A. Ahmad, Head and Chief Investment Officer, IFC Catalyst Fund, introduced IFC's AMC (Asset Management Company), the IFC Catalyst Fund, and some key issues relevant to this session. Professor Gordon Clark, Director, Smith School of Enterprise and the Environment, University of Oxford gave a lecture on how infrastructure could be bundled as a financial product and how the four models (direct, limited partner, bundled untraded portfolio product and universal traded portfolio product) are generally used by institutional investors for infrastructure investment. Fiona Stewart, Senior Financial Sector Specialist, World Bank, illustrated two key ideas that we need to consider to get institutional investors “moving”. One is governance; the other is an institutional investor friendly PPP structure. Raj Kannan, President & Managing Director, Tusk Advisory Pte Ltd, started with an overview of economic, demographic & investment situations in Indonesia and impediments to its continued growth – infrastructure deficits. He then talked about the respective role of Institutional Investors and Development Finance Institutions (DFI) in infrastructure investment in Indonesia. Following the four

speakers' presentations, a lively panel discussion addressed political uncertainty risks for institutional investors for investing in infrastructure, decarbonisation of infrastructure networks to achieve the global climate change commitment, how to balance economic infrastructure investment and social infrastructure investment in Indonesia, experience sharing on how to meet the challenge of the complicated procedures to make infrastructure investment a reality, how institutional investors deal with corruption issues in infrastructure investment, and how to measure the climate change impacts of investment conducted by fund of funds. Although potential good opportunities for infrastructure investment in EMDEs exist, there are still many barriers to overcome to make it a reality such as governance, capacity building, institutional investors friendly PPP structure. Given that commercial banks have been leading on setting terms of infrastructure deals in the past, there is an urgent need for infrastructure deals to be structured in such a way as to achieve investment grade to allow institutional investors to come in with long-term debt.

In Session Four, Simon Upton, the Director of Environment Directorate at OECD introduced the session by putting infrastructure investment in the context of population growth and climate change, quoting the IEA figures which project that maintaining existing levels of energy supply will cost \$40 trillion between now and 2035, under a central scenario, resulting in 4^oc of global warming by the end of the century. To keep to the 2^oc warming goal set by policy makers, investment in low-carbon energy and energy efficiency must quadruple. Professor Jim Hall, Director at the Environment Change Institute (ECI), University of Oxford, spoke about long-term planning and systems thinking for infrastructure investment. The value of systems thinking was illustrated through modelling of system failure events, where interdependencies cause failure in one infrastructure sector to propagate across other sectors. The ITRC has mapped spatial hotspots in infrastructure vulnerability in the UK and China. Jonathan Maxwell, Co-Founder & CEO at Sustainable Development Capital LLP, presented work on energy efficiency. While this helps to reduce CO₂ emissions, this is not the only advantage of energy efficiency. The challenge is to induce investment and to move from project-by-project funding to a systems investment approach. Dr Atif Ansar, Programme Director of the MSc in Major Programme Management (MMPM), Saïd Business School, University of Oxford outlined his vision for delivering infrastructure faster and cheaper. He argued that if the \$57 trillion target expenditure (according to McKinsey Global Institute) was actually achieved, then many countries could be expected to suffer financial crises worse than Greece's. His response was to reduce variety and to 'containerise' infrastructure. Christopher Kaminker, Economist/Project Manager in Long Term Investment at the Environment Directorate, OECD, highlighted the outcomes of the OECD report for G20 'Mapping Channels to Mobilise Investment in Sustainable Energy'².

The conference was a successful endeavour and provided meaningful insights in light of the importance of infrastructure for world economy and sustainable development. As a result, many participants expressed interest in establishing a platform to facilitate ongoing dialogue and debate in

² <https://g20.org/wp-content/uploads/2015/04/Mapping-Channels-to-Mobilize-Institutional-Investment-in-Sustainable-Energy1.pdf>

this burgeoning field. In response, the Smith School of Enterprise and the Environment (SSEE), the UK Infrastructure Transition Research Consortium (ITRC) of the University of Oxford, and the directors of the conference have proposed the establishment of the Oxford International Infrastructure Consortium (OXIIC), which aims to bring together experts from international organisations, governments, academia, financial institutions, and other public and private sectors to share their knowledge, insights and data in the field of infrastructure.

KEY MESSAGES

- **EMDEs are facing a massive infrastructure deficit.** While official development assistance from multilateral financial institutions and other regional development banks can play a part, attracting private finance to complement public funds is vital in providing governments with the long-term liquidity they need for infrastructure.
- **However, the real challenge is not a fundamental lack of capital, but rather a shortage of capital willing to invest in the more complex, longer-term and riskier investments that are typical of infrastructure projects in EMDEs.** Currently less than one per cent of pension fund assets are allocated directly to infrastructure projects, and the bulk of this is in advanced economies. This represents an untapped market for potential funding in infrastructure projects in EMDEs.
- **Two main concerns** of institutional investors when they confront infrastructure investment in EMDEs:
 - 1) **Whether infrastructure investment contributes to the broad goals of institutional investors.**
 - 2) **Institutional investors may feel that investing in EMDEs is uncertain and risky, bringing with it political, financial, social and environmental risks.**
- **Two critical elements of practical solutions for getting institutional investors moving:**
 - 1) **Governance of institutional investors**, such as who is on the board, how they are appointed, and whether the institution has report and investment policies, is very much linked to the inclination of institutional investors to invest in infrastructure assets.
 - 2) **Institutional investor friendly PPP structure** is very important to bring in institutional investors early on to think about critical issues in infrastructure investment such as credit ratings, refinancing risk, early payment and controlling creditors.
- In addition, to keep to the 2°C warming goal set by policy makers, investment in renewables and efficiency must quadruple. Infrastructure investment will shape the way we deal with climate change today and in the future. Therefore, **there is an urgent need to shift from a project-by-project approach to a systems-thinking approach for infrastructure investment** because i) it helps us understand systemic risks including climate change risks that are not factored into current infrastructure planning decisions; ii) it provides us with a common space for negotiation for different actors to understand the services that infrastructure provides.

- **Development Finance Institutions (DFIs) and institutional investors have a key role to play to guide the government in its mind-set change to introduce long-dated payment schemes.** For instance, the introduction of long-dated financing schemes like Availability Payment Scheme (APS) and Performance Based Annuity Schemes Plus (PBAS+) by the Indonesia government will provide attractive options for Indonesian institutional investors to enter infrastructure financing.
- **During the Turkish Presidency, G20 focused its efforts on ensuring inclusive and robust growth through collective action.** The Turkish Presidency has asked G20 members to create a country specific investment strategy and specific investment actions in order to promote inclusive and robust growth. These strategies have facilitators and safeguards in place for supporting improvements in investment.
- **The World Economic Forum demonstrated a new model of PPP governance for infrastructure development in Africa.** A business working group was created to bring key stakeholders together for implementation of the master plan. Additionally, a project prioritization methodology was created to help to systematically bring the 51 projects down to eligible projects that could accelerate private sector participation. The successful experience of the World Economic Forum showed that having a neutral platform that can bring public and private sector together at the highest levels to conduct preliminary project analysis in a non-competitive environment was an essential success factor in infrastructure development in EMDEs.
- **The Asian Infrastructure Investment Bank (AIIB) will provide a multilateral regional financing and investment platform for infrastructure development and improvement in Asia.** Through a participatory process, its founding members are developing its core philosophy, principles, policies, value system and operating platform. The Bank's foundation will be built on the lessons and experience of existing Multilateral Development Banks (MDBs) and the private sector. Its approach will be "lean, clean and green": lean, with a small but seasoned professional management cadre and highly skilled staff; clean, a principles-based organization with zero tolerance for corruption; and green, an institution built on respect for the environment.
- The AIIB will put in place and implement effective policies on **governance, accountability, finance, procurement, and debt sustainability** and adopt an **environmental and social framework** that draws on the experience of existing MDBs and international best practice. The Bank's strong and diverse ownership foundation will provide a sound base for enhanced development effectiveness.
- **AIIB will cooperate closely with existing MDBs and other development partners; its financing will complement and supplement their efforts.** Its areas of engagement are expected to include: energy and power, transportation and telecommunications, rural infrastructure and agriculture development, water supply and sanitation, environmental protection, urban development and logistics, and other productive sectors as deemed appropriate.
- **Academia has an important role to play including data sharing, demonstrating successful case studies in infrastructure investments and testing out new ways of thinking.** One interesting idea is to "containerise" infrastructure. (For more information, please refer to Dr Atif Ansar's work at the University of Oxford).

- **Other global efforts for facilitating sustainable infrastructure investment and development** include G20/OECD Task Force for Long Term Institutional Investors, the Global Infrastructure Initiative, the Global Infrastructure Hub, the Global Infrastructure Facility and others.

I. INTRODUCTION

The Oxford International Infrastructure Consortium (OXIIC), with co-sponsorship from the Smith School of Enterprise and the Environment (SSEE) and the Infrastructure Transition Research Centre (ITRC), hosted a conference on “*Infrastructure Investment in Emerging Markets and Developing Economies: Systems-Thinking for New Institutions and Global Challenges*” at St Catherine’s College, Oxford on 2 July 2015. The one-day conference explored the opportunities and challenges arising from infrastructure investment in emerging markets and developing economies (EMDEs). The event provided a platform for dialogue and debate among a variety of prominent experts from international organisations, multilateral development banks (MDBs), government, academia, and the private sector on Public-Private Partnership (PPP) and sustainable development issues that are constraining infrastructure development in EMDEs.

This report provides an overview of the proceedings with a view to distil some of the initial lessons learned from the conference and is organised as follows: Section I includes background information on the conference; Section II summarises the key messages from each session; Section III draws some preliminary conclusions and Section IV introduces the initial ideas on the operation and governance of OXIIC.

A. Background

EMDEs are facing a massive infrastructure deficit. Today 1.2 billion people live without electricity, 60 per cent of the world’s population lack internet access and at least 748 million people lack access to safe drinking water. According to World Bank estimates, an additional US\$1 trillion to US\$1.5 trillion of annual investment in low and middle income countries will be required through 2020 to meet the infrastructure demand from industry and households³.

Faced with a large infrastructure deficit and tight public finances, governments in EMDEs have no way of closing the financing gap using public funds alone. Attracting private capital to complement public funds is vital to providing governments with the long-term liquidity they need for infrastructure development. However, the real challenge is not simply a matter of money but a lack of bankable projects. Therefore, reinvigorating the supply of infrastructure in EMDEs requires work to establish a more supportive enabling environment for investment. In this context, new multilateral financial institutions such as the World Bank’s Global Infrastructure Facility (GIF), the Global Infrastructure Hub (GIH), the New Development Bank (NDB) and the Asian Infrastructure Investment Bank (AIIB) have

³ <http://www.worldbank.org/en/topic/publicprivatepartnerships/brief/global-infrastructure-facility>

been created successively to mobilise the private sector and institutional investors for infrastructure investment.

Further, whilst unlocking funds from different sources such as those in the private sector is a priority for financing the infrastructure deficit faced by EMDEs, it must be recognised that simply increasing the amount invested in infrastructure may not deliver the potential to foster strong, sustainable and balanced growth. Infrastructure investment strategies need to take into account that infrastructure assets are interdependent and constitute a wider system; therefore, the conventional project-centric approach adopted by many development agencies may lack the “systems-thinking” that is needed for ensuring the long-term development of EMDEs.

B. Organisation of Conference

The conference brought together leading experts from international organisations, academia and financial institutions to discuss challenges and solutions to mobilising infrastructure investment in EMDEs. In particular, it focused on:

- i) How multilateral financial institutions can function effectively as platforms to mobilise the private sector and institutional investors for infrastructure investment in EMDEs;
- ii) How we can move from project-thinking to systems-thinking for infrastructure and fully appraise the macro-economic, societal and environmental benefits and impacts of these investment pathways.

The conference was structured around the following four sessions:

- 1) Session 1: Infrastructure Investment in Emerging Markets and Developing Economies
- 2) Session 2: Keynote Address “Infrastructure Investment by Multilateral Financial Institutions”
- 3) Session 3: Public-Private Partnership in Infrastructure – Engaging Institutional Investors
- 4) Session 4: Long-term Planning and Systems Thinking in Infrastructure Investment

Approximately 160 people participated in the conference, with representation across a variety of organisations including international organisations, MDBs, government agencies, academia, and civil society. Active participation from the audience was central to achieving the objectives of the conference.

II. CONFERENCE PROCEEDINGS

A. Session 1: Infrastructure Investment in Emerging Markets and Developing Economies



Chair for Session 1

Marjory-Anne Bromhead

Natural Resources and Climate Change Adviser, World Bank

Speakers for Session 1

Hülya Paşaoğulları

Head, Public Private Partnership Department, G20 Investment and Infrastructure Working Group, Turkish Treasury

Bernard Sheahan

Director, Infrastructure & Natural Resources, International Finance Corporation

Hisaka Kimura

Unit Head, Private Sector Infrastructure Finance, East Asia, Asian Development Bank

Jean-Marc Aboussouan

Chief, Infrastructure & Energy Division, Inter-American Development Bank

Alex Wong

Head of Global Challenge Partnerships and Member of the Executive Committee, World Economic Forum

Session 1 focused on issues related to taking stock of pertinent infrastructure investment issues in EMDEs, including the key challenges in infrastructure investment and development, emerging trends, and solutions in addressing challenges.

➤ **Key Challenges in Infrastructure Investment and Development**

- **Legal & regulatory frameworks**
- **Business** climate
- **Institutional capacity** & policy frameworks
- **Sustainability**: climate change mitigation and adaptation
- **Project preparation** & pipeline
- Global **competition** for investments
- Financing, banking and capital markets and how to finance for the **long-term** for both bankable and non-bankable projects
- Failures in **design** and the unrealistic **expectations for the governments**
- **Lack of non-traditional sources of financing**. Institutional investors' participation in infrastructure and SME financing is limited due to a lack of:
 - Appropriate financing vehicles
 - Bankable projects that offer acceptable risk-adjusted returns
- **Information** and **data** gap
- Typical challenges in **Private Sector** Infrastructure Finance
 - High upfront capital costs
 - Relatively low return and uncertainties over tariff level and collection
 - Credit risks of host government
 - Technical and economic criteria of equipment
 - Operational and maintenance risks
 - Substantial project preparation time regardless of project size
- Challenges in **public-private partnership (PPP)** creation and implementation
 - Create dynamic clusters – traditional text book of the single asset approach is no longer sufficient
 - Difficult to address unattractive destinations (small population, low per capita income, remoteness from main investors, lack of quality labour force and domestic supporting industries)
 - How to minimize transaction costs
 - Technologies breakthrough – how to address smaller projects with new technologies; how to address new wave of PPP opportunity for upgrading existing projects
 - Cross-jurisdiction: how to mitigate additional risks and uncertainties; how to engage national policymakers responsible for allocating budgets and requesting assistance from multilateral institutions
- Achieving **sustainable** infrastructure investment: for example, in renewable energy investments, how to ensure affordability of energy is challenging
- Rural areas
 - Limited private sector investor/ commercial bank interest
 - Small infrastructure projects face high transaction costs

- Difficult to assess rural risks because public accounting non-existent

➤ Emerging Trends

- Political will, which has been one of the traditional impediments for improvement in infrastructure in emerging markets, is strong.
 - Egypt's ambitions for the investment needed to implement its existing infrastructure plans, are equivalent to the total amount of infrastructure investment by all the international institutions at the global basis delivered today. The scale of the ambition is remarkable.
 - Other examples include Ghana, Ivory Coast, Kenya, Ethiopia, Nigeria, Morocco, Bangladesh, Egypt and Turkey.
- Latin America is the cleanest region because a majority of countries are powered by hydro; however, there is an emerging trend for the development of dirty energy sources.
- Regional cooperation is springing up – e.g. the African infrastructure master plan

➤ Solutions to Address Challenges

- G20
 - During the Turkish Presidency, G20 focused its efforts on ensuring inclusive and robust growth through collective action. This can be formulated as the 'three Is' of the Turkish Presidency: implementation, inclusiveness and investment.
 - **Implementation:** the group have committed to 2% growth within 5 years and have designed a growth strategy to achieve it.
 - **Inclusiveness** is ensured through engaging small-and-medium-sized companies and low-income developing countries.
 - **Investment:** The Investment & Infrastructure Working Group continues to work on G20 multiyear investment agenda specifically focusing on the investment strategies for infrastructure.
 - G20 Investment Narrative
 - The Turkish Presidency has asked G20 members to create a **country specific investment strategy and identify specific investment actions** in order to promote inclusive and robust growth. These strategies have **facilitators** and **safeguards** in place for supporting improvements in investment.
 - ◇ There is also a set of **voluntary practices** to promote and prioritise infrastructure investment.
 - ◇ Increased **investor involvement** is planned for long-term infrastructure financing.
 - ◇ Focus: i) how they can increase the **private sector investment**; ii) how can they improve the efficiency of the **public sector capital expenditure**.
 - Supporting improvements in investment climate
 - ◇ Creation of G20/OECD Task Force for **Long-Term Institutional Investors**
 - Facilitating Financial Intermediation
 - ◇ Local currency bond market initiatives; standardised pooling vehicle for PPPs and its applicability to Islamic finance; Zero Draft Joint Action Plan on SME financing
 - Mobilising MDB resources
 - ◇ MDB balance sheet optimisation studies
 - Legal & institutional settings: G20 Best Practice on Promoting and Prioritising Quality

Investment; Governance Framework for Infrastructure

- **Global Infrastructure Initiative; Global Infrastructure Hub**
- **Global Infrastructure Facility**
- **Asian Infrastructure Investment Bank**
- **China** – successful case study on PPP in wastewater investment
 - Risk allocation was based on a template set by central government
 - Issued RMB bond off and onshore
- Other routes of investment included a private equity fund
- Infrastructure 360 award with Harvard: will identify, assess and reward sustainable infrastructure investments made by the private sector and public-private partnerships
- **World Economic Forum** demonstrates a new model of PPP governance
 - In 2012, governments in Africa signed the program for infrastructure development. It is a political document, in which, for the first time, a continent is agreeing to a master plan endorsed by its heads of state.
 - Created a Business working group and brought key stakeholders together for implementation of the plan. They created a project prioritization methodology that helped to systematically bring the 51 projects down to eligible projects that could accelerate private sector participation.
 - The successful experience of the World Economic Forum showed that having a neutral platform that can bring public and private sector together at the highest levels to conduct preliminary project analysis in a non-competitive environment was an essential success factor in infrastructure development in EMDEs.

B. Session 2: Keynote Address “Infrastructure Investment by Multilateral Financial Institutions”



Chair for Session 2

Professor Gordon Clark

Director, Smith School of Enterprise and the Environment, University of Oxford

Keynote Speaker for Session 2

Huan Chen

Chief Officer of the Multilateral Interim Secretariat of Asian Infrastructure Investment Bank

Session 2 covered issues related to the role of multilateral financial institutions in establishing a more supportive enabling environment for infrastructure investment. The keynote address mainly focused on the new multilateral financial institution, the Asian Infrastructure Investment Bank (AIIB), including the key milestones in its establishment, its guiding principles, its initial priority investment areas, its commitments and its proposed governance structure.

➤ **The key milestones in the establishment of AIIB**

- In October 2013, Chinese President Xi Jinping and Premier Li Keqiang announced the AIIB initiative during their respective visits to Southeast Asian countries. It was envisaged that the Bank would promote interconnectivity and economic integration in the region.

- In October 2014, representatives from 22 countries signed a Memorandum of Understanding (MOU) to establish the AIIB and Beijing was selected to host its headquarters.
 - On June 29, 2015, representatives from 57 Prospective Founding Members (PFMs) of the Asian Infrastructure Investment Bank (AIIB) gathered in Beijing at a Signing Ceremony of the Bank's Articles of Agreement at the Great Hall of the People.
- **AIIB will offer:**
- **Investment** by providing financial resource, cutting-edge knowledge and global best practice
 - **Innovation** through partnerships with MDBs, governments, private sector and civil society to develop bankable projects
 - **Integration** of environmental and social sustainability as a core element of AIIB's strategy and operation
 - **Integrity** through operating AIIB in a transparent manner
 - **Insight** on emerging issues and key trends that will drive infrastructure investment and interconnectivity in Asia
- **The initial priority of investment areas for AIIB**
- Energy
 - Transport
 - Urban development
- **The commitments of AIIB**
- **Lean**, with a small but seasoned professional management cadre and highly skilled staff
 - **Clean**, a principles-based organization with zero tolerance for corruption
 - **Green**, an institution built on respect for the environment
- **The proposed governance structure of AIIB**
- The AIIB will have a Board of Governors, a Board of Directors, a President, one or more Vice-Presidents, and such other officers and staff as may be considered necessary.
 - Each member of the AIIB will appoint a Governor to represent it on the Board of Governors. All powers of the AIIB are vested in the Board of Governors. The Board of Governors can delegate any of its powers to the Board of Directors except certain reserved powers. The Board of Governors meet annually.
 - The AIIB will have 12 Directors on its Board of Directors: nine elected by regional members and three elected by non-regional members. Each Director will have an Alternate Director. The Board of Governors will adopt rules enabling a Director elected by more than a specified number of members to appoint an additional Alternate Director. The Board of Directors will function on a non-resident basis, except as otherwise decided by the Board of Governors. The Board of Directors will meet regularly in physical meetings and have online meetings as needed at other times. The Board of Directors will be responsible for the direction of the AIIB's general operations and, for this purpose, will exercise all the powers delegated to them by the Board of Governors.

More about AIIB can be found on the AIIB official website <http://www.aiib.org/>

C. Session 3: Public-Private Partnership in Infrastructure – Engaging Institutional Investors



Chair for Session 3

John Bromley

Investment Manager, L&G Capital

Speakers for Session 3

Reyaz A. Ahmad

Head and Chief Investment Officer, IFC Catalyst Fund

Professor Gordon Clark

Director, Smith School of Enterprise and the Environment, University of Oxford

Fiona Stewart

Senior Financial Sector Specialist, World Bank

Raj Kannan

President & Managing Director, Tusk Advisory Pte Ltd

Session 3 discussed how to facilitate Public-Private Partnership (PPP) infrastructure investment in the EMDEs and how to prepare bankable infrastructure projects in EMDEs for institutional investors.

- **EMDEs are rapidly growing markets with vast potential but infrastructure deficit has become major bottleneck for economic growth.** Indonesia is one of the few countries that have been growing consistently at above 5% in the last decade, and it is expected to be No. 5 in the 10 largest economies by 2030. However, Indonesia's logistics costs, at 27% of GDP, are very high compared to the average ASEAN and ASIA PACIFIC logistics costs, which are at 10%. Poor quality of roads and high levels of congestion have made Indonesia's logistics costs the highest in the region. Underinvestment in infrastructure is major bottleneck for economic growth.
- **But change is on the way. Development Finance Institutions (DFIs) and institutional investors have a key role to play in guiding the government in its mindset change towards introducing long-dated payment schemes.** For instance, the Indonesian government has established new agencies and new funding schemes for PPPs and priority projects. The new PPP Unit will be directly involved in risk sharing frameworks and the design and implementation of innovative financing schemes like the Availability Payment Scheme (APS) and Performance Based Annuity Schemes Plus (PBAS+). The introduction of long-dated financing schemes like APS & PBAS+ will provide attractive options for Indonesian institutional investors to enter infrastructure financing.
- **Nonetheless, how can EMDEs attract institutional investment in infrastructure? There are two key questions facing institutional investors (especially pension funds) when they confront infrastructure investment in EMDEs.**
 - **Do infrastructure investments fit within fiduciary responsibility?** Do they have any kind of obligation to consider long-term assets? Is there something other than financial return that they should be thinking about? These questions are yet to be fully addressed or resolved and therefore more discussions and work should be directed towards this topic.
 - **Why do institutional investors feel uncomfortable about investment in EMDEs?** Investors generally lack sufficient knowledge about EMDEs and have concerns about the investment environment. This is why multilateral financial institutions are needed to provide a more supportive enabling environment for infrastructure investment in EMDEs. For instance, the IFC's Asset Management Company (AMC) has a strong track record of infrastructure investment in EMDEs and can help to relieve investors' concerns. In addition, multilateral financial institutions can function as partners to co-invest with institutional investors.
- **Given the key questions facing institutional investors when they confront infrastructure investment in EMDEs, practical solutions are needed for prompting institutional investor action. Two critical elements apply to the solutions. One is governance; the other is institutional investor friendly PPP structure.**
 - **On the one hand, governance of institutional investors,** such as who is on the board, how they are appointed and whether the institution has a report and investment policy **is very much linked to the situation for institutional investors when investing in infrastructure assets.** Research finds that pension funds with better governance generally have more diversified and longer-term portfolios.
 - **On the other hand, institutional investor friendly PPP structure is very important to bring in institutional investors early on to think about critical issues in infrastructure investment,** such as credit ratings, refinancing risk, early payment and controlling creditors. As commercial banks have been leading on setting terms of infrastructure deals in the past, there is an urgent need for infrastructure deals to be structured in a way to achieve investment grade so that institutional investors can hold long-term debt.

- **Infrastructure is still a relatively new financial product for institutional investors.** It has not been until the last two decades that investment banks like Macquarie Bank realised that infrastructure could be bundled together and sold as a risk return proposition to investors looking for that kind of risk exposure and return. As the returns on government bonds have been shrinking, infrastructure will become more and more attractive to institutional investors. **There are four main business models for institutional investors to invest in infrastructure.**
 - **Direct model:** large institutional investors like pension funds and sovereign wealth funds own and operate the infrastructure entity or facility directly. In direct ownership, a large pension fund gets an income stream or a set of different income streams from that type of investment. Few institutional investors choose this model, because the institutional investor has to be large enough to employ an internal team who can operate the infrastructure entity well. In addition, the institutional investor needs to think about the liquidity issue in owning the infrastructure facility directly over a long period, because it is not easy to find buyers should they want to sell.
 - **Limited Partner (LP) model:** institutional investors do not own the infrastructure facility directly, but join a (private equity) club, which owns one or several infrastructure facilities. Institutional investors choose to join a club based on common incentives and the club needs to choose a General Partner (GP) who has reputation in delivering the infrastructure service well. The success of this model depends on equal ability between limited partners, trust and contracts between LP and GP. The LPs do not own the infrastructure facility directly but they share the revenues and the GP earns fees at a variety of levels in the process. It is attractive to join a club because the institutional investor can find like-minded investors and share expertise, so it is an effective vehicle. However, institutional investors need to hire other external experts such as a capital law firm that understands the agreements to be signed. The transaction costs are high on this front, so institutional investors need to think about their capacity in meeting them.
 - **Bundled untraded portfolio product model:** this is the business model used by Macquarie Group. Institutional investors are generally locked into this model for a long time before they are allowed to exit, either having lost large sums of money, smaller sums or having gained little of value because most gains have been captured by the investment bank. This untraded product, where institutional investors do not have voting rights and cannot exercise ownership rights, makes institutional investors place their trust in whoever is managing it.
 - **Universal traded portfolio product model:** buying and trading an infrastructure product on the stock market, which has specific risk and return characteristics. It is not surprising that the premium to be held on infrastructure is not realised in this kind of traded portfolio product; the premium to be held is on direct holding and ownership of the infrastructure.
 - Unfortunately, what sold in the past 20-25 years were the bundled untraded portfolio products and, more recently, the universal traded portfolio products, where the rates of return are relatively poor.

- **In the end, infrastructure is not just a financial product; it is a service for the public. Public expectations relating to the quality and nature of infrastructure services makes a significant difference to realise the rate of return for institutional investors.**

D. Session 4: Long-term Planning and Systems Thinking for Infrastructure Investment



Chair for Session 4

The Rt. Hon. Simon Upton

Director, Environment Directorate, OECD

Speakers for Session 4

Professor Jim Hall

Director, Environment Change Institute, University of Oxford

Jonathan Maxwell

Co-Founder & CEO, Sustainable Development Capital LLP

Atif Ansar

Programme Director of the MSc in Major Programme Management (MMPM)

Christopher Kaminker

Economist/Project Manager, Long Term Investment, Environment Directorate, OECD

Session 4 focused on issues related to how to facilitate long-term planning and systems thinking for infrastructure investment. Here the key challenges for infrastructure investment and long-term planning, emerging trends and recommendations/solutions are summarised.

➤ **Key Challenges in Infrastructure Investment and Long-Term Planning**

- International Energy Agency (IEA) figures project that maintaining existing levels of energy supply will cost \$40 trillion between now and 2035, under a central scenario resulting in 4°C of global warming by the end of the century. To keep to the 2°C warming goal set by policy makers, investment in low-carbon energy and energy efficiency must quadruple. Infrastructure investment will shape the way we deal with climate change today and in the future.
- There is a theoretical gap between infrastructure investment and economic growth (Tony Venables et al., at Oxford).
- IEA reports that 40% of emission reduction opportunities come from energy efficiency; the challenge is how to attract investment and to move from project-by-project funding to a systems investment approach.
- Ansar summarised the challenges of big infrastructure
 - Big infrastructure suffers from a strikingly poor economic, social, and environmental track record at the project level.
 - Cost overruns (e.g. cost overruns in dam projects) are 96% [Ansar et al., 2014 at Oxford]. Despite their seeming benefits, infrastructure projects are a resource drag and consume vast sums of public money. In addition to being costly, they take a long time to build.
 - Rent seeking on past investments: Thames Water is a relevant example
 - High debt-financed dividend payouts among UK utilities
 - RWE acquired Thames Water for £4.3 billion in 2001 (a 33% premium on Thames Water's then market capitalisation) and sold to Kemble Water in 2006 for £8.0 billion
 - RWE doubled its money on the sale in just five years
 - RWE also made substantial earnings, e.g. £346.5m in 2006—a 31% jump on the previous year
- Often private companies make significant financial gains in buying and then quickly selling undervalued infrastructures, such as water companies in the UK.
- Sustainable infrastructure is a good investment, not just for ethical reasons but also in making sound financial sense. The problems with attracting investment have related to contradictory policies, poor regulation and existing subsidies for fossil fuels, creating an uneven playing field for sustainable infrastructure projects.
- A lack of data on risk was identified, with France given as an example of a country which mandates disclosure of climate risk information by investors.

➤ **Emerging Trends**

- In energy, there is a general movement towards decentralisation, with many new governments no longer focusing on centralised energy.
- New findings show that, for long-term investors, direct investment in bankable sustainable energy infrastructure projects can deliver risk-adjusted returns that match well with the profile of liabilities and produce steady, inflation-linked cash flows.
- Institutional investors have been pulling back from southern Europe, where regulatory instability has been prevalent, and moving into northwest Europe, where policy is seen as more stable. This is not ideal because capital has a geographical bias and is not flowing where it is most needed.

➤ Recommendations/Solutions

- There is a need to think of infrastructure from a systems perspective because i) it helps us understand systemic risks that are not factored into planning decisions; ii) it provides us with a common space for negotiation for different actors to understand the services that infrastructure provides.
 - The value of systems thinking was illustrated through modelling of system failure events, where interdependencies cause failure in one infrastructure sector to propagate across other sectors owing to network/spillover effects. In these cases, economies can compensate up to a threshold, beyond which damage costs increase exponentially.
 - Optimisation models can be used to understand how investment is sensitive to different levels of risks through time.
 - The Environmental Change Institute at Oxford has mapped spatial hotspots in infrastructure vulnerability in the UK and China. The systems approach is critical, as such vulnerabilities are not simply additive across sectors and traditional silo appraisal approaches can lead to over- or underassessment of risk because network/spillover effects are not accounted for. Systems modelling can better identify optimal solutions.
 - Oxford's work on infrastructure systems is influential in moving the UK towards a systems approach to infrastructure decision making. This can be used to evaluate national strategies by developing scenarios that capture changes in demographics and economics.
 - Demand management forms an essential component of future infrastructure planning.
 - The global infrastructure gap can be addressed through a systems approach to strategy assessment coupled with an understanding of the uncertainties.
 - A systems approach in investment allows small-scale assets to be bundled together.
- Three solutions to making infrastructure investment happen:
 - Selection of technologies, whether centralising vs decentralising or the right kind of light bulbs.
 - Project Structures, specifically management and procurement strategies.
 - Financing, in terms of establishing finance structures and making projects attractive to investment.
- Dr. Ansar argued that in order to solve the challenge of infrastructure, we need to reduce the variety of projects and “put infrastructure in a box” He then gave the example of “the shipping container” as an analogy for what needs to be done with other forms of infrastructure, such as electricity generation – i.e, modularised systems.
- Dr. Ansar advanced the argument, also reported in the New York Times, that “instead of building enormous, one-of-a-kind edifices like large dams, the study's authors recommend ‘agile energy alternatives’ like wind, solar and mini-hydropower facilities. ‘We’re stuck in a 1950s mode where everything was done in a very bespoke, manual way,’ Dr. Ansar said over the phone. ‘We need things that are more easily standardized, things that fit inside a container and can be easily transported’.”
- The establishment of a green bank was proposed, to help with data challenges and “crowd-in” private capital with limited public interventions.
- In order to facilitate investment, risks must be mitigated and transactions can be encouraged by governments, thereby maintaining stable investment environments.
- Successful sustainable infrastructure investment requires:
- Policy consistency, stability, transparency and strong political ambition
- Sustainable energy projects need to be well structured, use mature technologies (price competitive), located in strong economies, and with minimal construction and development

risks.

- How to incentivise energy efficiency?
 - Regulatory: China regulated a 5% energy consumption target; Singapore wants to increase productivity
 - Market: reduce subsidies for fossil fuels
 - Supply chain

III. CONCLUSIONS/NEXT STEPS

A. Conclusions

The main messages derived from the conference are summarised below.

- **EMDEs are facing a massive infrastructure deficit.** While official development assistance from multilateral financial institutions and other regional development banks can play a part, attracting private finance to complement public funds is vital in providing governments with the long-term liquidity they need for infrastructure.
- **However, the real challenge is not a fundamental lack of capital, but rather a shortage of capital willing to invest in the more complex, longer-term and riskier investments that are typical of infrastructure projects in EMDEs.** Currently less than one per cent of pension fund assets are allocated directly to infrastructure projects, and the bulk of this is in advanced economies. This represents an untapped market for potential funding in infrastructure projects in EMDEs.
- **Two main concerns** of institutional investors when they confront infrastructure investment in EMDEs:
 - 1) **Whether infrastructure investment contributes to the broad goals of institutional investors.**
 - 2) **Institutional investors may feel that investing in EMDEs is uncertain and risky, bringing with it political, financial, social and environmental risks.**
- **Two critical elements of practical solutions for getting institutional investors moving:**
 - 1) **Governance of institutional investors**, such as who is on the board, how they are appointed, and whether the institution has report and investment policies, is very much linked to the inclination of institutional investors to invest in infrastructure assets.
 - 2) **Institutional investor friendly PPP structure** is very important to bring in institutional investors early on to think about critical issues in infrastructure investment such as credit ratings, refinancing risk, early payment and controlling creditors.
- In addition, to keep to the 2°C warming goal set by policy makers, investment in renewables and efficiency must quadruple. Infrastructure investment will shape the way we deal with climate change today and in the future. Therefore, **there is an urgent need to shift from a project-by-project approach to a systems-thinking approach for infrastructure investment** because i) it helps us understand systemic risks including climate change risks that are not factored into current infrastructure planning decisions; ii) it provides us with a common space for negotiation for different actors to understand the services that infrastructure provides.
- **Development Finance Institutions (DFIs) and institutional investors have a key role to play to guide the government in its mind-set change to introduce long-dated payment schemes.** For instance, the introduction of long-dated financing schemes like Availability Payment Scheme (APS) and Performance Based Annuity Schemes Plus (PBAS+) by the Indonesia government will provide attractive options for Indonesian institutional investors to enter infrastructure financing.

- **During the Turkish Presidency, G20 focused its efforts on ensuring inclusive and robust growth through collective action.** The Turkish Presidency has asked G20 members to create a country specific investment strategy and specific investment actions in order to promote inclusive and robust growth. These strategies have facilitators and safeguards in place for supporting improvements in investment.
- **The World Economic Forum demonstrated a new model of PPP governance for infrastructure development in Africa.** A business working group was created to bring key stakeholders together for implementation of the master plan. Additionally, a project prioritization methodology was created to help to systematically bring the 51 projects down to eligible projects that could accelerate private sector participation. The successful experience of the World Economic Forum showed that having a neutral platform that can bring public and private sector together at the highest levels to conduct preliminary project analysis in a non-competitive environment was an essential success factor in infrastructure development in EMDEs.
- **The Asian Infrastructure Investment Bank (AIIB) will provide a multilateral regional financing and investment platform for infrastructure development and improvement in Asia.** Through a participatory process, its founding members are developing its core philosophy, principles, policies, value system and operating platform. The Bank's foundation will be built on the lessons and experience of existing Multilateral Development Banks (MDBs) and the private sector. Its approach will be "lean, clean and green": lean, with a small but seasoned professional management cadre and highly skilled staff; clean, a principles-based organization with zero tolerance for corruption; and green, an institution built on respect for the environment.
- The AIIB will put in place and implement effective policies on **governance, accountability, finance, procurement, and debt sustainability** and adopt an **environmental and social framework** that draws on the experience of existing MDBs and international best practice. The Bank's strong and diverse ownership foundation will provide a sound base for enhanced development effectiveness.
- **AIIB will cooperate closely with existing MDBs and other development partners; its financing will complement and supplement their efforts.** Its areas of engagement are expected to include: energy and power, transportation and telecommunications, rural infrastructure and agriculture development, water supply and sanitation, environmental protection, urban development and logistics, and other productive sectors as deemed appropriate.
- **Academia has an important role to play including data sharing, demonstrating successful case studies in infrastructure investments and testing out new ways of thinking.** One interesting idea is to "containerise" infrastructure. (For more information, please refer to Dr Atif Ansar's work at the University of Oxford).
- **Other global efforts for facilitating sustainable infrastructure investment and development** include G20/OECD Task Force for Long Term Institutional Investors, the Global Infrastructure Initiative, the Global Infrastructure Hub, the Global Infrastructure Facility and others.

B. Next steps

The conference on “*Infrastructure Investment in Emerging Markets and Developing Economies: Systems-Thinking for New Institutions and Global Challenges*” is part of a broader initiative that aims to provide a platform for dialogue and debate among a variety of prominent experts from international organisations, multilateral development banks (MDBs), government, academia, and the private sector on issues relevant to infrastructure planning, investment, regulation, governance, institutional investors, public-private partnership (PPP) and sustainable development, among others. To help achieve this objective, we would like to establish the **Oxford International Infrastructure Consortium (OXIIC)**, to continue to bring together experts from all over the world to exchange information and knowledge on these important themes.

IV. OXFORD INTERNATIONAL INFRASTRUCTURE CONSORTIUM

Infrastructure development has, over recent decades, increasingly found itself in the spotlight of the global economy and in development agendas. In OECD countries, deteriorating and ageing infrastructure is costly to business and families, and threatens future economic growth. In EMDEs, chronic underinvestment and a deficit in infrastructure have already become the major bottleneck to economic growth. Given the importance of infrastructure on the world economy and for sustainability, there is a growing interest in understanding issues relevant to infrastructure. The lack of data and information on infrastructure is one of the main reasons why institutional investors avoid taking up their theoretical place of prominence in the market for long-term investment in infrastructure assets. Furthermore, given the effects of different institutional and cultural contexts on infrastructure investment, a platform is needed to facilitate the exchange of information and knowledge on infrastructure worldwide. Many participants in the conference have expressed an interest in establishing a platform to facilitate such dialogue and debate in this burgeoning field.

In response to this need, the Smith School of Enterprise and the Environment (SSEE), the Infrastructure Transition Research Consortium (ITRC) of the University of Oxford and the directors of the conference have proposed the establishment of the Oxford International Infrastructure Consortium (OXIIC). The consortium will aim to bring together experts from international organisations, governments, academia, financial institutions, and other public and private sectors to share their information and knowledge.

The vision of OXIIC is as follows:

- 1) To offer a world-class, impartial and supportive environment for dialogue and debate on infrastructure between academia and industry
- 2) To facilitate the exchange of knowledge, data and information on infrastructure between academia, industry and policymakers
- 3) To work effectively with other institutions and organisations, where such partnerships can lead to outstanding research and insights

Once the OXIIC has been formally established within the university and is fully operational, membership will be open to any individual or institution within the field. The rights and obligations of members of the OXIIC will be explained in the OXIIC website (under construction). Broadly members of OXIIC can benefit from, but are not limited to, the following:

- 1) Maintain contact and dialogue with a global network of leading infrastructure experts of OXIIC across a spectrum of disciplines and fields
- 2) Access to cutting-edge academic knowledge, data and information relevant to infrastructure

- 3) Exclusive access to small-scale seminars showcasing successful case studies in infrastructure investment projects
- 4) Commissioned research on desired topics by Oxford academics
- 5) Priority in attending the OXIIC conferences if spaces are limited
- 6) Enjoy discounts in activities organised by OXIIC
- 7) Organise infrastructure-related events through the platform and network of OXIIC

The website of the Oxford International Infrastructure Consortium (OXIIC) once launched will be as follows: www.oxiic.ox.ac.uk (Please note that the website may still be under construction.)

Annex I. Conference Programme

Thursday, July 2, 2015

St Catherine's College, University of Oxford

09:00

Registration

Coffee, Tea, Refreshments

10:00

Welcome and Opening Remarks

Professor Gordon Clark

Director, Smith School of Enterprise and the Environment, University of Oxford

10:15 – 11:45

Session 1: Infrastructure Investment in Emerging Markets and Developing Economies

Emerging markets and developing economies (EMDEs) are facing a massive infrastructure deficit. In these economies, the number of people living in cities is expected to double by 2030, expanding the urban population by two billion. With mass urban migration comes a rising demand for basic services such as water, power and transport. EMDEs now spend about US\$1 trillion a year on infrastructure, but maintaining current growth rates and meeting future demands would require investment of at least an estimated additional US\$1 trillion a year through to 2020. This session aims to examine and take stock of pertinent infrastructure investment issues in EMDEs: What are the key challenges and barriers to investment? What successful approaches have been developed to overcome challenges and barriers? What lessons have been learned from unsuccessful initiatives? What prospects are there for cooperation and collaboration moving forwards?

[Session Chair and Commentator:](#)

Marjory-Anne Bromhead

Natural Resources and Climate Change Adviser; Former Sector Manager, Environment and Natural Resources, World Bank

[Speakers:](#)

Hülya Paşaoğulları

Head, Public Private Partnership Department, G20 Investment and Infrastructure Working Group, Turkish Treasury

Bernard Sheahan

Director, Infrastructure & Natural Resources, International Finance Corporation

Hisaka Kimura

Unit Head, Private Sector Infrastructure Finance, East Asia, Asian Development Bank

Jean-Marc Aboussouan

Chief, Infrastructure & Energy Division, Inter-American Development Bank

Alex Wong

Head of Global Challenge Partnerships and Member of the Executive Committee, World Economic Forum

12:00 – 12:30

[Photo Session](#)

12:45 – 13:45

[Lunch](#)

14:00 – 15:00

[Session 2: Keynote Address: “Infrastructure Investment by Multilateral Financial Institutions”](#)

Reinvigorating the supply of infrastructure in EMDEs requires work to establish a more supportive enabling environment for infrastructure investment. In this context, the Global Infrastructure Facility (GIF), Global Infrastructure Hub (GIH), New Development Bank (NDB) and Asian Infrastructure Investment Bank (AIIB) have been created successively to facilitate the preparation and structuring of complex infrastructure Public-Private Partnerships in EMDEs. What are the different mandates of these new institutions and how will they prepare bankable projects for the private sector and institutional investors in practice? How will they guarantee the quality of the infrastructure delivered to foster strong, sustainable and balanced growth for EMDEs?

[Session Chair and Commentator:](#)

Professor Gordon Clark

Director, Smith School of Enterprise and the Environment, University of Oxford

[Keynote Speaker:](#)

Huan Chen

Deputy Head of Working Group for establishment of Asian Infrastructure Investment Bank

Chief Officer and Team Coordinator of THE MULTILATERAL INTERIM SECRETARIAT OF AIIB

15:00 – 15:30

Coffee Break

15:40 – 17:10

[Session 3: Public-Private Partnership in Infrastructure – Engaging Institutional Investors](#)

The demand for infrastructure investment has gone beyond the fiscal capacity of the public sector. Public-Private Partnerships (PPPs) have the potential to provide efficiencies and global best practices through market incentives that attract world-class participants. In particular, institutional investors such as pension funds, insurance companies and sovereign wealth funds with long-dated liabilities have the potential to play a larger role in markets for long-term, illiquid assets such as infrastructure. However, the real challenge is not simply a matter of money but a lack of bankable projects. What are the prospects for the global PPP infrastructure market? What has been learned from previous PPPs in the global infrastructure market? What are the major concerns of institutional investors when they face opportunities for infrastructure investment? Which areas can the multilateral financial institutions bring into play for facilitating PPP infrastructure investment in the EMDEs?

[Session Chair and Commentator:](#)

John Bromley

Investment Manager, L&G Capital

[Speakers:](#)

Reyaz A. Ahmad

Head and Chief Investment Officer, IFC Catalyst Fund

Professor Gordon Clark

Director, Smith School of Enterprise and the Environment, University of Oxford

Fiona Stewart

Senior Financial Sector Specialist, World Bank

Raj Kannan

President & Managing Director, Tusk Advisory Pte Ltd

17:10 – 17:40

Coffee Break

17:45 – 19:15

[Session 4: Long-term Planning and Systems Thinking in Infrastructure Investment](#)

As much of the infrastructure is yet to be financed and built, this “deficit” presents an unprecedented opportunity for EMDEs to plan for an efficient and sustainable infrastructure system for the long-term. Since resources are limited and infrastructure assets are interdependent, efficiency and sustainability can only be guaranteed when we understand how infrastructure projects operate as “systems” and deliver value to the economy; when we shift from simply increasing the “quantity” of potentially wasteful infrastructure investment to ensuring “quality” infrastructure that is low-carbon and climate-resilient; when we can apply the philosophy of impact investing to responsible investment in infrastructure. In years when sustainable development goals and a global climate change deal are negotiated, key questions to examine will be: How do infrastructure projects operate as systems and deliver value to the economy and society? How can we evolve from a “project-to-project” approach to a more systematic model of investment? How do we design and appraise investment pathways so that long-term risks such as climate change can be managed and so that private capital can find attractive investment propositions?

[Session Chair and Commentator:](#)

The Rt. Hon. Simon Upton

Director, Environment Directorate, OECD

[Speakers:](#)

Professor Jim Hall

Director, Environment Change Institute, University of Oxford

Jonathan Maxwell

Co-Founder & CEO, Sustainable Development Capital LLP

Atif Ansar

Programme Director of the MSc in Major Programme Management (MMPM), Saïd Business School, University of Oxford

Christopher Kaminker

Economist/Project Manager, Long Term Investment, Environment Directorate, OECD

19:30 – 20:00

[Drink Reception](#)

20:00 – 22:00

[Dinner – Hosted by Professor Gordon Clark and Professor Jim Hall](#)

Annex II. Speakers Profile

Session 1

Chair

Marjory-Anne Bromhead

Natural Resources and Climate Change Adviser; Former Sector Manager, World Bank



Marjory-Anne Bromhead has nearly 40 years of experience in development globally, but especially in the Middle East, Eastern Europe, Central Asia, and African regions. After 5 years working for consulting engineering firms and an NGO, she was with the World Bank for 30 years and is now an independent consultant. Her work has spanned the breadth of water related programs (water supply and sanitation, water for energy, irrigation, integrated water resources and ecosystems management), agriculture, land and forest management, rural and urban development, disaster risk management, climate change and environment. Building and maintaining

infrastructure responsibly has been a key part of the development agenda in all of the countries she has worked in. She managed the World Bank programmes in environment, climate change and natural resource management for Eastern Europe and Central Asia and Africa. She made key contributions to the pilot work on Climate Investment Funds and the World Bank's Green Growth Strategy. She is currently undertaking project quality reviews for the South Asia region, covering all sectors, as well as for the Global Water Practice. Born in Scotland, she attended the Universities of Oxford and Edinburgh, and has three sons.

Speakers

Hülya Paşaoğulları

Head, Public Private Partnership Department, G20 Investment and Infrastructure Working Group, Turkish Treasury



Ms Hülya Paşaoğulları is Department Head at the General Directorate of Foreign Economic Relations in the Turkish Treasury and responsible for public private partnership projects. She is also leading the policy team of G20 Investment and Infrastructure Working Group in the course of the 2015 Turkish Presidency. Before joining the PPP Department, she gained professional experience in infrastructure project finance, donor funded project/programme cycles, sovereign borrowing, guarantee mechanisms and SME finance, with a proven record of due diligence and credit cost comparison. She has leading roles in structuring finance packages and

negotiating the financial and legal terms of public projects with leading commercial banks, IFIs, development

banks and ECAs. Ms Paşaoğulları, PMP, graduated from the Department of Industrial Engineering of the Middle East Technical University in 2000. She gained her MBA-Finance degree in 2010 at the Kenan-Flagler Business School, University of North Carolina at Chapel Hill, US.

Bernard Sheahan

Director, Infrastructure & Natural Resources, International Finance Corporation



Bernard Sheahan is Director of Global Infrastructure and Natural Resources at IFC, the largest global development institution focused exclusively on the private sector. He is responsible for IFC's investments in power, transport, utilities, and extractive industries.

He joined IFC in 1986, and has previously served as Director of IFC's Infrastructure Advisory Department and IFC's Director of Strategy. He holds a Bachelor's Degree from Dartmouth College and an MBA from Harvard University.

Hisaka Kimura

Unit Head, Private Sector Infrastructure Finance, East Asia, Asian Development Bank



Hisaka Kimura is responsible for promoting and financing private sector participation opportunities in infrastructure development in East Asia. Hisaka has over 20 years of experience in managing multi-stakeholder projects in various countries, including the People's Republic of China, Mongolia, the United Kingdom, Japan, South Africa, Russia, and Central and Eastern Europe. Her areas of expertise include clean energy, urban-rural environmental infrastructure, natural resources, emergency relief and reconstruction. Previous to joining the Asian Development Bank, Hisaka worked for the European Bank for Reconstruction and Development and Ernst & Young in

London. She holds Masters degrees from London Business School in Finance and Imperial College and the University of London in Environmental Economics.

Jean-Marc Aboussouan

Chief, Infrastructure & Energy Division, Inter-American Development Bank



Mr Aboussouan works in the Structured & Corporate Finance Department of the Inter-American Development Bank. As Chief of the infrastructure division he is responsible for the financing of energy, transportation, water and sanitation, and telecommunications projects in Latin America and the Caribbean. Mr Aboussouan has over 25 years of experience in the region. Before joining the IDB, Mr. Aboussouan worked at SG in Sao Paulo and earlier in his career, held positions at J.P. Morgan in New York, and at Cegelec in Sao Paulo as an engineer on electric

dispatching systems. Mr Aboussouan holds a Masters degree in Applied Physics, a graduate degree in Computer Systems Engineering from the Pierre et Marie Curie University, Paris, and an MBA in Finance/International Business from NYU's Stern School of Business.

Alex Wong

Head of Global Challenge Partnerships and Member of the Executive Committee, World Economic Forum



Alex heads the World Economic Forum's activities related to the development of Global Challenge Partnerships, a new institutional focus by the Forum to accelerate progress on the world's most pressing global challenges that require new or expanded models of public-private cooperation. Additional responsibilities include leading the Future of the Internet Global Challenge Initiative; and since its inception in 2010, leading the Global Strategic Infrastructure initiative. Since joining the World Economic Forum in 2000, Alex's previous responsibilities have included co-leading the development and implementation of the Forum's industry strategies as head of

the Centre for Global Industries in the World Economic Forum's Geneva headquarters, and leading the Forum's programmes in the Basics & Infrastructure industries from 2006-2015, and the IT & Telecoms, Media & Entertainment industries from 2000-2006. Prior to joining the Forum, Alex worked for 12 years in a variety of professional roles at Accenture, General Motors, and the US National Parks Service. He has a degree in Mechanical Engineering from the University of Toronto, and a Masters in Public Administration from Harvard University.

Session 2

Chair

Professor Gordon Clark

Director, Smith School of Enterprise and the Environment, University of Oxford



Professor Gordon L Clark DSc (Oxon) FBA is the Director of the Smith School of Enterprise and the Environment with cross-appointments in the Saïd Business School and the School of Geography and the Environment at Oxford University. He also holds a Professorial Fellowship at St Edmund Hall, Oxford. He is, as well, Sir Louis Matheson Distinguished Visiting Professor at Monash University's Faculty of Business and Economics (Melbourne) and a Visiting Professor at Stanford University. Previous academic appointments have been at Harvard's Kennedy School of Government, Harvard Law School (Senior Research Associate), the University of Chicago, Carnegie Mellon's Heinz School and Monash University. Other honours include being Andrew Mellon Fellow at the US

National Academy of Sciences and Visiting Scholar Deutscher Akademischer Austausch Dienst at the University of Marburg.

Keynote Speaker

Huan Chen

Deputy Head of Working Group for establishment of Asian Infrastructure Investment Bank

Chief Officer and Team Coordinator of THE MULTILATERAL INTERIM SECRETARIAT OF AIIB



Mr Chen is Director General of the China CDM Fund Management Centre, Ministry of Finance (MOF), China. In 1989, he joined the MOF and since then has engaged in international financial cooperation in a number of positions in the World Bank Department and the International Department of the MOF. In 1999-2002, he worked in the Office of the Executive Director for China in the World Bank, and served as Advisor and Alternate Executive Director. Chen joined the China CDM Fund Management Centre in August 2007 as Deputy Director General, and has served in his current position since August 2011. He served in the Working Group for the

Establishment of Asian Infrastructure Investment Bank in February 2014 and worked as Chief Officer in the Multilateral Interim Secretariat for the Establishment of the Asian Infrastructure Investment Bank in 2015. He holds a Bachelors Degree in English Literature and Masters Degree in Economics.

Session 3

Chair

John Bromley

Investment Manager, L&G Capital



John is an Investment Manager responsible for direct investment in the energy and infrastructure sectors at Legal & General. John began his career working for UK utility companies Anglian Water and then Severn Trent Water in both operational and commercial roles, before joining Ernst & Young's Infrastructure and Project Finance group (2004-2008). During that time he advised public and private sector clients on infrastructure projects including waste recycling, energy from waste and renewable energy technologies. In 2008 he joined John Laing to manage equity investments in UK and Australian infrastructure sectors before moving to Triodos

Investment Management in 2011 to focus exclusively on the European renewable energy market. John took over as Fund Manager of the institution-backed Ampere Equity Fund in 2013, completing the investment phase

for the portfolio of 15 utility-scale renewable energy assets (700MW) located across Europe and leading the Fund's participation in the 346MW Walney Off-shore Wind Farm. In 2014 John was appointed as a Director at GreenPower International, an independent renewable energy developer and operator owned by a highly regarded entrepreneur, before taking up his current role in Direct Investments at Legal and General earlier this year.

John studied Geography at Nottingham University, completed an MBA at Nottingham Trent University and recently participated in the Oxford Chicago Booth Valuation Programme.

Speakers

Reyaz A. Ahmad

Head and Chief Investment Officer, IFC Catalyst Fund



Reyaz joined AMC in September 2010 as Chief Investment Officer and Head of AMC's Fund of Funds group. He joined IFC in 1987 in the Energy Unit and worked on oil and gas projects in Asia, the Middle East and Latin America. From 1992 through 1999, he worked in IFC's Corporate Finance Services Department, focusing on privatization advisory transactions across a range of infrastructure and non-infrastructure sectors. In 2000, Reyaz took an external assignment as Vice-President, Strategy of Softbank Emerging Markets, a \$200 million VC fund, returning to IFC in 2002 as Manager of the Global Information & Communication Technologies Department. From 2003 until he joined AMC, he headed the sector team responsible for IFC's investments globally in solar, wind and other renewables energy supply chains, and energy-efficient machinery. Previously, Reyaz worked at the Boston Consulting Group, SG Warburg Securities and Courtaulds PLC. Reyaz holds a BA and MA (with Honours) in Engineering and Economics from Queens' College, Cambridge University and an MBA from INSEAD.

Fiona Stewart

Senior Financial Sector Specialist, World Bank



Fiona Stewart works for the World Bank's Finance and Markets Global Practice, providing policy advice on pension reform to governments around the world. Previously, she worked for the OECD's Financial Affairs Division for eight years and led the Secretariat of the International Organisation of Pension Supervisors (IOPS), an international body representing over 60 countries, dedicated to cooperation and research on pension supervisory issues. Prior to working at the OECD, Fiona worked in the investment industry. As head of American Express Asset Management in Japan she was responsible for investing \$2bn in Asian equity markets, and, as part of an international team, for managing \$20bn globally. She holds degrees from Oxford and Johns Hopkins Universities and a Chartered Financial Analyst qualification. She also served on the advisory board of one of the OECD's own pension funds.

Raj Kannan

President & Managing Director, Tusk Advisory Pte Ltd



Raj Kannan is the managing director of Singapore-based Tusk Advisory Private Limited (Tusk), which owns PT Tusk Advisory in Indonesia. He has over 25 years' experience in developing and advising on US\$15 billion worth of transactions in infrastructure, especially PPP projects in the Asia Pacific region. Raj has advised governments, state-owned enterprises and private corporations on deals in a myriad of infrastructure sectors including highways, urban transport, water and social infrastructure projects in Australia, China, India, Indonesia, Malaysia, Sri Lanka and The Philippines. Before founding Tusk, Raj was the executive director of an Australian infrastructure transactions management firm and prior to that he was the executive director of a Malaysian infrastructure conglomerate listed on the Kuala Lumpur Stock Exchange.

In recent years he has led the transformation of SOEs, establishment of infrastructure regulators and infrastructure bank and infrastructure-related M&As for multinationals and investment funds investing in Indonesia. He also led the development of Indonesia's 5-year plan called RPJMN 2015-2019 and he is currently the lead strategic adviser to the Indonesian Coordinating Ministry of Economic Affairs on the delivery of the government's priority infrastructure projects.

Raj is an alumnus of the Australian Graduate School of Management at the University of New South Wales, Sydney and holds a Bachelor's degree in civil engineering. Raj recently completed a postgraduate Diploma in Strategy and Innovation from the University of Oxford's Said Business School and he also completed an executive program in "Infrastructure in a Market Economy" from the Kennedy School of Government at Harvard University.

Session 4

Chair

Simon Upton

The Rt. Hon. Director, Environment Directorate, OECD



Simon Upton is the Environment Director at the Organisation for Economic Cooperation & Development (OECD). The Environment Directorate is responsible for Environmental Performance Reviews of Member Countries, the economic analysis of policy instruments used to improve environmental outcomes and a wide range of work related to water, biodiversity, climate and chemicals. He has played a key role in the development of the OECD's Green Growth Strategy. Mr Upton is a New Zealander and former Member of Parliament. He held a variety of ministerial offices between the years 1990 and 1999, notably the Environment and Research, Science & Technology portfolios. He chaired the UN Commission on Sustainable Development in 1999. He chaired the

Round Table on Sustainable Development at the OECD between 1998 and 2014, and became Environment Director at the OECD in 2010. He holds a BA and LLB (Hons) degrees from the University of Auckland, New Zealand, and an M.Litt from the University of Oxford. He is a Rhodes Scholar and Privy Councillor.

Speakers

Professor Jim Hall

Director, Environmental Change Institute, University of Oxford



Professor Jim Hall FREng is Director of the Environmental Change Institute in the University of Oxford. His research focuses upon management of climate-related risks in infrastructure systems, in particular relating to various dimensions of water security, including flooding and water scarcity. He currently leads the UK Infrastructure Transitions Research Consortium (ITRC), which is funded by a £4.7million Programme Grant for EPSRC and is developing and demonstrating a new generation of system simulation models and tools to inform analysis, planning and design of national infrastructure. Jim is a member of both the panel conducting the

Institution of Civil Engineers (ICE)'s 2014 State of the Nation's Infrastructure Assessment and the Engineering Policy Committee of the Royal Academy of Engineering. He has been awarded the George Stephenson Medal, the Robert Alfred Carr Prize and the Frederick Palmer Prize of the Institution of Civil Engineers for his work on flooding and coastal erosion, and the Lloyds Science of Risk prize for the work of his team on climate risk analysis. He was co-chair of the OECD-GWP Task Force on Water Security and Sustainable Growth.

Jonathan Maxwell

Co-Founder & CEO, Sustainable Development Capital LLP



Jonathan is the CEO and Co-Founding Partner of Sustainable Development Capital LLP. He has completed over 45 investment vehicle transactions over the last 16 years involving investment in infrastructure, private equity, real estate and listed securities. During this time he has worked on investments in Europe, the Middle East, Asia and the Americas. At SDCL he has advised on the formation of a number of investment vehicles involving total capital raised of approximately US\$600 million. He has also served as an advisor to governments, to the United Nations Environment Programme Finance Initiative and is a director and trustee of the Institute for

Sustainability in the UK. Jonathan was previously Director of Business Development for HSBC's real estate and infrastructure investment arm, where he managed a diverse range of successful investment transactions. Jonathan graduated with a degree in Modern History from Oxford University.

Atif Ansar

Programme Director of the MSc in Major Programme Management (MMPM), Saïd Business School, University of Oxford



A Fellow of Keble College, Atif is Programme Director of the MSc in Major Programme Management (MMPM) at the Saïd Business School. The MMPM is a two-year, part-time, course that attracts senior executives from around the world who lead major programmes across various arenas: large-scale infrastructure, major ICT, business change, urban development, defence equipment, big science, or major events. Atif has been a fixture at the University of Oxford since 2006. From 2006-2010 he undertook his DPhil (PhD), at Brasenose College, with the prestigious Clarendon Scholarship from Oxford University Press. Atif was a post-doctoral

Research Fellow from 2010-2013 with Professor Bent Flyvbjerg at the BT Centre for Major Programme Management at Saïd Business School, then from 2013-2015 he served as a Lecturer at the Blavatnik School of Government and Cohort Manager of the Major Projects Leadership Academy (MPLA). Atif previously undertook his Bachelor's degree at the School of Foreign Service at Georgetown University where he majored in Philosophy, Politics, and Economics.

Christopher Kaminker

Economist/Project Manager, Long Term Investment, Environment Directorate, OECD



Christopher Kaminker is an economist at the OECD. He leads the OECD Project on Institutional Investors and Green Growth and co-directs the OECD Green Investment Financing Forum. His published research focuses on the role of institutional investors in financing sustainable energy, mobilising the capital markets for infrastructure investment, and sustainable energy finance policy. His research has been featured in The Economist, Institutional Investor, Euromoney, Investment & Pensions Europe, Institutional Real Estate, and other media. Prior to his appointment at the OECD in 2010, Christopher worked in investment banking across institutional sales and

trading, principal investing and advisory roles at Société Générale and Goldman Sachs. Christopher is a PhD candidate at Oxford University under the supervision of Prof. Gordon Clark and graduated from the School of International and Public Affairs at Columbia University with a Master's in international energy management and finance policy.

Annex III. Conference Organisers



Yin Yang
Xi Hu
Michael J Dangerfield
Christopher Kaminker

Yin Yang



Yin Yang is a D.Phil. (doctoral) candidate at the University of Oxford under the supervision of Professor Gordon Clark. His doctoral research “The economic geography of urban infrastructure investment and governance – a comparison of Beijing and London” is focused on how different political, legal and governance frameworks influence the decision-making process of urban infrastructure investment and the performance of urban infrastructure provision. As an economic geographer, he is interested in infrastructure investment, governance, regulation, urban development, institutional investors, climate change and sustainable development. He is a member of the Association of American Geographers (AAG) and the Royal Geographical Society (with the Institute of British Geographers). He co-organised the special session on ‘Geographies of Urban Infrastructure’ at the AAG 2014 Annual Meeting in Tampa, US and gave a presentation at the International Symposium for Next Generation Infrastructure in Vienna in 2014. Yin once worked for the China Development Bank, the largest national infrastructure bank in China with RMB8.19 trillion (~USD1.36 trillion) assets under management. He holds a BEng in Hydrology and Water Resources Engineering from Wuhan University and a MEng in Environmental Engineering from Huazhong University of Science and Technology.

Xi Hu



Xi is a doctoral student at the Environmental Change Institute (ECI) and the Senior Wai Seng Scholar at the Asian Studies Centre, University of Oxford. Her research focuses on understanding the infrastructure development process in China, how the Chinese infrastructure system is vulnerable to climate change impacts such as flooding and droughts and what the adaptation implications are for policy makers. During her PhD, she has worked as an energy modeller for the UK Infrastructure Transitions Research Consortium; interned as a climate adaptation researcher with the Chinese National Development and Reform Commission and facilitated dialogues between Oxford and government agencies such as the Chinese Ministry of Water Resources. Her research has been presented at numerous conferences relating to infrastructure, including the International Symposium for Next Generation Infrastructure and the Second International Conference on Vulnerability and Risk Analysis and Management. Before joining Oxford, Xi conducted policy research at the Chinese Ministry of the Environment and Ministry of Land and Resources on both domestic and global levels. She also worked at the International

Finance Corporation (IFC) on Sino-African relations, the UK-India Business Council on corporate social responsibility, and as an analyst at Legal & General on investing in China. Xi holds a BSc in Environmental Policy with Economics and an MSc in Environmental Economics and Climate Change from the London School of Economics.

Michael J Dangerfield



Michael is a DPhil candidate at the University of Oxford, a postgraduate fellow of the Royal Geographical Society (RGS) and an associate of the Royal College of Science (RCS). As a legal, political and economic geographer his research focuses on the impact of resource extraction and infrastructure development on labour market regulation, functionality and indigenous systems of governance. His doctoral thesis examines Arctic development in the context of Greenland's emergence as a resource frontier and the impact of foreign direct investment on the island's evolving political ecology and labour market. During his PhD Michael has helped to formulate and articulate British Arctic policy by presenting his research in his capacity as a member of the British delegation to the 2014 Arctic Circle Assembly led by James Grey MP and by submitting evidence to the 2015 House of Lords Arctic Committee Report chaired by Lord Teverson. Michael is also a contributor to Oxford Analytica (OA) on matters relating to Arctic politics and policy. In addition to his role as Director of the Oxford International Infrastructure Consortium (OXIIC) Michael is a steering committee and founding member of the Oxford University Polar Forum (OUPF). Prior to embarking on his doctorate Michael was formally an external collaborator with the Employment Trends (EMP/TRENDS) Team at the United Nation's International Labour Organization (ILO). Over a period of seven years', he worked on the development of the Global Employment Trends (GETs), the Key Indicators of the Labour Market (KILM) and more broadly the measurement of the Millennium Development Goals (MDGs) employment indicator targets. Michael holds an MSc in Environmental Technology from Imperial College London, a BA (Hons) in Land Economy from the University of Cambridge and a postgraduate certificate in Nanotechnology and applied quantum physics from the University of Oxford.

Annex IV. List of Delegates

Title	First Name	Last Name	Affiliation
Mr	Russell	A Bishop	Global Commission on Economy and Climate
Mr	JP	Agrawal	Derivatives Value Advisors Ltd
Dr	Nihan	Akyelken	University of Oxford
Mr	Alo	Al-Ansari	Business owner
Mr	Mohammed	Al-Saffar	HM Treasury
Mr	Wissam	Anastas	Deutsche Asset & Wealth Management
Mr	Simone	Anzboeck	AECOM, , International Development
Dr	William	Arthur	Oxford Analytica
Mr	Pablo	Astudillo	School of Geography and the Environment, University of Oxford
Mr	Dominic	Behar	University of Oxford
Mr	Edoardo	Borgomeo	Water Programme, School of Geography and the Environment, University of Oxford
Ms	Jamie Lynne	Boutilier	Saïd Business School, University of Oxford
Mr	Garry	Bowditch	SMART Infrastructure Group, University of Wollongong, Australia
Mr	Ian	Brenkley	AECOM
Mr	Ben	Caldecott	Smith School of Enterprise and the Environment, School of Geography and the Environment, University of Oxford
Mr	Robert	Carlsson	Environmental Change Institute, School of Geography and the Environment, University of Oxford
Mr	Peter	Chamley	Arup Group Limited
Ms	Georgina	Chandler	School of Geography and the Environment University of Oxford
Mr	Abrar	Chaudhury	University of Oxford
Mr	Raj	Chaudri	University of Oxford
Mr	Gareth	Cooper	International Project Finance Association (IPFA)
Mr	Tim	Crosland	Barrister

Ms	Caryn	Davies	Saïd Business School, University of Oxford
Ms	Zaira	De Oliveira	Oxford Brookes University
Ms	Priyanka	Deouza	Saïd Business School, University of Oxford
Ms	Xiang	Dong	Xinhua News Agency
Ms	Lara	Doubell	Department of Social Policy and Intervention, University of Oxford
Mr	Rowan	Douglas	Willis
Ms	Xuelian	Duan	China Radio International London Bureau (Journalist)
Mr	Ian	Dunham	University of Oxford
Mr	Christopher	East	Green Templeton College
Miss	Shira	Eting	School of Geography and the Environment, University of Oxford
Ms	Sian	Evans	University of Oxford
Ms	Irina	Fedorenko	Green Templeton College, University of Oxford
Mr	David	Fischer	School of Geography and the Environment, University of Oxford
Mr	Donald	Furman	Independent consultant
Miss	Linda	Geaves	Environmental Change Institute, School of Geography and the Environment, University of Oxford
Dr	Michael	Gilmont	University of Oxford
Mr	Ryan	Glasgo	University of Oxford
Mr	Alex	Green-Wilkes	Institution of Civil Engineers
Mr	Gonzalo	Griebenow	University of Oxford
Mr	Robert	Gross	Berwin Leighton Paisner LLP
Mr	Feisal Yusup	Habibie	OXIS
Miss	Adelina	Halim	University of Oxford
Mr	Mark	Harvey	Department for International Development (DFID), UK Government
Dr	Shuaishuai	He	School of Geography and the Environment, University of Oxford
Mr	Yun	He	Saïd Business School, University of Oxford
Mr	Christian	Holkeboer	Saïd Business School, University of Oxford

Ms	Lili	Huang	Progressive TSL
Dr	Chris	Humphrey	University of Zurich
Mr	Ivaylo	laydjiev	Blavatnik School of Government, University of Oxford
Mr	Takeshi	Inagawa	Environmental Change Institute, School of Geography and the Environment, University of Oxford
Dr	Matthew	Ives	University of Oxford
Mr	Huadong	Jiang	China Economic Daily
Dr	David	Johnstone	School of Geography and the Environment, University of Oxford
Mr	Tunde	Karim	Director
Mr	David Martin	Kayondo	St. Catherine's College, University of Oxford
Mr	James	Kelly	Australian High Commission
Ms	Nadia	Khamis	Saïd Business School, University of Oxford
Mr	Karan	Khanna	University of Oxford
Mr	Ashley	Kingsborough	University of Oxford
Mr	Ed	Klinger	Saïd Business School, University of Oxford
Mr	Deepak	Kumar	University of Oxford
Mr	Christopher	Kutarna	University of Oxford
Ms	Lily	Lai	Gingko Tree
Ms	Jessica	Leigh	Environmental Change Institute, School of Geography and the Environment, University of Oxford
Miss	Mo	Li	University of Oxford
Miss	Yingqi	Li	Journalist
Mr	Xiawei	Liao	University of Oxford
Mr	Yingqi	Liu	Environmental Change Institute, School of Geography and the Environment, University of Oxford
Ms	Cecily	Liu	China Daily
Miss	Qiong	Lu	University of Oxford
Ms	Shali	Lu	School of Geography and the Environment, University of Oxford
Mr	Alex	Ma	Saïd Business School, University of Oxford

Mr	Andrew	Maclean	DFID and Private Infrastructure Development Group (PIDG), UK Government
Miss	Jenny	McArthur	University College London
Dr	Christine	McCulloch	School of Geography and the Environment, University of Oxford
Dr	Caitlin	McElroy	Smith School of Enterprise and the Environment, School of Geography and the Environment, University of Oxford
Mr	Sean	McKeon	Saïd Business School, University of Oxford
Mr	Bryan	McLure	City University
Mr	Andrew	McNab	Independent Sustainability Adviser
Mr	Mark	Miller	Overseas Development Institute
Ms	Helen	Miller	Berwin Leighton Paisner
Dr	Alex	Money	Smith School of Enterprise and the Environment, School of Geography and the Environment, University of Oxford
Dr	Mohammad	Mortazavi-naeini	University of Oxford
Mr	Laurent	Nahmias-Leonard	University of Oxford
Mr	Nikhil	Nair	University of Oxford
Ms	Claudia	Neuschulz	School of Geography and the Environment, University of Oxford
Mr	Gavin	Newton	Willis Limited
Mr	Devin	O'Brien	University of Oxford
Ms	Thanti	Octavianti	School of Geography and the Environment, University Oxford
Ms	Lara	Pace	Global Cyber Security Capacity Centre, , Oxford Martin School, University of Oxford
Mr	Prashant	Pandey	Graduate Student
Dr	Raghav	Pant	University of Oxford
Mr	Huw	Pohlner	University of Oxford
Mr	Robert	Potts	Oxford China Centre
Dr	Richard	Powell	School of Geography and the Environment, University of Oxford
Mr	Rudolph	Retief	University of Oxford
Dr	James	Rydge	Global Commission on the Economy and Climate
Mr	Faraidon	Saheb-Zadha	3i

Ms	Hazel	Sanger	Atlanta Society of Finance & Investment Professionals
Mr	Sanjoy	Sankaran	Saïd Business School, University of Oxford
Mr	Mike	Simpson	University of Oxford
Dr	Yang	Song	Northeast Normal University, China
Mr	Abhay	Soorya	University of Oxford
Mr	Matthew	Stainer	Portcullis Public Affairs
Mr	Timothy	Stiff	IMC Worldwide
Mr	Bo	Sundstrom	UK Department for International Development (DFID)
Mr	Graham	Thrower	Newcastle University
Ms	Laura-Marie	Töpfer	Smith School for Enterprise and the Environment School of Geography and the Environment, University of Oxford
Mr	James	Tunningley	University of Oxford
Ms	Briony	Turner	ARCC (UKCIP), School of Geography and the Environment, University of Oxford
Ms	Liwen	Wang	University of Oxford
Ms	Frances	Wang	Environmental Change Institute, School of Geography and the Environment, University of Oxford
Mr	Xiaoyang	Wang	School of Geography and the Environment, University of Oxford
Mr	John	Ward	Vivid Economics Ltd
Mr	Garth	Watson	Standards & Legal
Ms	Xuhong	Xu	China State-owned Asset Supervision and Administration Commission
Dr	Ji	Yu	China Executive Leadership Academy, Pudong
Mr	Zichen	Zhang	School of Geography and the Environment, University of Oxford
Ms	Chunyan	Zhang	China Daily UK
Miss	Mingkang	Zhao	University of Oxford
Mr	Qianxian	Zhou	Xinhua News Agency

Annex V. Sponsorship

Sponsors

This conference was co-sponsored by the UK Infrastructure Transitions Research Consortium (ITRC), the Smith School of Enterprise and the Environment (SSEE), and the Environmental Change Institute (ECI) at the University of Oxford.

The conference was jointly led by Professor Jim Hall and Professor Gordon Clark, Director of the ECI and SSEE respectively.

The Long-Term Investment Programme at SSEE, University of Oxford

The Long-Term Investment Programme at the Smith School of Enterprise and the Environment (SSEE) in the University of Oxford aims to deliver outstanding academic research to financial institutions such as asset managers, pension funds, insurance companies, and family offices, and to tackle the most pressing questions regarding sustainable long-term investment. Closely collaborating with the University of Oxford's Saïd Business School and the Global Projects Centre at Stanford University, the Smith School is concerned with providing the answers to the research issues that need global collaboration such as climate change, environment and infrastructure.

The UK Infrastructure Transitions Research Consortium (ITRC), Environmental Change Institute, University of Oxford

The UK Infrastructure Transitions Research Consortium (ITRC) is developing a new generation of infrastructure system simulation models and tools to inform the analysis, planning and design of National Infrastructure (NI). Working with partners in government and industry, their research examines energy, transport, water, waste, and information and communication technologies (ICT) systems at a national scale to:

- develop new methods for analysing performance, risks and interdependencies
- provide a virtual environment in which to test strategies for long-term investment
- understand how alternative strategies perform under constraints such as reliability and security of supply, cost, carbon emissions, and adaptability to demographic and climate change
- develop risk analysis models to test infrastructure systems' ability to withstand extreme weather shock events, and so inform long-term risk assessment and adaptation planning

