

Barriers and Opportunities for the Cities

Parallel Session 3-1: - Barriers and opportunities of
financing/investing in mitigation and adaptation

Tomonori SUDO

Senior Research Fellow,
JICA Research Institute

LCS-RNet Annual Meeting, Rome, October 1-2, 2014

Today's contents

- Assessing climate change and Cities – ongoing work of 2nd Assessment Report on Climate Change and Cities (ARC3-2)
- Barriers and opportunities of finance in mitigation and adaptation in Cities – Discussions and key messages so far



URBAN CLIMATE CHANGE RESEARCH NETWORK

About UCCRN

- The Urban Climate Change Research Network (UCCRN) is a consortium of over 550 individuals dedicated to the analysis of climate change mitigation and adaptation from an urban perspective.
- UCCRN aims to institutionalize a sustained state-of-the-knowledge assessment process of climate change science, tailored for urban needs while drawing on the experience of cities as they act to adapt to and mitigate the impacts of climate change and disaster risk.
- The UCCRN leads the Assessment Report on Climate Change and Cities (ARC3), an ongoing assessment process that creates cutting-edge synthesis of scientific, economic, and planning-related research and promotes knowledge-sharing among researchers and urban decision-makers and other stakeholders on mitigation and adaptation in cities.

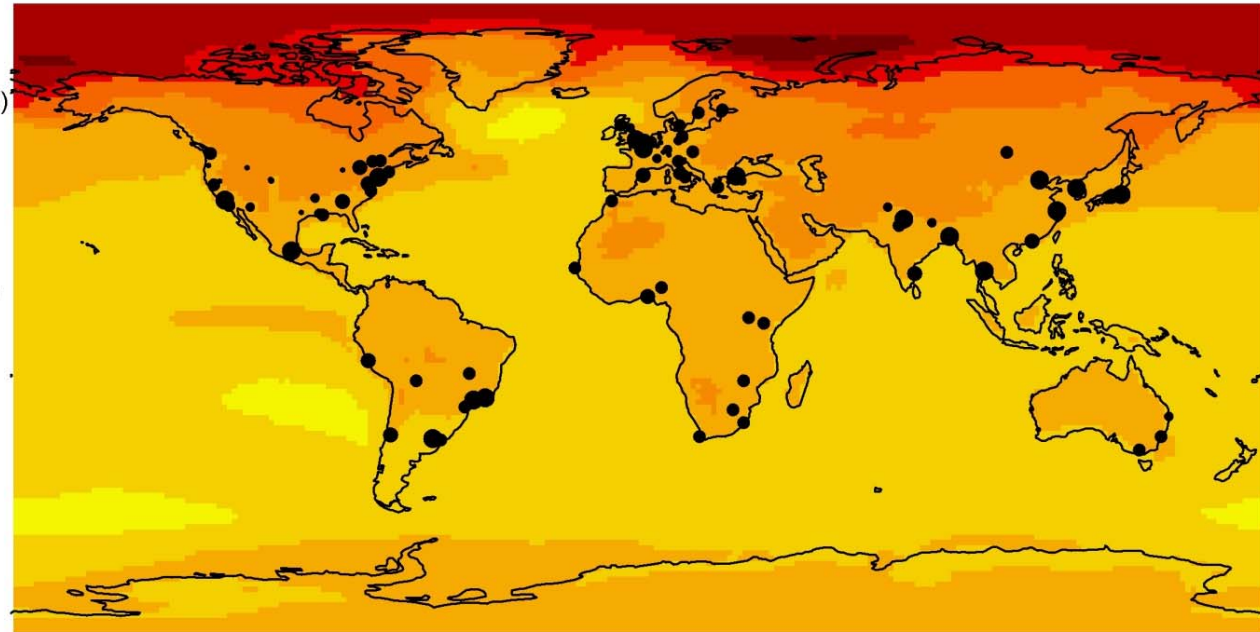
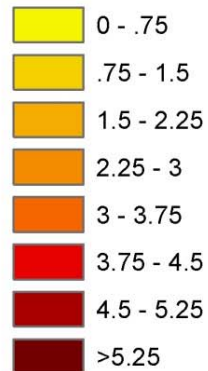
Temperature Change (2050s) and UCCRN Member Cities

City Size

Population of Metro Area

- Small (<500,000)
- Intermediate (500,000-1,000,000)
- Big (1,000,000-5,000,000)
- Large (5,000,000-10,000,000)
- Mega (>10,000,000)

Temperature Change (Degrees C)



UCCRN Member Cities

Africa

Abuja
Cape Town
Dakar
Durban
Harare
Johannesburg
Kampala
Nairobi
Rabat
Setif
Sfax
Lagos

Asia

Bangkok
Beijing
Chennai
Delhi
Dhaka
Eskisehir
Hong Kong
Jaipur
Kathmandu
Kyoto
Nagoya
Ningbo

Australia/Oceania

Gold Coast
Melbourne
Parkville
Sydney
Townsville
Wellington
Wembley

Europe

Aalborg
Athens
Barcelona
Berlin
Bonn
Bristol
Brussels
Copenhagen
Enschede
Exeter
Freiburg
Geneva
Glasgow
Groningen
Helsinki
Istanbul
Kokkola
Leipzig
London
Luxembourg
Naples
Newcastle upon Tyne
Oxford
Paris
Peterborough
Planken
Potsdam
Rome
Stockholm
Stuttgart
Tallinn
Trieste
Venice
Vienna

North America

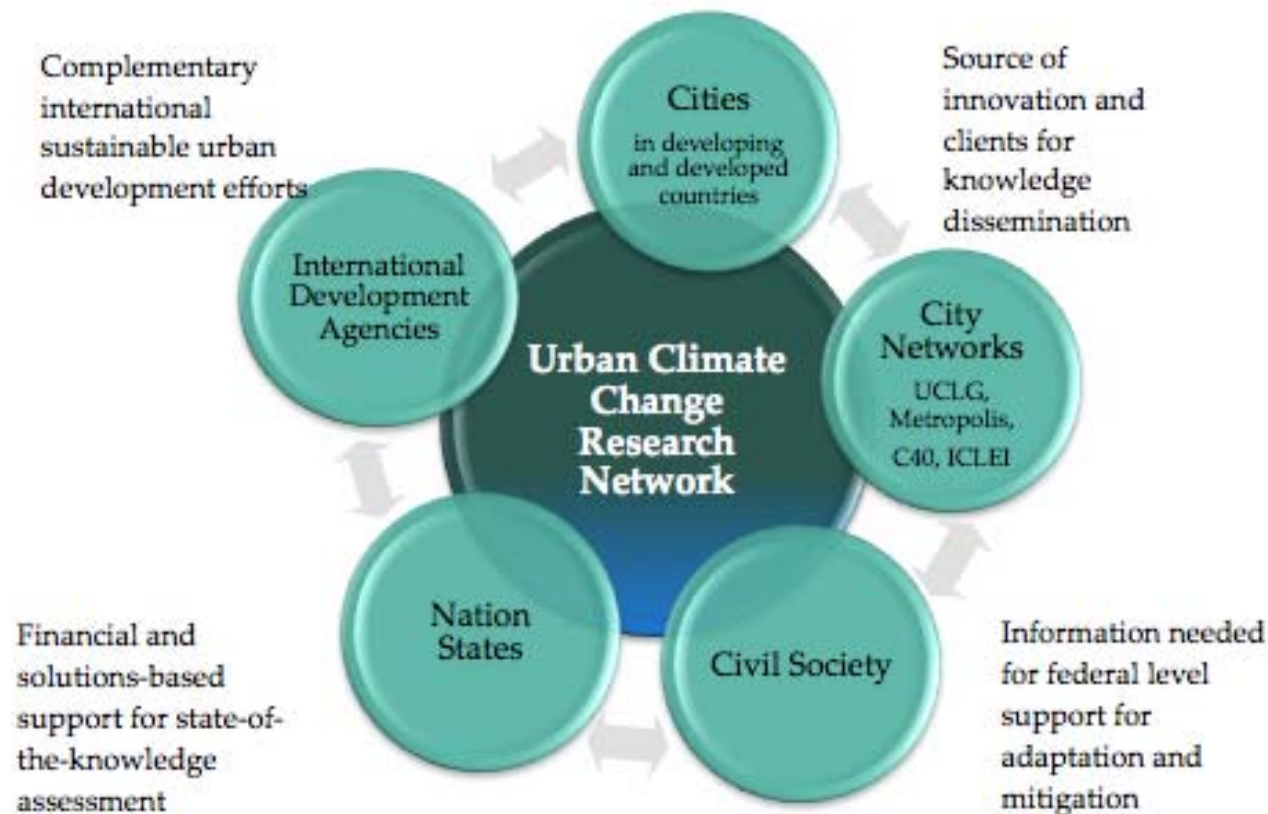
Amherst
Atlanta
Aurora
Baton Rouge
Boston
Boulder
Cambridge
College Park
College Station
East Lansing
Englewood
Eugene
Guelph
Hauppauge
Idaho Falls
Kingston
Los Altos
Los Angeles
Martinez
Mexico City
Montreal
Mountain View
New Haven
New Orleans
New York
Norfolk
North Little Rock
Nyack
Ottawa
Reno
Sacramento
Saint Catherines
San Diego
Seattle
Toronto
Tucson
Washington DC
Yardley

South America

Brasilia
Buenos Aires
Concón
Curitiba
Lima
Montevideo
Rio de Janeiro
Santa Cruz
Santiago
Sao Paulo

*colors represent mean annual temperature change for a mid-range scenario (RCP4.5) from CMIP5 models (2040-2069 average minus 1971-2000 average).
(35 CMIP5 models)

UCCRN Stakeholders



New and Existing UCCRN Partners

- **Durban Adaptation Charter** – MOU signed to be a key knowledge provider for their cities; in discussions to establish Latin American hub
- **C40** – Technical Advisory Group; Climate Change Hazard Typology
- **LSE Cities** – ARC3 material in Lord Stern's New Global Climate Economy report, released September 2014
- **UN-SDSN** – Co-leading Thematic Group for Sustainable Cities and the campaign for a stand-alone Urban SDG
- **ICMA/CityLinks** – To provide climate science to city teams; embedding UCCRN experts in city governments; trainings on the ground with UCCRN
- **UN-Habitat** – Using UCCRN 'Speakers Bureau', a list of ~40 names of UCCRN experts from around the world, on the ground, to speak at local panels and meetings
- **ICLEI Latin America** – In discussion to lead research in Latin American hub, in conjunction with USAID, DAC, Inter-American Development Bank



URBAN CLIMATE CHANGE RESEARCH NETWORK

UCCRN ARC3-2 Co-Editors

Cynthia Rosenzweig

NASA Goddard Institute for Space Studies

William D. Solecki

CUNY Institute for Sustainable Cities, Hunter-CUNY

Shagun Mehrotra

Milano at the New School University

Shobhakar Dhakal

Asian Institute of Technology

Paty Romero-Lankao

National Center for Atmospheric Research

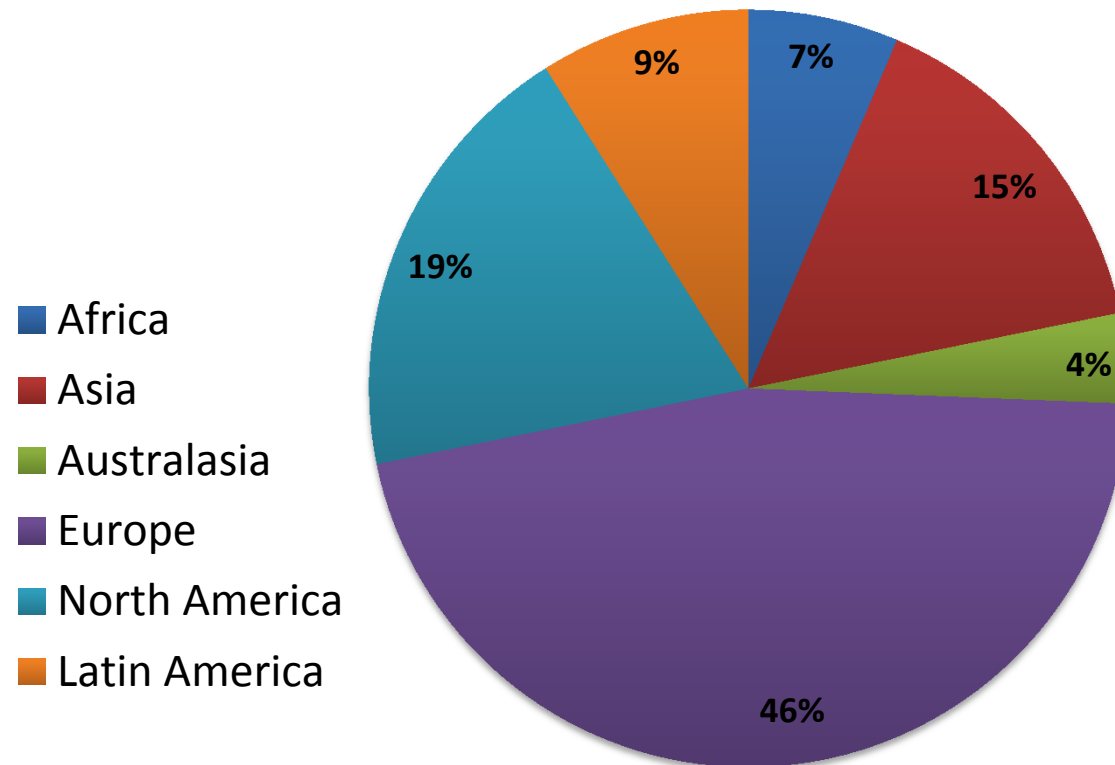
UCCRN Program Manager

Somayya Ali Ibrahim

Earth Institute, Columbia University

ARC3-2 Midterm Workshop Participants

Total Participants: 78
Number of Countries: 42



Developing Nations:
24 participants (31%)

Developed Nations:
54 participants (69%)

Male:
46 participants (59%)

Female:
32 participants (41%)

ARC3-2 Process

An **Open** Process

- Interactive with stakeholders
- Drawing on both peer-reviewed and practitioner literature
- Active in the regions during the process
- Focusing on communication and outreach



ARC3-2 Outline

Highlights on:

- Urban Demographics
- Urban Food Systems
- Sustainable Production and Consumption
- Attitudes, Perception, and Behavior
- Information and Communications Technology
- Transformation

ARC3-2 Outline

Front Matter: Co-Editor Bios, Pull-Out Quotes, Title Page, Table of Contents, Forewords, Preface

Summary for Urban Decision-Makers

Chapter 1 – Introduction

Section I: Cross-Cutting Themes for Climate Change and Sustainable Development

Chapter 2 – Urban Planning and Design

Chapter 3 – Mitigation and Adaptation: Barriers, Bridges, and Co-Benefits

Chapter 4 – Equity and Environmental Justice

Chapter 5 – Economics, Finance, and the Private Sector

Section II: Climate Science and Disaster Risk

Chapter 6 – Urban Climate Science

Chapter 7 – Disasters and Risk

Section III: Urban Sectors and Systems

Chapter 8 – Urban Energy

Chapter 9 – Water, Wastewater, and Sanitation

Chapter 10 – Urban Solid Waste Management

Chapter 11 – Urban Transportation

Chapter 12 – Housing and Informal Settlements

Chapter 13 – Urban Health

Section IV: Urban Ecosystems, Food, and Coastal Zones

Chapter 14 – Urban Ecology, Biodiversity, and Ecosystem Services

Chapter 15 – Urban Areas in Coastal Zones

Section V: Governance and Policy

Chapter 16 – Governing Carbon and Climate in Cities

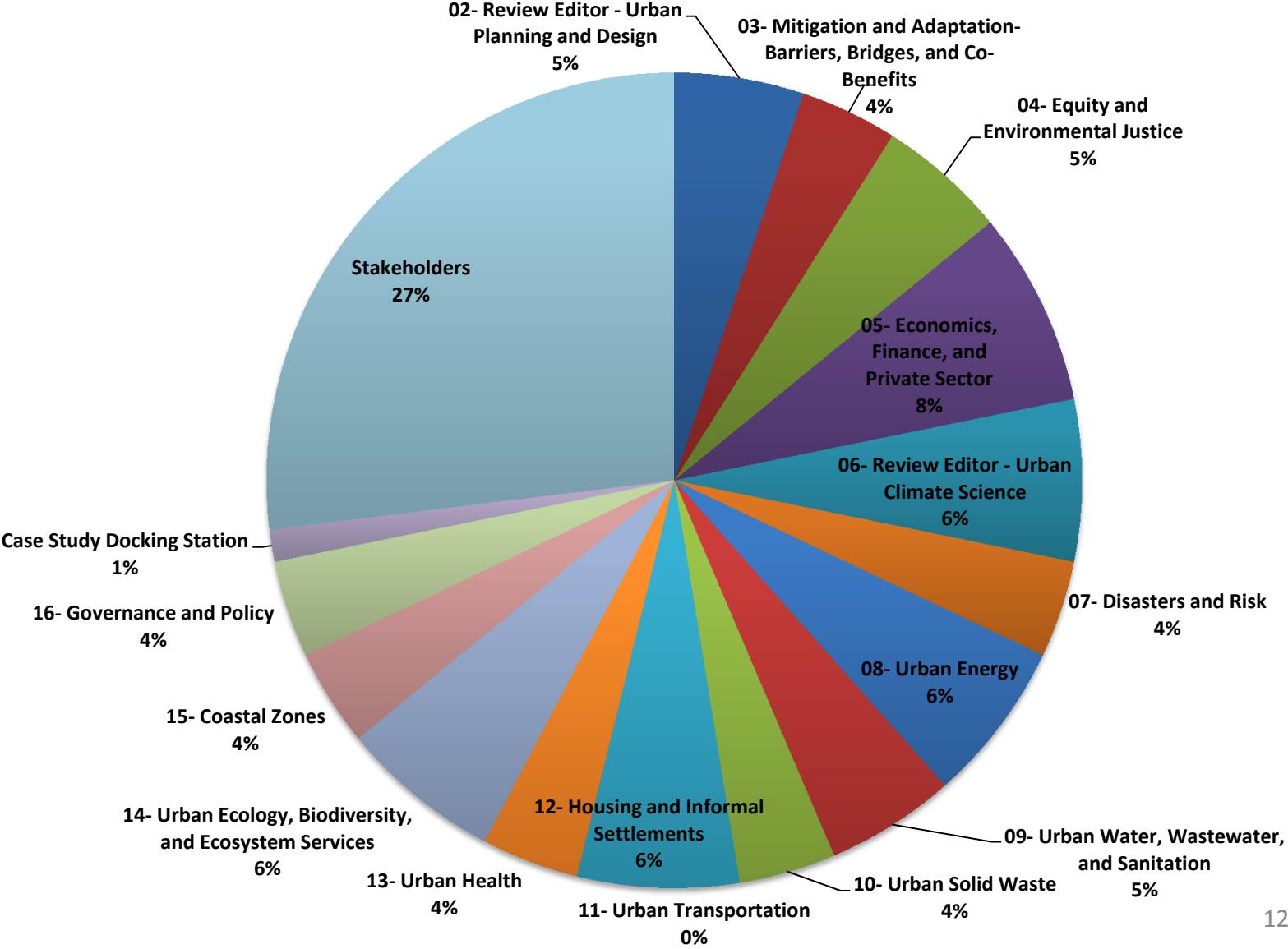
Conclusions and Moving Forward

Appendix 1 – UCCRN Case Study Docking Station

End Matter: Case Studies and Topics; Acronyms and Abbreviations; UCCRN Steering Group, ARC3-2 Authors, and Reviewers; Index



ARC3-2 Midterm Workshop Chapter Breakdown



ARC3-2 Timeline

September 2013: ARC3-2 International Initiating Workshop in New York City, USA

December 2013: Chapter Author Check-ins

January 15, 2014: First-Order Drafts due

First Review: ARC3-2 Co-Editors and Technical Editor Review

March 2014: Stakeholder Workshop – Housing and Informal Settlements in Dar es Salaam, Tanzania

April 2014: UCCRN ARC3-2 Session/Authors Meetings at World Urban Forum 7 in Medellin, Colombia

May 2014: UCCRN ARC3-2 Session/Authors Meetings at ICLEI Resilient Cities in Bonn, Germany

June 2014: UCCRN ARC3-2 Session at Natureparif Congress in Paris, France

July 31, 2014: Second-Order Drafts due

Second Review: Chapters sent out to Review Editors and Expert Reviewers for peer-review

September 2014: ARC3-2 Authors Midterm Workshop in London, UK

December 1, 2014: Third-Order Drafts due

Third Review: Co-Editors, Expert Reviewers, Stakeholders, and Institutional Review

March 1, 2015: Fourth-Order Drafts due

Fourth Review: Co-Editors, Stakeholders, and Institutional Review

May 1, 2015: Fifth-Order Drafts due

May 2015: Review and Polishing

June 2015: Submission Drafts due; submission to Cambridge University Press

December 2015: Publication - in time for COP21 in Paris

June 2016: Launch at Habitat III

Structure and content of Ch5.

- General structure & guiding principles
- Part 1: Challenges and Opportunities to Cities
- Part 2: Role of funding and finance/access to finance
- Part 3: Role of the private sector
- Part 4: Key messages
- Part 5: Case studies
- Part 6: Tools and guidelines
- Stakeholder engagement
- All other points

Local Development Benefits for Cities

- Job Creation
- Energy Cost Savings
- Higher Energy Cost Certainty
- Higher Electricity Supply Certainty
- Improved Local Business Competitiveness
- Improved Property Values and Tax Revenues
- Sectoral Clustering
- Marketing and Reputation

Role of funding and finance/access to finance

(Tomonori Sudo, Saliha Dobardzic, David Maleki & Reimund Schwarze)

- **Discuss:** What are the economic and political challenges for municipalities to fund CC activities,
- how much funds are available in the world and how to increase the access for cities.

1. Financing needs in cities

2. Challenges for cities in financing CC action

- **Project development barriers**
- **Political and regulatory barriers**
- **Financial barriers:** Poor credit worthiness

3. Finance opportunities and access to finance

- **Domestic Finance:** (Local taxes/charges, national transfers, borrowing, bond/equities)
- **International Public Finance** (GCF, AF, GEF, ...)
- **Market Mechanisms and innovative finance sources** (Urban CDM, City-level ETS)
- Land Value Capture)

Financing needs

Discuss: investment gap for the world under a business-as-usual scenario is far larger (\$100 trillion) than the incremental investments needed to accommodate climate change (\$ 14 trillion, 14%). Climate change considerations must be mainstreamed into such investments!

Sector	Business-as-usual scenario investment needs		2°C scenario investment needs		Incremental investment required		Sources
	Cumulative 2010–2030	Annual average	Cumulative 2010–2030	Annual average	Cumulative 2010–2030	Annual average	
Power generation	6,933	347	10,136	507	3,203	160	IEA
Power transmission and development	5,450	272	5,021	251	-429	-21	IEA
Energy total	12,383	619	15,157	758	2,774	139	
Buildings	7,162	358	13,076	654	5,914	296	IEA
Industry	5,100	255	5,800	290	700	35	IEA
Building & Industrial total	12,262	613	18,876	944	6,614	331	
Road	8,000	400	8,000?	400?	-	-	OECD
Rail	5,000	250	5,000?	250?	-	-	OECD
Airports	2,300	115	2,300?	115?	-	-	OECD
Ports	800	40	800?	40?	-	-	OECD
Transport vehicles	16,908	845	20,640	1,032	3,732	187	IEA
Transport total	33,008	1,650	36,740	1,837	3,732	187	
Water	26,400	1,320	26,400?	1,320?	-	-	OECD
Agriculture	2,500	125	2,500?	125?	-	-	FAO
Telecommunications	12,000	600	12,000?	600?	-	-	OECD
Forestry	1,280	64	2,080	104	800	40	UNEP
Other sectors	unknown	unknown	unknown	unknown	unknown	unknown	
Total investment	99,833	4,991	113,753	5,689	13,934	698	
	-\$100 tr	-\$5 tr	-\$114 tr	-\$5.7 tr	-\$14 tr	-\$0.7 tr	

Sources: OECD²⁰, IEA²¹, FAO²⁴, UNEP²⁵. Data presented in US\$ 2010 rates.

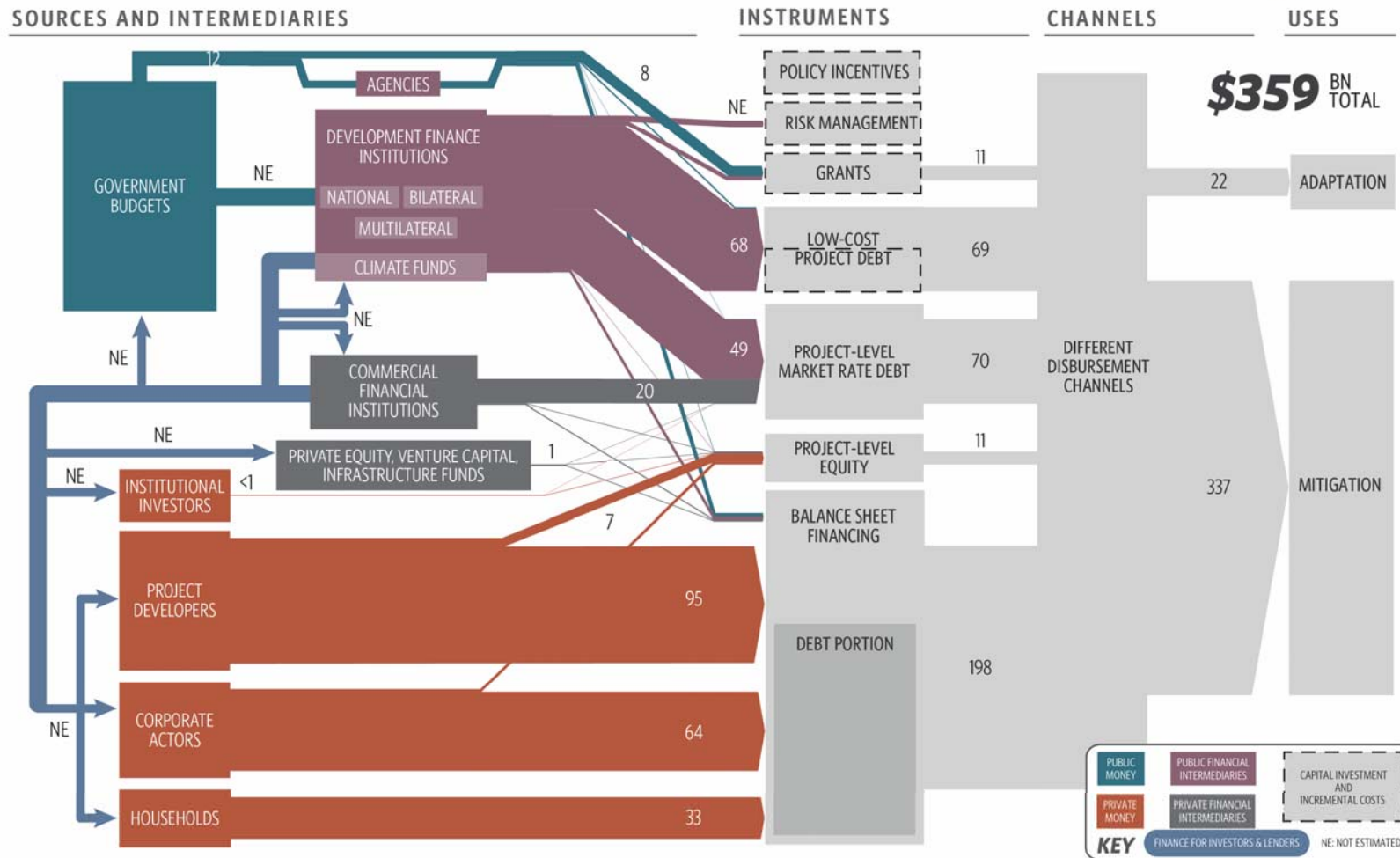
Note: Total investment does not include synergy effects that can occur between other investments besides energy, buildings and industry and transport. The total amount provided is a proxy of future investment. Investment in water and telecommunications infrastructure covers the OECD and emerging markets only. Investment in agriculture covers 93 developing countries only. See Appendix 1 for full details of assumptions, scope and calculations.

Available climate finance

Discuss: Climate finance, incl. international public funds, inadequate to deliver to the infrastructure needs of finance of low carbon development and climate risk management at the city level. Cities therefore must tap on their full spectrum to raise money for climate action. :

THE FLOWS OF CLIMATE FINANCE 2013

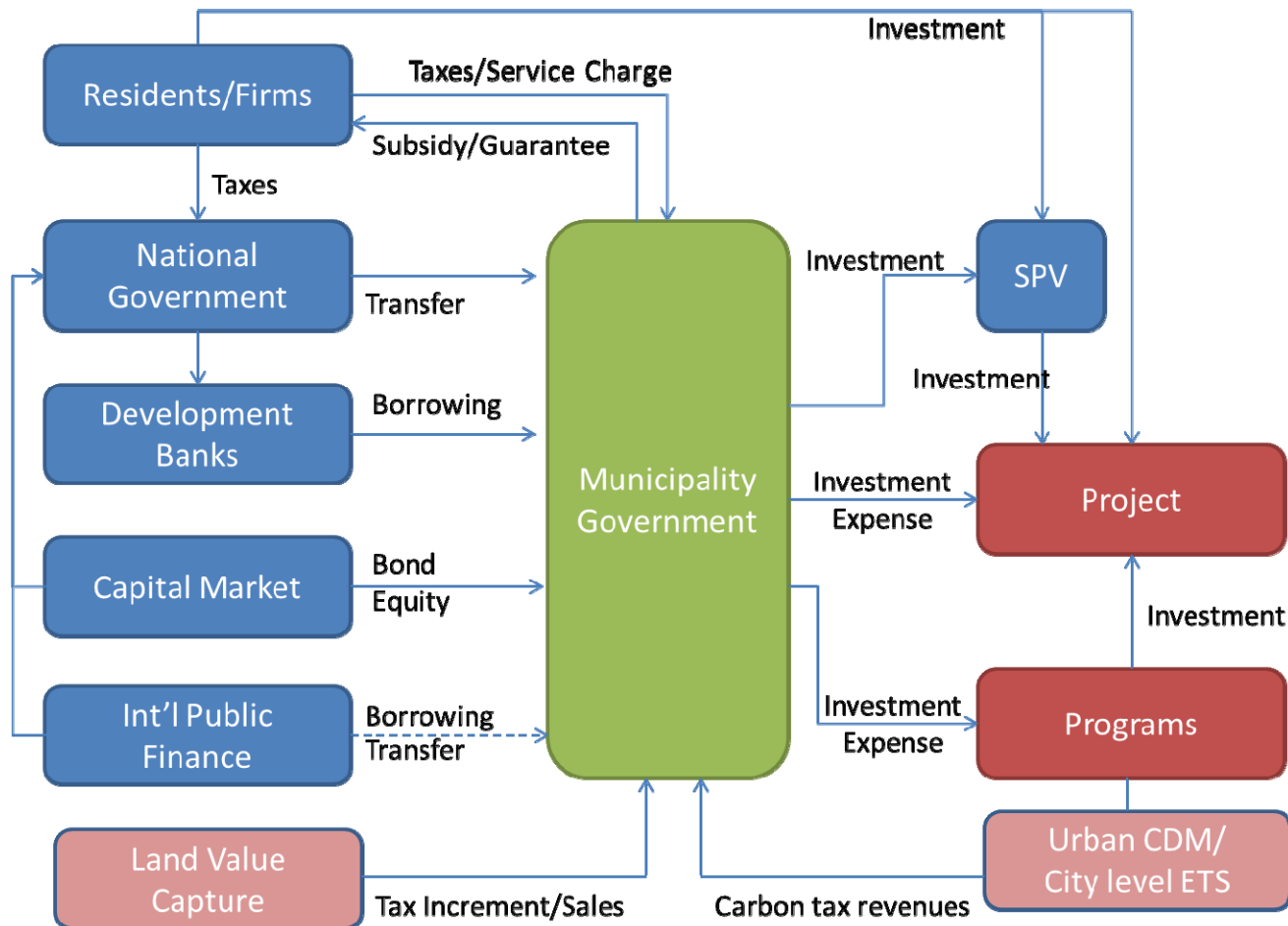
The Flow of Climate Finance 2013, also known as the 'spaghetti' diagram, illustrates the landscape of climate finance flows along their life cycle for the latest year available, mostly 2012.



Notes: Figures are indicative estimates of annual flows for the latest year available, 2011 or 2012 (variable according to the data source). Flows are expressed in USD billions and rounded to produce whole numbers. Where ranges of estimates are available, the mid-point is presented. All data presented relates to commitments in a given year due to the limited availability of disbursement data. The diagram captures upfront capital investment costs of low carbon, climate resilient activities plus grants for e.g. capacity building and enabling environment activities. The diagram highlights with a dotted line those financial resources which contribute to paying for upfront incremental investment costs, that is the difference in

Need for a diversity of city sources

Discuss: The limits of international public funding imply that most of the funding of CC action will have to be mobilized by local governments themselves with support from their national government. Public funding are most effective if they help overcome key problems of access to finance (e.g. creditworthiness) and support the development of capacities at the city level to improve access to diverse sources of funding. Innovative sources (e.g. City ETS) important.



Key messages so far

The focus will be on co-benefits in terms on local development and less environmental risks!

Summarize: Climate change mitigation/adaptation is a co-benefit of development and can help solve other existing development challenges at the city level (huge infrastructure deficit). Taking into account CC will better ensure the general well-being of their citizens. . . :

Importance of diversifying sources of finance and addressing barriers (e.g. liquidity, credit worthiness, capacity).

Summarize: Any single source, including international public finance, will be inadequate to deliver to the huge infrastructure needs of finance of low carbon development and climate risk management at the city level. Cities therefore must tap on their full spectrum to raise money for climate action. Public funding is most effective if they help overcome key problems of access to finance (e.g. creditworthiness) and support the development of capacities at the city level to improve access to diverse sources of funding and make the most effective use of funds available at the city level:

Next Steps

- Update Draft texts
- Collect case studies
- Involve stakeholders
 - Collaboration with “City Climate Finance Leadership Alliance”
 - Partners: AFD, KfW, CAF, JICA, Bank of America, WRI, Carbon Disclosure Project (CDP), C40, Climate Bonds Initiative, EIB, Gold Standard, ICLEI, Meridiam Infrastructure, UN-Habitat, World Bank Group, WWF

Thank you for your attention!
Your comments are highly appreciated

For further comments and questions, please do not hesitate to contact:

Tomonori SUDO < sudo.tomonori@jica.go.jp >