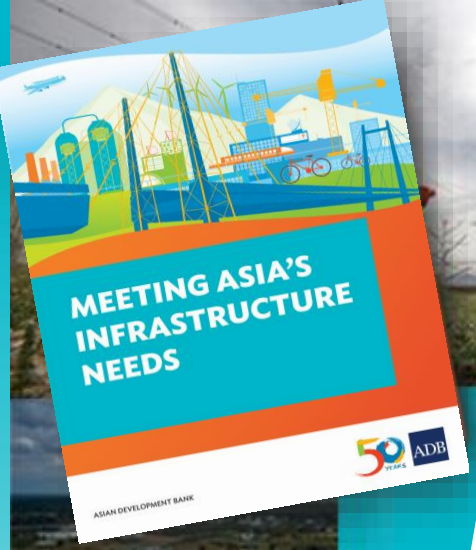


MEETING ASIA'S INFRASTRUCTURE NEEDS

Special supplement of

Key Indicators for Asia and the Pacific

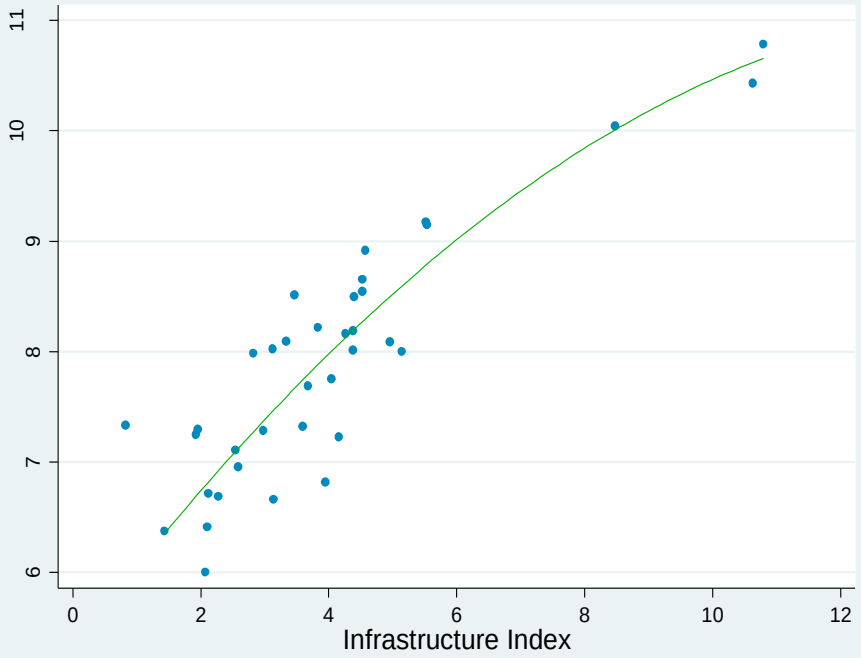
Key messages

- Developing Asia needs $26 trillion (in 2015 prices), or **$1.7 trillion per year,** for infrastructure investment in 2016-2030
- Without climate change mitigation and adaptation, the needs are $22.5 trillion, or **$1.5 trillion per year**
- These are more than double ADB 2009 estimates
- The infrastructure investment gap varies across countries
  - For **25 countries** in **2016-2020**, the gap is 2.4% of projected GDP; excluding PRC, this gap rises to 5% of projected GDP.
- Both public and private sectors must increase infrastructure finance—reforms are key

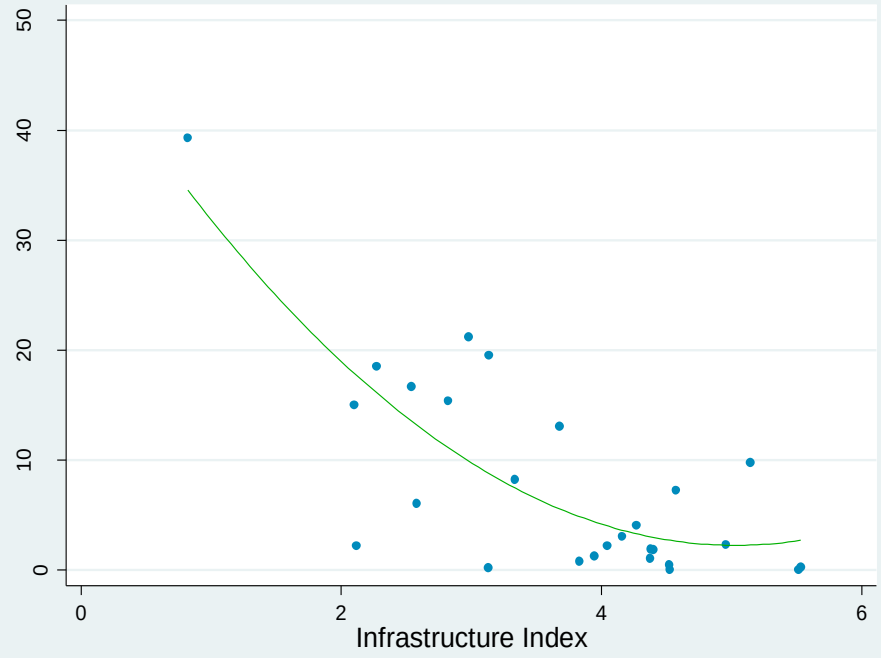
Infrastructure: How Much Does Asia Invest?

Infrastructure is associated with development

Infrastructure and GDP per capita



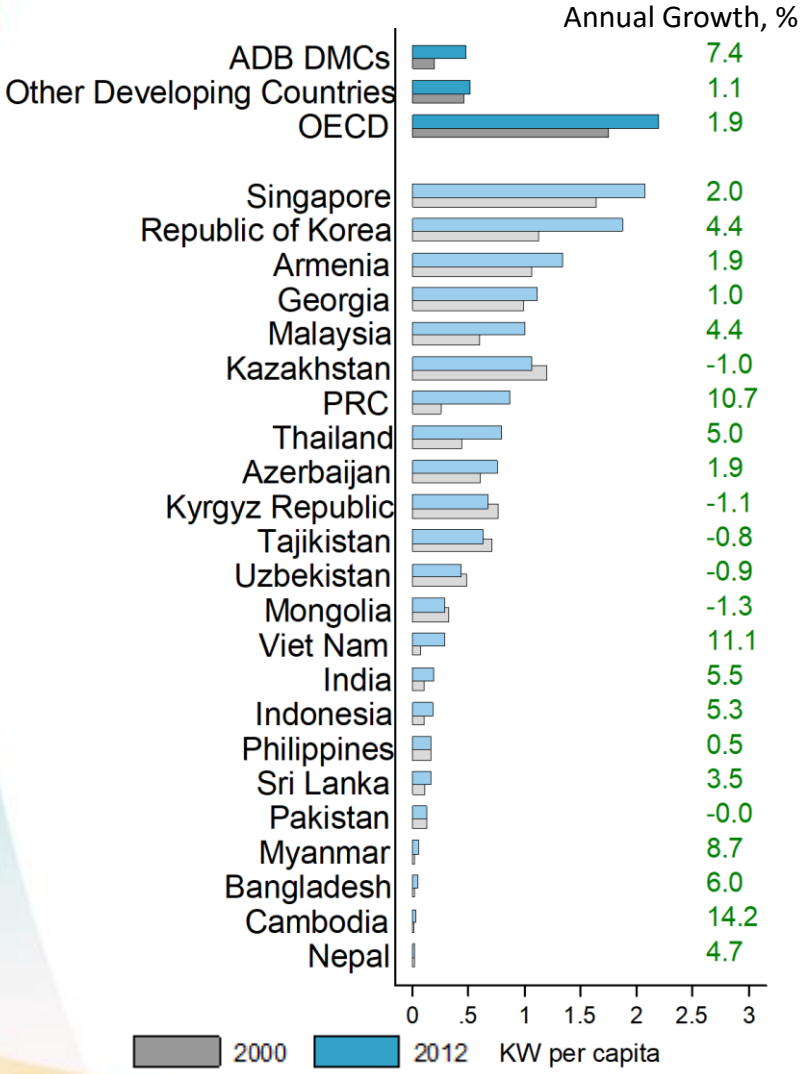
Infrastructure and poverty ($1.9 per day (2011 PPP)



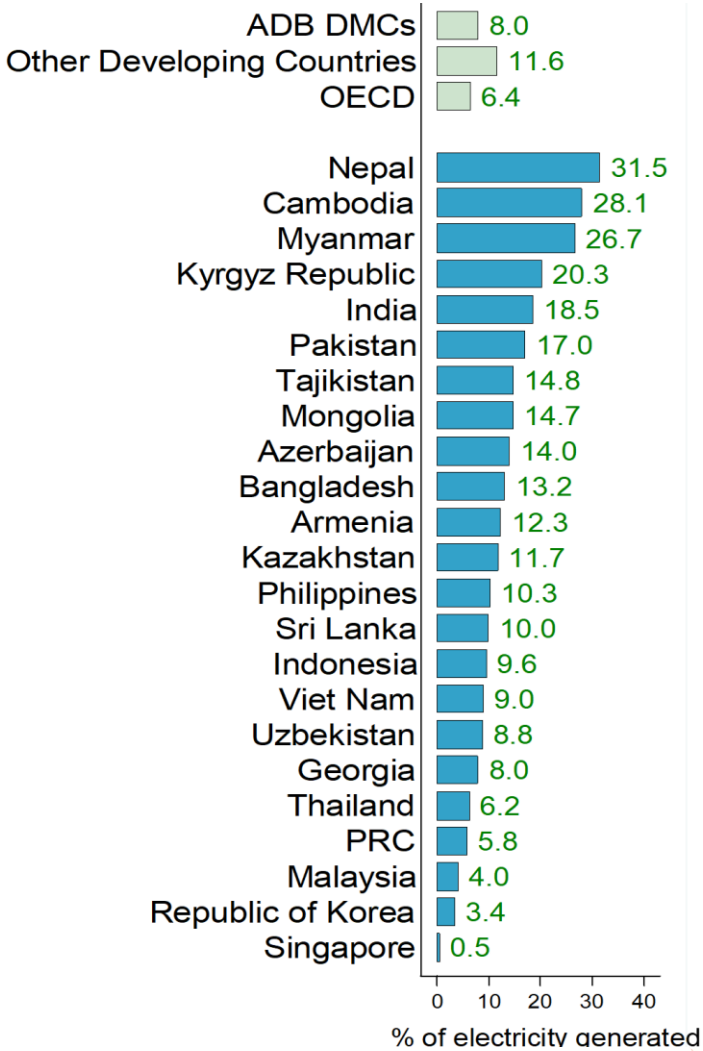
Note: Infrastructure index is computed based on first principal component of infrastructure stocks in roads, airport, electricity, telephone, mobile, broadband, water and sanitation. Higher values represent greater infrastructure availability.
Source: ADB estimates based on data from World Development Indicators and PovcalNet, World Bank

More and better infrastructure is needed

Electricity Generation Capacity



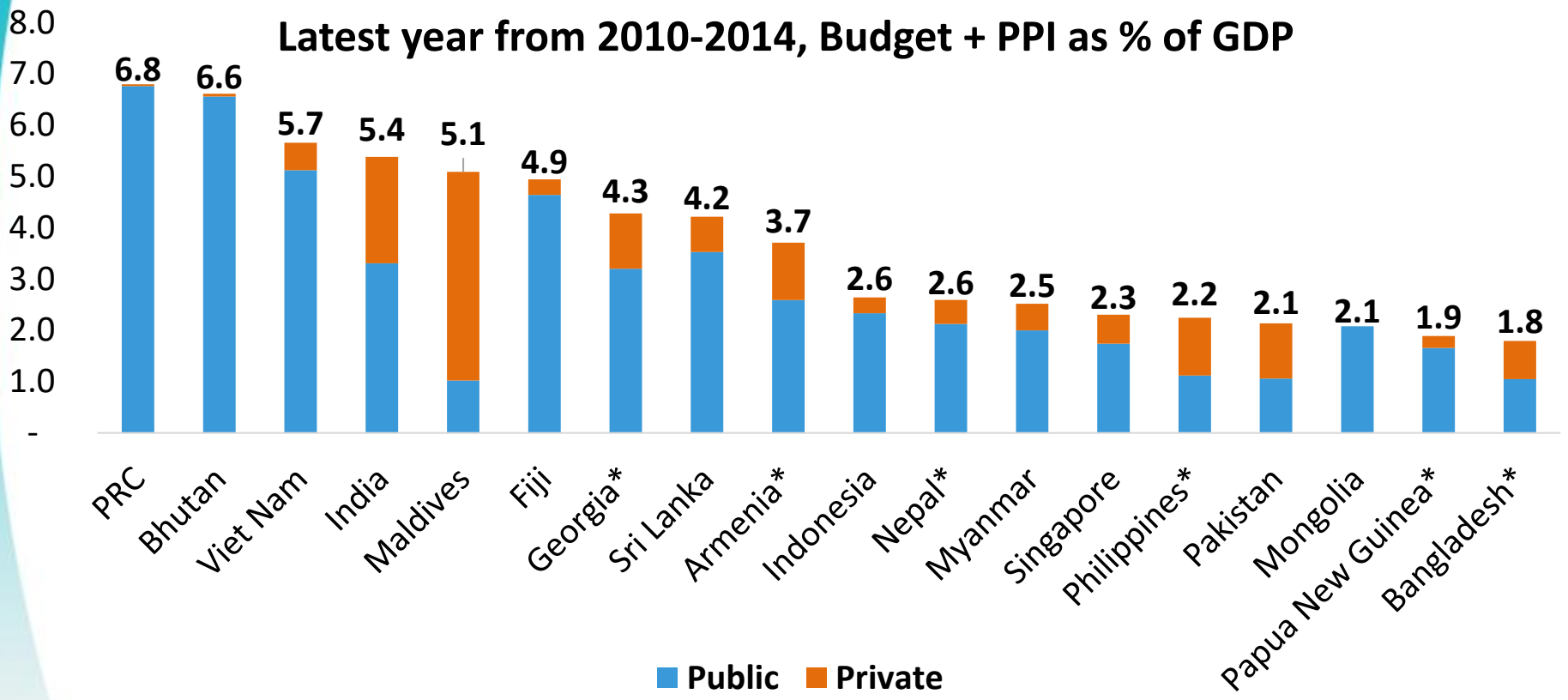
Transmission and Distribution Loss



Note: Regional averages are calculated with population as weights.

Source: International Energy Statistics, US Energy Information Administration; World Development Indicators, World Bank.

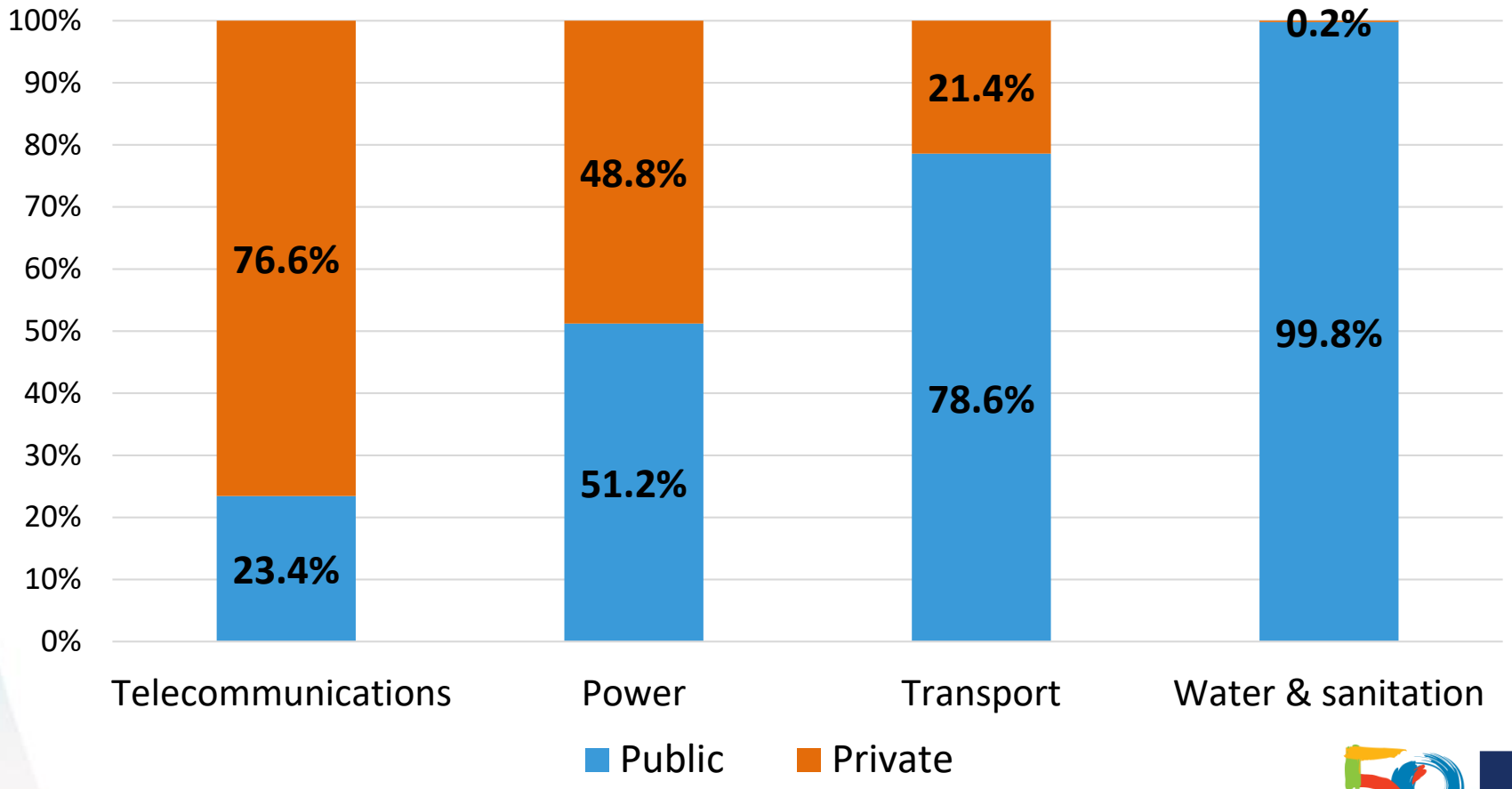
Infrastructure investment varies across countries



GDP = gross domestic product; PRC = People's Republic of China.
* Public sector includes central government budget only.
Note: Based on BUDGET + PPI measure. Actual budget investments except Armenia, Bhutan, Georgia, Maldives, Myanmar, and Thailand, which are planned or estimated budget investments.
Sources: Country sources for public sector investments; Private Participation in Infrastructure Database, World Bank; World Bank (2015); World Development Indicators, World Bank; ADB estimates.

Telecom and power more attractive to private finance

Public/Private share of infrastructure investment, 2011



Source: ADB estimates based on country sources and Private Participation in Infrastructure Database, World Bank; World Development Indicators, World Bank.


Assessing the Region's
Infrastructure Needs
45 Developing Member
Countries of ADB, 2016-2030

Method for assessing infrastructure needs

- **Baseline estimates:**
  - Based on relationship between each type of infrastructure and economic/demographic factors
- **Climate-adjusted estimates:**
  - Add climate mitigation and proofing costs: (i) climate mitigation to meet 2°C global climate goal; (ii) climate proofing: ADB experience or existing studies

Details on methodology

The baseline estimates use the approach of *Seamless Asia* to answer the question: How much infrastructure does Asia need for supporting a particular growth path?

- Step 1: Estimate relationship between infrastructure stocks and key economic and demographic factors
  - **E.g., how are kilometers of roads related to GDP, population density, urbanization, structure of production, etc.**
- Step 2: Use projections of GDP, population, and structure of production until 2030 to estimate stock of infrastructure in the future
- Step 3: Use "unit costs" to convert projected physical infrastructure stock increments into monetary values of "new" investment needs;
- Step 4: apply sector-specific depreciation ratios and projected stocks to obtain "maintenance and rehabilitation" costs

Details on methodology (2)

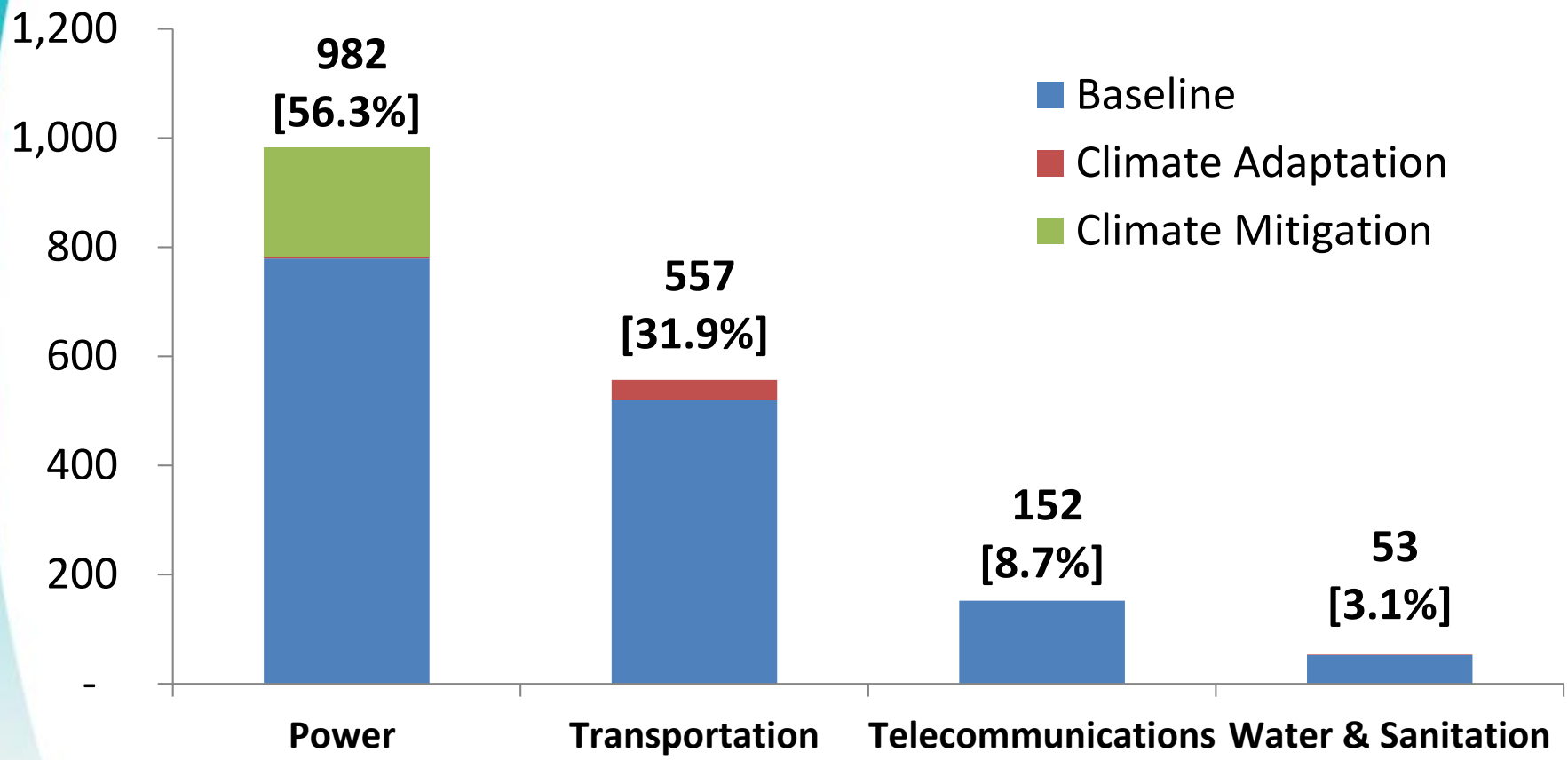
- **The climate-adjusted estimates** are based on customized version of World Induced Technical Change Hybrid Model (WITCH, Emerling et al., 2016)
  - Macroeconomic model with linked “bottom up” energy sector
  - 14 world regions, with developing Asia broken down into
    - India
    - Indonesia
    - People’s Republic of China
    - Rest of South Asia
    - Rest of East, Southeast Asia and Pacific
  - Climate module with endogenized carbon pricing and trade

Infrastructure investment needs, 2016–2030 ($ billion in 2015 prices)

	Baseline		Climate adjusted	
	Total	% of GDP	Total	% of GDP
Central Asia	492	6.8	565	7.8
East Asia	13,781	4.5	16,062	5.2
South Asia	5,477	7.6	6,347	8.8
Southeast Asia	2,759	5	3,147	5.7
The Pacific	42	8.2	46	9.1
Asia and the Pacific	**22,551**	**5.1**	**26,166**	**5.9**
Annual Average	**1,503**		**1,744**	

Sources: 2030 population projections from UN Population Division; others are ADB estimates.

Infrastructure investment needs by sector, annual average 2016–2030 ($ billion in 2015 prices)



Note: Figure s inside the brackets are percentage shares of total.
Source: ADB estimates.

Meeting Asia's Infrastructure Needs 25 Developing Member Countries of ADB, 2016-2020

How big are infrastructure investment gaps?

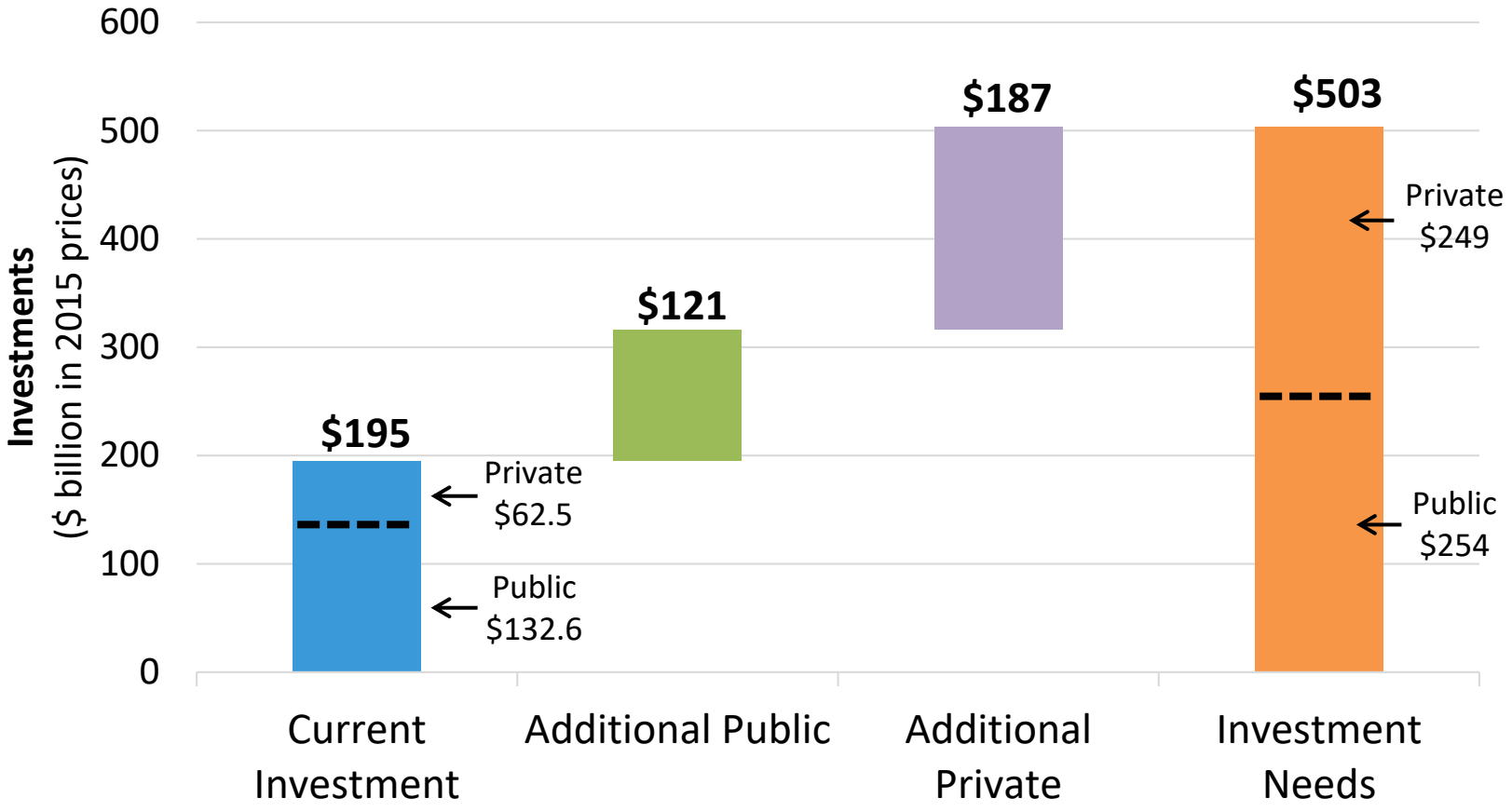
Infrastructure investments and gaps, 2016–2020 ($ billion in 2015 prices)

	Estimated current investment (2015)	Climate adjusted		
		Annual needs	Gap	Gap as % of GDP
Total (25 economies)	881	1,340	459	2.4
Total without PRC	195	503	308	5.0
PRC	686	837	151	1.2

Note: Gap = Investment Needs – Current Investment

Bridging the gap

Infrastructure investment by financing source, ***excluding PRC*,* 2016–2020,**
(annual average, $ billion in 2015 prices)



* 25 countries minus the PRC
Note: Numbers may not add up to total due to rounding.
Source: ADB estimates based on data from country budget documents, NAS data from national statistic offices, IMF Investment and Capital Stock Dataset, Asian Development Bank Key Indicators 2016, World Bank World Development Indicators, World Bank Private Participation in Infrastructure Database.

Policies to close the gap

- **Fiscal reforms**
  - Tax reforms
  - Spending reorientation
  - Prudent borrowing
  - Nontax revenues
- **Promoting private participation**
  - Create conducive investment climate
  - Deepen capital markets
  - Make greater use of pubic-private partnerships (PPPs)
- **Better planning, design and execution**

Role for MDBs

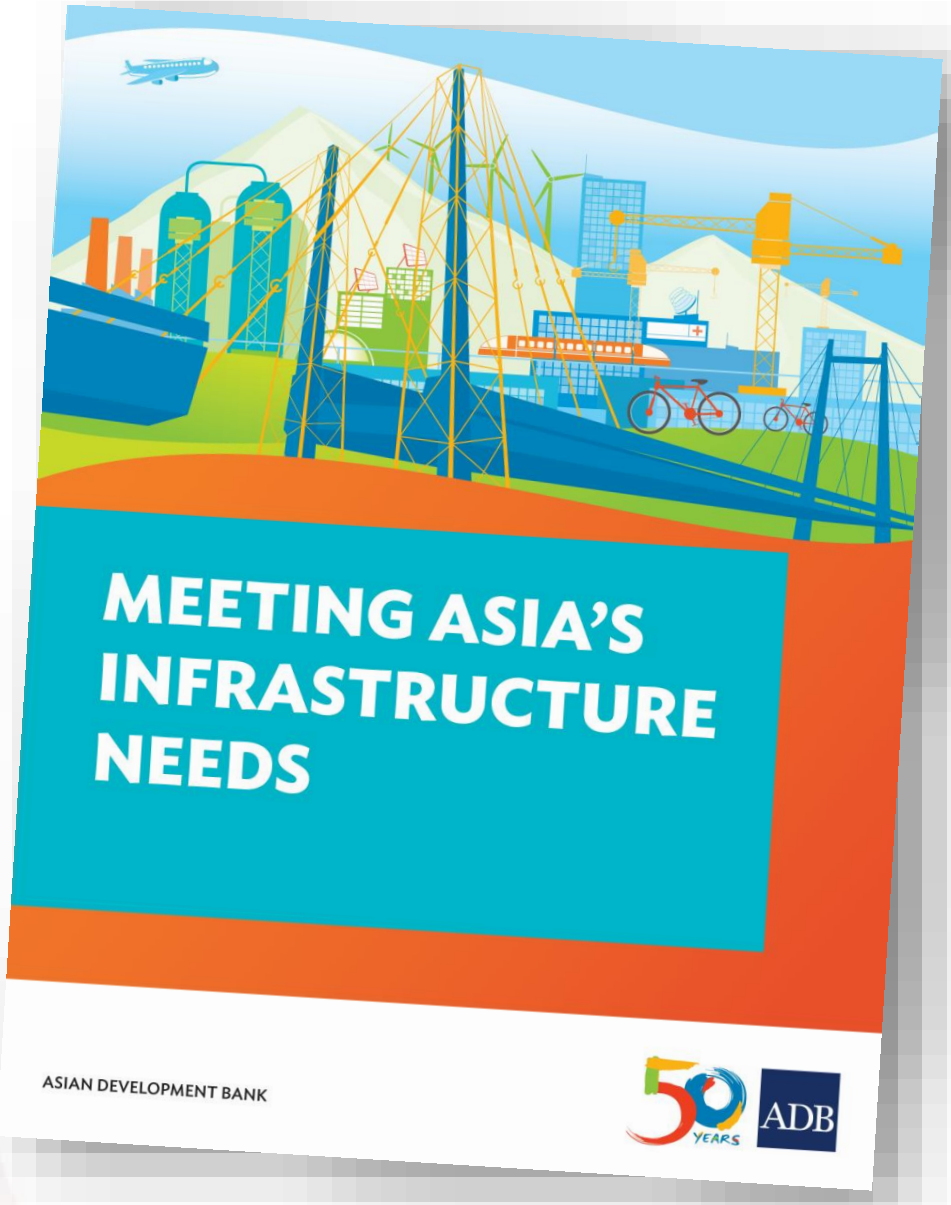
- MDB infrastructure financing in Asia is 2.5% of current investment
  - Without PRC and India: MDB share > 10%
- MDB finance for infrastructure will rise. For ADB
  - Scale up annual loan and grant approvals from $17.5 billion in 2016 to more than $20 billion by 2020
  - Growing share for the private sector
- Blending finance with expertise and knowledge, support policy reform, promoting regional cooperation

Next steps on infrastructure research

- Explore measurement of infrastructure investments using disaggregated GFCF data
- Study infrastructure financing including public private partnerships
- Impact evaluation studies
- Regulatory analysis (e.g., user charges, land value capture, etc.)

Key messages

- Developing Asia needs $26 trillion (in 2015 prices), or **$1.7 trillion per year,** for infrastructure investment in 2016-2030
- Without climate change mitigation and adaptation, the needs are $22.5 trillion, or **$1.5 trillion per year**
- These are more than double ADB 2009 estimates
- The infrastructure infrastructure gap varies across countries
  - For **25 countries** in **2016-2020**, the gap is 2.4% of projected GDP; excluding PRC, this gap rises to 5% of projected GDP.
- Both public and private sectors must increase infrastructure finance—reforms are key



Thank you!

50 YEARS ADB

Country composition across analysis

Sub-region / Country	Seamless Asia	This report	
	32 DMCs	45 DMCs	25 DMCs
Central and West Asia			
Armenia	✔	✔	✔
Azerbaijan	✔	✔	
Georgia	✔	✔	
Kazakhstan	✔	✔	✔
Kyrgyz Republic	✔	✔	✔
Tajikistan	✔	✔	
Turkmenistan		✔	
Uzbekistan	✔	✔	
East Asia			
People's Republic of China	✔	✔	✔
Hong Kong, China		✔	
Republic of Korea		✔	
Mongolia	✔	✔	✔
Taipei,China		✔	
South Asia			
Afghanistan	✔	✔	✔
Bangladesh	✔	✔	✔
Bhutan	✔	✔	✔
India	✔	✔	✔
Maldives		✔	✔
Nepal	✔	✔	✔
Pakistan	✔	✔	✔
Sri Lanka	✔	✔	✔

Sub-region / Country	Seamless Asia	This report	
	32 DMCs	45 DMCs	25 DMCs
Southeast Asia			
Brunei Darussalam		✔	
Cambodia	✔	✔	✔
Indonesia	✔	✔	✔
Lao PDR	✔	✔	
Malaysia	✔	✔	✔
Myanmar	✔	✔	✔
Philippines	✔	✔	✔
Singapore		✔	
Thailand	✔	✔	✔
Viet Nam	✔	✔	✔
The Pacific			
Cook Islands		✔	
Fiji	✔	✔	✔
Kiribati	✔	✔	✔
Marshall Islands		✔	✔
Fed. States of Micronesia		✔	✔
Nauru		✔	
Palau		✔	
Papua New Guinea	✔	✔	✔
Samoa	✔	✔	
Solomon Islands	✔	✔	
Timor-Leste	✔	✔	
Tonga	✔	✔	
Tuvalu		✔	
Vanuatu	✔	✔	

Our GDP growth projections

Region/country	Actual 2000-2015[1/]	Baseline projection 2016-2030[2/]
Developing member Economies	7.6	5.3
Central and West Asia[3/]	7.7	3.1
East Asia	8.5	5.1
South Asia[3/]	6.6	6.5
Southeast Asia	5.2	5.1
The Pacific	3.9	3.1
PRC	9.5	5.6
India	7.0	6.8
Indonesia	5.3	5.5

PRC = People's Republic of China

1/ Source: World Bank WDI and 2015 Key Indicators (for Taipei,China; Myanmar; Cook Islands; and Nauru);

2/ 2016-2017: 2016 Asian Development Outlook (ADO, 2016), 2018-2030: ADB projections; Lower (upper) bound represents a pessimistic (optimistic) scenario with the growth rates of individual DMCs lower (higher) by 1 percentage point than the point estimates for the 2016-2030 period.

3/ 2003-2015 annualized growth rate.