

# Beyond the Gap

How Countries Can Afford the Infrastructure They Need while Protecting the Planet



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## World needs \$94 trillion spent on infrastructure by 2040: report

### Infrastructure gap estimates between 2013-2030



Global  
**\$57 trillion**

North America  
**\$8.1 trillion**

Europe  
**\$16 trillion**

Asia  
**\$9 trillion**

Latin America  
**\$7.8 trillion**

Sub-Saharan Africa  
**\$1.8 trillion**

Middle East and North Africa  
**\$1.8 trillion**

South Asia  
**\$4.2 trillion**

\*IMR 2013  
\*American Council of International Policy 2014  
\*World Bank 2014  
\*World Bank 2014

Home > News and Events > News Releases >

## Asia Infrastructure Needs Exceed \$1.7 Trillion Per Year, Double Previous Estimates

## The world has an \$800bn annual infrastructure gap. Here's how to close it

**How much do you need to build a house?**

# How much do you need to build a house?





# How much do you need to build a house?



# Beyond the Gap

How Countries Can Afford the Infrastructure They Need while Protecting the Planet



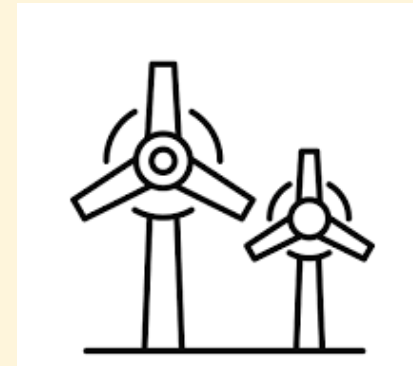


# A "new" approach

## 1. Objectives



## 2. Options



## 3. Uncertainties



# The report in numbers

- 5 sectors
- 7 SDGs
- 15 models
- Dozens of policies
- 50 experts interviewed
- Thousands of scenarios explored





A stylized illustration featuring a large black silhouette of a factory with multiple smokestacks. A red line, resembling a ramp or a path, starts from the bottom left and leads up to the factory. A wind turbine is positioned on the roof of the factory. A large orange sun is visible in the upper right corner. The background is a light yellow color, and a grey triangular shape is on the left side.

## What is the investment need?

Between 2% and 8% of GDP depending on countries' **goals** and the **efficiency** with which they pursue them

**Power: the cost of achieving universal access in 54 countries depends on the level of service targeted**



**Energy**



# Power: the cost of achieving universal access in 54 countries depends on the level of service targeted



**\$45-49** billion per year



Energy





# Power: the cost of achieving universal access in 54 countries depends on the level of service targeted



Energy



**\$45-49** billion per year



**\$53-58** billion per year

# Water & Sanitation: Lower-Cost Technologies Can Help Achieve the SDGs



Water supply  
and sanitation

6 CLEAN WATER  
AND SANITATION



# Water & Sanitation: Lower-Cost Technologies Can Help Achieve the SDGs



**\$170-200** billion per year



Water supply  
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# Water & Sanitation: Lower-Cost Technologies Can Help Achieve the SDGs

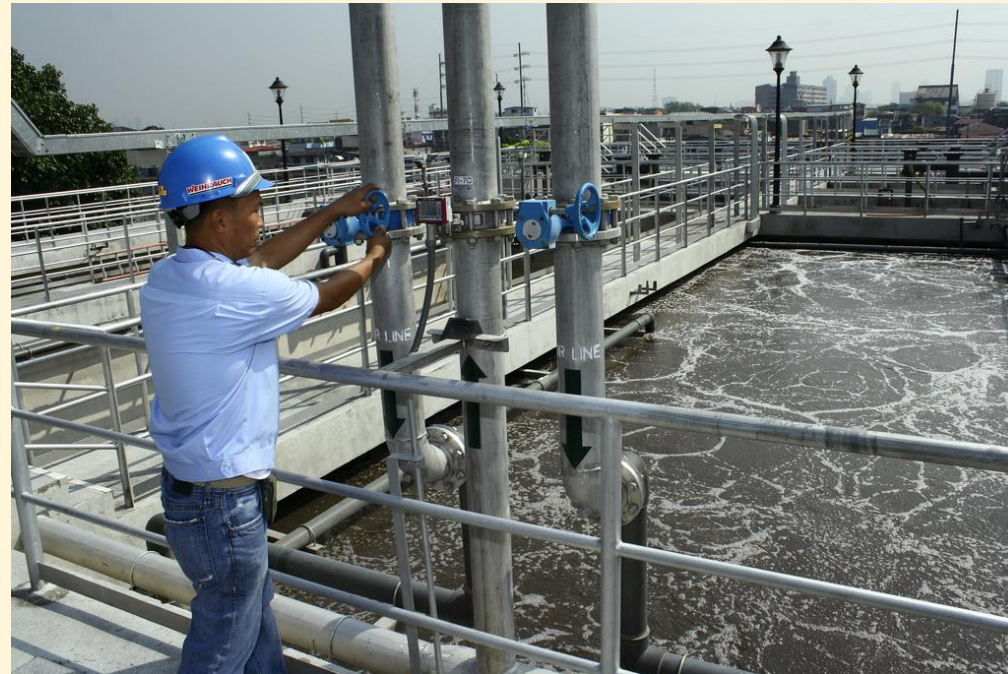


Water supply  
and sanitation

6 CLEAN WATER  
AND SANITATION



**\$170-200** billion per year



**\$200-230** billion per year

# Transport: how much does it cost to increase rural access?



Transport

9 INDUSTRY, INNOVATION  
AND INFRASTRUCTURE



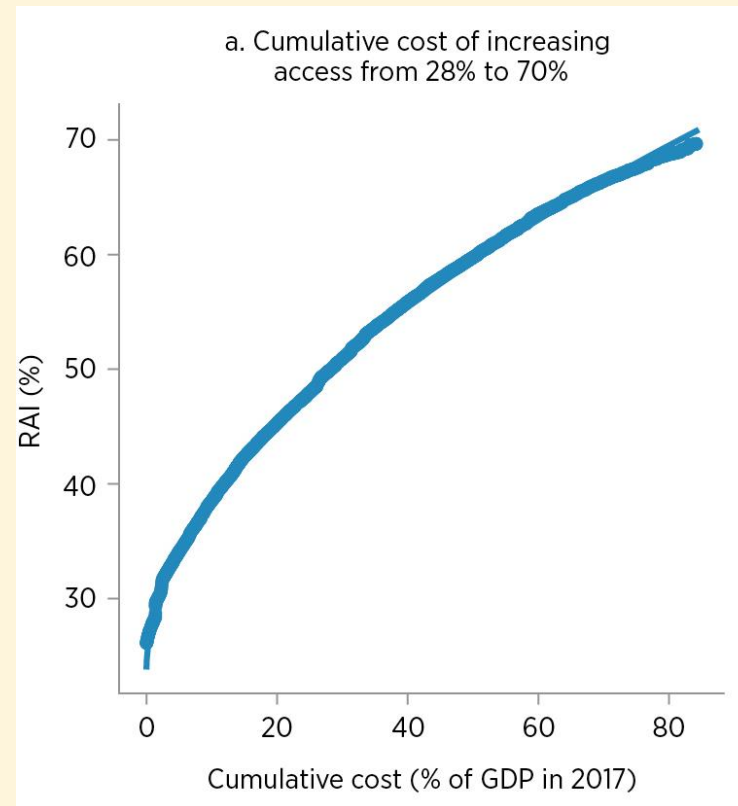
# Transport: how much does it cost to increase rural access?



Transport



## Sierra Leone





# What if all countries spent 1% of GDP per year for paving rural roads by 2030?



Transport

*% of rural population within 2 kilometers of a primary or secondary road*

Region	2017	If all countries in the region spend 1% of their GDP per year by 2030
East Asia and Pacific	52	61
Europe and Central Asia	29	40
Latin America and Caribbean	34	45
Middle East and North Africa	39	51
South Asia	43	57
Sub-Saharan Africa	29	46

*Note:* GDP for each country grows following the shared socioeconomic pathway 5, which has the highest growth rate.

9 INDUSTRY, INNOVATION  
AND INFRASTRUCTURE



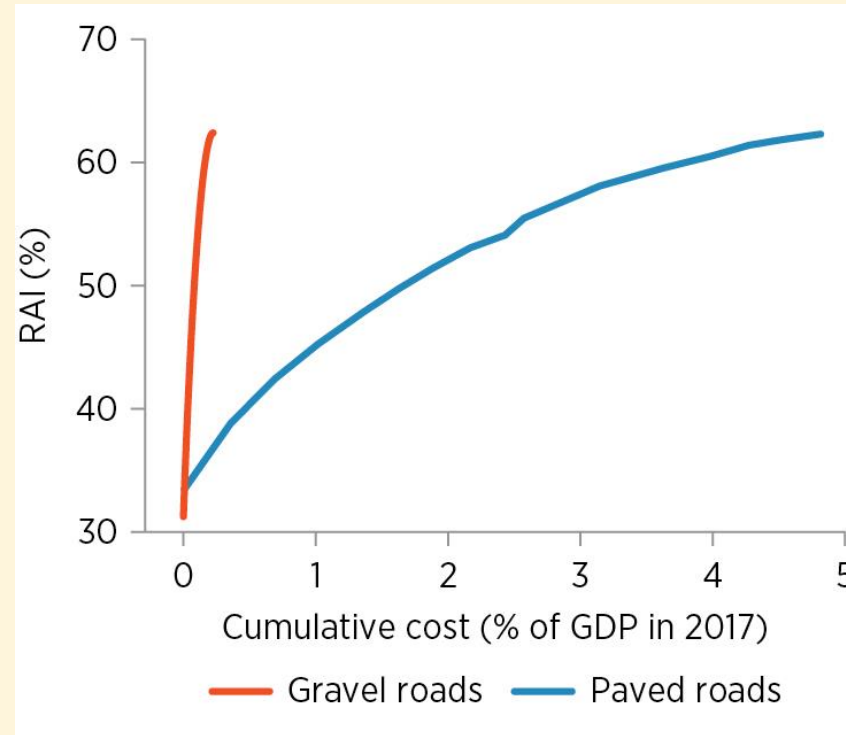
# Alternatives to paving can increase access at much lower cost



Transport



Cost of Rural Access, Morocco





Infrastructure investment paths compatible with full decarbonization need not cost more than more polluting alternatives



# Power: the cost of low carbon pathways depends on timing and demand management



Energy



# Power: the cost of low carbon pathways depends on timing and demand management

Early investments in renewables + demand management



**2.2%** of  
GDP per  
year



Energy

7 AFFORDABLE AND  
CLEAN ENERGY



13 CLIMATE  
ACTION



# Power: the cost of low carbon pathways depends on timing and demand management

Early investments in renewables + demand management



**2.2%** of GDP per year



Investments in fossil fuel generation + stranded assets

**3.0%** of GDP per year



Energy

7 AFFORDABLE AND CLEAN ENERGY



13 CLIMATE ACTION



# Urban transport: Land use planning lowers investment needs by 20 percent and reduces emissions

Dense cities  
&  
public transit

**0.37%** of GDP  
per year



Transport

9 INDUSTRY, INNOVATION  
AND INFRASTRUCTURE



13 CLIMATE  
ACTION





# Urban transport: Land use planning lowers investment needs by 20 percent and reduces emissions

Dense cities  
&  
public transit

**0.37%** of GDP  
per year



Sprawl & individual mobility

**0.47%** of GDP per year



Transport

9 INDUSTRY, INNOVATION  
AND INFRASTRUCTURE



13 CLIMATE  
ACTION





With the right policies, investments of 4.5 percent of GDP will enable LMICs to achieve the infrastructure-related SDGs and stay on track to full decarbonization by the second half of the century



**Energy**

Invest now in renewable energy and energy efficiency. use mini grids and micro grids to gradually ramp up access to electricity in the poorest areas



**US\$ 691B**  
**2.2% of GDP**



Energy



Transport

Invest now in renewable energy and energy efficiency. use mini grids and micro grids to gradually ramp up access to electricity in the poorest areas



Increase the utilization rate of rail and public transport. densify cities. promote electric mobility

US\$ 691B  
2.2% of GDP

US\$ 408B  
1.3% of GDP





Energy



Transport



Water supply  
and sanitation

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Increase the utilization rate of rail and public transport. densify cities. promote electric mobility



Provide safe water and sanitation using high cost technology in cities and low cost technology in rural areas

**US\$ 691B**  
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**US\$ 408B**  
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**US\$ 201B**  
0.55% of GDP



Energy



Transport



Water supply  
and sanitation



Flood protection

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Protect cities against coastal floods by Dutch standards. and accept higher risks than today from river floods

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US\$ 408B  
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US\$ 201B  
0.55% of GDP

US\$ 99B  
0.32% of GDP



Energy

Transport

Water supply  
and sanitation

Flood protection

Irrigation

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Support irrigation through subsidies to infrastructure only



**4.5 % of  
GDP  
(USD\$1.5  
trillion)**

**US\$ 691B  
2.2% of GDP**

**US\$ 408B  
1.3% of GDP**

**US\$ 201B  
0.55% of GDP**

**US\$ 99B  
0.32% of GDP)**

**US\$ 42B  
0.13% of GDP**



## Energy

Strongly reduce demand for energy through energy efficiency measures. provide access to electricity gradually in the poorest areas

**US\$ 283B**  
**0.90% of GDP**



## Transport

Increase the utilization rate of rail and public transport. densify cities. reduce demand for transport

**US\$ 172B**  
**0.53% of GDP**



## Water supply and sanitation

Provide only basic water and sanitation

**US\$ 119B**  
**0.32% of GDP**



## Flood protection

Keep coastal risk constant in relative terms, and accept higher risks than today from river floods

**US\$ 19B**  
**0.060% of GDP**



## Irrigation

Support irrigation through subsidies to infrastructure only. promote low meat diets

**US\$ 39B**  
**0.12% of GDP**

**2.0 percent of GDP**  
**(USD\$640 billion)**

Invest now in renewable energy and energy efficiency. use mini grids and micro grids to gradually ramp up access to electricity in the poorest areas

**US\$ 691B**  
**2.2% of GDP**

Increase the utilization rate of rail and public transport. densify cities. promote electric mobility

**US\$ 408B**  
**1.3% of GDP**

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Support irrigation through subsidies to infrastructure only

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**4.5 percent of GDP**  
**(USD\$1.4 trillion)**





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Protect cities against coastal floods by Dutch standards. and accept higher risks than today from river floods

**US\$ 99B**  
**0.32% of GDP**

Support irrigation through subsidies to infrastructure only

**US\$ 42B**  
**0.13% of GDP**

**4.5 percent of GDP**  
**(USD\$1.4 trillion)**

Do not invest in energy efficiency. Provide high access to electricity everywhere using fossil energy for 10 years and then early-scrap these capacities to switch to low carbon.

**US\$ 942B**  
**3.0% of GDP**

Let cities sprawl. do not favor rail and public transport utilization. answer mobility demand with more roads

**US\$ 1017B**  
**3.3% of GDP**

Provide safe water and sanitation using high cost technology

**US\$ 232B**  
**0.65% of GDP**

Protect cities against coastal floods by Dutch standards. Invest to maintain current absolute losses from river floods constant over time

**US\$ 315B**  
**1.0% of GDP**

Subsidize both irrigation infrastructure and water

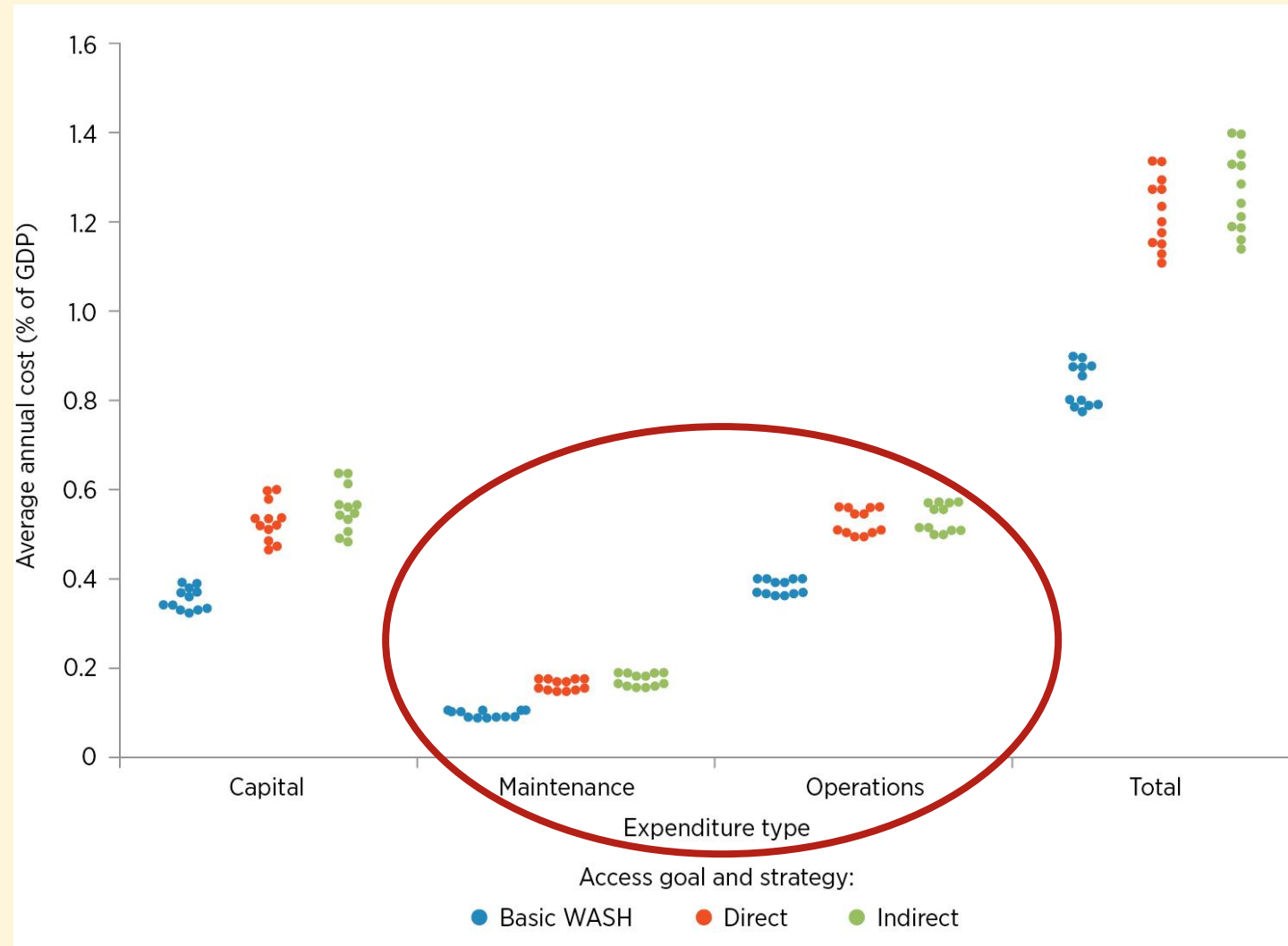
**US\$ 63B**  
**0.20% of GDP**

**8.2 percent of GDP**  
**(USD\$2.7 trillion)**



Investing in infrastructure is not enough: steady flow of resources for operations and maintenance is a necessary condition for success

# Water & Sanitation: O&M cost as much as capital for water and sanitation



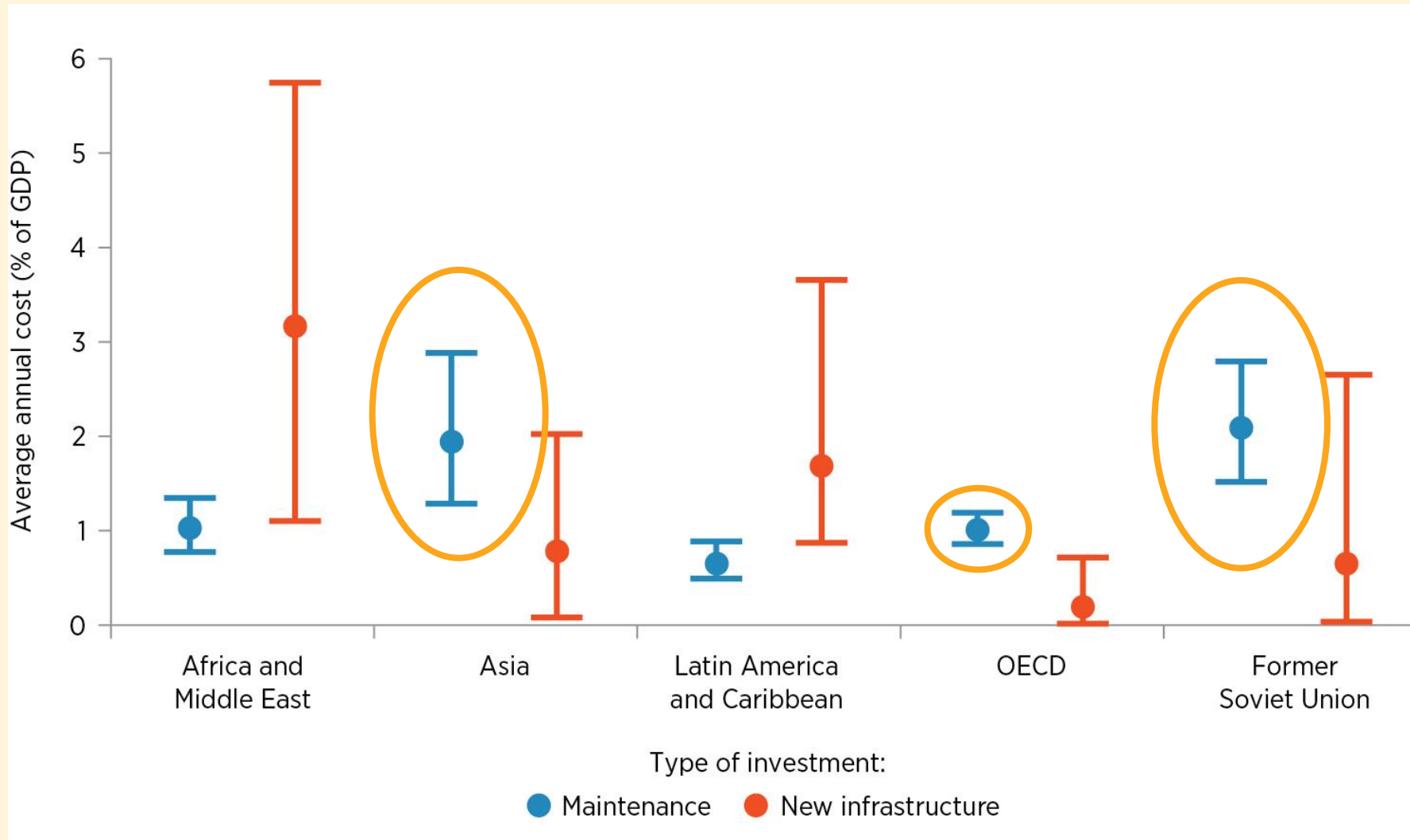
Water supply  
and sanitation



# Transport: in some regions maintenance costs as much as new investment



Transport



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AND INFRASTRUCTURE





- How much countries need to spend on infrastructure depends on their goals, but also the efficiency with which they pursue these goals. Good policy can achieve ambitious goals at half the cost.
- Infrastructure investment paths compatible with full decarbonization by the end of the century need not cost more than more polluting alternatives.
- Investing in infrastructure is not enough; maintaining it matters. Maintenance ensures reliability and reduces the total life-cycle cost of transport and water and sanitation infrastructure more than 50 percent.

# Take-aways



## Hitting the Trillion Mark

A Look at How Much Countries Are Spending  
on Infrastructure

*Marianne Fay  
Sungmin Han  
Hyeon Il Lee  
Massimo Mastruzzi  
Moonkyoung Cho*



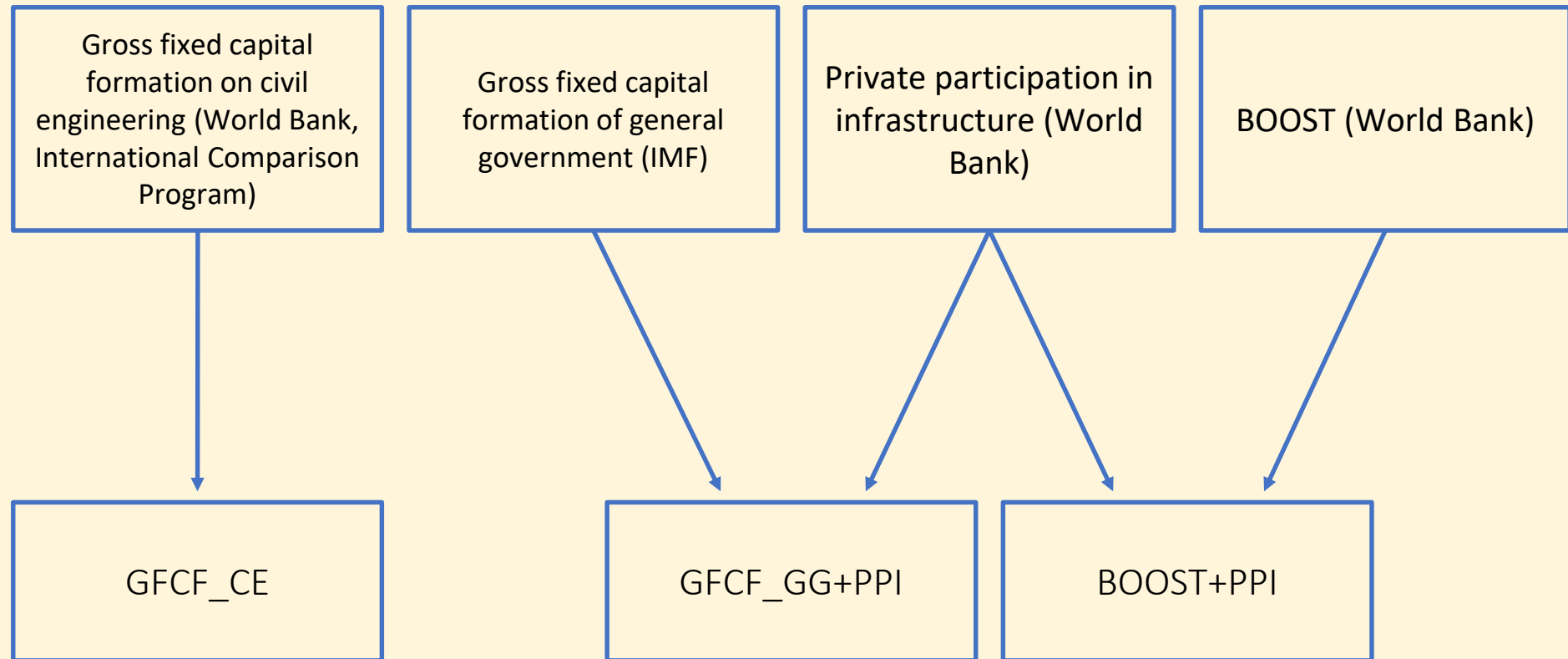
**WORLD BANK GROUP**

Sustainable Development Practice Group

Office of the Chief Economist

February 2019

# No data but several proxies

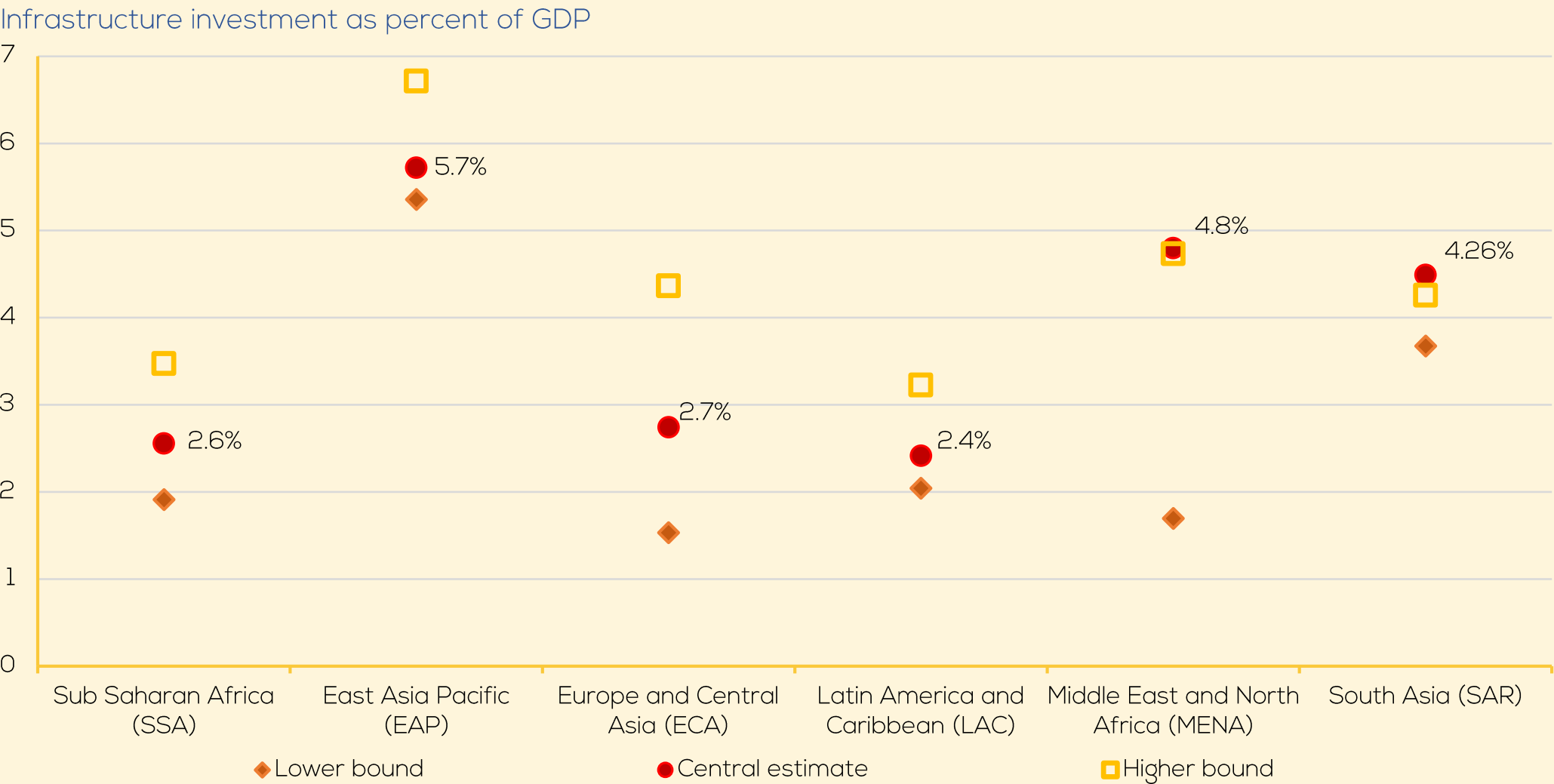


## On average, developing countries likely invest around 4% of GDP or around \$1-1.2 trillion in infrastructure

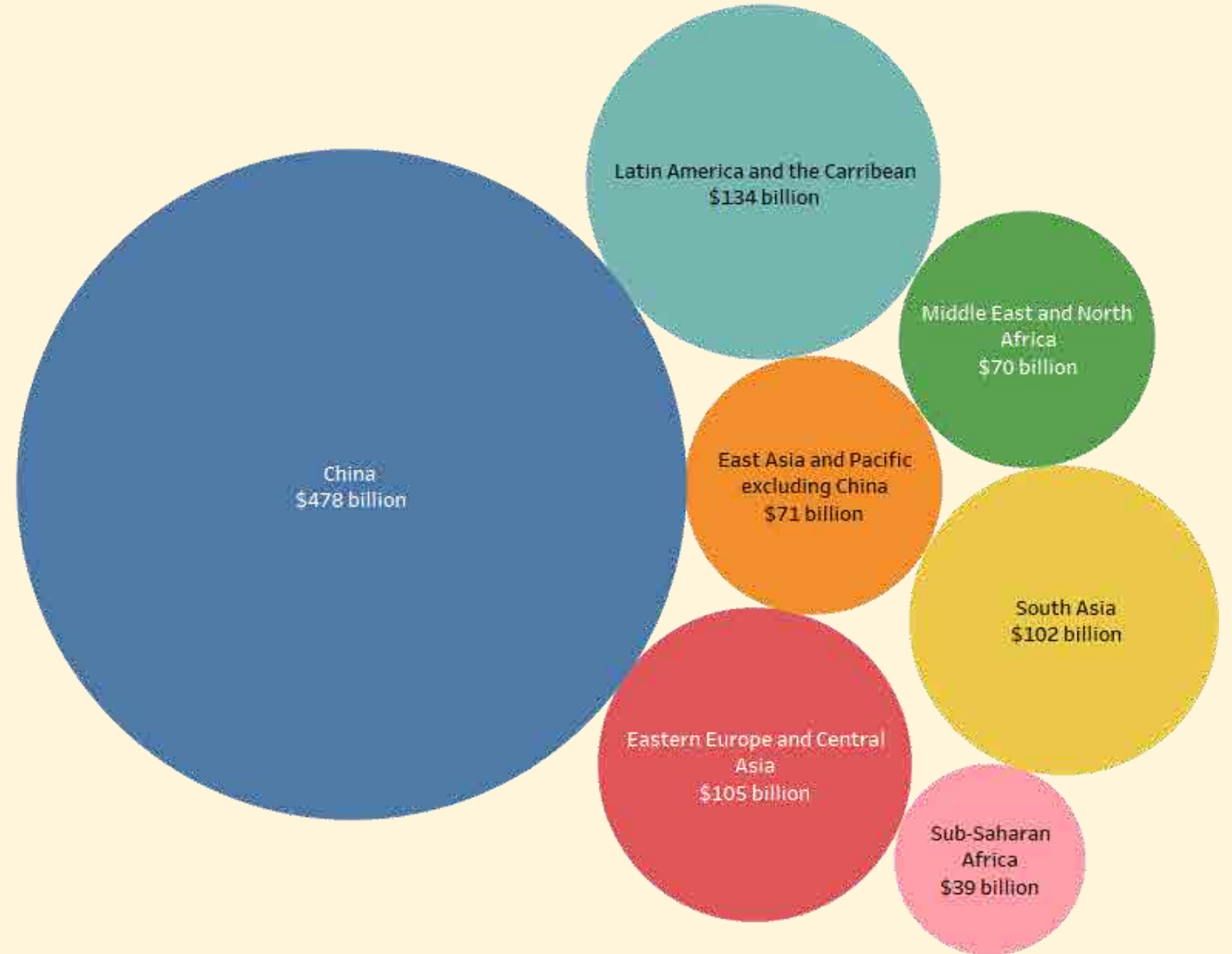
	Lower-bound estimate (fitted values)	Central estimate: (BOOST or Min of two GFCFs)	Upper-bound estimate (0.9 GFCF_CE)
Weighted average (% GDP)			
All LMIC	3.40	4.12	4.99
LMIC excluding China	2.07	3.13	4.39
(2011 US\$ trillions)			
All LMIC	0.82	1.00	1.21
LMIC excluding China	0.34	0.52	0.73



# But with significant variations across regions



About half  
(48%) of  
infrastructure  
investment  
happens in  
China



# How spending compares with needs

