SUSTAINABLE INFRASTRUCTURE SERIES

Beyond the Gap

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

WORLD BANK GROUP

Editors
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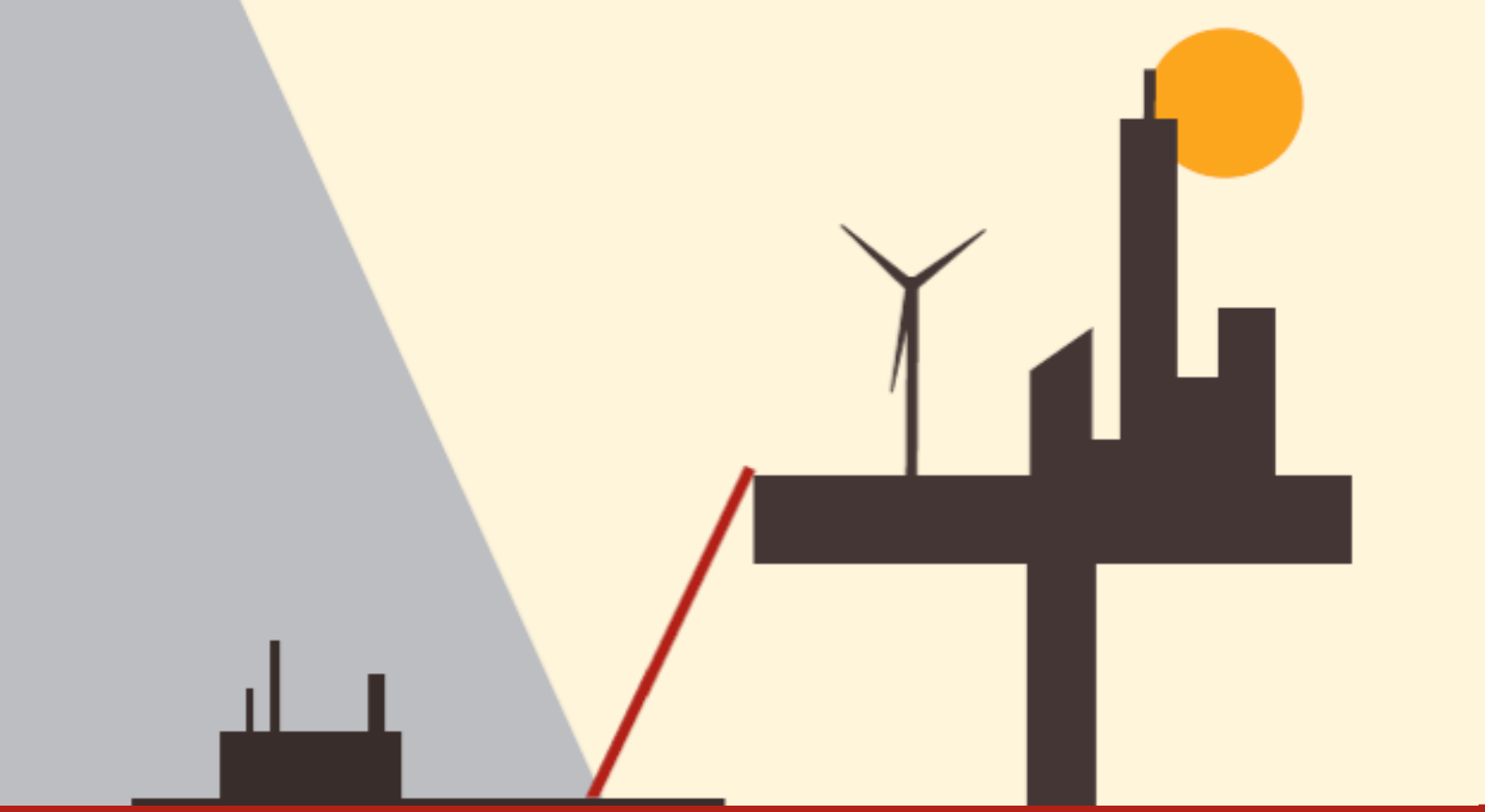
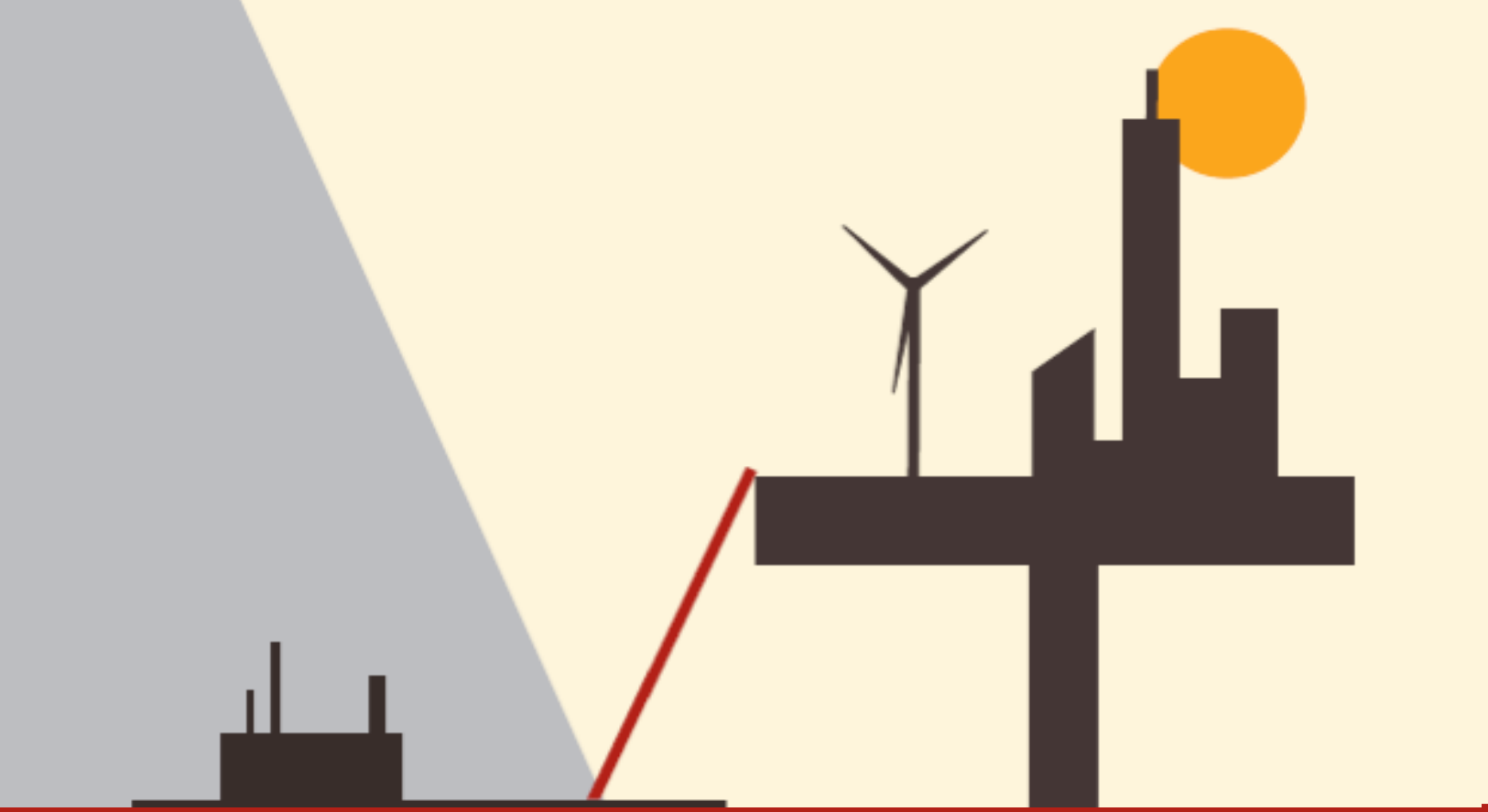


What is the investment need?

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



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

(3,3 percent of GDP per year in Latin America and the Caribbean)

Energy

Transport

Water supply and sanitation

Flood protection

Irrigation

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

1,2 % of GDP in Latin America and the Caribbean

+

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

US$ 408B
1.3% of GDP

1,4 % of GDP in Latin America and the Caribbean

+

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

US$ 201B
0.55% of GDP

0,5 % of GDP in Latin America and the Caribbean

+

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

US$ 99B
0.32% of GDP)

0,2 % of GDP in Latin America and the Caribbean

+

Support irrigation through subsidies to infrastructure only

US$ 42B
0.13% of GDP

0,1 % of GDP in Latin America and the Caribbean

→ 4.5 % of GDP (USD$1.5 trillion)

→ **3.4 % of GDP (USD$ 1.1 trillion)**

Energy

Transport

Water supply and sanitation

Flood protection

Irrigation

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

US$ 283B
0.90% of GDP

+

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

US$ 172B
0.53% of GDP

+

Provide **only basic** water and sanitation

US$ 119B
0.32% of GDP

+

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

US$ 19B
0.060% of GDP

+

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

+

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

US$ 201B
0.55% of GDP

+

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**

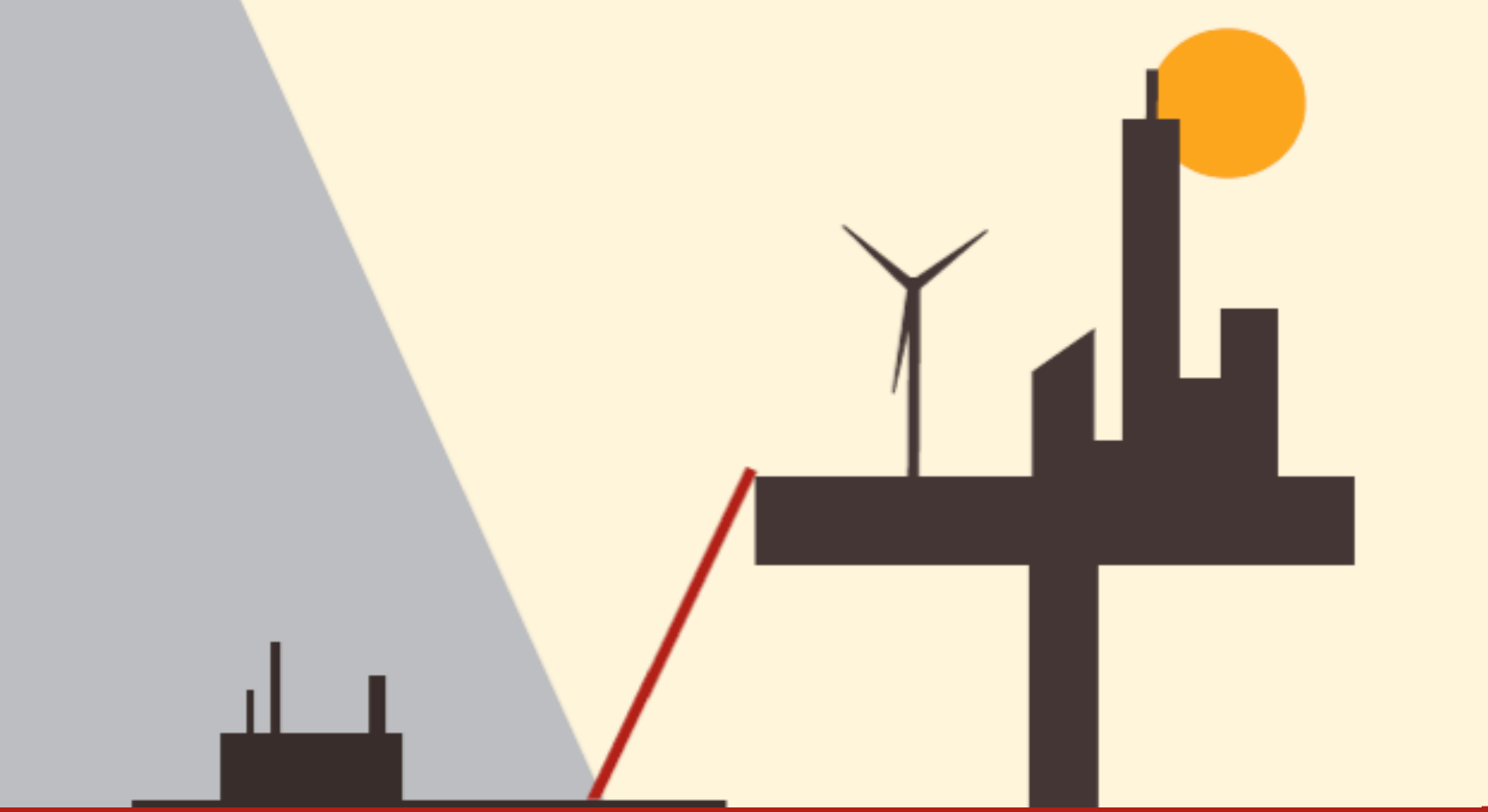
US$ 315B
1.0% of GDP

+

Subsidize both irrigation infrastructure and water

US$ 63B
0.20% of GDP

→ 8.2 percent of GDP (USD$2.7 trillion)



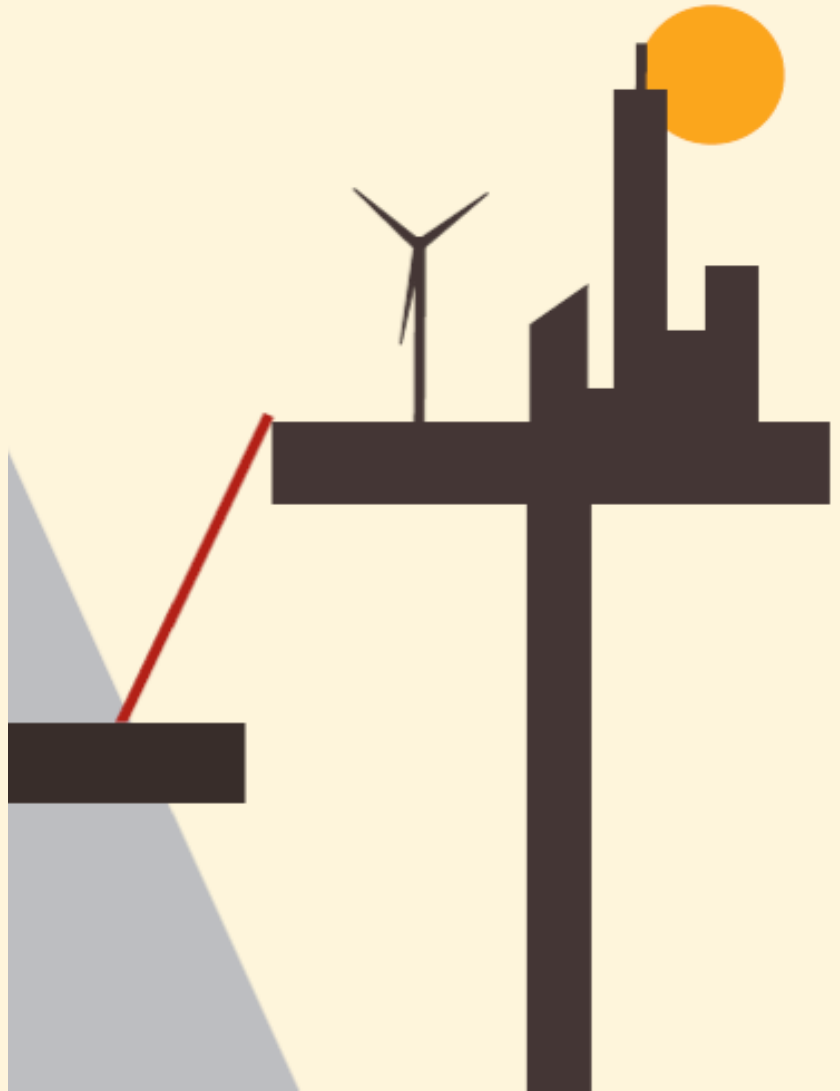
Investing in infrastructure is not enough: steady flow of resources for **operations and maintenance** is a necessary condition for success

Take-aways

- 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 by more than 50 percent.



Policy Research Working Paper 8730

Hitting the Trillion Mark

A Look at How Much Countries Are Spending on Infrastructure

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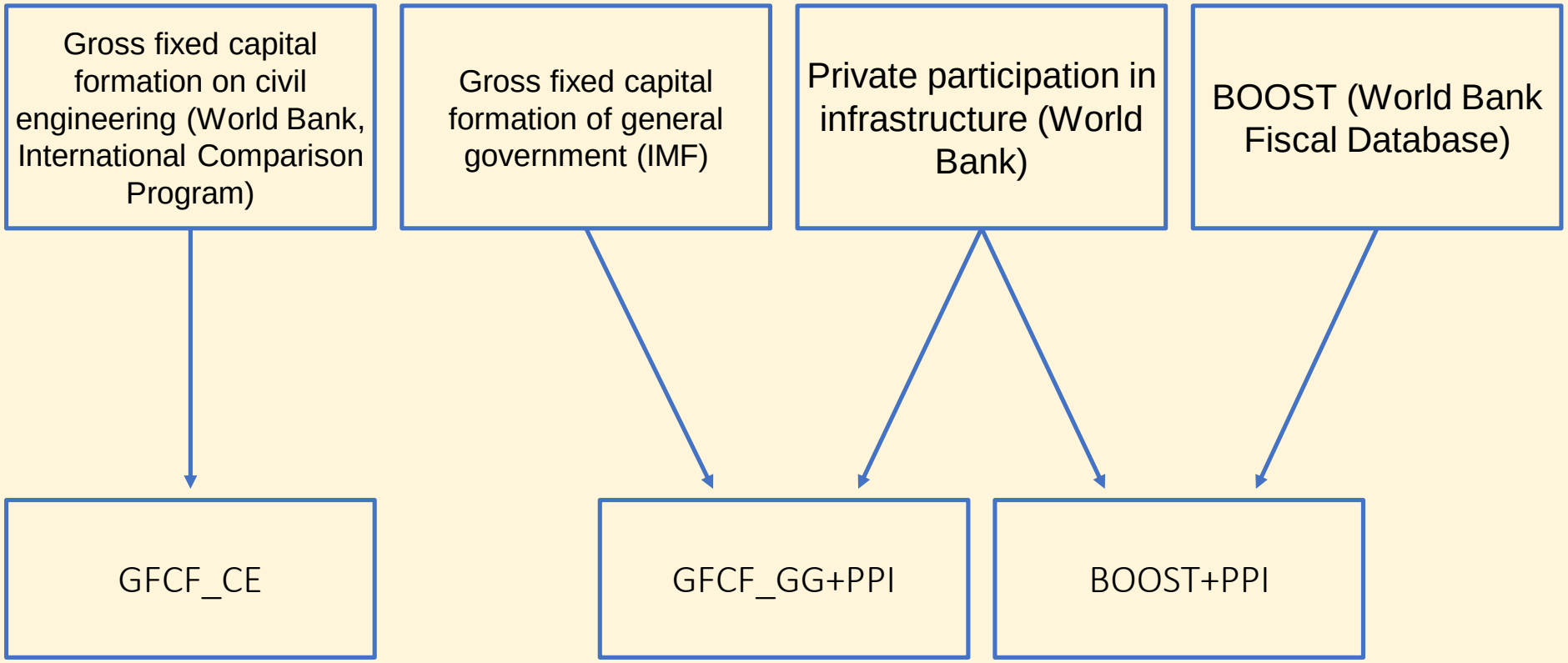
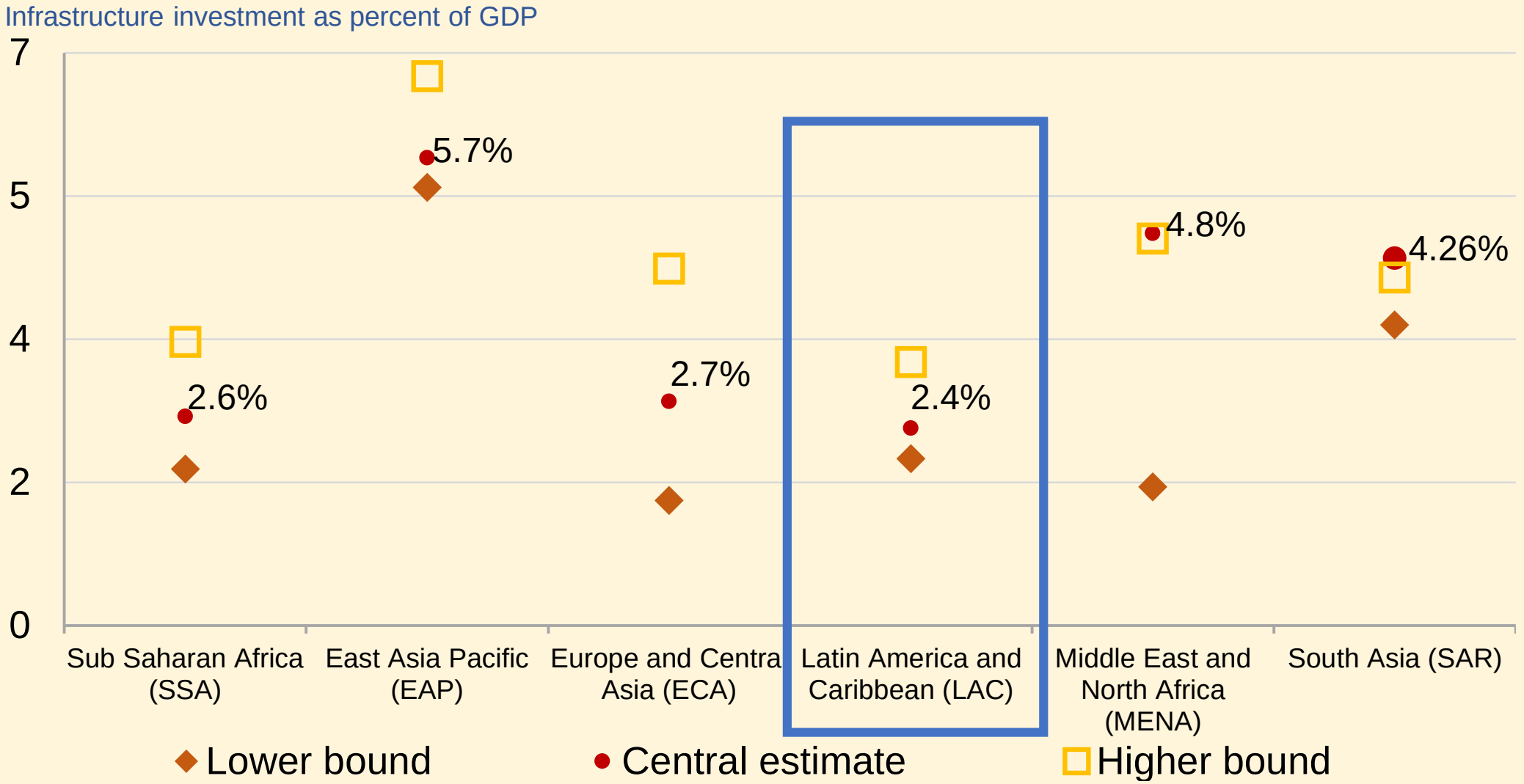
No data but several highly imperfect proxies



On average, developing countries likely spend around 4% of GDP or around $1-1.2 trillion on infrastructure

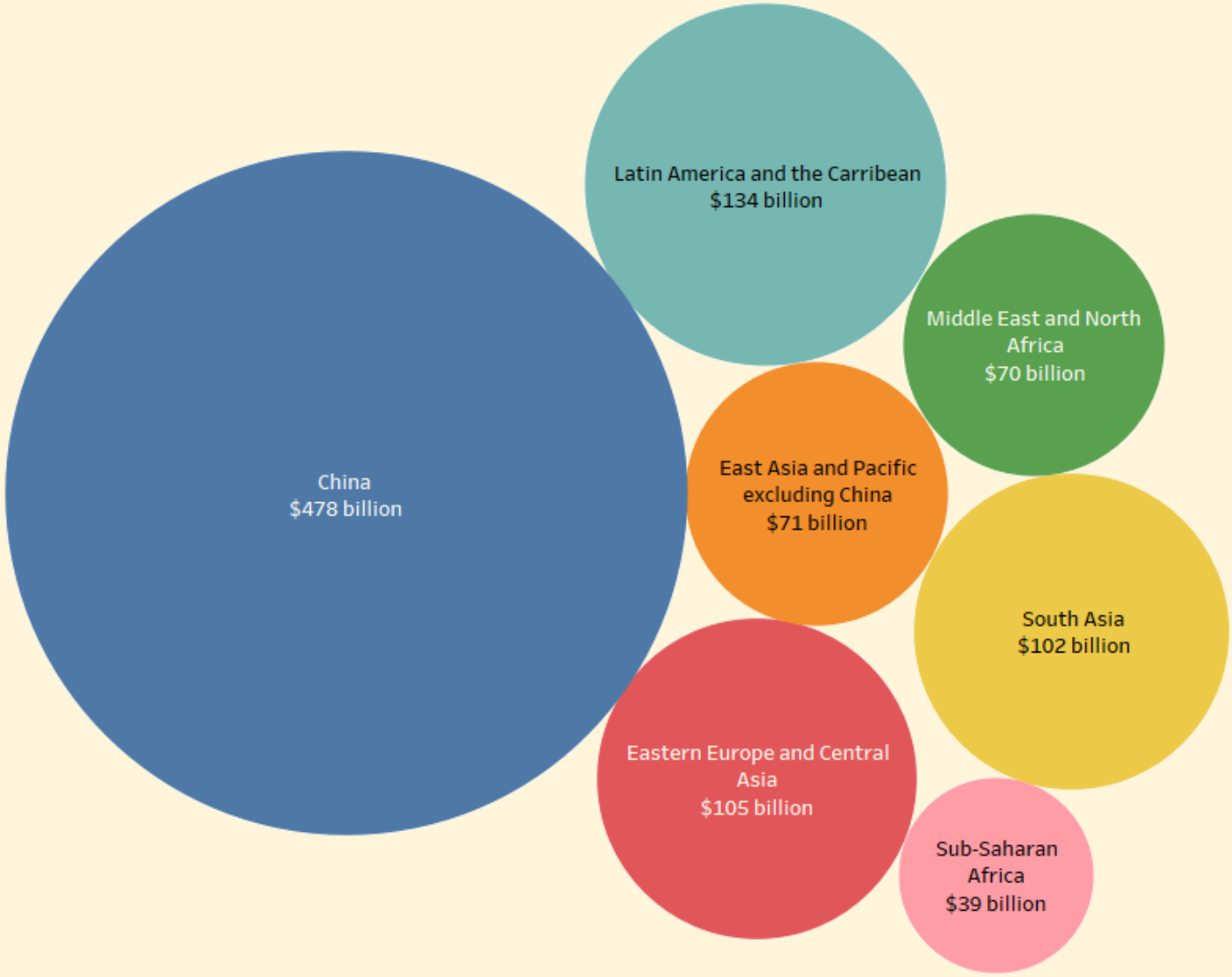
	Lower-bound estimate (fitted values)	Central estimate: (BOOST or Min of two GFCFs)	Upper-bound estimate (0.9 GFCF_CE)
(% GDP)			
All LMIC	3.40	4.12	4.99
LMIC excluding China	2.07	3.13	4.39
(2011 US$ trillions)			
All LMIC	0.82	1.00	1.21
LMIC excluding China	0.34	0.52	0.73

With significant variations across regions



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

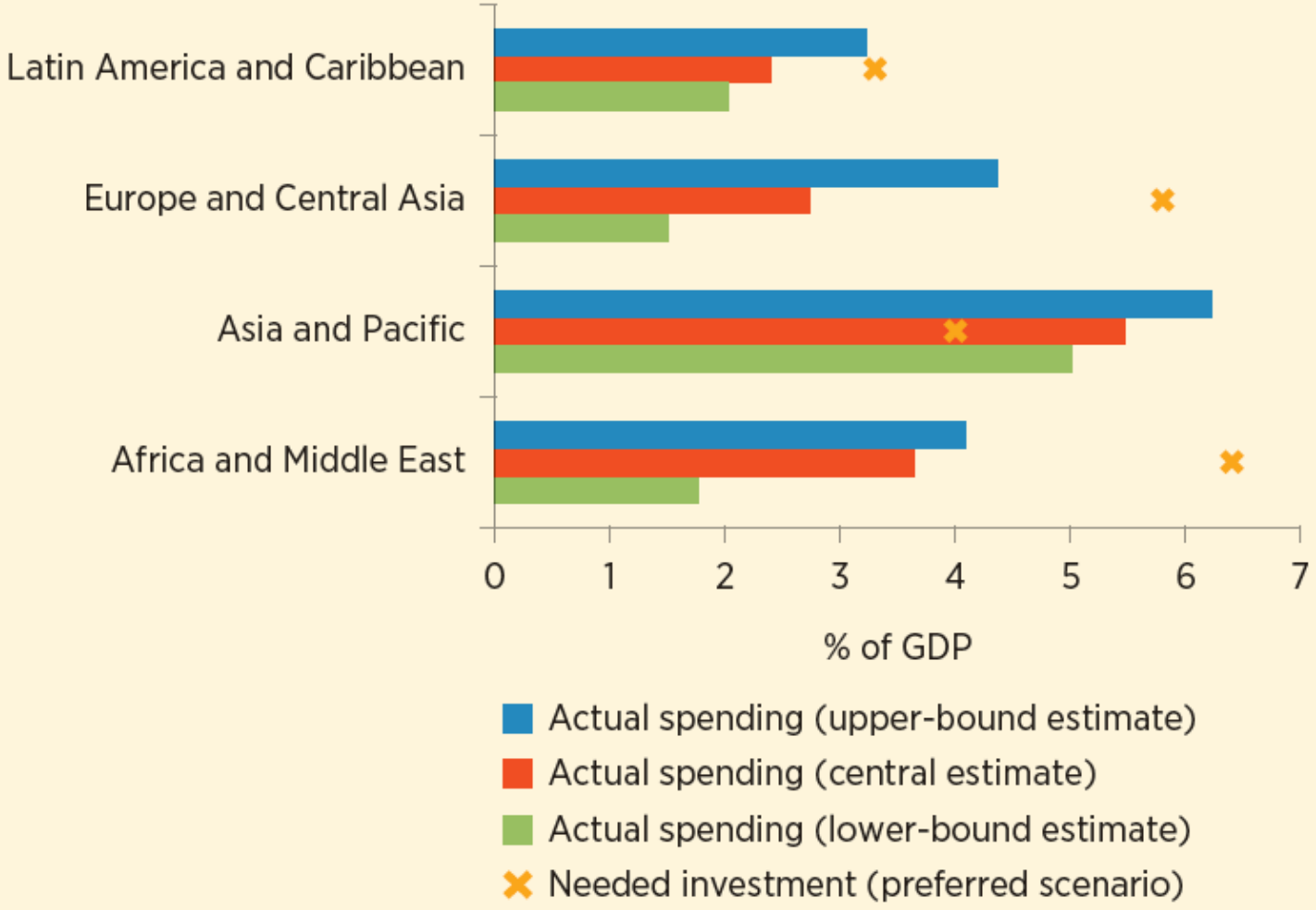
Latin America as the region that spends the most (excl. China)…



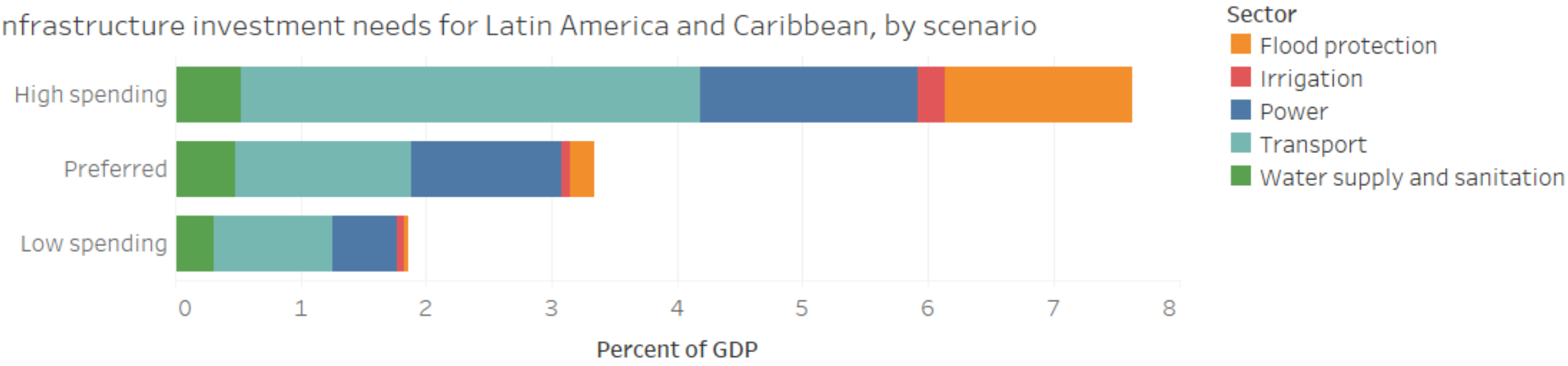
The public sector continues to dominate

Region	Lower bound	Central estimate	Upper bound
(Private investment as % of total investments)			
Sub-Saharan Africa	23	17	13
East Asia and Pacific	2	2	2
Europe and Central Asia	30	17	10
Latin America and the Caribbean	27	23	17
Middle East and North Africa	17	6	6
South Asia	46	37	39
All LMICs	13	11	9
China	1	1	1
LMICs without China	31	20	14

How spending compares with needs



Infrastructure investment needs for Latin America and Caribbean, by scenario



Estimates for past investment