

Aaron Bielenberg,
Mike Kerlin, Jeremy
Oppenheim, and
Melissa Roberts

The next generation of infrastructure

Sustainability & Resource Productivity March 2016

Sustainable projects will add trillions to the world's infrastructure costs. Our report finds that private-sector investors must look at new ways to fill the gap.

The international consensus on sustainable economic development gained momentum in 2015, culminating last December in Paris with a broad global accord on reducing the level of greenhouse gases. A new McKinsey report—*Financing change: How to mobilize private-sector financing for sustainable infrastructure*—examines a key element of progress: ensuring that the transport networks, energy networks, and waste and water facilities in demand across the globe, notably in middle-income countries, will be climate resilient, be socially inclusive (by diminishing poverty or increasing employment), and reduce carbon emissions.

While business groups, development banks, and governments have all pledged significant increases in funding and research for sustainable infrastructure, the scale of the challenge is enormous: from 2015 to 2030, global demand for new infrastructure could amount to more than \$90 trillion,¹ almost double the estimated \$50 trillion value of the world's existing stock. That means we will literally be rebuilding our world over the next 15 years. Moreover, while such investments promise to multiply economic and business opportunities, a number of barriers must fall to attract the necessary finance.

Making it happen

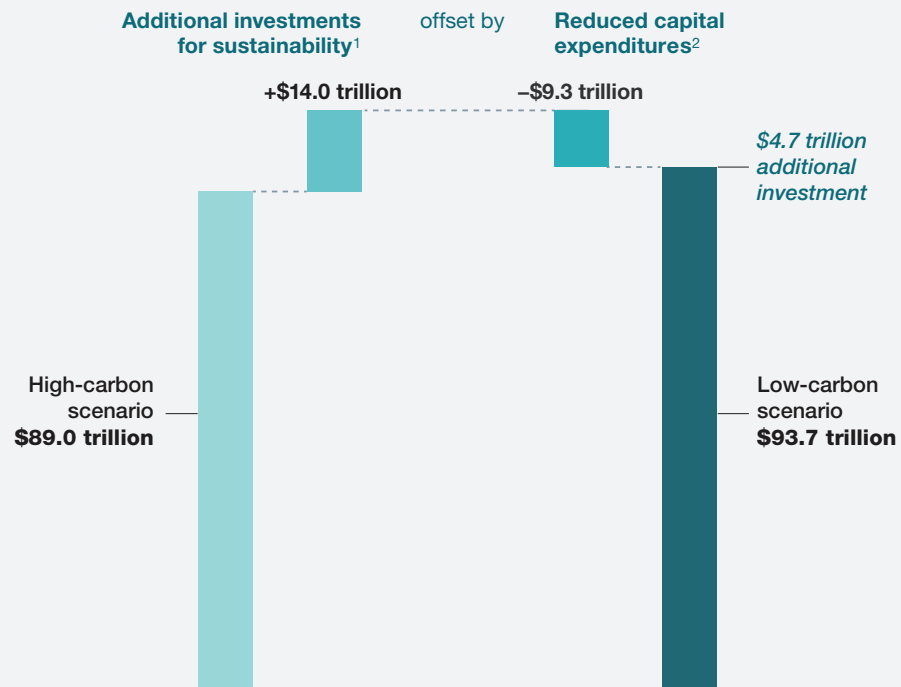
The world needs to find \$7.7 trillion annually over the next 15 years, up from \$3 trillion today, to pay not only for additional infrastructure but also for sustainable projects, which are typically more expensive than traditional ones (exhibit). Our projections show that this sustainability “premium” could add \$14 trillion to overall infrastructure costs between 2015 and 2030. Corresponding declines in investment for fossil-fuel projects and the lower cost of investing in densely configured urban areas will offset some of that. The bottom line: we estimate that an additional 6 percent in up-front capital will be required to raise the level of the new infrastructure to the sustainability standards achieved, for example, in Colombia's recent Fourth Generation roadway expansion and Kenya's Lake Turkana wind-power network.

¹ *Better growth, better climate*, The New Climate Economy, 2014, newclimateeconomy.report.

Exhibit

Building sustainable infrastructure over the next 15 years will require an additional \$4.7 trillion.

Projected global demand for infrastructure services, 2015–30
(estimated in constant 2010 dollars)



¹Projected costs of \$9 trillion in low-carbon power generation and \$5 trillion in energy efficiency.

²Projected savings of \$6 trillion in reduced fossil-fuel costs, \$3 trillion via more compact urban footprints, and \$0.3 trillion in reduced electricity transmission and distribution.

McKinsey&Company | Source: Global Commission on the Economy and Climate

This demand differs by sector and country type. Our research showed that much of the sustainable-infrastructure funding gap is likely to occur in middle-income nations—those with annual per-capita incomes from \$1,045 to \$12,745—whose continued development and increasing prosperity are vital to global growth prospects and business opportunities. We estimate that the energy sector, which will also be critical for higher living standards and levels of business expansion, accounts for more than 50 percent of the funding gap for sustainable projects in these middle-income economies.

The vast scale of what's needed, combined with fiscal constraints in the public sector, suggests that private-sector financing will be crucial. Corporate and institutional investors, we estimate, could provide \$1 trillion to \$1.5 trillion in additional private capital for sustainable

projects—up to half of the annual investment gap. But that will happen only if several structural barriers and market inefficiencies currently adding costs and hampering returns are removed. These include the following:

- **Poor transparency.** Only half of the G-20 nations publish their infrastructure project pipelines, so it is difficult for investors to learn which projects are available and to assess whether they are “bankable.”
- **A lack of scale.** Often, economies of scale are not sufficient for larger investments. A third of the outlays in new clean-energy capacity, for example, go to small-scale projects, like rooftop solar.
- **Shaky operating models.** In sub-Saharan Africa, for instance, 70 percent of the water utilities provide is wasted by leakage, unmetered, or stolen.
- **Corruption.** Notwithstanding the attractions of infrastructure investments, corruption often makes adjusting their return-to-risk ratios particularly difficult.
- **Taxes and regulations.** Tighter global banking regulations, such as Basel III, have the unintended effect of reducing the interest of big global institutions in longer-term cross-border infrastructure investments. Uncertain local tax regimes often raise the bar for investments by increasing the risk that returns will take a hit.

The efforts of development banks and international aid organizations may be particularly important. Bodies such as the International Finance Corporation could provide technical assistance to nations by helping them to prioritize projects and demonstrating the feasibility of returns to investors. (For example, they could counsel government officials on the relative risks and returns of new roadways as opposed to rapid-transit systems.)

Global organizations can also help finance the investment premiums that some projects demand. The European Bank for Reconstruction and Development, for example, finances higher up-front costs for sustainable energy projects after it audits the long-term savings from new energy efficiencies. (The savings are applied to the amortization of the investment premium over the life of the project.) Development banks can also offer loan guarantees, particularly for the higher-risk projects that may have difficulty attracting private lenders.

Governments too can play an important role by requiring potential bidders (or would-be private partners) to meet sustainability criteria. Suppliers bidding on Australia’s \$8.3 billion North West Rail Link project, for instance, had to meet sustainability requirements covering materials, transport, waste, energy, and water.

Structural improvements in financial markets could also encourage greater private participation. The wider syndication of infrastructure loans by development banks, for instance, would

significantly broaden the capital base. Establishing a secondary market for sustainable infrastructure-related securities would provide for the greater recycling of development capital, and more innovative financial instruments could give investors greater flexibility.



World leaders have committed themselves to sustainable economic development and to the heightened demands of climate policies. Accelerating the flow of private capital into sustainable energy, water, and transport systems will be a fundamental element of any realistic effort to reach these ambitious new goals. □

[Download the full report on which this article is based, *Financing change: How to mobilize private-sector financing for sustainable infrastructure*, on McKinsey.com.](#)

Aaron Bielenberg is an associate principal in McKinsey's Washington, DC, office, where **Melissa Roberts** is a consultant. **Mike Kerlin** is a principal in the Philadelphia office, and **Jeremy Oppenheim** is a director in the London office.