



Power and Roads for Africa: What the United States Can Do

by Vijaya Ramachandran

Why should the United States care about economic growth in Africa? Because it is the right thing to do and the smart thing to do. Helping to spur economic growth in Africa promotes our values, enhances our security, and helps create economic and political opportunities for the people of the continent. Public interest in Africa is higher than ever—witness consumer movements such as Product Red—and bipartisan political support recently renewed funding for the President's Emergency Plan for AIDS Relief (PEPFAR). Several new opportunities now exist for U.S. firms to compete and benefit from a win-win partnership with the region.

Central to the issue of growth is the development of the private sector. Without new jobs and businesses, there is no chance for many Africans to raise their standard of living. But Africa's private sector is burdened by the staggering costs of two key hurdles: the lack of power and roads.¹ These create indirect costs that lower productivity by 10 to 20 percent on average, as compared to businesses in China.² The United States can help Africa overcome these obstacles by transferring the cutting-edge technology and know-how of the U.S. private sector to provide energy and build roads, thereby promoting growth and reducing poverty in the region.

Lack of electricity is a major constraint for businesses

The need for electricity in Africa is both enormous and unmet, with many cities and towns experiencing blackouts several times a day. For businesses, energy as a share of total cost is as high as 10 percent; in China, by comparison, it is only 3 percent (see figure, next page). Almost all businesses in Nigeria resort to electricity from generators, which is three times more expensive than electricity from the public grid.³ Fuel for generators can be hard to find, and maintenance is costly. In Kenya, where 70 percent of businesses own generators, the lack of electricity is now considered an even greater problem than corruption.

Environmental degradation from fuel-based power is another concern. Seventy-five percent of all households in Africa rely on

biomass or on kerosene lamps that provide poor lighting and create indoor air pollution, while also accelerating deforestation.

Poor roads limit access to markets

Roads and railways in some of the low-income economies in Africa lag far behind every other region in the world. Businesses are able to supply only fragmented regional markets or restrict themselves to market opportunities with profits large enough to cover high transport costs. In all but the richest African countries, less than half of imports are delivered by road, with investors relying on costly air shipments instead. In the poorest countries, most businesses sell their goods only in local markets. The lack of infrastructure also creates a major disincentive for anyone wishing to start a business. Agriculture is also impacted, with farmers unable to transport their goods overland to domestic markets or international ports.

What the U.S. can do to build roads and bring power to Africa

1. Support a \$1 billion Clean Energy Fund for Africa, managed by the Overseas Private Investment Corporation (OPIC), to facilitate the transfer of clean technology, including renewable energy, from the United States to Africa.
2. Encourage the African Development Bank (AfDB) to focus on regional, clean infrastructure projects, in return for an increased U.S. capital contribution of 25 percent per year for the next four years to AfDB.
3. Ensure that the World Bank increases its allocation toward regional infrastructure projects in Africa and makes this a central mission of the International Development Association (IDA), its soft loan window for the poorest countries. At least 50 percent of IDA's Africa allocation should be spent on such projects, with an emphasis on clean technology.



Vijaya Ramachandran, is a senior fellow with expertise in private sector

development, entrepreneurship, and foreign direct investment. She manages CGD's corporate engagement activities which help international firms join the fight against global poverty. She is the author of *Africa's Private Sector: What's Wrong with the Business Environment and What to Do About It* (forthcoming) and holds a Ph.D. Harvard University.

The White House and The World

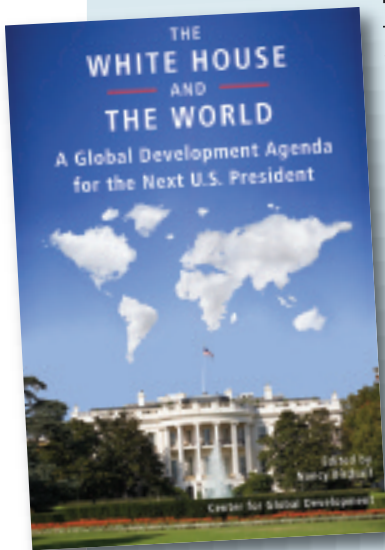
Each day brings fresh evidence that Americans' well-being is linked to the lives of others around the world as never before. Accelerating advances in technology and the creation of new knowledge offer undreamed-of opportunities. Yet global poverty, inequality, disease and the threat of rapid climate change threaten our hopes. How will the U.S. president elected in November 2008 tackle these global challenges?

The White House and the

World: A Global Development Agenda for the Next U.S. President shows how modest changes in U.S. policies could greatly improve the lives of poor people in developing countries, thus fostering greater stability, security, and prosperity globally and at home. Center for Global Development experts offer fresh perspectives and practical advice on trade policy, migration, foreign aid, climate change and more. In an introductory essay, CGD president Nancy Birdsall explains why and how the next U.S. president must lead in the creation of a better, safer world.

The White House and the World Policy Briefs present key facts and recommendations drawn from the book in a succinct form designed for busy people, especially senior policymakers in the executive and legislative branches of government. This brief is drawn from "Power and Roads for Africa: What the United States Can Do" by CGD senior fellow Vijaya Ramachandran.

The White House and the World Policy Briefs were made possible by the Connect US Fund of the Tides Foundation, by Edward Scott Jr., the chairman of CGD's board, and by others whose unrestricted funding makes such collaborative and cross-cutting work possible.



"No Electricity Presently Available"

In the summer of 2007, the government of Kenya made an unusual appeal to the Kenya Association of Manufacturers, urgently requiring them to move their production schedule from their regular hours to a nighttime schedule of 11:00 p.m. to 5:00 a.m. Unable to provide power for more than a few hours a day, the government needed massive load-shedding to protect the power system from being overwhelmed. The manufacturers were in turn faced with the problem of getting workers to and from work in the dark, with vastly increased logistical and security costs.¹¹

Such stories are not uncommon in Africa. In Nigeria, harried citizens often refer to NEPA—the Nigerian Electric Power Authority—as No Electricity Presently Available.

How the United States can help African businesses: A Clean Infrastructure Initiative for Africa

The United States should support a Clean Infrastructure Initiative to provide modern energy through renewable energy sources and facilitate the construction of roads in Africa via multilateral institutions, such as the African Development Bank (AfDB) and the World Bank.

Why should this initiative focus on clean infrastructure? As a major source of greenhouse gas emissions, developed countries have an indisputable responsibility to address global warming. But even if rich countries were to suddenly halt their emissions, developing countries, particularly those in tropical Africa, would soon face a climate crisis as the result of their own; they must therefore find ways to develop clean energy.⁴ The stakes are high: temperatures in many developing countries are already close to or beyond the thresholds at which further warming will reduce agricultural potential. These countries also have less capacity to adapt. And because agriculture constitutes a large fraction of GDP in developing countries, a decrease in productivity will impose large income losses.⁵ The disease burden in these countries could also greatly increase with further warming.

Transfer innovations in clean energy

Africa has a unique opportunity to lead the world by becoming a producer (and even an exporter) of clean energy—notably hydroelectric and solar power—with zero net emissions of greenhouse gases. It can avoid a dependence on coal and avert the predicament of some rapidly growing countries where rising incomes are accompanied by a high incidence of respiratory

disease and other health problems caused by increasing air and water pollution.

African reserves of renewable resources—solar, wind, hydro, and biofuel—are the highest in the world and greatly exceed annual consumption. Small-scale power installations, such as micro-hydro schemes or rooftop solar panels, are well suited to a continent where traditional grid-based electricity will likely never be cheap, reliable, or far-reaching. And because such installations can be supplied by many private sector firms, there can be less need for government regulation, which is unavoidable in the case of grid-based energy supplied by public utilities.

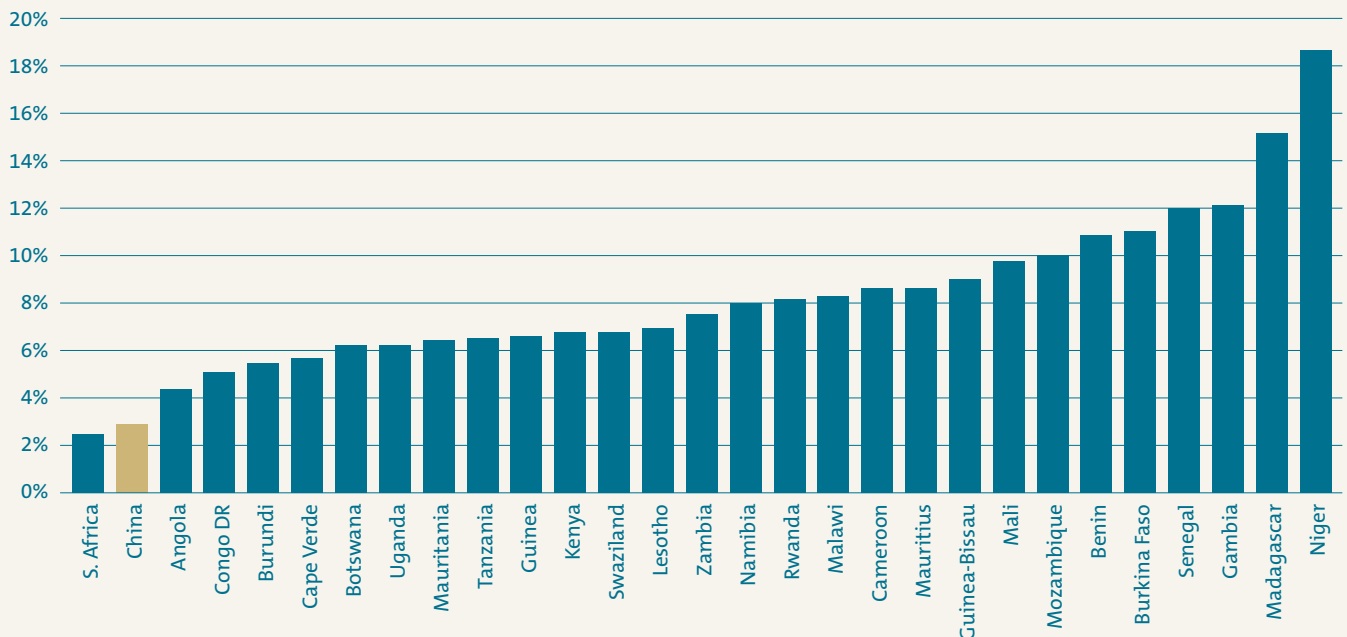
An array of clean power technologies is now being funded by American venture capitalists and others who see the demand created by legislated emissions reductions in rich countries as a major incentive for investing in renewable energy.⁶ For example, Google.org has launched a \$500 million effort to develop electricity from alternative energy sources that will be cheaper than electricity from burning coal.

The United States, through its Overseas Private Investment Corporation (OPIC), can monitor these new developments in clean energy and speed their production by lowering the risks for American businesses through tax credits or by using other mechanisms such as “advance market commitments” like those currently used to develop vaccines.⁷ OPIC can also play a key role in facilitating linkages between U.S. innovators (and U.S. private equity funds interested in financing them) on the one hand, and African businesses and governments on the other.

OPIC recently announced the creation of a Catalyst Private Equity Fund of \$100 million for water and clean energy projects in the Middle East and North Africa. This type of market-based mechanism could potentially be scaled up: a \$1 billion Clean Energy Fund for Africa to provide guarantees to investors and facilitate technology transfers would be a good way to start. Several micro-hydro projects in Africa are already providing electricity for a few hundred households each. Although small-scale energy projects are crucial for a sparsely distributed population, large-scale power is also necessary, especially for growing metropolitan areas. Hydropower in particular has the potential to meet a significant share of Africa’s power needs. The most ambitious such project is the Grand Inga Dam in the Democratic Republic of the Congo, which seeks to harness the Inga Falls on the Congo River and generate up to 39,000 MW of electric power, supplying the needs of most of the African continent.

Hydropower projects generate controversy on several counts, but there are new best-practice models to learn from, such as the Nam Theun 2 hydroelectric project in Lao People’s Democratic Republic (PDR), with its numerous social and environmental safeguards to protect the people and the biodiversity affected by the project. Some critics question the wisdom of depending on hydropower in an era of climate change-induced drought and unreliable rainfall. But this concern can be mitigated by increasing water storage capacity, which is currently at only about 5 percent of potential storage levels. Other serious concerns—about resettlement of large numbers of people, the

Energy as a Share of Total Business Costs





destruction of waterfalls, and the loss of wildlife habitat—can be addressed through consultative processes, involvement of community organizations at every stage of the project, and external monitoring by relevant agencies.

Build and maintain roads via multilateral institutions

A network of roads connecting all sub-Saharan capitals and other cities with populations over 500,000 would result in an expansion of overland trade of about \$250 billion over fifteen years, with both direct and indirect benefits for Africa's rural poor, according to a 2006 World Bank study.⁸ The study estimates an upfront cost of \$20 billion, and \$1 billion in yearly maintenance. (The map above shows the transnational road network proposed, along with the transcontinental corridors proposed by AfDB.) The United States should work with AfDB, the World Bank, and other multilateral institutions to reduce the transport bottlenecks constraining growth in the region.

U.S. construction companies have considerable expertise building roads in different topographical and climatic conditions and could compete successfully on bids while generating jobs in Africa at the same time. An emphasis on preserving biodiversity in the planning of roads can also mitigate the environmental tradeoffs seen in the past, such as deforestation and the loss of habitats.

What about maintenance, which is often cited as a bigger challenge than building infrastructure? Two factors provide cause for optimism: the first is the existence of new best-practice models which show how maintenance can be funded through user fees, included in construction contracts, outsourced to independent providers, or contracted in other ways based on competitive bidding. The number of bidders would also increase when maintenance projects are bundled regionally and provide more scale.

The second reason for optimism about infrastructure maintenance is the rise of a technocratic class in many African countries. We are no longer in the Africa of the 1970s—many countries have undergone macroeconomic reforms and several democratically elected leaders have successfully brought the best talent back to their countries. As a middle class emerges across the continent, there will be even greater demand for the maintenance of infrastructure. Designing, constructing, and maintaining infrastructure has a greater promise of success than ever before.

Corruption and efficiency concerns will need to be addressed in relation to tendering and procurement processes, collection of tolls, and maintenance contracts for roads and power plants. Here too, best-practice models exist, as well as a vast reserve of technical capacity, especially within multilateral institutions such as the World Bank and AfDB.

Regional investment projects, backed by international funding, can lead to fears of a loss of sovereignty in decision-making at the national level. But such projects will bring with them layers of safeguards, and national policymakers recognize that improved infrastructure in their countries will drive growth.

One example of excellent cooperation is the West African Power Pool, where collaborating governments have successfully relinquished some decision-making power in order to maximize the supply of electricity on a regional basis.⁹ In many ways, such large-scale infrastructure investment is more likely to succeed than smaller efforts because it comes with more money, more international attention, and more safeguards. Large regional projects that visibly improve infrastructure can also motivate governments to do more and do better.

For all these efforts to succeed, the United States must work through the multilateral process, especially by supporting AfDB. In 2006, a working group convened by the Center for Global Development made a strong case for AfDB to focus exclusively on infrastructure over the next three to five years.¹⁰ The AfDB should also provide support for tendering, procurement, and ongoing maintenance of infrastructure facilities. Currently, about 40 percent of AfDB's overall program budget of between \$2 billion and \$3 billion goes toward infrastructure—far below Africa's infrastructure needs. The United States, as the second largest non-regional shareholder, should emphasize the need for larger projects focused on clean infrastructure. It should also encourage AfDB to build up its professional capacity in the area of infrastructure, particularly in facilitating public-private partnerships. If the AfDB can deliver on this objective, the United States should consider increasing its capital contribution to the organization by up to 25 percent per year for the next four years.

Power and Roads for Africa: What the United States Can Do



Another key player on the continent, the New Partnership for Africa's Development, has effectively partnered with AfDB in an arrangement in which AfDB has the main responsibility for infrastructure investments. The United States can support the Partnership and AfDB in financing clean infrastructure projects and provide technical assistance for the maintenance, regulation, and pricing of services.

The World Bank can also play a role in infrastructure provision through the regional component of its concessional lending window, the International Development Association's, both directly and by assisting AfDB. However, multilateral institutions are geared toward working at the level of individual countries, and fixing the incentive structure within these organizations will be a crucial part of the solution to delivering regional public goods to Africa. The United States—

Endnotes

¹ This brief is based on surveys of about 11,000 businesses in twenty-seven African countries (enterprisesurveys.org).

² Benn Eifert, Alan Gelb, and Vijaya Ramachandran, "Business Environment and Comparative Advantage in Africa: Evidence from the Investment Climate Data," Working Paper 56 (Washington, D.C.: Center for Global Development, 2006).

³ Adeola F. Adenikinju, "African Imperatives in the New World Trade Order: Country Case Study of the Manufacturing Sector in Nigeria," in E. O. Ogunkola and A. Bankole, eds., *Nigeria's Imperatives in the New World Trade Order* (Nairobi and Ibadan: Africa Economic Research Consortium and the Trade Policy Research and Training Programme, 2005).

⁴ David Wheeler, "Another Inconvenient Truth: A Carbon-Intensive South Faces Environmental Disaster, No Matter What the North Does," Working Paper 134 (Washington, D.C.: Center for Global Development, 2007), <http://www.cgdev.org/content/publications/detail/14947/>.

⁵ William R. Cline, *Global Warming and Agriculture: Impact Estimates by Country* (Washington, D.C.: Center for Global Development, 2007).

⁶ Venture capital activity in solar energy alone increased almost fourfold from \$59 million in 2004 to \$308 million in 2006 (see "Bright Prospects" in the *Economist* (March 8, 2007), http://www.economist.com/search/displaystory.cfm?story_id=8766045). In the United States, twenty-five states and the District of Columbia have binding clean energy standards, and California's recent greenhouse gas law requires the state to reduce its overall emissions by 25 percent by 2020. The U.S. Department of Energy's goal is to make solar power cost-competitive with the grid by 2015.

⁷ Michael Kremer, Owen Barder and Ruth Levine, *Making Markets for Vaccines: From Ideas to Action* (Washington, D.C.: Center for Global Development, 2005).

⁸ Piet Buys, Uwe Deichmann, and David Wheeler, "Road Network Upgrading and Trade Expansion in sub-Saharan Africa," Policy Research Working Paper 4097 (Washington, D.C.: World Bank, 2006).

⁹ www.ecowapp.org.

¹⁰ AfDB Working Group, "Building Africa's Development Bank: Six Recommendations for the AfDB and its Shareholders." (Washington, D.C.: Center for Global Development, 2006). http://www.cgdev.org/files/10033_file_AfDB_ENG.pdf.

¹¹ Steve Mbogo, "Big Companies Demand Higher Rebates in Energy Saving Plan," *Business Daily Africa* (July 26, 2007).

as a major shareholder of these institutions—is uniquely positioned to get this done.

Conclusion: Building clean infrastructure and boosting growth

The United States has an unprecedented opportunity to help Africa in its search for a high and sustainable rate of growth by helping to build the region's infrastructure using new and clean technology. Addressing Africa's road and power crisis will benefit businesses in both the United States and Africa, and low-carbon or carbon-free technology will benefit not just the African people but the whole world.

Further Reading

Vijaya Ramachandran. 2008. "Power and Roads for Africa: What the United States Can Do." In *The White House and the World: A Global Development Agenda for the Next U.S. President*. Nancy Birdsall, editor. Washington, D.C.: Center for Global Development.

Nancy Birdsall. 2007. "Do No Harm: Aid, Weak Institutions, and the Missing Middle in Africa." Working Paper 113. Washington, D.C.: Center for Global Development. <http://www.cgdev.org/content/publications/detail/13115>

Piet Buys, Uwe Deichmann, and David Wheeler. 2006. "Road Network Upgrading and Overland Trade Expansion in sub-Saharan Africa." Policy Research Working Paper 4097. Washington, D.C.: World Bank. http://papers.ssrn.com/sol3/papers.cfm?abstract_id=951870

David Canning and Peter Pedroni. 1999. "Infrastructure and Long Run Economic Growth." Working Paper 99-09. Center for Analytical Economics, Cornell University. <http://www.arts.cornell.edu/econ/CAE/infrastructure-7-99.pdf>

Benn Eifert, Alan Gelb, and Vijaya Ramachandran. 2005. "Business Environment and Comparative Advantage in Africa: Evidence from the Investment Climate Data." Working Paper 56. Washington, D.C.: Center for Global Development. <http://www.cgdev.org/content/publications/detail/2732/>

Energy Sector Management Assistance Program, World Bank. 2007. "Technical and Economic Assessment of Off-grid, Mini-grid and Grid Electrification Technologies." ESMAP Technical Paper 121/07. <http://siteresources.worldbank.org/EXTENERGY/Resources/336805-1157034157861/ElectrificationAssessmentRptSummaryFINAL17May07.pdf>



www.cgdev.org

For print copies, email Publications@cgdev.org
www.cgdev.org