Engineering, Economics and Regulation
for Energy Access in Developing Countries: Key Actors - Institutions
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1. What do people think of when I say “Institutions” involved in energy system development?
2. Why spend time on institutions?
   2.1. High risk money, and expertise is needed, even in large countries like India, but especially in African countries.
   2.2. What sorts of risk are we discussing?
      2.2.1. Business - execution, market, planning
      2.2.2. Currency/Monetary/Fiscal
      2.2.3. Sovereign/Military
      2.2.4. Political
3. The motivations of outside actors.
   3.1. Geopolitical
   3.2. Humanitarian
   3.3. Trade
   3.4. Security and stability
   3.5. Climate change
   4.1. USAID (Power Africa)
   4.2. OPIC
   4.3. EXIM
   4.4. DFID, NORAD, EU, France
   4.5. Development Banks: World Bank, AfDB, ADB, IDB, AIIB
   4.7. UN (SE4All, GEF)
4.1. USAID (Power Africa)

Many of USAID’s energy programs are advisory - drawing on the expertise of US universities, the national labs and government departments and agencies (DOE, FERC etc). Many have a capitalist/democratic ideological aspect, and are focused on countries thought to be stability threats, or who may be geopolitically important to US interests.

**Example Regional and Country Specific Programs**

**INDIA Program to Accelerate Clean Energy - PACE-R and PACE-D**

HAITI, INDIA, KENYA, NEPAL, UGANDA  
2011–ONGOING  
[Renewable Energy Microfinance and Microenterprise](#)

**GEORGIA, JORDAN, KENYA, MACEDONIA, NIGERIA**  
2015–ONGOING  
[Engendering Utilities](#)

**Global Programs**

Sector Reform and Utility Commercialization

Energy Regulatory Partnership Program

Enhancing Capacity for Low Emission Development Strategies

**Power Africa** - Bottom Up deal making and advising; leveraging EXIM, OPIC  
Power Africa’s goal is to add more than 30,000 megawatts (MW) of cleaner, more efficient electricity generation capacity and 60 million new home and business connections within a decade.

1. Transaction focus
2. De-risking private sector investment
3. On the Ground advisory transaction support
4.2. OPIC

Founding
1971 Richard Nixon. An agency of the US government that operates as a bank and operates at a profit.

Mission
The Overseas Private Investment Corporation (OPIC) is a self-sustaining U.S. Government agency that helps American businesses invest in emerging markets. Established in 1971, OPIC provides businesses with the tools to manage the risks associated with foreign direct investment, fosters economic development in emerging market countries, and advances U.S. foreign policy and national security priorities. OPIC helps American businesses gain footholds in new markets, catalyzes new revenues and contributes to jobs and growth opportunities both at home and abroad. OPIC fulfills its mission by providing businesses with financing, political risk insurance, advocacy and by partnering with private equity investment fund managers.

Operations
OPIC services are available to new and expanding businesses planning to invest in more than 160 countries worldwide. Because OPIC charges market-based fees for its products, it operates on a self-sustaining basis at no net cost to taxpayers. All OPIC projects must adhere to best international practices and cannot cause job loss in the United States. OPIC supports American national security and foreign policy as well as American business.

By supporting investment in regions around the world that are experiencing challenges such as poverty or conflict, OPIC helps promote economic and political stability, while also helping American businesses gain footholds in many of the world’s emerging and fast-growing markets. To date, OPIC has supported more than $200 billion of investment in over 4,000 projects.

Risk Insurance and loans to US firms of up to $250M.

Energy Role
In 2016, OPIC committed $1.4 billion to energy transactions and critical infrastructure around the world. This included $55 million for off-grid energy projects to bring electricity to some of the poorest and most remote communities.

In 2015, OPIC surpassed its initial pledge of $1.5 billion to Power Africa, with financing and political risk insurance to a variety of power projects from Kenya to Ghana. To date, OPIC has committed $2.1 billion in financing and insurance commitments towards 22 Power Africa projects. These investments will lead to the development of more than 1,700 MW of new power generation in Africa.
The official export credit agency of the United States federal government. Operating as a government corporation.

The bank finances and insures foreign purchases of United States goods for customers unable or unwilling to accept credit risk. According to its charter, the Ex-Im Bank does not compete with private sector lenders, but rather provides financing for transactions that would otherwise not occur because commercial lenders are either unable or unwilling to accept the political or commercial risks inherent in the deal.

The bank was established in 1934 by an executive order, and made an independent agency in the Executive Branch by Congress in 1945.

The cost and effectiveness of the bank are controversial. While the Ex-Im Bank projects will earn the U.S. government an average of $1.4 billion per year for the next 10 years, an alternative analysis from the Congressional Budget Office found that the program would lose about $2 billion during the same period, partly due to discrepancies in how credit risk is accounted for. Both conservative and liberal groups have been critical of the bank, and some continue to demand its termination.

Roughly $3B/yr to energy projects (GE) and much more to aircraft (Boeing, LMC)
4.4. DFID, NORAD, EU

We don’t have time to say much here except that these are all significant bilateral agencies. Their character is somewhat less parochial than that of USAID, and their overall scale in proportion to national income is much larger, although their energy portfolios are modest.
4.5. Development Banks: World Bank, AfDB, ADB, IADB, AIIB

There are the World Bank and other regional and much smaller versions of the World Bank falling within the Bretton Woods Institutions + the Asia Infrastructure Investment Bank.

The exception is the AIIB, the Asia Infrastructure Investment Bank, which is solely funded by China. Started in the second half of 2016. It anticipates annual loans in the range $10-15B.

By not insisting on some free market economic policies recommended by the World Bank, the AIIB is likely to avoid the criticism leveled against its rivals, which some say impose unreasonable demands on borrowers.
Founded in 1944, the
**International Bank for Reconstruction and Development**—soon called the World Bank—has expanded to a closely associated group of five development institutions. Originally, its loans helped rebuild countries devastated by World War II. In time, the focus shifted from reconstruction to development, with a heavy emphasis on infrastructure such as dams, electrical grids, irrigation systems, and roads. With the founding of the International Finance Corporation in 1956, the institution became able to lend to private companies and financial institutions in developing countries. And the founding of the **International Development Association** in 1960 put greater emphasis on the poorest countries, part of a steady shift toward the eradication of poverty becoming the Bank Group’s primary goal. The subsequent launch of the **International Centre for Settlement of Investment Disputes** and the **Multilateral Investment Guarantee Agency** further rounded out the Bank Group’s ability to connect global financial resources to the needs of developing countries.

**MIGA focuses on insuring investments** in the areas where it can make the greatest difference

- Countries eligible for assistance from the **International Development Association** (the world’s poorest countries)
- **Fragile and conflict-affected** environments
- **Transformational Projects** – large scale and significant investments, with the potential for bringing about transformational change in the host country
- **Energy Efficiency and Climate Change** - complex energy and infrastructure projects that improve energy capacity as well as transportation projects that have a positive impact on pollution control (such as mass transport)
- **Middle Income Countries** where we can have strong impact

The Bank’s founders thought that countries would borrow from the Bank temporarily, until they grew enough to borrow commercially (NAC 1946, p. 312; Black 1952). The Bank could arguably address capital market failures if private banks would not lend to truly creditworthy projects in developing countries out of fear that they would not be repaid. In that case, a multilateral institution backed by the world’s governments might be able to secure repayment.

Some critiques argue that the growth of private capital flows to the developing world has rendered the Bank irrelevant.

Modern analyses should proceed from the premise that the Bank’s central goal is and should be to reduce extreme poverty, and that addressing failures in global capital markets is now of subsidiary importance.
Why might donor countries choose to work through an international organization to advance the goal of reducing poverty?

Developing country government policy is a key factor influencing poverty, with an importance far greater than the direct impact of aid.

**Effective aid therefore often involves negotiating agreements with recipient country governments that include policy reforms.**

There are economies of scale in negotiating such agreements that can be realized by an entity such as the Bank, and pooling funds into such an entity may also improve donors’ collective bargaining position in negotiations with governments. Moreover, we argue that the World Bank’s status as a multilateral organization and its technocratic staff enhances its credibility and legitimacy in policy discussions with developing-country governments. This has allowed it tremendous policy influence relative to the explicit and implicit subsidies it receives, making it a bargain for those who value its mission of reducing extreme poverty and share its mainstream economic views on what policies best advance that goal.

The World Bank Group operates through divisions that have differing roles. Three of these groups can arguably be interpreted either through the narrow lens of addressing international capital market imperfections or through the broader lens of poverty reduction: the International Bank for Reconstruction and Development (IBRD), which lends to governments; the International Finance Corporation (IFC), which invests in commercial projects; and the Multilateral Investment Guarantee Agency (MIGA), which sells insurance policies to private investors against noncommercial—that is, political—risks.

**The IBRD, IFC, and MIGA work primarily in middle-income countries, with financial terms ostensibly close to market terms. Their books show them earning profits.**

Governments pledge capital on a drawdown basis in part to cover possible loss of capital. This is an implicit subsidy that commercial banks cannot offer.

**IDA**

**IDA offers a combination of grants and of loans on such highly concessional terms that they amount to grants for very low-income countries, currently defined as those with per capita income of less than $1,215 per year (at market exchange rates).**

The overwhelming majority of Bank subsidies from its shareholder countries go to the International Development Association (IDA), its arm for making grants and highly concessional loans to the lowest-income countries, and other funding vehicles for the same countries. The Bank’s greatest impact comes from its role in the dramatic policy changes many developing countries have undertaken in multiple sectors that most economists would consider likely to reduce poverty, either by increasing growth or
promoting equity.

The World Bank Group also holds Trust Funds supported by donors and used for pre-specified purposes related to addressing poverty (broadly defined) such as fighting AIDS and malaria, immunizing children, or promoting access to education in the developing world. In general, Trust Funds are not intended to generate financial returns. Donors subsidize these poverty-focused parts of the Bank much more than the other parts.

Every three years, donors meet to replenish IDA resources and review its policy framework. The replenishment process typically consists of four formal meetings held over the course of one year. In addition to officials from donor governments (known as “IDA Deputies”), representatives of borrowing member countries are invited to participate to help ensure that IDA’s policy and financing frameworks are responsive to country needs. Four IDA18 replenishment meetings were held in 2016:

In the fiscal year ending June 30, 2015, IDA commitments totaled $19 billion, of which 13 percent was provided on grant terms. New commitments in FY15 comprised 191 new operations. Since 1960, IDA has provided $312 billion for investments in 112 countries. Annual commitments have increased steadily and averaged about $19 billion over the last three years.

The capital stock of the IFC and IBRD is $64.8 billion. Assuming a 3 percent diskless return on this sum gives an estimate of $1.9 billion per year in opportunity cost in the foregone interest from investing in a riskless security.

Including this implied cost, plus grants, the implied cost from IDA activities is in the range $11-14B/year representing an annual donor subsidy embodied by the Bank including the foregone interest opportunity and grants. This is trivial relative to the economies and budgets of both recipients and donors. The total GDP of client- countries receiving IDA credits is $2 trillion; the total GDP of IBRD-only borrowers is $27 trillion. The total GDP of the Bank’s ten largest donor-shareholders is $47 trillion, and their total government budgets exceed $13 trillion.

IBRD - loans to governments of primarily middle income countries plus considerable technical and policy advice.

Lending to middle income countries risks competing with commercial banks unfairly and may drive up lending costs for those countries as Bank loans have repayment preference. However, the interest from these IBRD loans also generates income for IDA programs, which benefits low income countries.
IFC - commercial loans in middle income countries plus considerable banking and technical advice.

As demand for its services has increased over time, the Bank Group has risen to meet them. For perspective, the World Bank made four loans totaling $497 million in 1947, as compared to 302 commitments totaling $60 billion in 2015. $152B loans outstanding. (The 4 largest US banks each have loans outstanding totaling more than $650B.)

The World Bank’s engagement in the energy sector is aimed at supporting developing countries to secure the affordable, reliable and sustainable energy supply needed to end poverty and promote shared prosperity. It assists countries to pursue environmentally, financially, fiscally and socially sustainable energy sector development.

The Sustainable Energy for All (SE4All) Initiative, co-led by the World Bank, aims to accomplish three goals by 2030:
1. universal access to electricity and clean cooking fuels;
2. doubling the share of renewable energy in the global energy mix,
3. and doubling the improvement rate of energy efficiency.

The WBG supports development of energy systems based on lowest-cost options with an emphasis on renewable sources such as hydropower, wind, solar and geothermal, while also promoting energy efficiency. Projects support achievement of universal access to electricity and modern household fuels, as well as improved utility performance and sector governance.

We are scaling up efforts to improve energy efficiency, and support all forms of renewable energy. The WBG is helping countries develop national and regional gas markets and where it makes economic sense, use natural gas as a lower-carbon energy source. We also focus on long-term energy planning, and promote market solutions—supported by the right policy, regulatory and contractual frameworks—to increase the leverage of our financial resources.

The World Bank also supports strategic technical assistance initiatives through global partnerships and trust funds such as the Energy Sector Management Assistance Program (ESMAP) and the Global Gas Flaring Reduction Partnership (GGFR). These initiatives include the SE4All Technical Assistance Program to help countries reach the 2030 goal of universal energy access, the Global Geothermal Development Plan, Lighting Africa, Lighting Asia, Renewable Energy Resource Mapping, Energy Efficiency Guidance Notes and the Energy Subsidy Reform Technical Assistance and Delivery Facility.

We also recognize the global challenge of balancing energy for development with its impact on climate change and strive to help client countries realize affordable alternatives to coal
power. There has been no WBG financing for “greenfield” coal-fired power plants since 2010.

Since 2008, the Bank Group has provided $48.6 billion for energy projects, $24 billion from IBRD, $11.4 billion from IDA and balance from IFC and MIGA.

Of the total Bank Group financing, $12.4 billion—25.6 percent—was for renewable energy projects and programs, reflecting the determination of many countries to seek lower-carbon energy solutions. Energy efficiency, and transmission and distribution accounted for nearly one-third of energy financing. About 16 percent of the portfolio since 2008 is devoted to fossil fuel projects.

The Bank is the keeper of the Global Tracking Framework, which is worth a good look. Global Tracking Framework (GTF - http://gtf.esmap.org)
The Sustainable Energy for All (SE4ALL) initiative, co-chaired by UN-Secretary-General Ban Ki-moon, and World Bank Group President Jim Yong Kim, is a global coalition of governments, private sector, civil society and international organizations that aims to achieve three goals by 2030: 1) Universal access to electricity and modern cooking solutions, 2) Double the rate of improvement in energy efficiency, reducing the compound annual growth rate of energy intensity to -2.6%. 3) Doubling the amount of renewable energy in the global energy mix from its current share of 18% to 36% and Since 2012, some 80 partner countries from the developing world have signaled their commitment to SE4ALL.

Existing investments in energy totaling about $409 billion a year need to be increased by an additional $600-800 billion every year till 2030 to achieve the above goals. Specifically, that is $45 billion more for electricity expansion, $4.4 billion more for cooking solutions, $394 billion for energy efficiency, and $174 billion for renewable energy. These estimates are in a Global Tracking Framework for the Sustainable Energy for All Initiative, produced in 2013 by a team of experts from 15 agencies co-led by the World Bank Group and the International Energy Agency. In addition to its leadership role in the corporate governance of the initiative, and the on-going US$7 billion annual lending program, the WBG is contributing to the three overall objectives through a number of additional initiatives:

- **The Energy Sector Management Assistance Program** (ESMAP) is a global knowledge and technical assistance program administered by the World Bank. ESMAP provides analytical and advisory services to low- and middle-income countries to increase their know-how and institutional capacity to achieve environmentally sustainable energy solutions for poverty reduction and economic growth. ESMAP is funded by Australia, Austria, Denmark, Finland, France, Germany, Iceland, Lithuania, the Netherlands, Norway, Sweden, and the United Kingdom, as
well as the World Bank. The WBG in partnership with ESMAP will provide SE4ALL Technical Assistance for the preparation of Investment Prospectuses in 10 of the 80 SE4ALL partner countries to identify critical energy projects and help to facilitate the associated financing. ESMAP will also support the Global Geothermal Development Plan, Renewable Energy Mapping program and Energy Efficient Cities Initiative

• The World Bank-led Global Gas Flaring Reduction (GGFR) initiative is a public-private partnership that brings together representatives from major oil-producing countries and companies. The GGFR aims to minimize the flaring of natural gas associated with oil production by fostering critical collaboration between governments and industry so together they can address policy challenges and specific project implementation. These efforts are starting to pay off. Since 2005, flaring of gas has dropped worldwide by almost 20 percent, preventing over 270 million tons of CO₂ emissions, equivalent roughly to taking some 52 million cars off the road. GGFR will step up flaring reduction efforts over next four years to improve the efficiency of the energy supply industry.

• Lighting Africa is a joint IFC and World Bank program that works towards improving access to better lighting in areas not yet connected to the electricity grid. Lighting Africa catalyzes and accelerates the development of sustainable markets for affordable, modern off-grid lighting solutions for low-income households and micro-enterprises across the continent. Lighting Asia and Global LEAP (Lighting and Energy Access Partnership) will build on Lighting Africa success in providing solar lanterns as a first step toward access.
APPENDIX: The IMF

The IMF’s fundamental mission is to ensure the stability of the international monetary system. It does so in three ways: keeping track of the global economy and the economies of member countries; lending to countries with balance of payments difficulties; and giving practical help to members.

**Surveillance**
The IMF oversees the international monetary system and monitors the economic and financial policies of its 189 member countries. As part of this process, which takes place both at the global level and in individual countries, the IMF highlights possible risks to stability and advises on needed policy adjustments.

**Lending**
A core responsibility of the IMF is to provide loans to member countries experiencing actual or potential balance of payments problems. This financial assistance enables countries to rebuild their international reserves, stabilize their currencies, continue paying for imports, and restore conditions for strong economic growth, while undertaking policies to correct underlying problems. Unlike development banks, the IMF does not lend for specific projects.

**Capacity Development**
IMF capacity development—technical assistance and training—helps member countries design and implement economic policies that foster stability and growth by strengthening their institutional capacity and skills. The IMF seeks to build on synergies between technical assistance and training to maximize their effectiveness.