

US International Energy Assistance and Cooperation:
Has the Title V Objective Been Realized?

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I. EXECUTIVE SUMMARY

Energy has been recognized by both the Obama and Trump Administrations as an important element of US foreign policy and national security strategy. But the clean energy/climate change approach under Obama has given way to the fossil fuel priority and “energy dominance” theme of the Trump Administration.

Title V of the Nuclear Non-Proliferation Act of 1978 authorized a program to help developing countries pursue non-nuclear energy alternatives. Although it was never specifically funded, the US government has pursued an active international energy assistance and cooperation program with developing countries for many years.

The global energy role of developing countries has greatly expanded since 1978, with non-OECD countries now accounting for almost 60% of global energy consumption. With their income, population and urban growth, they are projected to account for all of the world’s growth in primary energy from 2017-2040.¹ These are the big energy markets of the future and the fundamental question is: how will the US government and its companies pursue these opportunities and face the challenges of China, Russia, Japan, Germany, S. Korea and other competitors?

This paper presents a snapshot of current USG programs and the roles of the main USG agencies in implementation. It distinguishes four major types of activity: (1) technical assistance for energy policy and sector reform; (2) energy technology cooperation; (3) energy capital project assistance; (4) energy trade and investment promotion.

US agency funding in FY16 (not including the Export-Import Bank or Treasury funding to the International Finance Institutions) is estimated at over \$2.5 billion, with the largest outlays from the Overseas Private Investment Corporation, the Millennium Challenge Corporation and the US Agency for International Development. The main geographical focus of these programs and projects was in Sub-Saharan Africa and the Near East (including Afghanistan and Pakistan). One of the main Obama Initiatives was Power Africa, a “whole of government” initiative coordinated by the NSC and USAID that focused on mobilizing US private investment for power generation and improving energy access in Sub-Saharan Africa. This initiative gained substantial bipartisan support in Congress, which led to the passage of the Electrify Africa Act of 2015.

¹ See both International Energy Agency, World Energy Outlook 2017, p. 65 and BP Energy Outlook 2018, p. 14.

With the Trump Administration's elimination of climate change programs, proposed deep cuts in the FY18 and FY19 foreign operations budgets of State and USAID, and the proposed termination of OPIC and TDA, the future of US international energy assistance and cooperation programs has uncertain. Preliminary numbers for FY17 appear to show a reduction in funding to around \$2 billion, reflecting drops in both USAID and MCC obligations. The Congress resisted proposed cuts to overall foreign assistance in FY17 and the recent action on the FY18 Omnibus appropriations bill increased funding for OPIC and TDA, maintained levels for Development Assistance while making smaller than proposed cuts in ESF and AEECA accounts.

This paper argues for the development of a new programmatic emphasis and framework that would restore an "all of the above" energy emphasis to the foreign operations budget and recognize the key roles of OPIC and TDA to an effective strategy. Power Africa represents a model that should be adapted to other regions to ensure support for US security, economic/commercial and environmental interests.

II. BACKGROUND AND PURPOSE

Title V of the Nuclear Non-Proliferation Act of 1978 authorized but did not fund the creation of a program to help developing countries pursue non-nuclear energy alternatives.² The United States Government has however pursued international energy assistance and cooperation programs with developing countries over the years since 1978 that have focused on non-nuclear energy development. These programs have been driven by security, economic development, and environmental objectives but have generally, except in a few countries of the former Soviet Union, not been motivated by nuclear non-proliferation concerns or desires to limit nuclear power development. Non-proliferation remains nevertheless an important strategic foreign policy concern, especially as additional developing countries seek to develop nuclear capabilities and power facilities and China and Russia step up efforts to finance and build nuclear plants in the politically-sensitive countries in the Middle East and South Asia and challenge US leadership in the international nuclear order.

The global energy scene has changed dramatically since 1978 with the emergence of the developing, non-OECD world as the leading region in terms of energy consumption and growth and the impact of changing economic and environmental factors on energy technology choices. The non-OECD countries in 2016 accounted for 58 percent of global primary energy consumption, compared to only 42 percent in 1980.³ Consumption has grown by almost twice and CO2 emissions have risen from 15GT to over 32GT.⁴ Although fossil fuels still account for around 80% of global primary energy consumption, the costs of renewables have dropped

² Title V specifically states: "The United States shall initiate a program, consistent with the aims to cooperate with developing countries for the purpose of – (1) Meeting the energy needs required for the development to such countries; (2) Reducing the dependence of such countries on petroleum fuels, with emphasis given to utilizing solar and other renewable energy resources; (3) Expanding the energy alternatives available to such countries."

³ International Energy Agency, World Energy Outlook 11, Table 2.3, p. 81 and BP, Statistical Review of World Energy June 2017, p. 8.

⁴ IEA, World Energy Outlook 2017, Figure 1.1, p. 42.

rapidly and renewable energy accounted for more than half of all the new electricity generation capacity additions in 2016.⁵

The purpose of this report is to consider current US international energy assistance and cooperation efforts with developing countries. It will principally review the nature, magnitude and direction of policies, strategies and programs under the two Obama Administrations (2009-2016) and the first year of the Trump Administration (2017). The report does not propose to assess and evaluate the effectiveness and impact of the energy assistance and cooperation activities and is mainly descriptive in nature. The early actions and strategies released by the Trump Administration clearly show a substantial change in direction from the Obama Administration's strong emphasis on global climate change and renewable energy. The report will speculate on how these changes may affect future international energy programs and make some suggestions on what the Congress might consider in authorizing new activities in this sphere.

III. GOALS, STRATEGIES AND MECHANISMS

The important role of energy in our foreign policy has been evident in both the Obama and Trump Administrations' policies. But the US energy position has dramatically changed since 2010 when Obama's National Security Strategy stressed US energy dependency and the need to take the lead in the development of clean energy technologies that can cut greenhouse gas emissions, improve energy efficiency and reduce dependence on oil.⁶ This focus was highlighted in the first Quadrennial Diplomacy and Development Review (QDDR) in 2010, which emphasized that "international energy policy lies at the intersection of economics, geopolitics and development,"⁷ and proposed the creation in the Department of State of both an Undersecretary for Economic Growth, Energy and Environment and a new Bureau of Energy Resources "to unite our diplomatic and programmatic efforts in oil, natural gas, coal, electricity, renewable energy, energy governance, strategic resources and energy poverty."⁸

With the shale oil and gas revolution in the United States fundamentally changing the US oil and gas import position, the Trump Administration pledged to "embrace energy dominance" in its December 2017 National Security Strategy.⁹ This strategy calls for five main energy-related actions:

- Reduce barriers to US energy development;
- Promote exports of energy, technology and services;
- Ensure energy security of the US and its allies;
- Attain universal energy access;

⁵ Ibid., p. 230.

⁶ The White House, US National Security Strategy, 2010, p. 30.

⁷ US Department of State, Quadrennial Diplomacy and Development Review, 2010, p. 40.

⁸ Ibid., p. vii.

⁹ The White House, US National Security Strategy, December 2017, pp. 21-2.

- Further America's technological edge in energy.

The Trump strategy is very fossil energy dominated and the Administration has touted US LNG, coal, and oil exports and their benefits to both the US and our allies. It stands in sharp contrast to Obama's 2015 National Security Strategy that cited climate change as a top risk to US security. A January 11, 2018 letter by 160 members of Congress to President Trump calls attention to this omission and the importance of climate change to US national security.¹⁰

A signature initiative of President Obama was the Global Climate Change Initiative (GCCCI), which was included as part of the September 22, 2010, Policy on Global Development. GCCCI sought to integrate climate change into US foreign assistance strategy to foster a "low-carbon future".¹¹ This initiative was founded on the imperative of international cooperation such as the US had fostered in creating the Major Economies Forum for Energy and Climate on March 28, 2009. The US joined with other developed countries following the Copenhagen Conference of Parties in committing resources to climate change and clean energy. The US "Fast Start Climate Finance Initiative ran from 2010-2012 and involved US assistance to more than 120 countries for clean energy as well as adaptation and sustainable landscapes. These resources, that included bilateral assistance, trade and investment and financing to multilateral and International Financial Institutions totaled an estimated \$2.435 billion over the 2010-2012 period.¹² The US also worked to establish the Green Climate Fund and pledged \$3 billion, the most of any country, to this new mechanism. Overall the industrial countries endorsed the goal of mobilizing \$100 billion per year for developing countries climate projects by 2020.

Underlying this international effort was the US commitment to reduce US greenhouse gas emissions. The first pledge in November 2009 called for a 17% reduction from 2005 levels by 2020. Subsequently prior to the Paris Climate Summit, the US increased the pledge to 26-28% reductions from 2005 by 2025. The Administration introduced the Clean Power Plan in August 2015, which further proposed a 32% reduction from 2005 levels by 2030.

With the election of Donald Trump, US climate policy dramatically changed. Trump announced US plans to withdraw from the Paris Agreement on June 1, 2017; and reneged on the remaining \$2 billion of the \$3 billion Obama pledge to the Green Climate Fund. In October 2017 EPA Administrator Pruitt announced the decision to terminate the Clean Power Plan.

During the Obama Administration, State and DOE actively supported and participated in the UN's Sustainable Energy for All Initiative, championed by UN Secretary General Ban Ki Moon and co-chaired with the President of the World Bank Jim Yong Kim. This initiative involved a partnership among governments, IFIs and private sector organizations focused on three main goals: universal access to electricity and clean cooking fuels by 2030; doubling of the rate of energy efficiency by 2030; doubling of the role of renewable energy in the global energy mix by 2030. Secretary Kerry was a member of the High Level Advisory Group and State served on the

¹⁰ Phil McKenna, "106 Lawmakers Urge Trump: Restore Climate Change in National Security Strategy," Inside Climate News, January 16, 2018.

¹¹ See Obama Archives, Climate and Energy. www.obamawhitehouse.archives.gov.

¹² US Department of State, "Meeting the Fast Start Commitment, FY12, www.state.gov/faststartfinance.

Steering Committee. The work of this Initiative provided the foundation for the Sustainable Development Goal Seven on energy that was endorsed by world leaders along with other SDG goals at the UN in the fall of 2015. With the departure of Ban Ki Moon, the SE for All Initiative was spun off to a non-governmental organization based in Austria where it receives financial support from the Austrian government and European donors. The Trump NSS does mention promoting universal energy access but the approach is not described. Power Africa, which does focus on increasing energy access to 30 million consumers, is however cooperating with SE For All.

The Obama strategy clearly emphasized the importance of USG interagency cooperation and working through international alliances and organizations, particularly on global issues like climate change. The PEPFAR health experience was commonly cited as an example of the “Whole of Government Approach” that they espoused. President Obama’s Power Africa Initiative, which will be discussed below) embodied this Whole of Government Approach and has been a major instrument of US international energy assistance. It has brought together a wide range of US government departments and agencies within a common coordination framework: The National Security Council and Office of Management and Budget, Department of State, US Agency for International Development (which provided day-to-day management from an office in South Africa), Millennium Challenge Corporation, Departments of Energy, Treasury and Commerce, Trade and Development Agency, Overseas Private Investment Corporation, Export-Import Bank, and the Environmental Protection Agency. The sections below describe the roles and activities of these various agencies in the US international energy approach, focusing on the energy technical assistance, energy technology cooperation, energy capital assistance, and energy trade and investment promotion dimensions. Below is a chart showing key agencies and functions.

US AGENCY INTERNATIONAL ENERGY PROGRAMS

Agency	Type of Program	Focus of Activities
Department of State	--energy policy and investment dialogue	--oil and gas diplomacy -- power sector investment
Agency for International Development	--technical assistance for energy sector reform --selected capital assistance	--energy regulation --power system improvement --renewables and off-grid
Department of Energy	--technology cooperation --energy assessments, policy dialogue	--energy efficiency, LNG, CCS, renewables, environmental management
Millennium Challenge Corporation	--grant capital assistance --related technical assistance	--power distribution/transmissions --small hydro and renewables
Trade and Development Agency	--feasibility studies, trade missions and promotion events	--gas strategies, power and renewables
Overseas Private Investment Corporation	--loans, equity, insurance	--power generation, renewables
Export-Import Bank	--loan guarantees, export credits	--oil and gas equipment and services, --power sector equipment and services

IV. TECHNICAL ASSISTANCE FOR ENERGY POLICY AND SECTOR REFORM

The United States provides a broad range of energy technical advisory services and training to developing countries to help them build the institutional and human resource capacities to plan and manage better their energy sectors.

The US Agency for International Development(USAID) is the principal vehicle for US energy technical assistance although MCC, State and DOE are also important providers.

The developing countries face a range of challenges in the management and transition of their energy sectors, ranging from basic institutional, governance and human resources constraints to critical energy access, poverty and environmental issues.¹³ USAID seeks to address these problems through global, regional and country programs and projects. Creating the right policy and institutional framework (the “enabling environment”) for private investment and entrepreneurial development is at the core of USAID programs. The table below provides a snapshot in FY16 of the main project vehicles that USAID has developed in the sector at the

¹³ For a discussion of these challenges, see Robert F. Ichord, Jr., “Transforming the Power Sector in Developing Countries: A Strategic Framework for Post-Paris Action,” Atlantic Council, Global Energy Center, October 2016.

various levels and in major areas of programmatic emphasis. Projects are grouped here in four major areas, although projects often cut across the areas:

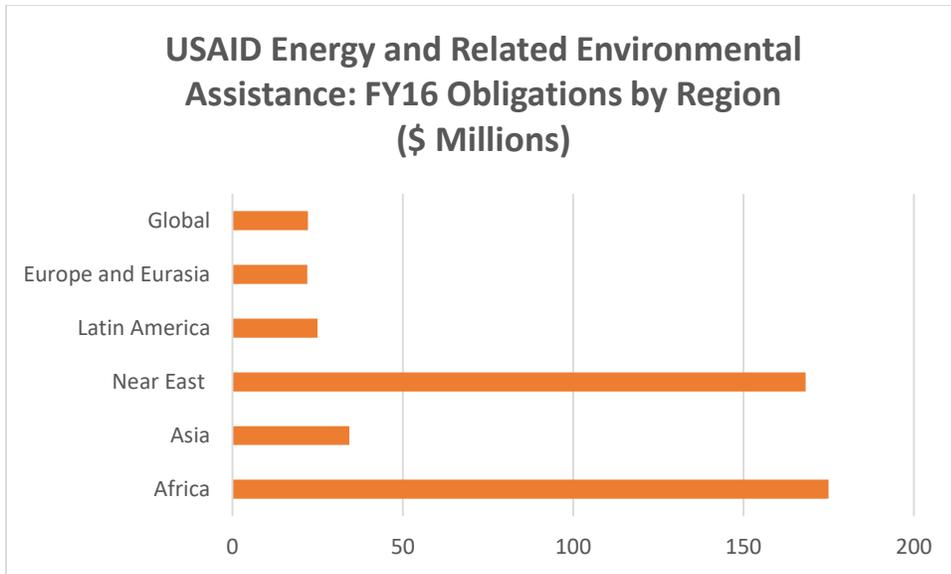
- (1) Institutional and Regulatory Development: This area includes broader sector reform projects and ones that are focused on development of professional energy regulatory capacity and an investment framework conducive to private investment and sound utility operation.
- (2) Energy Efficiency and Renewable Energy Development: Projects in this area generally have been called “Clean Energy” projects, seek to promote low emission options, assess resources and develop strategies and support national programs to advance energy efficiency and renewable energy technologies and their commercialization.
- (3) Energy Access and Rural Poverty: The challenge of expanding energy access, one of the key elements of the UN Sustainable Development Goal 7, is a central USAID concern and is closely linked with poverty reduction and how energy can increase rural productivity and incomes.
- (4) Utility Performance Improvement and Grid Modernization: A major program focus has been on enhancing the performance, both financial and technical, of the national, and in some countries municipal, utility systems. Modernization of electricity grids and the issues of facilitating integration of variable renewable energy sources is an important component of this work.

USAID ENERGY PROGRAM DIRECTIONS AND KEY PROJECTS

Institutional & Regulatory/Investment	Energy Efficiency & Renewable Energy Dev.	Energy Access & Poverty Reduction	Utility Performance Improvement
Global Projects			
--Regulatory Partnership --CTI Private Financing Advisory Network	-- Energy Efficiency for Clean Development -- EC-LEDS (Low Emissions)	--Powering Agriculture	--Utility Partnership --Sector Reform and Utility Commercialization
Regional/Multi-Country Projects			
--Power Africa --Caribbean Clean Energy Finance Facility --South Asia Regional Initiative	--Clean Power Asia	--Africa: Scaling Off-Grid Energy --Developing Sustainable Cookstove Sector --Renewable Micro-finance	--Engendering Utilities
Country Projects			
--Congo(DRC) Power Sector Reform --Jordan Energy Sector Capacity Building --Kosovo Energy Reform --Philippines Energy Policy	--Colombia Clean Energy --India- Partnership to Accelerate Clean Energy --Indonesia Clean Energy --Vietnam Clean Energy	--Bangladesh: Catalyzing Clean Energy --Haiti: Pilot Project for Sustainable Electricity Distribution	--Colombia Clean Energy -- Nepal Hydropower --Pakistan Hydro, Thermal Rehabilitation Projects and Wind Transmission --Ukraine: Municipal Energy --Afghanistan: Kajaki Dam

An exact accounting of US energy technical assistance is difficult to provide since the individual projects may fall under different energy, economic, infrastructure and environmental budget line items. This report focuses on obligations of funding in actual contracts or grants. These actual outlays are usually different than budget requests to Congress or country budget allocations for different sectors. Contracts and grants for a specific project are often funded in tranches over several years. Annual obligations numbers therefore may only capture a portion of the funding planned or ultimately provided to a project. Based on USAID’s relatively new foreign assistance dashboard,¹⁴ USAID obligated \$330 million for energy in FY16 and was active in 26 countries. Removing the capital assistance projects in Afghanistan and Pakistan and adding clean energy and low emissions projects listed under the environment category, a rough estimate of USAID’s energy technical assistance obligations is in the range of \$300 million in FY16. The largest country specific energy obligations (excluding global and regional projects) were in: Afghanistan, Pakistan, Liberia, Ukraine, Jordan, Congo DRC, Bangladesh, India, Colombia, and the Philippines. The following chart shows obligations by region, with the Near East (including Afghanistan and Pakistan) and Africa accounting for over 75% of the total energy obligations.

¹⁴ See FAE:Dashboard at <https://explorer.usaid.gov>.



Source: USAID Foreign Assistance Dashboard for FY16: See Appendix B for Details

Under the Obama Administration, some of the energy assistance funding was grouped under the Clean Energy pillar of the GCCI initiative and a centralized decision process involving State’s climate offices had a major role in determining country levels and the role of clean energy vis-à-vis adaptation and sustainable landscapes funding. Most of this clean energy funding came from the Development Assistance (DA) Account. Considerable energy funding however was programmed outside of the GCCI, including Economic Support Fund activities in Afghanistan, Pakistan, and Jordan and AEECA funds for programs in the Europe and Eurasia region.

A major initiative under the GCCI was the EC-LEDs (Enhancing Capacity in Low Emissions Development), which worked with 25 partner countries on the development and implementation of low emissions development strategies and programs. The program was led by USAID with technical coordination by DOE’s National Renewable Energy Laboratory (NREL). These efforts sought to be inter-Ministerial and cross sectoral in their engagement with counterparts and applied a planning methodology that examined possible low emission policy options in relationship to a business as usual scenario. Of the 25 countries, about 11 had a major concentration on clean energy. In many cases the main counterpart was the Ministry of Environment, which in most countries was relatively weak politically compared with the Ministry of Energy.

Two other energy partnership programs that fostered regulatory and electric utility system reforms have been pursued under Cooperative Agreements with the National Association of Regulatory Utility Commissioners (NARUC) and the US Energy Association (USEA). These programs involved professional exchanges and seminar/workshops that brought together US and country government and energy industry counterparts. These programs generally complemented bigger USAID or State technical assistance contracts with leading US consulting-company consortia that provided both long and short-term experts to work in depth on policy, regulatory, and institutional reform areas.

A major Presidential initiative under the Obama Administration that, except for a small amount

Power Africa Funding: Key Countries in FY16 (N.B. Some Countries are funded from Regional Accounts)

USAID: Liberia, Congo(DRC), Mozambique, Ghana, Uganda, Djibouti, Tanzania, Nigeria, Ethiopia

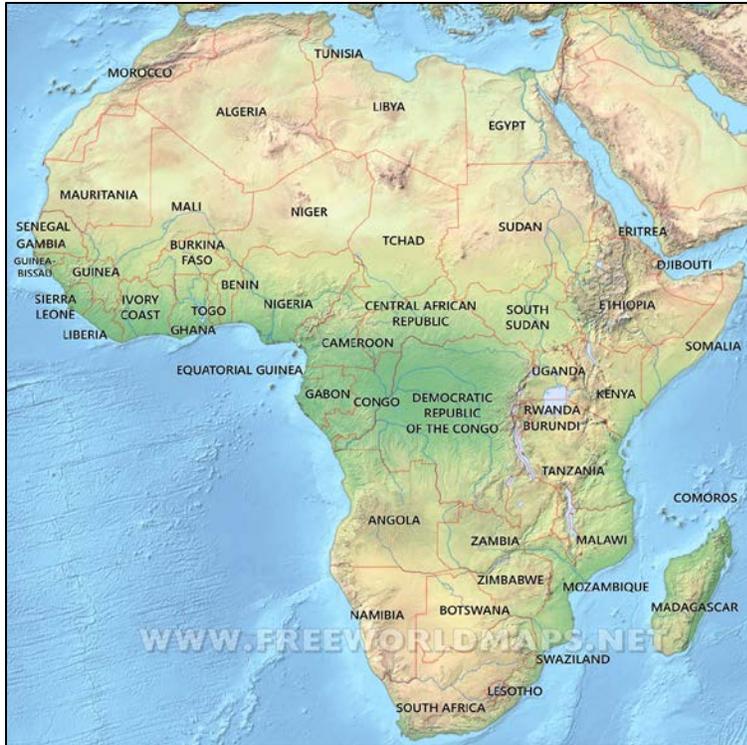
MCC: Liberia, Tanzania, Ghana, Benin, Sierra Leone

OPIC: Ghana, Uganda, Guinea, Senegal, Nigeria, Tanzania

TDA: Ghana, Nigeria, S. Africa, Kenya, Sierra Leone, Zambia, Mozambique, Madagascar

of GCCI funds, was funded separately was Power Africa. This ongoing program works with African countries to address their serious deficit of energy by expanding investment for generation and increasing access to electricity for businesses and households. It both fosters energy sector reform as well as promotes private sector investment. It targets in on removing specific obstacles that can facilitate and unlock specific transactions. It followed the “Whole of Government” model, was coordinated by the NSC as well as USAID in the field from an office in South Africa and included significant involvement from US trade and investment agencies, i.e. Commerce, OPIC, Export-Import Bank, and TDA. The 2017 Power Africa Annual Report estimates that in its four years, Power Africa has facilitated the financial close of 7,200MW of power generation capacity, helped to connect 10.6 million homes and businesses, engaged in 80 transactions worth \$14.5 billion, and stimulated more than \$500 million in US exports.¹⁵ OPIC, which originally pledged \$1.5 billion to the effort, has more than exceeded this level of investment support. Funding in FY16 is estimated at \$175 million from USAID, \$643 million from MCC, \$425 million from OPIC, and \$14 million from TDA. (See Appendices).

¹⁵ USAID, Power Africa Annual Report, August 2017, www.usaid.gov.



With the creation by Congress and Secretary of State Clinton of the Energy Resources Bureau in the Department of State, State established two global energy reform programs: one was on reform and improved management of oil and gas (Energy Governance and Capacity Initiative), including non-conventional gas, sectors in over a dozen developing countries; and a second focused on power sector improvements and investment issues (Power Sector Program) for example in Central America and the Caribbean. These programs were small compared with USAID energy assistance programs and sought to fill in gaps (e.g. in relationship to shale gas development experiences and issues) and be catalytic in nature. The Trump Administration requested \$6 million for the Energy Resources Bureau in its FY18 budget request.

One of the most important energy sector reform efforts that the United States government has supported is with Mexico and the fundamental energy policy and market reforms pursued by the Pena Nieto Government. On the electricity market side, both State and USAID have funded advisors that have been instrumental in developing the new competitive market framework and designing the renewable energy auctions that have led to enormous private sector investment in wind and solar technologies at prices that have been among the lowest in the world. The USDOE was also substantially engaged in energy cooperation activities with Mexico related to both cross-border natural gas and electricity trade issues and clean energy areas like energy efficiency. It appears that the Trump Administration will abruptly end the USAID energy assistance activities in Mexico.

During the first year of the Trump Administration, USAID, under its new Administrator Mark Green, who was formerly US Ambassador in Tanzania and knows the Power Africa Program well, has begun to recast its energy programs and has clearly downplayed climate change. But

USAID has continued to award new energy contracts in FY17, including some dealing with renewable energy and energy access.

USAID released a major new solicitation in December 2017 that would contract with a group of US companies that would be available to provide technical services for a broad scope of energy activities up to a total amount of \$500 million. The objective of the work is stated as follows: “provide USAID Mission, Regional Bureau, host country stakeholders and partners with ready access to technical assistance and capacity building to manage the legal, regulatory, policy, governance, operational, financial, economic and transactional component of improved energy sector performance and strengthened enabling environment for private sector investment.”¹⁶ Four main cross-cutting themes are identified:

- Clean Energy: USAID supports countries to integrate and scale clean energy technologies.
- Energy Poverty: USAID supports countries in their efforts to expand access, while ensuring that the electricity supply is stable, resilient, affordable, and environmentally sustainable.
- Energy Sector Governance and Reform: USAID supports reforming and restructuring the energy sector and improving the accountability and transparency of authorities and institutions in the energy sector, as the foundations for improved performance and greater investment.
- Energy Security: USAID supports countries in their efforts to increase their energy security, through measures that encourage diversification of energy types and supply sources, promote use of sustainable domestic resources (such as renewable energy), reduce overall demand through energy efficiency and demand response measures, and facilitate better functioning of energy markets and greater integration through cross-border trade.

These prospective contracts replace a set of former energy contracts and will provide a convenient set of pre-negotiated instruments under which USAID missions and Bureaus can, if they wish, developed Task Orders for individual project implementation. The key question will be what budgetary resources will be devoted to energy programs as discussed in the Budget section below.

V. ENERGY TECHNOLOGY COOPERATION

This section addresses the role of energy technology cooperation in our overseas energy activities. Countries are interested in a wide-range of energy technologies in which US national laboratories and private companies are engaged. Bilateral and multilateral activities are carried out, centered in the US Department of Energy but also involving other agencies such as the Environmental Protection Agency, and the Department of the Interior. Cooperation in this area has spanned the technology gamut from renewable energy and energy efficiency to clean coal and shale gas development.

¹⁶ USAID Request for Proposals (RFP) SOL-OAA-17-000108 Energy IDIQ II, December 14, 2017, p. 13, www.fedbizopps.gov.

Although US energy reform assistance programs contain a significant focus on technical issues, e.g. integration of renewable energy into electrical grids, there are a separate set of bilateral and multilateral technology cooperation programs.

The bilateral energy technology programs have tended to focus on major emerging market countries that are central to US global energy policy concerns: i.e. China, India, Mexico, Saudi Arabia. DOE is generally the lead for these interactions, often with funding from the OES (Oceans, International Environment and Scientific Affairs) Bureau of the State Department. Under the Obama Administration they were oriented towards renewable energy development and energy efficiency issues in support of US global climate diplomacy. Programs with China (US-China Clean Energy Center) and India (Program to Accelerate Clean Energy – PACE) were the largest efforts and were managed by the DOE laboratories. Reported State funding for the US-China Clean Energy Center was \$1.5 million in FY16.

The main multilateral efforts were with the Clean Energy Ministerial (CEM) process under the Major Economies Forum, the R&D Committee of the International Energy Agency, and the International Renewable Energy Agency, whose creation in Abu Dhabi the US supported as an exception to our general policy on new international organizations. Other initiatives such as the DOE-inspired Carbon Sequestration Leadership Forum and the Global Methane initiative led by EPA were generally smaller in size.

The CEM, for which the US served with State funding (e.g. \$2 million in FY16) as the Secretariat through 2016, when the International Energy Agency took over the coordination role, established a set of technology-oriented working groups to share information and stimulate government and private investment. From this process arose the Mission Innovation Initiative that was developed for the Paris Climate Summit, involving 22 countries that pledged to double their clean energy R&D funding over five years to drive down costs and create new options to address climate change. It was paralleled by a private sector Breakthrough Energy Coalition championed by Bill Gates and other industrial leaders from various countries.

Leaders in the Mission Innovation Initiative agreed on seven major innovation challenges and selected lead countries for each:

1. Smart Grids (China, India, and Italy)
2. Off-Grid Access to Electricity (France and India)
3. Carbon Capture (Saudi Arabia and the United States)
4. Sustainable Biofuels (Brazil, Canada, China and India)
5. Converting Sunlight (EC and Germany)
6. Clean Energy Materials (Canada, Mexico and the United States)
7. Affordable Heating and Cooling of Buildings (EC, UAE and UK).

The United States has also played an important role in the emergence of the International Renewable Energy Agency, established in Abu Dhabi in January 2009. The US, through the

State Department's International Organization Bureau budget, has been the third largest contributor to IRENA, after Abu Dhabi and Germany, at about \$4-5 million per year. IRENA has rapidly grown in membership to 154 members with 26 in accession status. It has become an authoritative source of information and advice on renewable technology and investments. Its products and services include: annual reviews of renewable energy employment, renewable energy capacity statistics, renewable energy cost studies; renewable energy readiness assessments, the global renewable atlas, renewable energy benefits studies, the Remap country analyses of renewable energy prospects to 2030, renewable energy technology briefs, facilitation of regional renewable energy planning, renewable energy project development tools.¹⁷ With the proposed budget cuts for the State Department and the US participation in international organizations, the US role in IRENA is likely to decline.

The International Energy Agency, based in Paris and to which the US contributed \$618,000 in FY16, has had an active program of technology cooperation for many years. Focusing on renewable energy, energy efficiency, fossil fuels, and fusion, the IEA coordinates 39 Technology Partnership Agreements involving 53 countries.

VI. ENERGY PROJECT CAPITAL ASSISTANCE

Although USAID has provided substantial capital assistance for energy infrastructure over the years (e.g. rural electrification in Asia and power plants in Egypt, Pakistan and Iraq) the focus of this type of assistance has narrowed to a smaller set of strategic countries. Formerly provided as loans, these projects are today financed on a grant basis generally under ESF account funding.

While capital funding for power sector work in Iraq has been phased out, projects continue in Afghanistan and Pakistan. Afghanistan efforts have focused on transmission and distribution infrastructure as well as hydro and solar generation. Reported funding in FY16 was \$63.5 million including \$5 million for the Kajaki Dam. The USAID Pakistan program has provided significant funding for rehabilitation of major hydro and thermal generation units, some of which the US funded initially like the Tarbela Dam and the Guddu Combined Cycle Gas complex, as well as transmission projects. Funding for Tarbela rehabilitation and wind transmission projects in FY16 were \$25 million and \$43 million respectively. The advancement of wind development in Pakistan is an interesting example of US inter-agency cooperation and the combined use of technical assistance, capital assistance and trade and investment promotion tools. While USAID provided technical assistance for energy regulatory development for renewables and planning for Pakistan's transmission grid as well as capital assistance financing for transmission infrastructure to integrate the planned wind farms, OPIC provided financing for US developers, e.g. General Electric, of several wind farm projects in the Sind Province that were competing with Chinese and companies from other countries.

MCC has taken the lead role with respect to grant capital funding for energy infrastructure with numerous Compact and Threshold Agreements financing power generation, transmission and distribution facilities. Over its 13 years, MCC has moved to incorporate significant policy and institutional reform conditions into its agreements to ensure the sustainability of projects and

¹⁷ About IRENA, www.irena.org

encourage private sector investment and has increased the level of its technical assistance to advance the reforms. Early energy compacts were in Georgia for gas pipeline rehabilitation and Indonesia, for small renewable energy investments. With the advent of the Presidential Power Africa Initiative, MCC has worked to develop Compacts in Africa for power sector development, including Ghana II (\$498 million); Liberia (\$257 million); Malawi (\$351 million); Benin (\$375 million); and Sierra Leone (\$23 million), not including the earlier 2008 Compact for transmission in Tanzania. Following the earthquake in Nepal that damaged their power infrastructure, MCC developed a \$500 million Compact that was signed in September 2017. A new Threshold agreement in Kosovo for \$49 million will finance a Reliable Energy Landscape project including energy efficiency. MCC obligated \$651 million for energy in FY16 (see Table below) out of total MCC obligations of \$963 million, or over two-thirds.

Millennium Challenge Corporation FY16 Energy Funding

<u>Country</u>	<u>Obligated Funding</u>
Ghana	\$417,313,578
Liberia	\$201,080,058
Sierra Leone	\$ 23,185,000
Nepal	\$ 8,396,339
Benin	\$ 906,464
Tanzania	\$ 249,303
Total	\$651,130,742

Countries are happy to receive grant funding for energy infrastructure projects that otherwise they would probably have to be financed on a loan basis. They also see such projects as providing tangible illustrations of how foreign assistance is helping their economies. But given the limited US funding in this sector, there is a strong case to be made that investments in institutional and human resource development may have greater and longer-term impacts for sustainable development. For instance, it is not unusual to see officials trained under USAID programs in the US that are now leading their energy agencies. The US has a comparative advantage in this sphere especially compared to China or other countries that focus on physical infrastructure and providing contracts for their companies. On the other hand, grant funding for capital projects like those from MCC can sometimes give the US greater ability to influence

recipient energy policies and institutional and governance reforms as well as advance US commercial interests in these markets.

VII. ENERGY TRADE AND INVESTMENT PROMOTION

The so-called USG “trade agencies” have been a key component of the overall US international energy cooperation effort. This section examines the roles of the US Overseas Private Investment Corporation, the Trade and Development Agency, and the Export-Import Bank in promoting US energy trade and investment overseas. With the focus of the Trump Administration on trade and renegotiation of agreements with major partners, this section will consider what changes are and may occur in energy activities of these organizations.

The Trump Administration has questioned the need for OPIC and TDA and President Trump’s nominee to head of Export-Import Bank, who was on record as opposing its activities, was rejected by the Senate and sent back to the Administration. The budget proposal for FY18 proposed cutting funding for both OPIC and TDA.

OPIC has been very active in supporting overseas energy project investment, through both its insurance products and direct financing. Although, until recently, it was limited by Congress in its support for oil and gas development, it has moved significantly to ramp up activities in renewable energy. These reached \$1 billion or more per year during the second Obama term. In 2016, OPIC reported energy activities of \$1.4 billion, of which \$55 million was for off-grid energy projects. OPIC has been a major player in the Power Africa Initiative, pursuing insurance and financing of projects, especially solar, wind and hydro, in Nigeria, Guinea, Uganda, Senegal, Tanzania, and Ghana. OPIC has supported renewable energy project development in South Asia, i.e. wind in Pakistan and solar in India, and Central America and the Caribbean, i.e., solar in El Salvador and solar and wind in Jamaica.

A partner in the promotion of US trade and investment has been TDA, a small agency of about \$75 million per year that helps catalyze US exports of goods and services. Energy and infrastructure has traditionally been a strong focus of TDA and reported funding obligations for energy in FY16 totaled \$30 million allocated to 75 activities in 26 countries. Although known for its support of pre-feasibility and feasibility studies that help US companies compete with other country entities for larger infrastructure or power projects, TDA also pursues exchange activities and trade missions, often together with the US Departments of Commerce and Energy, that expose overseas officials to US industries, companies, and technologies. TDA has also focused on renewable energy development working with Panama, Madagascar, South Africa, Ghana, Zambia, Vietnam, Jamaica, India, Belize, Tanzania, the Philippines and others over the past two years.

TDA is also expanding its support for natural gas projects and US exports and has is leading a new US. Gas Infrastructure Export Initiative, that was launched on November 17, 2017, in support of the Trump Administration policies to expand US LNG exports. Under this Initiative TDA and the US gas industry, including partners LNG Allies and the US LNG Association, will work to advance gas infrastructure in key LNG receiving countries through reverse trade missions, feasibility studies, training and technical assistance.

The Export-Import Bank has historically been an important supporter for the export of US energy technology and services. But it has had a troubled existence over the past few years, with a major debate over its extension and future in the Congress. Although the Congress did finally vote to extend its charter, it has been hamstrung by the lack of a quorum of Directors on the Board that has resulted in limiting its loan and loan guarantee authority to \$10 million per project. Nevertheless, in FY17, Export-Import managed to underwrite \$3.4 billion in loan guarantees. Ex-Im's outstanding portfolio as of late 2017 was \$72 billion. Both Power and Oil and Gas together have accounted for roughly 20% of this portfolio; as of FY17, power was about \$4.195 billion (5.8%) and oil and gas represented 15.6% at \$11.270 billion.

VIII. US ROLE VIS-À-VIS OTHER COUNTRIES AND INTERNATIONAL ORGANIZATIONS

US international energy cooperation activities do not occur in a vacuum. The way the United States government interacts with other countries and international organizations is critically important to understanding the political, diplomatic and economic/commercial context and impact of the programs. This section will touch on some of the important issues in how the US deals with other bilateral donors like China and such key international organizations as the World Bank and regional development banks.

The financing and investment requirements of the developing countries are huge and the amount of governmental and international financial institution financing inadequate. Mobilizing private financing is critical. The Sustainable Energy For All Finance Committee completed a study in 2015 that tried to estimate funding levels to meet the 2030 goals of universal access, doubling of the rate of energy efficiency and the doubling of the share of renewables. The report estimates that for the period from 2010-2030, more than \$1 trillion per year is needed, broken down as follows: \$49.4 billion for energy access (compared with about \$9 billion currently); \$442-650 million for renewables (from a base of about \$258 million); and \$560 billion for energy efficiency (compared with a current estimated \$130 billion).¹⁸

The SE4All report calls not only for improvements in energy sector governance and management to reduce risks for investors but also the development of financing mechanisms that can facilitate private capital flows and public-private partnerships, i.e. project preparation facilities, green bond market development, IFI de-risking instruments, insurance products focusing on removing specific risks, and aggregation structures that promote bundling and pooling approaches for small-scale opportunities.

The IEA's WEO 2017 estimates investment needed for power generation and transmission by region. Out of a world total of \$6.741 trillion from 2017-2025, about \$4.241 trillion is needed in the non-OECD countries, or about \$471 billion per year over this period.¹⁹

The US sometimes cooperates with other bilateral donors and international organizations and international financial institutes to enhance and leverage its funds. Especially important are the

¹⁸ Sustainable Energy for All, SE4All Advisory Board's Finance Committee Report, July 4, 2015, p.1.

¹⁹ IEA, World Energy Outlook 2017, Table 6.5, p. 252.

World Bank and the regional development banks that are involved in policy dialogues and technical assistance as well as capital project loan financing. The US Treasury, which represents the USG on the boards of these institutions, has been an important contributor to World Bank facilities such as the Global Environmental Facility and the Clean Technology Fund. Treasury was also the lead US government agency on the Board of the Green Climate Fund and the Obama Administration provided \$1 billion of a \$3 billion pledge prior to the renegeing by the Trump Administration on the remaining amount. The GEF has allocated about \$500 million toward clean energy and energy efficiency in its current 7th Replenishment. The overall enacted level of funding for Treasury support to GEF in FY17 was \$146 million.

USAID and Treasury have worked closely with both the World Bank and the African Development Bank on the Power Africa effort that helped catalyze both institutions to expand their lending for the region. USAID obligated \$3 million to the African Development Bank in FY16 for the AFDB's Sustainable Energy Fund.

Under AFDB President Donald Kaberuka, energy has become a top priority with a goal of allocating \$3 billion over the 5 years. AFDB is financing power transmission (e.g. Ethiopia) as well as generation projects in solar (e.g. Morocco, Mali); wind (e.g. South Africa and Kenya); hydro (e.g. Zambia, Tanzania, Nigeria); and geothermal energy (e.g. Kenya). The AFDB like the World Bank is using partial risk guarantees for some of their projects, given the poor financial condition of the electric utilities in most African countries.²⁰

World Bank Group is a major source of financing for both technical assistance and energy capital projects. It reports energy financing of \$49 billion since 2010 of which energy efficiency and renewable energy projects have assumed an increasing role with \$21 billion. Energy financing in FY15 was \$6.5 billion. The World Bank, IFC and MIGA all seek to mobilize private and commercial financing. They have set a goal of \$25 billion in commercial funds mobilized over the FY16-FY20 period.²¹

The InterAmerican Development Bank also has a considerable program in the energy sector, with a major emphasis on clean energy from renewables and natural gas. IDB funding of over \$600 million since 2016 have included loans for solar in Mexico and Chile, geothermal in Nicaragua, wind in Argentina and Uruguay, energy efficiency in Jamaica and Mexico, and LNG to power in Brazil and Panama, as well as sector reform and rural electrification in Honduras and Bolivia.²²

The Asian Development Bank has a long history of lending in the energy sector, especially for hydro power projects. It currently has a broad mix of energy projects in its portfolio, including oil and gas and coal as well as renewables and transmission/distribution. In 2016-2017, major energy loans totaling over \$4 billion per made, with Pakistan, India, Bangladesh and Azerbaijan receiving the largest share.²³

²⁰ See www.afdb.org/energy and power.

²¹ See www.worldbank.org energy projects and programs.

²² See www.iadb.org/en.

²³ See www.adb.org/sector/energy.

The expansion of Chinese overseas funding has been one of the most significant trends in the international development world over the past several years. China has become the largest source of energy finance with an estimated \$43.2 billion in funding from the China Development Bank and the Export-Import Bank of China alone in 2016.²⁴ The Boston University China Energy Finance database estimates that over the period 2000-2016, the two Chinese banks provided \$160 billion in energy finance, mainly in Asia, concentrating on power plants projects in the coal and hydroelectric sectors. These efforts greatly exceed the combined energy loan commitments of the World Bank and regional development banks. The Chinese Belt Road Initiative has further intensified the Chinese international power and infrastructure push, with China pledging over \$1 trillion in infrastructure financing. The creation of the Asian Infrastructure Investment Bank is one vehicle China has established to support its Belt Road initiative. The AIIB to date is undertaking 11 energy projects out of 25 listed as approved. They support a range of interventions in power transmission and distribution, natural gas, solar and hydro power development and coal replacement and air quality improvement in Pakistan, Bangladesh, Myanmar, Azerbaijan, India, Egypt and Tajikistan.²⁵

The United States government has taken a cautious approach towards the Belt Road Initiative and did not send a high-level official to the Belt Road heads of state Summit last year in Beijing. Recent reports suggest that United States is discussing with Australia, India and Japan the notion of a broader Indo-Pacific strategy with an emphasis on infrastructure that would serve to counter Chinese influence²⁶ and is even reconsidering its position on the Trans-Pacific Partnership mechanism, following the imposition of tariffs by both countries. During the Obama Administration there was considerable debate over how best to deal with the growing Chinese overseas financing. Former Obama USAID Administrator Raj Shah was a strong proponent of cooperation with China and discussed with the Chinese cooperation on development of the gigantic Inga Hydro Project in the DRC and other possibilities in the context of the Power Africa Initiative. His successor, Acting USAID Administrator Lenhardt, signed a Memorandum of Understanding with the Chinese Ministry of Commerce in 2015.²⁷ Other USG officials have sought to encourage greater Chinese collaboration and co-financing with the IFIs to bring more transparency to Chinese projects and ensure that proper standards and concerns for the governance, corruption and environmental implications of development financing were applied.

IX. CONGRESS AND THE BUDGET PROCESS

Although international energy program funding has not been a big slice of the past foreign operations budgets and expenditures (compared to health for example), it has not been insignificant. The Trump Administration's shifts on energy and environment however raise great uncertainty over future funding for this sector. These shifts are occurring within the broader

²⁴ Kevin P. Gallagher, "China Global Energy Finance: A New Interactive Database," Boston University Pardee School of Global Studies, Global Economic Governance Initiative, www.bu.edu.

²⁵ Approved Projects Overview – AIIB, www.aiib.org.

²⁶ Reuters, "Australia, U.S. India and Japan in talks to establish Belt and Road alternative: report", February 18, 2018, www.reuters.com.

²⁷ "Memorandum of Understanding on US-China Development Cooperation and the Establishment of an Exchange and Communication Mechanism, September 2015, www.usaid.gov.

context of the Trump Administration's efforts to make deep cuts in State and USAID programs, i.e. 31% proposed cut in International Affairs in FY19 or \$41.7 billion. International energy and environmental programs are targeted for significant reductions along with related cuts to climate change, renewable energy and energy efficiency in the EPA and DOE budgets.

Strong voices in Congress have expressed opposition to these cuts in development and diplomacy funding. The Executive Branch has operated under Continuing Resolutions in recent years and Congress again passed on March 22, 2018 a FY18 Omnibus appropriations bill within the two-year budget framework approved in early February 2018. The enacted foreign operations budget under the FY17 Omnibus Act contained \$8.7 billion for health, \$2.995 for Development Assistance, and \$1 billion for ESF and \$291 million for Europe and Eurasia, \$905 million for MCC, and \$75 million for TDA. Treasury was appropriated \$146 million for the GEF (Global Environmental Facility) and \$1.3 billion for World Bank IDA.²⁸ The Senate Foreign Operations Committee Report recommended \$291 million for Power Africa and \$177 million for clean energy in the DA budget and \$2 million for the Caribbean Energy Security Initiative

The Foreign Operations budget submission for FY18 omitted climate change from its presentation and recast most country program descriptions to eliminate line-items for energy. The line item on environment in the FY18 budget request was reduced from \$1.7 billion to \$185 million, not including funding for the GEF. The proposed FY18 budget merged development assistance and ESF accounts into one Economic Support and Development Fund with a request level of \$4.9 billion which represented a large \$4.2 billion decrease in the merged budget. The Congress rejected this approach in the final FY18 Omnibus, actually increasing funding for OPIC and TDA and keeping DA funding flat at \$3 billion while reducing funding for ESF (\$713 million or 15.2%) and AEECA (\$168 million or 16.8%).²⁹

A few energy funding priorities are included in the FY18 budget request. Six million is requested for the Energy Resources Bureau (ENR) of the Department of State. The narrative indicates that: "Funds will support good governance in traditional hydrocarbon sectors as well as advanced energy technologies by building the institutional capacity needed to manage resources for the benefit of recipient countries' long-term economic development and in support of opening markets and strengthening global energy security. Funds will also allow ENR to provide a wide range of technical and advisory support to create solvent, reliable, transparent, and sustainable power sectors in countries across the globe; the overall objectives for this support is promoting efforts to expand reliable energy access, stimulating development and deployment of sustainable energy solutions that improve energy access or security, and bringing solvency to power sectors. Energy transformation programs in emerging economies also afford strategic opportunities to promote market-oriented policies and level playing fields for U.S. exporters and investors to compete in the world's largest and fastest growing electricity sectors."

The FY18 foreign operations budget request also continued support for Power Africa under the Electrify Africa Act with specific mention of energy access and distribution in Ghana, Senegal

²⁸ "State-Foreign Operations Appropriations, Fiscal 2017: Where the Money Goes" www.media.cq.com.

²⁹ US Global Leadership Coalition, "Congress Finalizes FY18 Spending: Rejects Doctrine of Retreat, Restores Funding for International Affairs Budget," March 23, 2018, www.usglc.org.

and Tanzania. In Asia, Philippines and Vietnam requests mention energy as do those for Ukraine, Kosovo and regional energy security in Europe and Eurasia. Energy infrastructure and energy supply continue to be a priority in Afghanistan and Pakistan and in the Central Asia sub-region, but tensions with Pakistan over terrorism issues may reduce future energy funding. Electricity is included as a component of the West Bank and Gaza program in the Middle East.³⁰ The now-former Secretary Tillerson, in his speech on cooperation in the Western Hemisphere suggested some continuing funding in the region for energy initiatives like the Caribbean Energy Security Initiative, especially in light of the problems in Venezuela that has used supply of fuel to Caribbean and Central American states as a means of political influence.³¹

The Trump Administration's proposed FY18 budget recommended the elimination of OPIC and TDA. But the Administration has recently taken a new tack since Trump's November Asian trip. The FY19 Budget Request proposes the creation of a new development finance institution that would consolidate the development finance functions of OPIC and USAID's Development Credit Authority program that provides loan guarantees. OPIC's President and CEO Washburne endorsed this proposal on February 12th.³²

X. CONCLUSIONS

Energy issues are of growing importance to US foreign policy and the expanding markets in the developing, non-OECD countries are a key factor influencing US international energy policy and programs. Under the Obama and Trump Administrations, the United States government has pursued a range of international energy assistance and cooperation activities with developing countries to advance US security, trade and development and environmental interests.

Looking back at Title V of the Nuclear Non-Proliferation Act of 1978, its main theme of cooperation with developing countries in helping them meet their energy needs through renewable and non-nuclear alternatives has and is being pursued by various agencies of the US government. Title V's proposed energy sector and resources assessments, trade facilitation, partnerships, training, technology cooperation and technical exchanges have become a centerpiece of US overseas energy work.

Under the Obama Administration, international energy programs focused on "clean energy" and were largely grouped under the climate change umbrella and the GCCI (Global Climate Change Initiative), with the exception of Power Africa and ESF and AEECA programs in such countries as Pakistan, Afghanistan, Jordan, Ukraine and Georgia. During this period both OPIC and MCC increased substantially their focus on energy investment and sector development with MCC becoming the largest source of US grant capital assistance. Overall US funding for international energy assistance and cooperation (excluding Export-Import Bank guarantees) in FY16 is

³⁰ FY2018 Congressional Budget Justification – Department of State, Foreign Operations and Related Programs, May 23, 2017, www.state.gov.

³¹ Rex W. Tillerson, Remarks on "US Engagement in the Western Hemisphere," February 1, 2018, www.state.gov.

³² "OPIC Commends FY2019 Budget Proposal for Modern Development Finance institution," February 12, 2018, www.globenewswire.com.

estimated at something over \$2.5 billion. The main geographical focus of these programs and projects has been in Sub-Saharan Africa and the Near East (including Afghanistan and Pakistan).

The advent of the Trump Administration in 2017 saw a dramatic shift in orientation and view towards government funding for development assistance and US international investment, with proposals for deep cuts in State and USAID and the elimination of both the Overseas Private Investment Corporation and the Trade and Development Agency. In energy, the new Administration embraced the notion of US “energy dominance” and the use of US abundant coal, gas, and oil resources and exports to further US trade and foreign policy objectives. The Obama focus on international assistance and international multilateral cooperation to tackle climate change was eliminated and the budget submissions for FY18 and FY19 generally removed or cut substantially line items for energy and environment. Although in the final FY18 Omnibus Appropriations Act Congress resisted the proposed deep cuts in the International Affairs budget, actual funding levels for international energy programs are still uncertain and the FY19 administration budget again proposes substantial cuts to foreign aid.

The Administration and Congress need to recognize that big cutbacks in international energy assistance and cooperation programs will hurt the US competitive position vis-à-vis other countries like China that are ramping up financing in their aggressive pursuit of developing country energy markets. While most developing countries in the post-Paris Climate framework are expanding their renewable energy and energy efficiency investments, the Trump Administration is emphasizing fossil fuels. A reduction in US programs to support renewable energy would work against the market forces that are furthering the expansion of these sources due to favorable cost, technology and environmental factors. Although US LNG exports can help some countries diversify their energy mix, the United States needs to take advantage of its strong renewable technology base to help countries pursue these sources.

The experience of the Power Africa “whole of government” program with its bipartisan Congressional support in the Electrify Africa Act has generally been positive. Its strong private investment and transactional approach has worked and can serve as a model that can be adapted to US energy assistance and cooperation in other regions.

The Congress and the Trump Administration need to create a new framework for international energy activities in the foreign operations budget that allows an “all of the above” energy approach to receive greater visibility and funding. The leadership of State and USAID is critical to this process but the key trade and investment roles of OPIC, TDA and Ex-Import Bank, as well as the Departments of Treasury and Commerce, in this strategy need to be recognized and the agencies supported.

Appendix A: Estimated USG International Energy Funding

Appendix B: US Agency for International Development

Appendix C: Millennium Challenge Corporation

Appendix D: Overseas Private Investment Corporation

Appendix E: US Trade and Development Agency

Appendix A:
Estimated USG International Energy Funding
(FY16 and Preliminary FY17)
(Excluding Export-Import Bank and Treasury IFI)
(Dollars Millions)

<u>Agency</u>	<u>FY16</u>	<u>FY17</u>
USAID	446	289
MCC	651	334
OPIC	1400	1365
TDA	30	32
<u>STATE</u>	<u>10</u>	<u>10</u>
<u>TOTAL</u>	<u>2537</u>	<u>2030</u>

Sources: USAID Foreign Assistance Dashboard, TDA and OPIC Annual Reports and web sites; State number is an estimate.

Appendix B: USAID Energy and Related Environmental Assistance Summary
Obligations in FY16 and FY17 (millions)

<u>Area</u>	<u>FY16</u>	<u>FY17</u>
Global	20.9	16.1
Africa	170.5	57.2
Middle East & S.Asia	178.6	160.6
Other Asia	12.3	8.6
Latin America	23.0	22.9
Europe and Eurasia	19.6	23.8
Total	424.9	289.3

Appendix B Detail: USAID ENERGY AND RELATED ENVIRONMENTAL ASSISTANCE (FY2016)						
Obligations by Region and Country (\$ Millions)						
	<u>Country</u>	<u>Activity</u>				<u>Obligation</u>
Africa						
	Regional	Power Africa Transaction and Reform				78
	Regional	East Africa Regional Construction				10.6
	Regional	Power Africa ElectriFi Agreement				10
	Regional	Power Africa:AfDB Sustainable Energy Fund				10
	Regional	Power Africa Investor One Facility				5
	Regional	Scaling Solar Partnership with World Bank				4.2
	Regional	Modern Energy Services				7.85
	Regional	Modern Energy Services				1.8
	Regional	Climate Economic Analysis				1.75
	Regional	USAID-Shell Foundation Coop. Agreement				7
	Regional	USEA Energy Utility Partnership				1.4
	Regional	Power Africa Delivery Unit				1.3
	Regional	Power Africa Senior Advisors				1
	Regional	Power Africa Transaction and Reform				0.9
	Regional	Enhancing Sustainable Utility Regulation				0.9
	Regional	Regulatory Partnership				0.8
	Regional	Gender Equality for Climate Change				0.8
	Regional	Modern Energy Services				0.4
	Regional	Partnerships for Enhanced Research				0.3
	Regional	Power Africa Transaction and Reform				3.7
	Regional	AfDB				3
	Regional	Power Africa Transaction and Reform				0.5
	Regional	LEDS				0.3
	Regional	Financing Growth				0.1
	Congo (Kinshasa)	Power Sector Reform				5
	Mozambique	Support Policy Env. And Economic Deve.				2.5
	Ghana	Integrated Resources and Resilience Planning				1.9
	Ethiopia	Scaling Solar Partnership with World Bank				1.7
	Tanzania	Modern Energy Services				1
	Uganda	Modern Energy Services				1
	Uganda	Modern Energy Services				0.8
	Uganda	Cooperative Dev. Rural Electrification NRECA				0.8
	Uganda	Modern Energy Services				0.5
	Uganda	Modern Energy Services				0.3
	Uganda	Environment Management for the Oil Sector				2.9
	Djibouti	Utility Partnership Program				0.4
	Djibouti	Power Africa Transaction and Reform				0.8
	Nigeria	Modern Energy Services				0.3
	Madagascar	Scaling Solar Partnership with World Bank				0.1
	Zambia	Modern Energy Services				0.1
	Kenya	Powering Agriculture				2
	Kenya	LEDS				1.2
Subtotal Africa						174.9

Asia						
	Bangladesh	Rural Electrification with World Bank				0.7
	Bangladesh	Clean Energy				3.9
	Philippines	LEDS				3.5
	Indoneia	Energy Utility Partnership Program				0.1
	Indonesia	Sector Reform and Utiity Commercialization				0.4
	Indonesia	Clean Energy Development				5.1
	China	Smart Cities (City Links)				2.5
	Regional	LEDS				1.1
	Regional	Clean Power				2.2
	Regional	Private Financing Advisory Network				1.7
	Regional	LEDS with DOE				0.3
	Regional	EC-LEDS				2
	Vietnam	Clean Energy				1.7
	Nepal	Hydropower Development				1.5
	Vietnam	LEDS				1.2
	India	Grid Integration with DOE				2
	India	PACE-D				2.4
	India	Utility Partnership				0.5
	India	Energy Utility Partnership Program				0.7
	India	Enhancing Sustainable Utility Regulations				0.5
	India	LEDS with DOE				0.3
Subtotal Asia						34.3

Near East						
	Aghanistan	Engineering Support				60.4
	Afghanistan	Kajaki Dam Hydropower Project				5
	Afghanistan	Modern Energy Services				0.1
	Pakistan	Guro Ketu Bandar Wind Power Project				43
	Pakistan	Tarbela Dam Repair and Maintenance 2				25
	Pakistan	Clean Energy for Pakistan's Economy				10
	Pakistan	DCA Bank Loan Portfolio Guarantee				7.5
	Pakistan	Training for Pakistan				2.9
	Pakistan	Agreement of Dept of Army for Develop Water				1
	Pakistan	Commercial Dev. With Commerce Dept.				0.8
	Pakistan	Modern Energy Services				0.7
	Pakistan	Energy Policy Project				0.6
	Pakistan	Utiity Partnership				0.2
	West Bank/Gaza	Palestine Renewable Energy Project				5
	Jordan	Energy Sector Capacity Building				6
Subtotal Near East						168.2

Latin America						
	Regional		Clean Energy Finance Facility			6
	Regional		Central America Energy Initiative			4.2
	Colombia		Clean Energy			3.6
	Haiti		Sector Reform and Utility Commercialization			1.1
	Guatemala		LEDS			3
	Mexico		LEDS			3.2
	Mexico		LEDS			1.4
	Mexico		Utility Regulation			0.3
	Mexico		LEDS			0.2
	Jamaica		Sector Reform and Utility Commercialization			1.9
Subtotal Latin America						24.9
Europe and Eurasia						
	Ukraine		Municipal Energy Reform Project			7.5
	Ukraine		Financing Growth			1.7
	Ukraine		Regulatory Partnership			0.2
	Ukraine		Utility Partnership			0.2
	Regional		Eurasia CASA-1000			2
	Regional		USEA Partnership			1.5
	Regional		LEDS			1.5
	Regional		Energy Regulatory Partnership			1.5
	Regional		Central Asia Smart Water Project			0.7
	Georgia		EC LEDS Clean Energy Program			2.5
	Georgia		Energy Partnership USEA			0.4
	Georgia		Regulatory Partnership			0.1
	Macedonia		Modern Energy Services			0.3
	Kazakhstan		Climate Mitigation			1.8
Subtotal Europe and Eurasia						21.9
Global						
	World		Financing Growth			0.2
	World		Renewables, Energy Efficiency, Grid Manage.			3.6
	World		EC LEDS			2.3
	World		Powering Agriculture			10.9
	World		EC EDS			1
	World		Clean Energy Emissions Reduction			0.8
	World		Sector Reform and Utility Commercialization			0.8
	World		Energy Efficiency and Renewables			0.7
	World		Energy Regulatory Partnership	NARUC		0.6
	World		Energy Utility Partnership USEA			0.6
	World		Energy Sector Technical Leadership			0.6
Subtotal Global						22.1
Total All						446.3

**Appendix C: Energy Funding by the Millennium Challenge Corporation(MCC)
FY16 and FY17 by Country (\$ Millions)**

<u>Country</u>	<u>FY16</u>	<u>FY17</u>
Ghana	418	0
Liberia	201	0
Sierra Leone	23	0
Benin	0.9	0
Tanzania	0.2	0
Senegal	0	263
<u>Nepal</u>	<u>8.4</u>	<u>71</u>
<u>Total</u>	<u>651.5</u>	<u>334</u>

Appendix D: Funding for Energy (Finance and Insurance) by the US Overseas Private Investment Corporation (OPIC) FY17 by Region – (\$ Millions)

(N.B.: The OPIC web site indicates that OPIC energy activities, both finance and insurance, totaled \$1.4 billion in 2016. No breakout is given. Annual Report for FY16 numbers don't seem to add up to this much. Numbers for FY17 below are closer).

<u>Region:</u>	<u>FY17</u>
Africa	342.1 million (292 finance; 50 insurance)
ME and S. Asia	586.9 million (46.9 finance; 539.1 insurance)
<u>Latin America</u>	<u>436.5 million (407.25 finance; 29.25 insurance)</u>
<u>Total</u>	<u>1365.5 million</u>

**Appendix E: Energy Project Funding by the US Trade and Development Agency
(Obligations for FY16 and FY17 by Region) (\$Millions)**

<u>Region</u>	<u>FY16</u>	<u>FY17</u>
Africa	14.793	22.175
ME and S. Asia	0.813	2.494
Other Asia	3.328	6.428
Latin America	8.122	5.501
Europe	0.380	0
<u>Global</u>	<u>0.923</u>	<u>1.242</u>
<u>Total*</u>	<u>28.359</u>	<u>37.843</u>
FY 2017 Annual Report:	30.407	32.523

*Total based on review of summary detailed obligations data from TDA Annual Reports