This annual report describes the key activities of Powering Agriculture: An Energy Grand Challenge for Development (PAEGC) implemented over the period of October 2017 to September 2018.

Powering Agriculture: An Energy Grand Challenge for Development continued its work in support of new and sustainable approaches to accelerate the development and deployment of clean energy solutions for increasing agriculture productivity and/or value in developing countries to help end extreme poverty and extreme hunger. The initiative is the result of a partnership of the United States Agency for International Development (USAID) with Sweden through the Swedish International Development Cooperation Agency (Sida), the Government of Germany, Duke Energy Corporation, and the Overseas Private Investment Corporation (OPIC); collectively known as the ‘Founding Partners’.
Powering Agriculture follows the Grand Challenges for Development (GCD) model which focuses on defining problems, identifying constraints, and providing evidence-based analysis for a variety of development issues. The Grand Challenges for Development initiative is rooted in two fundamental beliefs about international development:

- Science and technology, when applied appropriately, can have transformational effects; and
- Engaging the world in the quest for solutions is critical to instigating breakthrough progress.

1.1 The Problem

Agriculture continues to be the primary source of livelihood for most households in developing countries. Continued population growth requires that farms and agribusiness produce, process, and transport an increasing amount of food. The Food and Agriculture Organization of the United Nations (FAO) estimates that by 2050 at least 60% more food will need to be produced on the same amount of agricultural land. Clean energy technology that can be used to intensify agricultural production will be crucial in meeting this demand.

Increasing access to clean energy and efficiency technologies will enable farmers to:

- mechanize their operations
- add value to commodities through processing, and
- store fresh produce in refrigerated containers to extend its shelf life.

Powering Agriculture contributes to the 2030 Agenda for Sustainable Development by supporting the following sustainable development goals (SDG):

- SDG 1 No Poverty
- SDG 2 Zero Hunger/Sustainable Agriculture
- SDG 5 Gender Equality
- SDG 7 Affordable and Clean Energy
- SDG 8 Economic Growth
- SDG 9 Innovation
- SDG 13 Climate action
- SDG 17 Partnerships for the Goals
These advancements will lead to:

- more food in the market
- increased incomes for farmers and traders, and
- decreased dependency of the agriculture sector on fossil fuels.

Significant barriers continue to hinder the integration of clean energy technology in agriculture development:

- Farmers are not aware of the variety of new technologies that may be appropriate for them.
- Clean energy technologies are relatively new, therefore farmers have limited access to distributors for installation, parts, and service.
- Farmers often do not have the means to cover high capital costs associated with clean energy upgrades - and financing is seldom available.

Likewise, clean energy enterprises seeking to serve these farmers face a number of barriers:

- Limited access to debt and equity to support business development and growth.
- Low demand due to a lack of awareness by farmers and other customers of the economic and environmental benefits of the technologies.
- The client base of agricultural communities is remote, scattered, and often very poor.
- There are few examples of successful business models that have been effective in delivering clean energy solutions to the agriculture sector in developing countries.

These issues create an unproductive cycle in which suppliers and buyers are not connected, and farmers and agribusinesses are unable to leverage more cost-effective clean energy technologies. Strengthening the links between modern energy service providers and the agriculture sector will create positive feedback loops to increase productivity along major components of the agricultural supply chain: (1) on-farm productivity; (2) cold storage; (3) transport; (4) post-harvest agriculture processing; and (5) agriculture waste for energy applications.

1.2 The Solution

Energy is critical to almost every aspect of the agricultural value chain. Globally, the food sector consumes 30 percent of total energy supply and generates 20 percent of global emissions.

In order to solve the challenges described in section 1.1, Powering Agriculture was launched in 2012 to:

- support clean energy technology and business model innovations for agriculture;
- ensure that financial intermediaries have the capital they need to help organizations scale their innovations and reach the farmers and farm-related businesses that need these technologies;
- develop partnerships with public and private sector organizations that want to support the goals of the Powering Agriculture program; and
- serve as a clean energy and agricultural information resource for people around the world.
The activities of Powering Agriculture associated with the Innovators supported through the Grand Challenge’s two Calls for Innovation are scheduled to run through 2019.

This year the Founding Partners signed agreements with two organizations – AlphaMundi and Factor[e] – to create the Powering Agriculture Investment Alliance. The Investment Alliance will catalyze a minimum of $25 million in private sector finance for ventures with the potential to achieve transformational development impact in the clean energy/agriculture nexus. Powering Agriculture’s activities under the Investment Alliance will continue through 2021. Read more about the Investment Alliance in Section 3.1.
1.3 The Work of Powering Agriculture

Powering Agriculture utilizes a cross-sectoral nexus approach to concurrently focus on the energy and agricultural sectors while providing technical, business acceleration, financing, and policy support to its innovators and other stakeholders.

TECHNOLOGY & BUSINESS MODEL INNOVATION

Powering Agriculture provides innovation grants ($500,000–$2,000,000) to design, pilot and deploy clean energy solutions to different points along the agricultural production cycle.

Powering Agriculture provides on demand, tailored technical assistance using the Powering Agriculture Support Task Order (PASTO) implemented by Tetra Tech.

MAINSTREAMING

Powering Agriculture utilizes the regional Hub managed by GIZ in East Africa. Powering Agriculture collaborates with U.S. Government-led partnerships such as Power Africa and Feed the Future to integrate clean energy solutions within regional/national agriculture production and food security programs.

FINANCING FACILITY

Powering Agriculture leverages funds to mobilize private sector equity and debt investments within the clean energy/agriculture space.

KNOWLEDGE MANAGEMENT

Powering Agriculture serves as a clean energy and agricultural information resource hub for people around the world by providing knowledge products that contain detailed data on the policy, economic, gender, and energy requirements to end extreme poverty and extreme hunger in developing countries.
1.4 The Founding Partners
The Founding Partners have made financial and in-kind contributions to finance the activities of Powering Agriculture. In-kind contributions are technical assistance resources that individual Partners have committed to support the goal of Powering Agriculture but are managed by the individual Partners themselves. USAID serves as the administrator of Powering Agriculture managing the disbursements of the finances. Table 1.1 provides a description of each Founding Partner.

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| United States Agency for International Development | The American people, through the USAID, have provided economic and humanitarian assistance worldwide for nearly 50 years. www.usaid.gov  
USAID's support and implementation of Powering Agriculture is coordinated by USAID's Bureau for Economic Growth, Education and Environment (E3.). |
| Government of Sweden | Sweden through the Swedish International Development Cooperation Agency (Sida) -- an authority under the jurisdiction of the Swedish Ministry for Foreign Affairs -- focuses on improving living conditions for developing nations around the world.  
www.sida.se/English/  
Sweden's support for Powering Agriculture is coordinated by Sida's Unit for Global Economy and Environment. |
| Government of Germany | The Federal Ministry for Economic Cooperation and Development (BMZ), develops the guidelines and the fundamental concepts on which German development policy is based. It devises long-term strategies for cooperation with the various players concerned and defines the rules for implementing that cooperation. These are the foundations for developing shared projects with partner countries and international development organizations. All efforts are informed by the United Nations’ Sustainable Development Goals.  
www.bmz.de/en  
The Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH implements the German contribution to the Powering Agriculture Energy Grand Challenge on behalf of BMZ.  
The GIZ Project Sustainable Energy for Food – Powering Agriculture is not only contributing to the global initiative but backing up PAEGC efforts by additional pilot projects, research, and capacity development.  
GIZ Powering Agriculture runs a Nairobi-based hub for East Africa, to take advantage of the vast potential for the energy/agriculture nexus and to capitalize on the fact that most of the Powering Agriculture Innovators are implementing their projects in East Africa. With staff on the ground and close proximity to the American, Swedish, and German embassies and Missions in East Africa, the hub activities include pilot projects and studies as well as capacity building. The hub is meant to function as an accelerator for regional as well as supra-regional knowledge exchange, particularly focusing on the Powering Agriculture Innovators located in the region. |
| Duke Energy | Duke Energy, one of the largest electric power companies in the United States, supplies services in a sustainable manner - affordable, reliable, and clean. www.duke-energy.com/  
Duke Energy's support for Powering Agriculture is coordinated by Duke's Federal Government Affairs unit. |
| The Overseas Private Investment Corporation | OPIC is the U.S. Government’s development finance institution. It mobilizes private capital to help solve critical development challenges and in doing so, advances U.S. foreign policy. Because OPIC works with the U.S. private sector, it helps U.S. businesses gain footholds in emerging markets, catalyzing revenues, jobs and growth opportunities both at home and abroad. OPIC achieves its mission by providing investors with financing, guarantees, political risk insurance, and support for private equity investment funds. www.opic.gov/.  
OPIC's support for Powering Agriculture is coordinated by OPIC's Agriculture and Project Finance unit. |