Climate Technology Program | *In Brief*

No. 4

Adapting Global Entrepreneurship Acceleration Models to Clean Tech in Developing Countries:

The Ghana Climate Innovation Center

In Ghana, the World Bank Group is showing that a business development model that grew out of Silicon Valley can be applied to clean technology business incubation in developing countries. A business "accelerator" exercise brought together a cohort of seven competitively selected firms as part of the new Ghana Climate Innovation Center. Lessons learned from this project are being applied across the World Bank's network of seven Climate Innovation Centers and can provide guidance to any effort supporting innovation of new commercial solutions and businesses that address climate challenges in developing countries.

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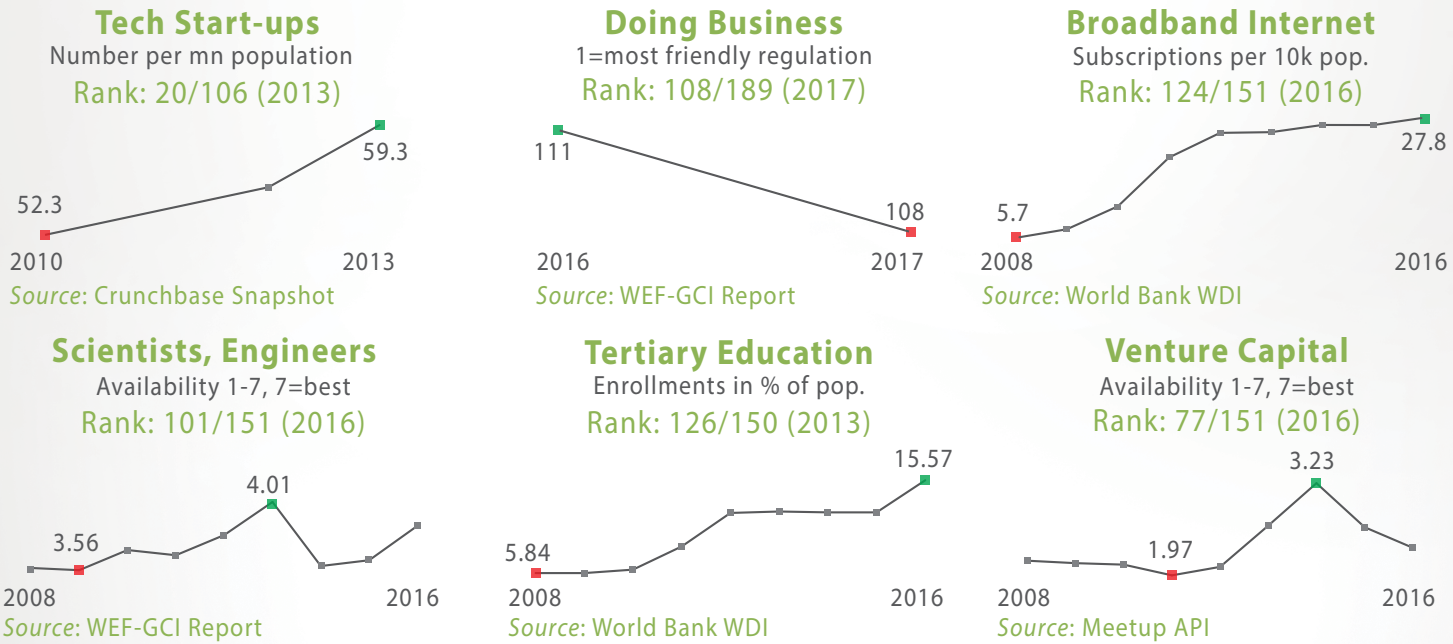
Introduction

Silicon Valley is famed as the birthplace of high-tech innovation and fast-growing technology firms. One important invention from this region is the business accelerator, a new model for entrepreneurial business development itself. Instead of focusing on a single business, accelerators bring together a cohort of promising start-ups for mentorship, coaching, and early-stage financing. From their recent beginnings in Silicon Valley, business accelerator programs have spread worldwide as a way for both established and developing economies to foster entrepreneurial business innovation and growth. In contrast to traditional business incubators, accelerators bring together a cohort of carefully selected start-ups and established firms for intensive coaching, mentorship, concept development, customer validation, and often seed financing over a period of a few months. The goal is to accelerate the transition from concept to flourishing business through sharing ideas and best practices and peer-to-peer learning. In addition to individual business successes, accelerators create a community of entrepreneurship and increase the number of firms able to get over the initial hurdles of start-up and on a path to growth and job creation.

The World Bank Group's Climate Technology Program (CTP) is testing a fundamental question: Can the accelerator model, invented to help software and web-based firms in highly developed economies, work in developing countries in lines of business focused on hardware and geared toward growth in the green technology sphere? The CTP put this question to the test in Ghana as part of an effort that culminated in 2016 with the launch of the Ghana Climate Innovation Center (GCIC). Selected indicators for Ghana's innovation ecosystem are shown in **figure 1**.

Innovation of commercial climate-friendly solutions and the businesses to deploy them are both an urgent need and a great opportunity for the developing world. Climate change is disproportionately impacting developing countries. The means

Figure 1. Selected Indicators Show Innovation Ecosystem is Growing in Ghana*



* All data could be found at ***TCdata360*** (http://tcdata360.worldbank.org/).

of mitigating that impact, or adapting to it, must fit local circumstances best understood by local private and public actors. Rapid growth in climate business sectors combined with the importance of local knowledge add up to a great opportunity for small firms and start-ups to scale up, create jobs, drive economic development, and contribute to the global response to climate change.

Lessons learned from the Ghana pilot—the aspects that worked well and the obstacles and areas for improvement—are being incorporated into accelerator programs across the global network of Climate Innovation Centers (CICs) supported by the World Bank Group and can provide guidance for many efforts to drive local innovation of businesses in this space.

What is an Accelerator?

Accelerators are a relatively new concept, developed over the last decade as an alternative to the traditional business incubator model that works with a business over several years. The accelerator concept involves not an individual business but a "cohort" or group of companies and start-ups brought together for mentoring, instruction, and peer-to-peer learning on everything from customer analysis to product development and testing to investor pitching to accessing finance. For-profit accelerators such as Y Combinator, launched in Silicon Valley in 2005, and Techstars in Boulder, Colorado, in 2007, bring together carefully selected groups of entrepreneurs for four or five months of intensive training and mentoring. The participants move to the area, share meals, and work collaboratively on honing ideas, analyzing markets, testing products, and moving toward production and sales. Dubbed by Fortune magazine as "a spawning ground for emerging tech giants," the list of companies that have emerged from Y Combinator's accelerator includes Dropbox, Airbnb, and Reddit. The accelerator model has been replicated in the United States and around the world through such forums as the Global Accelerator Network (GAN), which brings together more than 70 accelerators in over 100 countries working in seed-stage mentorship with start-ups and entrepreneurs.

The goal of accelerators is twofold: for participating firms, it is to speed their entry into markets with innovative and profitable products; for investors, it is to make available a carefully vetted set of firms with the potential for high return on investment with reduced risk of outright business failure.

Applying the Accelerator Model to CICs

Building on its experience launching CICs in Africa, Asia, and the Caribbean, the CTP sought to test the accelerator concept in the context of clean tech entrepreneurship in developing countries. A number of common threads would characterize the accelerator pilot. Participating entrepreneurs, start-ups, and established firms would be selected through a highly competitive process that considered business success to date, the quality of the underlying product concept, the level of commitment to the program, and other qualities. The accelerator would provide intensive mentorship drawing upon local and international experts in a variety of fields. Participants would work together in open settings, sharing and critiquing ideas, developing and testing products, and honing skills needed to pitch potential investors.

However, a number of critical differences would distinguish the CTP's accelerator concept from its famous counterparts in the world's high-tech centers:

- The accelerator would be based in a relatively poor Sub-Saharan African country.
- Whereas the established accelerator model focused on software and web-based firms, the CTP's would develop primarily hardware-focused products, such as solar-powered pumps and energy-efficient cook stoves. One limitation is that software companies have in general much more in common than hardware companies, and clean tech accelerators should be aware that exchange of ideas and cross fertilization are less likely to happen.
- CTP accelerator participants would focus exclusively in the green-tech field.
- A longer mentorship period—six months instead of the more typical four—would be built into the program to accommodate the typically longer startup phase of hardware based companies.
- The CTP accelerator would offer participants no immediate equity investment, thus simplifying the terms of entry into the program. Admission to the accelerator is for free: no payment nor equity share is required from the entrepreneurs.

These unique features clearly added a level of challenge to the CTP accelerator endeavor that would show up in some of the lessons learned. But they did not prove to be crippling to the concept, and both the lessons learned and the progress achieved in the pilot accelerator are being applied actively in accelerators being prepared by other CIC teams.

The Ghana CTP Accelerator

As the newest CIC, Ghana emerged as the preferred site for the CTP's first accelerator. Figure 1 shows that the innovation ecosystem in Ghana is growing over the past few years. The accelerator program preceded launch of the Ghana CIC in order to begin working with local firms while the CIC's staffing and program designs were being completed. One of the desired outcomes of the experiment was to identify a cohort of businesses that could continue to work with the CIC once it was launched. The accelerator also helped speed the launch of the Ghana center itself by generating interest and enthusiasm in both the public and private sectors. The model piloted in Ghana will now be tested in other established CICs, and new centers may organize accelerators as one of their first operational activities.

An initial solicitation for participants in a two-day green tech business innovation boot camp drew some 90 applicants. The initial pool was reduced to 20 participants in the boot camp, and from that group seven companies were selected for participation in the accelerator based on a pitch in front of a judging panel.

Like the accelerators operating in high-tech centers, the Ghana accelerator worked with participants on business ideation, team building, preparation and testing of product prototypes, fund-raising, and development of a compelling "pitch day" presentation. See box 1 for a short story of how the accelerator helped a participant shift its business strategy. As stated earlier, the Ghana accelerator's longer six-month time frame was due to the longer time needed to develop physical, hardware product prototypes compared to most software products.

The Ghana accelerator offered tailored mentoring and support on a one-to-one basis. Contests with recognition and prizes were a feature for the enterprises that showed the best performance for impact, market potential, and innovation. The

Box 1. Accelerator Helps Solar Firm Shift Strategy for Nearer-Term Sales

The opportunities and challenges inherent in the Ghana accelerator can be seen through the lens of one of the participants, Atlas Business and Energy Systems (ABES) Limited (see the photo below). ABES won the solar category of the Green Innovators Boot Camp. Established in 2010 as an equipment manufacturer in the renewable energy sector, ABES is the first company to design and assemble solar modules and charge controllers in Sub-Saharan Africa. The company, with three full-time and two part-time employees, was having difficulty competing with importers. In addition to competition issues, ABES faced difficulties attracting investors, bureaucratic red tape, staff management issues, an underutilized assembly plant, and high costs of after-sales services. With the help of the accelerator, ABES developed a strategy to shift from manufacturing and assembling solar products to becoming a wholesaler and retailer in the field. The plan helped speed the move toward sales and turning a profit. Activities during the accelerator included development of sales and marketing materials, improving the firm's website, advertising, and generally working to increase name recognition. Longer term, the firm is open to the possibility of returning to manufacturing or assembly, with a focus on unique products for Ghana.

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program included a public relations component, including a high-visibility awards event, participation in the launch of the Ghana Climate Innovation Center, investor pitching sessions, and a high-profile showcase for new products and services.

Private sector accelerators in developed countries typically offer an equity investment in which the accelerator provides seed funding (in addition to mentorship and other services) in exchange for a percentage ownership of the resulting firm. In Ghana, this equity funding mechanism was not made available to participants, but it may be in future CIC accelerators. The CTP's clean tech accelerator concept shares with its more established counterparts the idea that the accelerator's purpose is not just to help start-ups improve and hone their concepts but also to help potential investors identify early-stage firms that could be viable investments.

The Ghana accelerator hosted seven companies representing several clean tech sectors. **Figure 2** briefly describes the participants. Five companies produce tangible products, such as bamboo charcoal briquettes and liquid fuel derived from plastic waste; one delivers both products and services (energy audits as well as smokeless institutional cookstoves); and one is involved in advocacy for green buildings. The goal and expectation of the accelerator effort is not so much that one of these firms will become the next Uber or Apple (though it is not completely out of the question). Rather the idea is that incubation of developing country enterprises through the accelerator process will help create a climate for innovation, investment, and business growth in the green

Figure 2. Summary Table of the Participants in the Ghana Accelerator

Company Name	Sector	Brief Description
Comeph and Associates	Waste Management and Biogas	The enterprise aims to commercialize a liquid fuel produced from plastic waste. They joined the Accelerator to test the market and create awareness for their product.
Kwamoka Farms and Processing Ltd.	Agroforestry	The enterprise develops high biomass yielding bamboo plantations and sells sustainable bamboo and bamboo products. They joined the Accelerator to test and prepare the market for bamboo poles.
Atlas Business and Energy Systems	Solar	The enterprise sells solar panels, photovoltaic components and complete solar products such as solar street light. They joined the Accelerator to increase sales, increase brand recognition and assess the feasibility of new business lines.
Best Performance Engineering Services and Solutions Ltd.	Energy Efficiency	The enterprise conducts energy audits for organizations and designs and constructs smokeless institutional cook stoves. They joined the Accelerator to increase sales and expand into new markets.
Ghana Green Building Council	Green Building	The organization specializes in advocacy for green buildings and generate revenues from certification of Green Buildings for a fee. They joined the Accelerator to promote its rating tool and assessment and certification service.
Global Bamboo Ltd.	Climate Smart Agriculture	The enterprise focuses on the production of bamboo charcoal and briquettes, but also produces other bamboo products, such as furniture and mats. They joined the Accelerator to produce prototypes, create awareness, test the market and optimize the products.
Green Ghanaian Initiative	Other	The organization provides sustainable green products, such as recyclable bins, and services to event organizers to make their events as environmentally friendly as possible. They joined the Accelerator to fine-tune their business model.

technology space that does not yet exist, and that these business improvements may have spillovers into other areas beyond the clean technology field. A further goal is to scale up climate innovation, with the help of accelerators, to the point of having significant and measurable beneficial impact on reducing greenhouse gas emissions.

Lessons Learned

The key takeaway from the Ghana accelerator experience was that this approach can work in developing countries provided that organizers and participants adjust to the challenges particular to incubating clean technology start-ups in more challenging economic environments. One key adjustment to make relates to an underlying theme that drives most accelerators: focus on customer development rather than product development. Start with a quick and dirty prototype, test it and get customer feedback, and use the feedback to guide further product development. Experience in Ghana showed that the lean start-up concept might be challenging in the context of clean technology in developing countries. As Charlotte Benedicta Ntim, one of the managers of the Ghana accelerator, noted, "In the sphere of climate innovation, the largest obstacle in Ghana is that of attitudinal change. For many companies, it quickly became clear that 'green' is not only a concept that is hard to sell in this context but, at times, can actually be an impediment due to the perception that climate-friendly is analogous to more expensive."

In addition, the Ghana accelerator attracted a range of innovators, from very early startups to small early-revenue companies. They are mostly "the usual suspects" that know the development communities well. This does not fit the Silicon Valley model, because the Ghana accelerator participants are

Figure 3. Adapting the Accelerator Model: External Factors

Accelerator factors	High-tech accelerator: Western model	Clean tech accelerator: developing country model	Ghana accelerator approach or issues
Business focus	Software and web-based high-tech business development	Hardware-based clean tech business development	Participants selected for concept quality and potential to impact climate change
Business environment	Highly developed economies with robust infrastructure, high levels of competition, wealth of entrepreneurial expertise	Weaker economies and infrastructure; less competition but also fewer entrepreneurial experts	Keen private sector interest in climate innovation and clean tech business development; need to build public sector support for climate innovation
Customer environment	Robust consumption of tech innovation by businesses and consumers	Smaller markets; less disposable income; some skepticism about value of clean tech products	Adapt customer validation work to particular challenges of local markets; ensure customer demand before commencing production
Financial factors	Software and web-based start-ups need less capital; accelerators offer mentorship in exchange for % stake in venture	Hardware-based start-ups more capital-intensive; private financing environment challenging	No finance provided to participants; no % stake required by accelerator; World Bank Group may provide financing in future accelerators
Overall goals	Help foster the next generation of high-tech giants; create a more robust pipeline of tech start-ups; create a support community for tech entrepreneurship	Support clean tech start-ups in developing economies; create jobs and growth while contributing to climate change response	Generate growth and create jobs; foster business formation and formalization; bolster country's climate change contribution; help accelerate launch of Ghana Climate Innovation Center

not potential "unicorn" companies with huge return prospects, but they could be the ones to make a significant environmental impact. The Ghana CIC has twin goals of fostering entrepreneurship and creating climate impact, and it is still learning to find the right balance when assessing companies into the program.

Figures 3 and **4** compare key elements of the accelerator model as applied in high-tech business incubation in developed countries with some of the differences and challenges present in clean technology accelerators in developing countries and the approaches to those challenges taken by the Ghana accelerator. The comparisons are divided into external factors relating to the business environment and internal factors relating to how the accelerators themselves operate.

Taking the Pilot Global

Across the network of seven Climate Innovation Centers, work is underway to restructure the CIC operational model from one based on proof-of-concept competitions to a more targeted model consisting of ideation sessions, boot camps, and accelerators. For example, in the Caribbean CIC, a new suite of services being offered includes accelerator programs involving intensive mentoring, networking, and customization services. Graduates of the Caribbean CIC boot camp will be encouraged to apply to participate in an accelerator program. In early 2016, more than 100 participants attended boot camps held in Jamaica and Trinidad and Tobago. The top three teams from each received grant funding to further perfect their business model, and winning teams were guaranteed access to the accelerator program.

Figure 4. Adapting the Accelerator Model: Internal Factors

Accelerator factors	High-tech accelerator: Western model	Clean tech accelerator: developing country model	Ghana accelerator approach or issues
Cohort selection	Highly competitive; participants selected based on viability of business model, quality of proposal, ability to raise capital	Highly selective based on viability of business model and potential climate change impact	Boot camp model used to trim roster of applicants down to manageable (7 firms) roster of accelerator participants
Duration of program	4 months	6 months: hardware companies need more time for R&D, sourcing, etc.	6 months in first pilot; duration may be extended for more intensive mentoring
Program logistics	Participants travel to accelerator site and live in campus-like environment for duration of program	Cost issues relating to travel and facilities may not support campus approach	Program did not require live-in participation; accelerator participants commuted to program
Cohort quality	Accelerator participants often highly experienced entrepreneurs and high-tech innovators	Limited entrepreneurial experience; participants often single individuals	Participants not always able to devote full time to program because of outside work responsibilities
Data quality	Extensive economic and sector data available	Limited availability of hard data for conducting due diligence	Lack of data shifted due diligence emphasis from number-crunching to relationship building
Mentor quality	Experts available with experience in tech entrepreneurship applicable to software and web-based businesses	Less readily available mentors in clean tech hardware fields that range from solar to cookstoves	Finding mentors with expertise applicable to accelerator participants proved challenging

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About Us

The Climate Technology Program (CTP) In Brief series is a publication of the World Bank Group's Trade and Competitiveness (T&C) Global Practice and infoDev. infoDev's CTP is managed by the Innovation and Entrepreneurship Unit of T&C.

CTP focuses on the growing opportunities of the clean technology sector in developing countries. Through a global network of seven Climate Innovation Centers, the program provides local entrepreneurs with the knowledge and resources they need to launch and scale their innovative business solutions to climate change. CTP In Brief is a series of knowledge briefs highlighting important aspects of the CTP global and in-country operations and research.

Learn more at www.infoDev.org/climate.

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1818 H Street NW
Washington, DC 20433
Website: *www.infodev.org*
Email: *info@infodev.org*
Twitter: *@infoDev*
Facebook: */infoDevWBG*

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