

SLATT UNDERGRADUATE STUDENT FELLOWSHIP PROGRESS REPORT

SLATT SCHOLAR:	Kalule Raymond Guwatudde
FACULTY ADVISOR:	Abigail Mechtenberg
REPORT PERIOD:	Summer 2019
PROJECT TITLE:	Assessing the feasibility of Pay-as-you-go(PayGo) systems in renewable energy systems
CONNECTION TO ND ENERGY'S RESEARCH AREAS (CHECK ALL THAT APPLY):	<input checked="" type="checkbox"/> Energy Conversion and Efficiency <input type="checkbox"/> Sustainable and Secure Nuclear <input type="checkbox"/> Smart Storage and Distribution <input type="checkbox"/> Transformation Solar <input type="checkbox"/> Sustainable Bio/Fossil Fuels <input checked="" type="checkbox"/> Transformative Wind

MAJOR GOALS AND ACCOMPLISHMENTS:

List your major research goals and provide a brief description of your accomplishments (1-2 sentences). Indicate the percentage completed for each goal. Please use a separate sheet to share additional details, technical results, charts, and graphics.

MAJOR RESEARCH GOALS	ACTUAL PERFORMANCE AND ACCOMPLISHMENTS	% OF GOAL COMPLETED
Analyzed feasibility of adding PayGo systems to bio-gas	Concluded that adding a PayGo system to bio-gas is not feasible at this stage because the risk of explosions from gas is too high since there was not a satisfactory risk/emergency plan in place in Uganda.	100%
Analyzed feasibility of adding PayGo system to wind turbines	Wind turbines are effective in most parts of Uganda with enough wind speed. Adding a PayGo system to a wind turbine system requires very similar technical specifications to most solar PayGo systems. The wind turbine is currently being built and the PayGo system will be added to it and tested between August and November. The PayGo system will collect different data points on the usage on to a dashboard.	50%
Organizing renewable energy systems incubator in Uganda	Six different energy teams have been set up in Uganda and are each developing their own renewable energy devices and competing for a cash prize. The goal of the incubator is to contribute towards developing a renewable energy curriculum for high schools, vocational institutes and universities that will be a launchpad of renewable energy entrepreneurs.	20%
Fully operational table generator	My team was able to build a fully functional human powered table generator that can recharge batteries and other devices too.	100%

RESEARCH OUTPUT:

Please provide detailed information below regarding any output resulting from your research project. Please check with your faculty advisor if you are unsure how to respond.

CATEGORY	INFORMATION
JOURNAL ARTICLES	(Sponsor, Project Title, Pls, Award Date, Award Amount)
BOOKS AND CHAPTERS	(Journal Name, Title, Authors, Submission Date, Publication Date, Volume #, Page #s)
PUBLIC PRESENTATIONS, SEMINARS, LECTURES	(Book Title, Chapter Title, Authors, Submission Date, Publication Date, Volume #, Page #s)
AWARDS, PRIZES, RECOGNITIONS	(Event, Presentation Title, Presentation Date, Location)
INTERNAL COLLABORATIONS FOSTERED	(Purpose, Title, Date Received)
EXTERNAL COLLABORATIONS FOSTERED	Yasa Uganda. To undertake fabrication of renewable energy devices. Weekly emails.
WEBSITE(S) FEATURING RESEARCH PROJECT	
OTHER PRODUCTS AND SERVICES (e.g., media reports, databases, software, models,	(URL)

curricula, instruments, education programs, outreach for ND Energy and other groups)

RESEARCH EXPERIENCE:

Please let us know what you thought of your research experience: Did this experience meet your expectations? Was there something else that could have been done to improve your research experience? Were lab personnel helpful and responsive to your needs? What could have been done differently, if anything, to achieve additional research results?

My research experience was a great learning experience in terms of exploring what's possible with renewable energy. I initially set out to assess the feasibility of adding a PayGo system to bio-gas systems in Uganda because that would make it a more affordable cooking option. However, my team lacked the tools and experience to carry out the test in a risk-free environment within a reasonable budget. We therefore pivoted to assessing the feasibility of PayGo with wind turbine systems as they carried less risk and their implementation would be closer to that of solar PayGo systems.

MAJOR GOALS AND ACCOMPLISHMENTS
(Additional Details, Technical Results, Charts and Graphics)





