ENERGY EFFICIENT REFRIGERATORS FUNCTIONAL DEMONSTRATION IN AWUTU SENYA EAST AND GA EAST MUNICIPALITIES

Simon Bawakyillenuo | Innocent Agbelie

January 2017

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SAMSET
Supporting Sub-Saharan Africa's Municipalities with Sustainable Energy Transitions

TABLE OF CONTENTS

TECHNOLOGY PROFILE

BRIEF DESCRIPTION OF THE TECHNOLOGY

The Energy Efficient Refrigerators are new technologies certified and promoted by the Energy Commission (EC) of Ghana under the United Nation's Sustainable Energy for All (SE4ALL) programmes geared towards energy efficiency and sustainable energy usage in the household and commercial sectors. Between 2011 and 2014, the EC of Ghana ran the Refrigerator Energy Efficiency project which targeted the replacement of some 15,000 old inefficient refrigerators around the country that consume on average, 1200 kWh/year with efficient ones which consume about 250kWh/year.

The Energy Efficient Refrigerators come in different grades with respect to their efficiency levels. There are often efficiency labels attached to the products to indicate the level of efficiency of the refrigerators. Five star labeled refrigerators are the more efficient products while fewer star labeled refrigerators indicate less efficiency. The Energy Efficient Refrigerators are built with a thermo-start that turns the refrigerator off for few minutes at peak frost and turns it back on when the refrigerator is beginning to defrost. The design of Energy Efficient Refrigerators include all sizes from table tops, through double deck, double door to freezers. These products are specifically designed to perform the same functions as the old inefficient ones but with less energy intensity.

PURPOSE OF THE TECHNOLOGY

The Energy Efficient Refrigerators are basically developed to help conserve energy and reduce income spent on energy through cutting down electricity consumption. Aside helping to conserve energy nationwide, the use of these energy efficient refrigerators can also help increase the income savings of households especially, female headed households. These savings can then be spent on other competitive households' needs. Practical demonstration of the energy efficiency potentials of this technology will help in its enhanced adoption rate.

IDENTIFICATION OF THE TECHNICAL PROBLEM(S) FACED BY THE PRIVATE SECTOR FIRM, GROUP OR ASSOCIATION

In order to facilitate easy penetration of the Energy Efficient Refrigerators into the Ghanaian society, the EC of Ghana has instituted the Fridge Replacement programme where people can send their old inefficient refrigerators to designated shops to be replaced with the energy efficient ones after assessing the functionality of the old one. Despite the energy conservation and income saving potential of the Energy Efficient Refrigerators, patronage in Awutu Senya East Municipality (ASEM) Ga Est municipality (GEM) has been poor. Under the "Supporting Sub Saharan Municipalities with Sustainable Energy Transitions" project in which ASEM and GEM are partners, State of Energy survey reports produced by ISSER reveal an alarmingly low rate of adoption of the Energy Efficient Refrigerators in the two municipalities despite high awareness rate and willingness to use. The study further revealed that people's knowledge of the EC fridge replacement programme is limited to fair awareness with little knowledge of how the programme is ran and how the products function.

HOW DOES THE TECHNOLOGY IN QUESTION ASSIST IN ADDRESSING THE PROBLEM(S) IDENTIFIED IN ABOVE

i) Demonstrating how the Energy Efficient Refrigerators function in the two municipalities in terms of how much money is saved per day or month from using these refrigerators compared to the old inefficient ones will change the perception of people about the technology and will improve the adoption of the technology in the two municipalities
ii) Evidently demonstrating the energy efficiency of these refrigerators against the old inefficient ones and their income saving potentials will improve the penetration rate beyond the fridge replacement programmes to the point where people are willing and ready to get rid of their old energy inefficient fridges and acquire the energy efficient ones.
iii) The low adoption of the technology is partly attributed to lack of trust and believe in the new technology. Some people will never adopt this technology on the basis of little or no trust in procurement processes that are largely under-emphasised. Others will only adopt after users have testified positively about the technology. The practical demonstration will clear lots of doubts in the system and cause mass adoption in the municipalities.

THE PROPOSED MEANS (E.G. HANDS ON TRAINING WORKSHOPS, DEMONSTRATIONS, LICENSING AGREEMENTS, ETC.) BY WHICH THE TECHNOLOGY WILL BE TRANSFERRED TO THE PRIVATE SECTOR FIRM, GROUP OR ASSOCIATION

This practical demonstration exercise has come out strongly as a priority strategy towards sustainable energy transitions during the Strategy Development stage under the SAMSET project. This calls for sourcing funds to undertake such exercise and also devising strategic ways other than the approaches already used to reach the targeted groups in the municipalities.

The Energy Efficient Refrigerators Programme has been inadequately publicised even among the targeted consumers countrywide. Lack of in-depth publicity about the programmes has left majority of the people with just very little knowledge of the technology. The main proposed means through which this technology can effectively be transferred to the municipalities is through practical demonstrations of the functionality of the energy efficient refrigerators at: organized workshops in the two Municipalities, Assembly meetings, Town council meetings, Meet the community workshops and other known meetings involving organized groups such Market Women Associations, Hair dressers Associations among others.

Other means of transferring this technology to the people in these two municipalities shall include partnering the technology (energy efficient refrigerator) sale shops, like Hisense, Somovision and Melcom who can influence the public through their advertisements in the media. Showcasing consumption statistics and efficiency characteristics of this technology in the media can be a big propeller of mass adoption of this technology.

EXPECTED RESULTS: HOW WILL THE ADOPTION OR USE OF THE TECHNOLOGY IMPACT UPON PRODUCTIVITY LEVELS ON THE PRIVATE SECTOR FIRM, GROUP OR ASSOCIATION?

i) Successful adoption of the energy efficient refrigerators through the demonstration exercise will help conserve energy in the Municipalities and country at large. This will put less pressure on an already limited energy supply infrastructure that is dependent on fossil fuel power plants with unmeasurable carbon emission and climate change implications.

ii) Increased adoption of this technology will have positive effects not limited to national but also household units. The use of energy efficient refrigerator will decrease the expenditure on electricity thereby increasing household savings that can be channeled into any other productive activities. Through the demonstration exercise, people will appreciate how power savings per hour turns into a huge income savings by a year that can take care of other household goods and services. At the national level, there will be a huge energy conservation and cost minimization in terms of electricity production and distribution.

iii) Achieving optimum use of the energy efficient refrigerator similar to the obsolete inefficient technology with minimal energy intensity results in available resources to be distributed to other competing sectors. Less energy expenditure means available resources to improve self or business productivity with minimum energy intensity.

SUSTAINABILITY ARRANGEMENTS

After the demonstration exercise to showcase the functionality of the technology (energy efficient refrigerators) and its energy conservation as well as income savings potentials, certain strategies will be adopted to sustain the adoption of the technology in the two municipalities and beyond. First of all, accessibility of the technology must improve drastically across the municipalities and beyond. More exchange points must be opened beyond the current known few points to facilitate the exchange of old refrigerators with the energy efficient ones. When knowledge of the technology becomes common and known to majority of the potential beneficiaries, inaccessibility of the technology will discourage adoption. The technology accessibility should also be expanded to include lower income and average income households. Currently, the law bans the importation of second hand fridges without much clarity on importation of second hand efficient refrigerators, which are only slightly used and could still be efficient. Such class of goods are affordable to the low income and middle class households who seem currently excluded from the target group of the new energy efficient refrigerators. The law on the importation should be carefully reviewed to give room for the importation of energy efficient second-hand refrigerators.

SUSTAINABILITY ARRANGEMENTS

INSTITUTION	KEY PLAYERS	RESPONSIBILITIES
ISSER	Lead Researcher	1. Coordination of activities 2. Disseminating evidence based results from the demonstration exercise 3. Procuring all logistics and equipment
ASEMA	1. Municipal Chief Executive 2. Municipal Co-ordinating Director 3. Municipal Planning Officer	1. Organization of workshops, meetings. 2. Collaboration with research team 3. Dissemination of evidence based results at other Assembly's own meetings
GEMA	1. Municipal Chief Executive 2. Municipal Co-ordinating	1. Organization of workshops, meetings. 2. Collaboration with research team

	Director 3. Municipal Planning Officer	3. Dissemination of evidence based results at other Assembly's own meetings
Energy Commission	1. SEA4ALL representative 2. Fridge replacement programme committee representative	3. Rendering support for the project 4. Taking few policy lessons
ECG	ECG Technical team	1. Providing technical assistance with meter readings, energy consumption rate of old and new technology

ASSESSMENT OF PROJECT IMPLEMENTATION

SUMMARY TABLE OF UPDATES ON THE PROJECTS

No.	Objective	Activity (ies)	Result in Relation to Objective	Outcome(s) on Beneficiaries/ Target Group	Impact in relation to Specific / Overall Objectives
1	Sensitisation and planning for the demonstration exercise	1. Workshop involving all key stakeholders 2. Planning of activities 3. Mapping of targeted groups	Stakeholders have been sensitized on the technology. An action plan for the implementation of the project was drawn and identified target beneficiary groups were mapped.	Through the sensitization and effective planning by the project team, different beneficiaries of varied income groups (high, medium and low), community classes (first, second and third) and commercial groups were identified to benefit from the demonstration exercises. Various concerns, questions and issues, which were raised by the different beneficiary groups in the implementation process were addressed by the team in a bid to ensure the optimal	The overall objective of the project is to promote or enhance mass adoption of energy efficient refrigerators by household and commercial players in ASEM and GEM through effective educational campaign in the form of practical demonstrations. Effective planning and sensitisation facilitated the smooth implementation of the project. Particularly, it enabled the team to select the appropriate beneficiary groups, who did not only benefit from the demonstrations, but will in turn be disseminators of the education they

				benefits from the demonstrations.	received, to the wider general public.
2	Procurement of equipment and logistics	1. Preparation and costing of all the equipment needed to carry out the demonstration exercise. 2. Purchase of items	The research team scouted the market to identify the appropriate equipment at competitive prices for the project. After the reconnaissance market survey, the team went ahead to purchase all relevant equipment required for the demonstration exercise including efficient refrigerator, inefficient refrigerator, generator, and switch board.	The physical presence of the various equipment used for the demonstration gave the households and commercial beneficiaries the opportunity to better appreciate the energy demand management message being sent across.	The display of the equipment (the two types of refrigerators) connected to the electricity and Watt meters for all beneficiaries to observe was a key determinant of beneficiaries' willingness to use or buy the technology (energy efficient refrigerator).
3	Piloting of demonstration equipment	1. Installation of the purchased equipment 2. Testing the equipment on the technology to be certain they are working	Achievement of objectives 4 and 5 below depended on successful piloting of the various demonstration equipment. The equipment were successfully tested in the presence of all stakeholders at ISSER, University	The household and commercial beneficiaries were more convinced of the results that were shared with them from the pilot on the basis of the efficacy of the various equipment.	The willingness to use or adopt the technology (energy efficient refrigerators) is totally dependent on the conviction of the beneficiaries. Without total conviction of the project team, the beneficiaries could not be convinced either, hence, it was very useful to carry

			of Ghana. The team was therefore convinced about the efficacy of all the equipment.		out a pilot demonstration to assess the functionality of the various equipment.
4	Energy Efficient Refrigerator Demonstration exercises in ASEM and GEM	1. Carry out 12 energy efficient refrigerator demonstration activities in ASEM 2. Carry out 12 energy efficient refrigerator demonstration activities in GEM	24 energy efficient refrigerator demonstration activities were successfully carried out in ASEM and GEM involving beneficiaries from first, second and third class communities in both municipalities.	More than 300 household heads and commercial players from different income and community classes benefited from the 24 energy efficient refrigerator demonstration activities in ASEM and GEM. The following quotes of some beneficiaries are testament to the fact that the demonstrations had been an eye opener to them as far as the benefits on EE fridges are concerned: *"You showed us in the demonstration that EE fridge is the best and I saw it for myself how the second-hand fridge consumes more energy"* *"You should have come with the demonstration before we bought our old fridges. Now I have to go get a new one"* *"I never knew the EE refrigerator saves energy*	After the demonstration activities in both ASEM and GEM, majority of the participants have expressed willingness to use and willingness to buy the technology (energy efficient refrigerators). The following views were expressed by some of the beneficiaries during the post-demonstration interviews: *"After seeing it [EE refrigerator] worked with my own eye after you came to show us, I am willing to use one"* *"Because you showed us how it (EE refrigerator) consumes less energy, only a fool will not go in for this fridge after this education"* *"My brother, I saw it when you came to show us how it works. I am very convinced now"* *"I am willing to buy it (EE refrigerator) because I saw it work and because I am very convinced it will save me more*

				and money until you came to educate us" *"The demonstration was very useful because the adverts on TV are not convincing enough"*	*money if I buy the EE fridge"* *"I have even told my wife that we should go get one (EE fridge) next month. I am really happy about the education"*
5	Impact assessment of the technology	1. Development of impact evaluation instrument 2. Collection of data on participants' willingness-to-buy and willingness-to-use before and after the technology transfer demonstration activities 3. Analysis of data and impact assessment of the demonstration	The impact assessment instrument (Pre and Post Demonstration Questionnaires) was developed and piloted to capture the views of beneficiaries on the efficiency and functioning of the EE refrigerators before and after the demonstrations. Prior to the demonstration exercises in both ASEM and GEM, the questionnaires were administered or where required, face-to-face interviews were carried out to solicit various views on the technology. A week after the demonstration, the beneficiaries were interviewed through phone calls to obtain the after-demonstration	In responding to the questionnaires before and after the demonstration activities in both ASEM and GEM, different beneficiaries expressed their views in respect of their perceptions on the technology, the obstacles they encountered or are encountering in an attempt to acquire the technology and recommended measures that could facilitate its acquisition.	To ascertain the future adoption trends of the technology (EE refrigerators), it is important to assess the impact of the demonstration exercises on beneficiaries. As stated earlier, majority of beneficiaries have been impacted by the demonstration as they expressed the willingness to use or buy the technology (EE refrigerators) after the demonstration exercises. However, the assessment reveals that many of the beneficiaries have affordability issues and some proposed measures such as "soft" loans or hire purchase deals to ease their affordability challenges: *"I wouldn't even think twice about getting an EE fridge if I get a soft loan. Now I know with evidence that EE fridge is the best"*

			views on the technology.		*"If the conditions are okay, I will take it because the EE fridge is good to buy"* *"If only the conditions are favourable, I will take a loan for this EE fridge but never for Inefficient one"* *"I can pay in installment so a hire purchase or loan deal will also help me acquire one"* *"If the terms are agreeable, then I will take the hire purchase but not the loan"*

ASSESSING WHETHER THE ADOPTION OR TRANSFER OF THE TECHNOLOGY ADDRESSED THE PROBLEM BEING FACED BY THE FIRM/ GROUP OR ASSOCIATION (BENEFICIARIES)

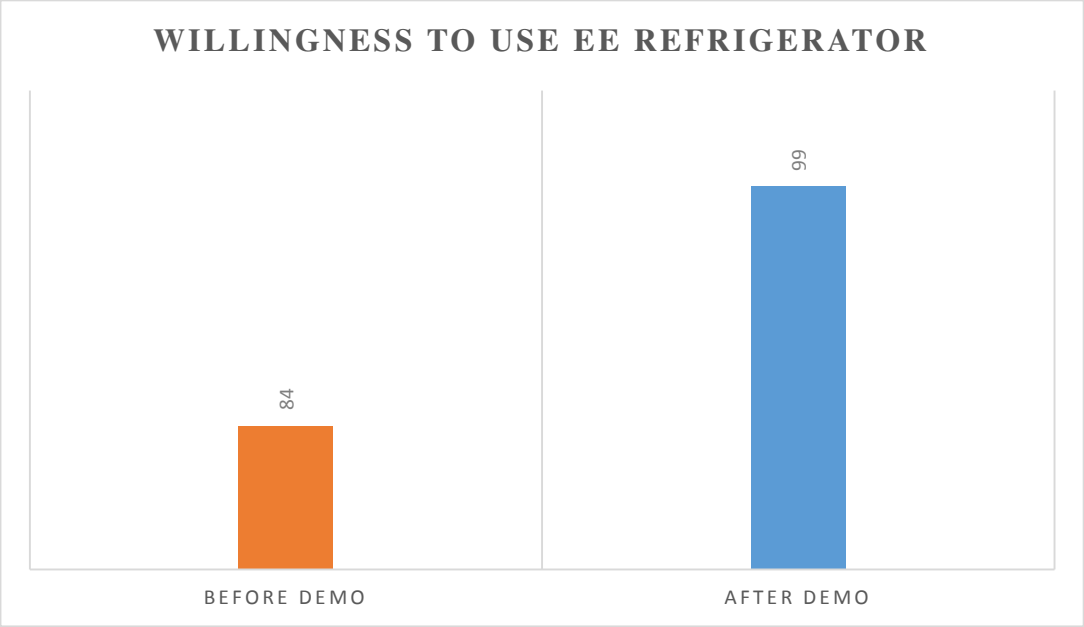
The technical problem identified as being faced by households and commercial players in ASEM and GEM is low rate of adoption of the Energy Efficient Refrigerators. The low adoption of the technology is partly attributed to lack of trust and believe in the new technology. Some people will never adopt a technology if they have little or no knowledge of the functionality and efficiency of the technology. Others will only adopt after users have testified positively about the technology. This Technology Transfer Project sought to demonstrate practically the energy efficiency of the new refrigerators against the old inefficient ones as well as their income saving potentials so as to improve the adoption rate of the technology in the two municipalities.

Over 300 household heads and commercial players participated in the Energy Efficient Refrigerator demonstration activities in both ASEM and GEM. 214 beneficiaries (representing over 70%) were randomly selected for the pre and post demonstration surveys. Evidently from the pre-demonstration survey, close to 49% of the beneficiaries have no knowledge of energy efficient

refrigerators. About 74% of the beneficiaries own a refrigerator and out of that, only 30% confirmed they had the Energy Commission's energy efficiency label on their refrigerators at the time of purchase. In effect, about 70% of fridge owners presumably had old and inefficient refrigerators in our sample. Before the demonstrations were carried out, 84% of the beneficiary participants indicated that they are willing to use the EE refrigerators. About 1% and 15% said they are not willing to use and are not sure of using the EE refrigerators respectively. Meanwhile, a reduced proportion (70%) indicated that they are willing to buy the EE refrigerators out of their earned money.

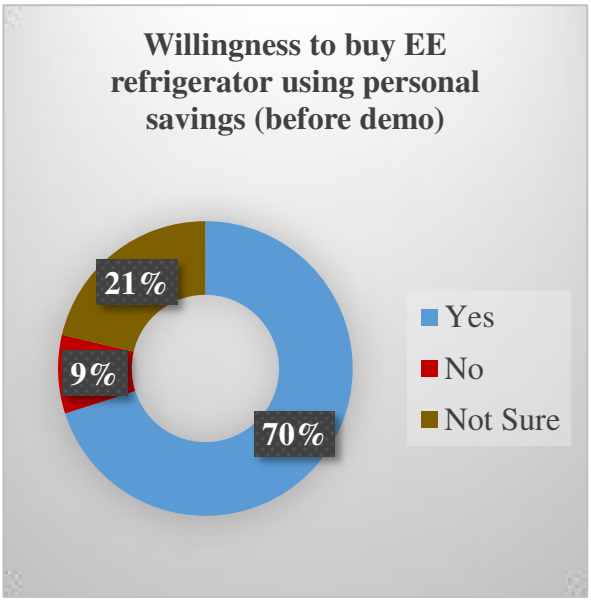
The post-demonstration survey revealed that 45%, 54.44% and 0.56% of the beneficiary participants are very convinced, convinced and not convinced on the efficiency and functioning of the EE refrigerators respectively. About 99% of the beneficiaries are willing to use the EE refrigerators after the demonstration compared to 84% before the demonstration, an increase of 15 percentage points (Figure 1).

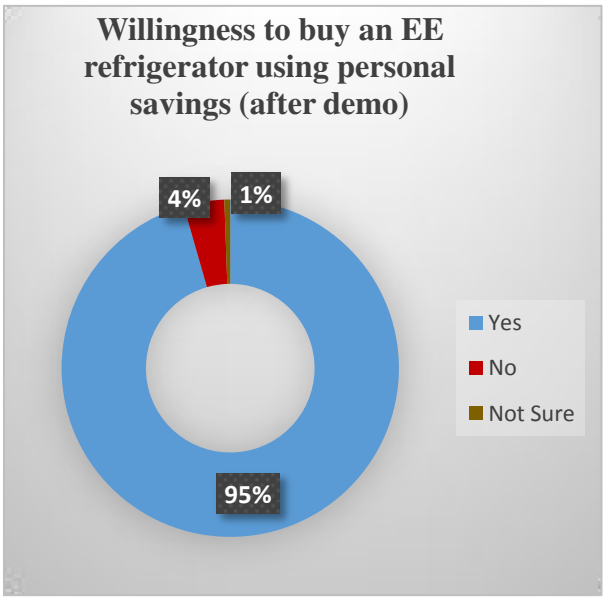
Figure 1: Willingness of beneficiary participants to use EE refrigerators before and after demonstration (Percentages)



Additionally, about 95% of the beneficiaries are now willing to buy an EE refrigerator out of their personal savings compared to the proportion in the pre-demonstration (70%) – also, an increase of 25% percentage points (Figure 2). Evidently, these practical demonstrations have had an impact in respect of the number of people who are now willing to use and buy the EE refrigerators in the two municipalities compared to the before demonstration phase as far as the sample beneficiary participants are concerned.

Figure 2: Willingness of beneficiary participants to buy EE refrigerator using personal savings before and after the demonstration (Percentages)





SUMMARY OF FEEDBACKS RECEIVED FROM BENEFICIARIES, TARGET GROUPS DURING OR AFTER TECHNOLOGY TRANSFER

During the demonstration, ample time was allocated for questions, comments and suggestions to clear doubts and enhance understanding for all beneficiaries. The questions and issues related to the technology were addressed by the project team, which comprised the researchers from ISSER, Municipal Assembly officers (partners) from ASEM and GEM, collaborators from Energy Commission and Electricity Company of Ghana. The following are some of the key questions, concerns and suggestions that were voiced out by beneficiary participants:

"This is a very good education which has revealed a lot to us. Personally, I am not aware of this information on energy and money saving through the use of EE refrigerators and I believe there are so many people out there who, just like me, are not fortunate to have this information and they 'kill' themselves with the second-hand fridges. I think you should do more to reach a lot more people even if it requires you use all available public information systems" (An elderly beneficiary participant A from GEM).

"If the EE refrigerators are this good as we have just witnessed, and the government is aware of this, why are they not tough on those who import the second-hand refrigerators into the country? Why are the used ones still coming in? Because for the consumer, he/she is looking at his/her pocket

and those used ones seem a little cheaper to many people" (An elderly beneficiary participant B from GEM).

"It seems the Energy Commission (EC) is doing us lots of disservice. If they know this is how the second-hand fridges are 'killing' us (moneywise), why are they doing little about dealers in such goods, both importers and sellers? Why are dealers still at Lapaz right now, at this very moment still selling these energy consuming gadgets? Are they (EC) doing their jobs?" (A male beneficiary participant (1) from ASEM).

"I love what you people are doing here. I am not aware of this information before this demonstration, many of my colleagues abroad are not aware of it either. Meanwhile, those of us abroad are the major contributors to this problem. If you can do enough for this information to get to our people abroad who usually buy and import the used fridges into the country, that will be a big breakthrough to solving this problem" (An elderly beneficiary participant C from GEM)

"*Is there any mechanisms put in place by the Energy Commission (EC) to check fake labels in the refrigerator market? We all know there are fraudsters who could effectively imitate the EC's EE labels and paste on the inefficient refrigerators"* (A beneficiary participant (1) from GEM)

"Could government increase taxes on importation of second-hand refrigerators to serve as a disincentive to importers so that they shift to importation of efficient refrigerators? (An elderly beneficiary participant D from GEM)

"What is the target group for this demonstration exercise? And when one buys an EE refrigerator, how long does its efficiency lasts? (An elderly beneficiary participant A from ASEM)

"If you are not prepared financially to replace the inefficient refrigerator you currently use, what could you do to the inefficient refrigerator to reduce it's per kilowatt consumption? (An elderly beneficiary participant B from ASEM)

The post-demonstration responses to the questionnaire also revealed the beneficiaries' delight and appreciation in the energy efficient refrigerator demonstration, which have changed their perceptions towards the technology and their willingness to use and buy. The following views were recorded in the post-demonstration survey;

"Until the demonstration, I didn't know I could save that much from using the EE refrigerator. I am seriously thinking about changing the one I have by saving little by little" (A beneficiary participant (2) from ASEM)

"After the demonstration, I have already made up my mind to save towards the EE fridge and discard the old one" (An elderly beneficiary participant A from GEM)

"I am very convinced that EE fridge will save me money and consume less of my prepaid than second-hand fridge" (An elderly beneficiary participant C from ASEM)

"From the demo and flyers that I have (from you), am really convinced the EE fridges save money a lot. it will benefit me in the future" (A beneficiary participant (3) from ASEM)

"I have used the old fridge before and I know how energy saving the new EE refrigerator is. I pay far less now using the EE one compared to when I was using the old one" (An elderly beneficiary participant E from GEM)

"It's good to have one at home as it saves you money. I am so willing especially after the demonstration. Only the cost of the new one is high". (An elderly beneficiary participant from D ASEM)

"The demonstration shows that it (EE refrigerator) saves money and so am willing because I am convinced" (A beneficiary participant (4) from GEM)

"I am willing because I saw it worked and because I am very convinced it will save me more money if I buy the EE fridge" (A beneficiary participant (5) from GEM)

"I am very much willing because of its energy efficiency characteristics. But the issue is affordability and I can't force other co-tenants to change theirs at where I live" (An elderly beneficiary participant E from ASEM)

A common concern raised by many beneficiaries has to do with the possibility of the national government and development partners running another social intervention programme similar to the Fridge Replacement Programme ran by the Energy Commission (2012 – 2014). This, according to them will afford them the opportunity to exchange their old refrigerators with new energy efficient ones since majority of them are poor and do not come by the sum of money required to out-rightly purchase the new EE refrigerators easily. Many voiced out that, a social intervention for the poor to enable them acquire EE refrigerators and get rid of the energy consuming second-hand refrigerators will not only help the poor but also conserve energy for other sectors including, industrial and commercial sectors for economic development.

SUSTAINABILITY AND THE PROSPECTS OF PROJECT CONTINUITY AFTER THE FUNDING PROVIDED BY THE TDTC HAS ENDED

Reactions from the beneficiaries to the energy efficient refrigerator demonstration in ASEM and GEM indicate that the practical demonstration is essential and presents a vital information that needs to reach every household in the two municipalities. At the backdrop of this, the need for the continuity of this project cannot be over emphasized. It is the desire of the project team and all collaborators to see this project continue so that many more people can benefit and save money in their pockets.

Due to resource and especially, time constraints, only 24 demonstrations have been carried out on different platforms, involving different groups of people of different backgrounds in the two municipalities on the ticket of TDTC. Undoubtedly, the information is cut out from thousands of people who also deserve to know and benefit from it. Whiles the practical demonstrations using the two refrigerator types (new EE refrigerator and old inefficient refrigerator) were undoubtedly crucial in convincing the beneficiaries, the message can still be sent out to other groups without the refrigerators but with the charts produced from the readings taken out of the refrigerators using the Watt Up Meters. In this vein, the project team with the collaborators will strategise to the best of their ability to visit more platforms like churches, durbars, festivals, schools and work places with the charts and brochures/flyers produced as that could serve as a less costly way of disseminating the information to a lot more people.

The Sustainable Energy Strategy documents for ASEM and GEM produced under the “Supporting Sub Saharan Africa Municipalities with Sustainable Energy Transitions” (SAMSET) clearly outlined effective educational campaigns as a continual strategic action for the two municipalities across variety of issues including, energy demand management, waste, renewable energy and energy efficiency. Though SAMSET I comes to a closure in September 2017, the partners are exploring other channels to phase-in SAMSET II and, if that becomes a reality, then educational campaigns such as “The Functional Demonstration of Energy Efficient Refrigerators” as well as “Energy Efficient Cookstoves” will be key work packages.

No.	Indicator	Before Technology Transfer / Adoption	After Technology Transfer/ Adoption
a.	Revenue	-	-
b.	Productivity	-	-
c.	Net Profits (Gain)	**Zero (0)**	• **Average monthly cost of running double deck old refrigerator is GHC 51.599** • **Average monthly cost of running double deck EE refrigerator is GHC 2.478** ➢ **Net gain for anyone who leaves old refrigerator for new EE refrigerator is GHC 49.121 per month**
d.	Employment	-	-
e.	Annual household economic savings of EE refrigerators adopters or would-be adopters	Zero (0)	**Estimated Annual Cumulative Cost in Ghana Cedi in respect of electricity tariffs for anyone who leaves old refrigerator for new EE refrigerator:** **Old Fridge: GHC 619.188** **EE Fridge: GHC 29.735** **Savings : GHC 589.453**
f.	Annual energy conservation (kWh) from EE refrigerators adopters or would-be adopters	Zero (0)	**Estimated Annual Cumulative kWh Consumption for anyone who leaves old refrigerator for new EE refrigerator:** **Old Fridge: 919.632 kWh** **EE Fridge: 88.603 kWh** **kWh Savings : 831.029 kWh**
g.	Annual Carbon emission reduction from EE refrigerators adopters or would-be adopters	Zero (0)	**According to the Energy Commission of Ghana,** • **10,000 old inefficient refrigerators replaced with EE refrigerators (during the Fridge Replacement Programm 2012-2014) saved 400 GWh of electricity and 1.1 million tons of CO_2 annually.** **Total sample of inefficient refrigerator owners (70% of 214) is 150** • **If 50% of 150 beneficiary participants obtain EE refrigerators, about 8,250 tons of CO_2 will be saved annually** • **If all 150 beneficiary participants (who own inefficient refrigerators currently) obtain EE refrigerators, about 16,500 tons of CO_2 will be saved annually** • **If all beneficiary participants (over 300) persuade at least one person to shift to an EE refrigerator, over 33,000 tons of CO_2 will be saved annually.**

SUMMARY OF LINKS AND SYNERGIES WE HAVE DEVELOPED DURING THE IMPLEMENTATION OF THE PROJECT

All the collaborators have been very supportive during the implementation of the project and they look forward to more collaboration on energy efficiency related projects in the future. The Energy Commission (EC) of Ghana willingly gave out the Watts Up Meters to be used for the demonstration exercises. They have assured the Project team of unconditional material, equipment and human resource supports to any energy related projects being undertaken by the research team from ISSER. Furthermore, the EC seeks to collaborate with the researchers at ISSER to run training sessions periodically for students in the ISSER Postgraduate Programme on how to use the Watts Up Meters to measure the efficiency of refrigerators.

The Electricity Company of Ghana (ECG) has also been very supportive. They have assured the team of any support they are capable of offering in terms of energy related projects. The municipal partners also had great support from their top officials to partake in the demonstration activities and support the research team from ISSER and, this further strengthened the existing collaborations.

The research team also established new networks with some beneficiary participants of the project. These individuals assured the research team of their willingness to organize community people for subsequent demonstrations, if any, in the municipalities. Their contacts have been kept for future initiatives.

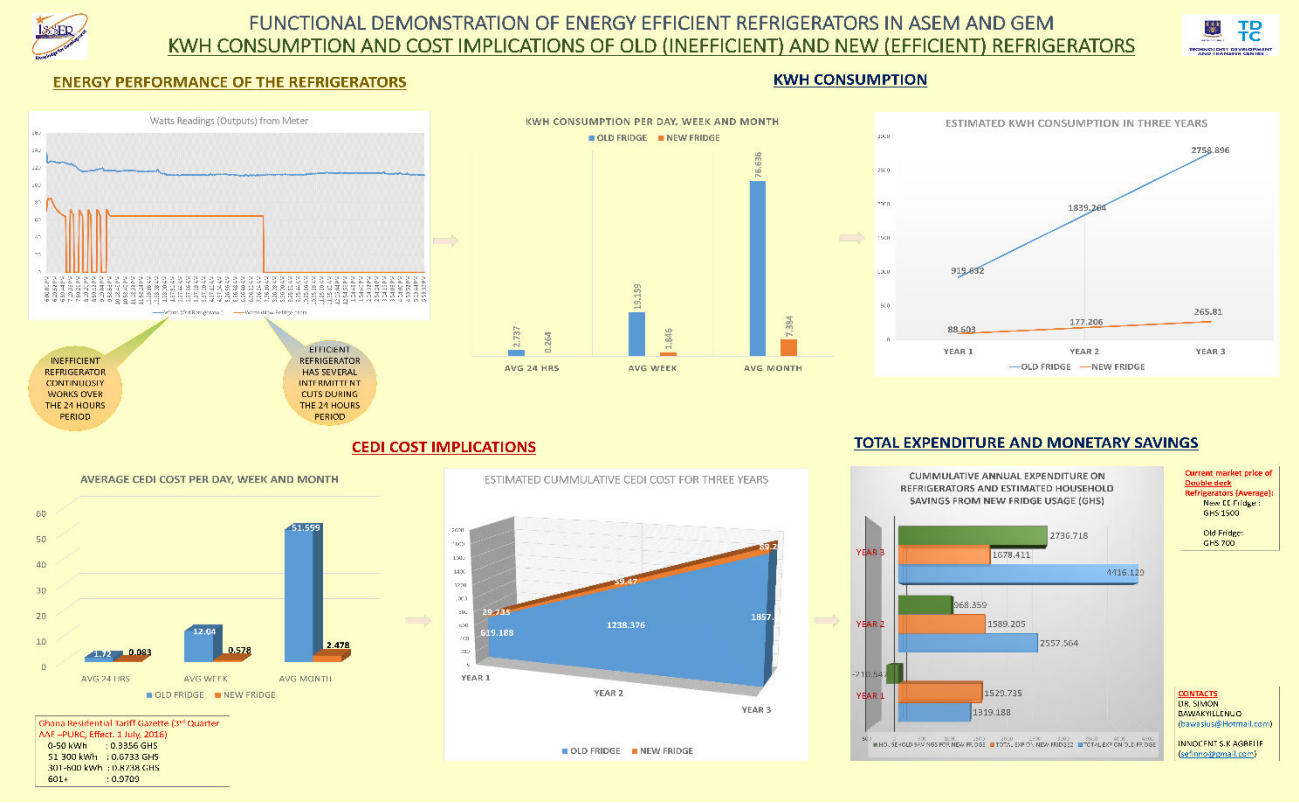
PICTURES

- The following are attached as :
  - Sample pictures of the EE refrigerator demonstration exercises in ASEM and GEM
  - Sample of the Poster used in the EE refrigerator demonstration exercises in ASEM and GEM.

SAMPLE PICTURE FROM ASEM DEMONSTRATION

SAMPLE PICTURE FROM GEM DEMONSTRATION

POSTER – ENERGY EFFICIENT REFRIGERATOR DEMONSTRATION IN ASEM & GEM



SAMSET PROJECT INFO

ABOUT US:

SAMSET is a 4-year project (2013-2017) supporting Sustainable Energy Transitions in six urban areas in three African countries – Ghana, Uganda and South Africa. A key objective is to improve 'knowledge transfer frameworks' so that research and capacity building efforts are more effective in supporting this challenging area.

The Team

The project team includes a leading university in each of the three Africa countries – University of Ghana, Uganda Martyrs University and University of Cape Town - as well as an NGO in South Africa, Sustainable Energy Africa. In addition, the team includes two leading universities in the UK – Durham University and University College London, and a UK consultancy, Gamos.

Project funders

This project is co-funded by UK aid from the UK Department for International Development (DFID), the Engineering & Physical Science Research Council (EPSRC) and the Department for Energy & Climate Change (DECC), for the benefit of developing countries.

Project ref: EP/L002620/1
The views expressed in this project are not necessarily those of DFID, EPSRC or DECC.

SAMSET PARTNERS MUNICIPALITIES

UKaid from the British people

Research Councils UK Energy For a Low Carbon Future

DEPARTMENT OF ENERGY & CLIMATE CHANGE