



**Sustainable Energy for All (SE4ALL)
GHANA**

**MONITORING, EVALUATION AND REPORTING SYSTEM
TO TRACK PROGRESS TOWARDS THE ACHIEVEMENT
OF THE SE4ALL COUNTRY GOALS**



12 August 2015

EXECUTIVE SUMMARY

This document presents the Monitoring, Evaluation and Reporting (MER) system which will be applied to track progress towards the achievement of Ghana SE4ALL goals as set in the country SE4ALL initiative, and reflected in the Country Action Plan (CAP) and upcoming Action Agenda (AA). This version of the MER system is based on targets, objectives and activities set in the CAP 2012, some of which are updated in the AA Summary (2015). The MER system will need to be updated following the publication of Ghana's SE4ALL AA to reflect any addition or change to the CAP 2012. The MER system is comprised of a Logical Framework ("Logframe"), a Monitoring Plan, an Evaluation Plan, a Reporting Plan and a Performance Assessment Framework. The Logframe provides a strategic overview of the activities under the SE4ALL initiative that Ghana pursues, outlining the main results to be achieved at various levels, and their associated key performance indicators. It provides a general frame to focus the monitoring, evaluation and reporting efforts.

The Monitoring Plan provides a guide on how to monitor data that will show how Ghana is progressing toward the achievement of its SE4ALL goals. It includes a list of specific indicators which will enable tracking all relevant aspects of the implementation of Ghana's activities under the initiative. A monitoring protocol is associated to each indicator with specific indication on the frequency of the data collection as well as the responsible monitoring entities.

The indicators currently included in the MER system under each goal and objective are:

SE4ALL Global Goal 1: Universal Energy Access by 2030	
SE4ALL Ghana Goal 1: Ensure universal access to modern energy services by 2020	
1	<i>National electricity access percentage (%) - measure based on number of hh connected</i>
2	<i>National access percentage to modern energy for cooking (%) - measure based on number of hh using LPG or non-BLEN manufactured biomass cookstoves as primary solution for cooking</i>
1.1) SE4ALL Ghana Objective 1: Provide access to electricity in remote communities using decentralised renewable energy systems	
3	<i>Number of households using RE as primary source of energy for lighting and very low power appliances (≤ 30 kW)</i>
4	<i>Number of households using RE as primary source of energy for lighting and low power appliances (31 - 150 kW)</i>
5	<i>Number of households using RE as primary source of energy for lighting and medium to high power appliances (>150 kW)</i>
6	<i>Number of communal facilities with access to electricity through a decentralised RE system</i>
7	<i>Number of solar lanterns distributed in off-grid communities</i>
1.2) SE4ALL Ghana Objective 2. Improve access to modern energy for productive uses	
8	<i>Number of water pumps for irrigation (as PUE): 8a): grid-connected 8b): solar PV connected</i>
9	<i>Number of businesses with access to energy through decentralised RE systems, - focus on solar dryers</i>
1.3) SE4ALL Ghana Objective 3. Improve access to LPG as a clean cooking fuel	
10	<i>Percentage of households using LPG as primary fuel for cooking (%)</i>
11	<i>Number of distributed LPG cylinders in rural areas</i>
1.4) SE4ALL Ghana Objective 4. Improve access to energy efficient and improved cookstoves by woodfuel users	
12	<i>Number of public institutions, commercial cooking and agro-processing activities using</i>

	<i>improved woodfuel cookstoves as primary device for cooking</i>
13	<i>Number of households using improved firewood cookstoves as primary cooking device</i>
14	<i>Number of households using improved charcoal cookstoves as primary cooking device</i>
15	<i>Percentage of hh using non-BLEN manufactured biomass cookstoves</i>
SE4ALL Global Goal 2: Double the share of renewable energy (RE) in the global energy mix by 2030	
SE4ALL Ghana Goal 2: Increase the proportion of RE in the total national electricity mix to 10% by 2020	
16	Percentage of RE in the national electricity mix (%)
16a	<i>On-grid RE capacity (MW)</i>
16b	<i>Off-grid RE capacity (MW)</i>
2.1) SE4ALL Ghana Objective 1: Provide access to electricity in remote communities using decentralised renewable energy systems	
17	<i>Installed capacity of RE mini grids in off-grid communities (MW)</i>
18	<i>Total capacity of Solar Community Lighting Systems (Solar Street lights) installed in off-grid communities (MW)</i>
19	<i>Total capacity of solar lanterns distributed in off-grid communities (MW)</i>
20	<i>Total capacity of Solar Home Systems installed in off-grid communities (MW)</i>
SE4ALL Global Goal 3: Double the global rate of improvement in energy efficiency by 2030	
SE4ALL Ghana Goal 3: to ensure that all households using charcoal or firewood for cooking will use improved energy saving cookstoves by 2020.	
3.1) SE4ALL Ghana Objective: At least a 30% increase in the efficiency of woodfuel stoves in the country	
21	<i>Annual average firewood consumption for cooking per household (kg/hh*year)</i>
22	<i>Annual average charcoal consumption for cooking per household (kg/hh*year)</i>

Carrying out an objective and frequent evaluation of the progress made is important in order to identify potential hurdles during activities' implementation and take corrective actions if needed. Therefore, the evaluation basically consists of analysing the indicators and comparing the results against the baseline and the interim and final targets that were set in Ghana's CAP. This will provide the necessary information to take corrective actions on if needed.

The reporting process implies producing a performance assessment report where the results from the evaluation are described. This report will be produced annually and shared in forums or by other means in order to inform the public and all relevant organisations of the results of Ghana SE4ALL initiative.

The Performance Assessment Framework, which is based on the Logframe, is the key instrument for managing the collection, analysis and reporting on the performance data that must nourish the MER activities. It captures key elements of expected results of Ghana's CAP implementation, by outlining proposed key performance indicators for each results level, targets, baselines, frequency of data collection, data sources and methods, as well as responsibilities for this data collection and consolidation.

Finally, the MER is flexible enough to capture additional indicators, to be added to the system when and if is considered appropriate, in accordance with any change made to Ghana's CAP during its implementation and those associated with Ghana's priority High Impact Opportunities, Action Agenda and Investment Prospectuses. For this, section 7 presents a guideline for updating the MER system.

ABBREVIATIONS AND ACRONYMS

AA	Action Agenda
AESD	Agricultural Engineering Services Directorate
BLEN	Biogas-LPG-Electricity-Natural gas
CAP	Country Action Plan
DPs	Development Partners
DRF	Data Request Form
EC	Energy Commission
EE	Energy Efficiency
GEDAP	Ghana Energy Development and Access Project
GHACCO	Ghana Alliance for Clean Cookstoves
GIDA	Ghana Irrigation Development Authority
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (German Society for International Cooperation)
GLSS	Ghana Living Standard Survey
GoG	Government of Ghana
GSS	Ghana Statistical Service
GTF	Global Tracking Framework
HH/hh	Household
HIO	High Impact Objectives
ICT	Information and Communication Technologies
JICA	Japan International Cooperation Agency
LPG	Liquefied Petroleum Gas
MER	Monitoring, Evaluation and Reporting
MoFA	Ministry of Food and Agriculture
MoP	Ministry of Power
MoPet	Ministry of Petroleum
NPA	National Petroleum Authority
PAF	Performance Assessment Framework
PCU	Power conditioning unit
PDN	Power distribution network
PHC	Population and Housing Census
PPP	Purchasing Power Parity
PUE	Productive Use of Energy
PV	Photovoltaics
QA	Quality Assurance
RE	Renewable Energy
SE4ALL	Sustainable Energy for All
SHS	Solar Home System
UN	United Nations

GLOSSARY

Access to electricity	Access to electricity is defined in two levels: number or percentage of communities with an electricity access point running through, and number or percentage of households connected to the national grid or to an off-grid system.
Access to modern energy for cooking	Access to modern energy for cooking is defined as the availability of modern cooking solutions, which include clean/efficient/improved cookstoves (i.e. manufactured non-BLEN cookstoves or BLEN cookstoves).
Community	A community is defined as a group of people living in the same locality with a population of 500 and above.
Decentralised RE system	It is a renewable energy system that is generally used in villages and rural areas that are not connected to the national grid. Decentralised RE systems may include, for example: <ul style="list-style-type: none"> • Family-size biogas plants; • Solar street lighting systems; • Solar lanterns and solar home systems; • Solar water heating systems; • Solar cookers; • Standalone renewable energy based power generators (solar, wind, biomass); • Wind pumps; • Micro-hydro plants.
Household	A household (hh) is defined as a person or a group of persons, who live together in the same house or compound and share the same house-keeping arrangements. In general, a household consists of a man, his wife, children and some other relatives or a house help who may be living with them. However, it is important to remember that members of a household are not necessarily related (by blood or marriage) because non-relatives (e.g. house helps) may form part of a household ¹ . According to the latest Census (2010), the average household size is of 4.4 people.
Improved cookstove	According to the GTF, an improved cookstove is a manufactured non-BLEN cookstove or a BLEN cookstove. Improved cookstoves have advantages of fuel savings and reduced indoor air pollution.
Information and Communication Technologies (ICT)	ICT includes any communication device encompassing: mobile phone, radio, television, and computer.
Mini-grid	Single or various power systems (installed capacity of 10 kW to 10 MW) feeding electricity into a small distribution grid designed to generate electricity centrally and providing it for various applications to establishments spread within a designated geographical area. Mini-grids essentially have centralised electricity generating capacity mainly consisting of renewable energy generator, a battery bank to store the electricity, power conditioning unit (PCU) consisting of junction boxes, charge controllers, inverters, distribution boards and necessary wiring/cablings, etc., all located within an appropriately constructed building and power distribution network (PDN).
Mini-utility	Isolated power system supplying one communal facility without distribution grid ranging in capacity from 1 kW to 100 kW. Mini-utilities are typically installed on rooftop or on ground within the premise of communal facilities

¹ Source: Ghana Statistical Service. (May, 2012). 2010, Population & Housing Census, Summary Report of Final Results.

	such as church, school and clinic. Mini-utilities can also be used as a mini-enterprise to provide services for multiple applications such as to charge battery and run small machines, which can be used by the community members and where users would typically pay for services on an hourly basis. Technically, mini-utilities are larger in capacity than SHS for communal use while functioning without power distribution network unlike mini-grids.
Peri-urban	Peri-urban characterises rural-urban transition zones that are proximate to an urban area and benefit from the urbanisation process. A peri-urban area is neither entirely urban nor purely rural in the traditional sense. It is at most a partly urbanized rural area.
Productive Use of Energy (PUE)	PUE refers to the use of energy in micro-small-medium enterprises, agriculture, artisans, handcraft, food processing and all other income-generating activities. In accordance to the CAP 2012, productive uses of energy involve the utilization of energy - both electric and non-electric energy in the form of heat and mechanical energy - for activities that enhance income and welfare. These activities are typically in the sectors of agriculture, rural enterprise, health and education. Examples of such activities include pumping water for agriculture, agro-processing, lighting, information and communications, and vaccine refrigeration.
Rural	All localities with less than 5,000 persons are classified as rural ¹ .
Solar Home System (SHS)	Isolated power system (up to 1 kW) supplying one individual establishment (e.g. household) without distribution grid. SHS will also include solar lanterns since various innovative solutions are being developed in this market, which blurs the boundary between SHS and solar lanterns.
Traditional cookstove	Unimproved self-made stoves. It refers to traditional open fire, mud stove or coal pot cooking methods ² .
Urban	Localities with 5,000 or more persons were classified as urban ¹ .

² Source: Global Alliance for Clean Cookstoves, Accenture. (2012). Ghana Market Assessment Executive Summary.

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1 INTRODUCTION

Ghana sets its own SE4ALL country goals and targets in its Country Action Plan (CAP) from 2012, which are also incorporated in the future Action Agenda (AA) to be released during the course of 2015. These will contribute to achieving the overall SE4ALL global initiative launched in 2011 by the United Nations (UN).

Ghana's SE4ALL goals are:

- Under **Universal Energy Access**: To ensure universal access to electricity and universal access to modern energy for cooking (clean cooking solutions) by 2020;
- Under **Renewable Energy**: To increase the proportion of RE in the total national electricity mix by 2020³;
- Under **Energy Efficiency**: to ensure that all households using charcoal or firewood for cooking will use improved energy saving cookstoves by 2020.

Specifically, Ghana seeks to achieve the following four strategic high impact objectives (HIO):⁴

- Provide access to electricity in remote communities using decentralised renewable energy systems;
- Increase the productive use of electricity in both on and off-grid electrified communities through targeted interventions;
- Increase the use of LPG as primary fuel for cooking; and,
- Improve access to energy efficient and improved cookstoves by woodfuel/charcoal users.

As stated in the SE4ALL initiative *“Accountability and transparency are essential for tracking Sustainable Energy for All’s global progress”*. This is true from both the global and the national perspective. Therefore, Ghana presents and describes in this document the Monitoring, Evaluation and Reporting (MER) system that will be applied in order to track its progress towards the achievement of its SE4ALL country goals and objectives, which will contribute to achieving the global goals of the initiative.

The MER system is composed of the following parts:

- A Logical Framework (the “Logframe”)
- A Monitoring Plan
- An Evaluation Plan
- A Reporting Plan
- A Performance Assessment Framework
- A Guideline for updating the MER system in the future.

Each part is described in Sections 2 to 7. The Performance Assessment Framework presented in Section 6 summarises the main information of Sections 3 to 5.

2 LOGICAL FRAMEWORK

The Logical Framework presented below (Table 1) outlines the main characteristics of Ghana's SE4ALL initiative. The purpose of this Logframe is to show how the main objectives and country goals relate and contribute to the global goals. It briefly shows the operational planning, monitoring and evaluation considerations for tracking progress of Ghana's CAP implementation, towards the achievement of the SE4ALL goals.

The Logframe is organised on various levels which correspond to the SE4ALL global goals, Ghana's SE4ALL specific goals and Ghana's SE4ALL objectives. It contains relevant performance indicators at goal level that intend to monitor the overall contribution of the country initiative to the global initiative. There are, in addition, more specific indicators related to the specific objectives to be achieved.

³ This goal excludes large hydroelectric plants as RE source

⁴ Ghana's CAP 2012 and SE4ALL Ghana's Action Agenda Summary (2015).

The logical framework intends to present an overview of the SE4ALL initiative with a wide set of indicators. A selection of indicators is made (see Section 3) to show progress of the initiative as per the CAP 2012, which is focused on specific country objectives and therefore indicators to be tracked are selected based on that focus.

Table 1: Logical Framework

Results	Indicators	Definitions	Sources and Means of Verification	Assumptions and Comments	Related indicator number in PAF (Table 5) and Figure 1, Figure 2, Figure 3, and Figure 4
SE4ALL Global Goal 1: Universal energy access by 2030					
1. Increase access to electricity	<i>National electricity access percentage (%)</i>	Definition: Access to an electricity service in terms of households. The electricity services may be of any kind: traditional, renewable, on-grid, off-grid.	Responsible entities: Ministry of Power (MoP) Sources of information: Ministry of Power annual reports, Population and Housing Census (PHC), Ghana Living Standard Survey (GLSS).	Assumption: Ghana will continue to monitor this indicator at least in terms of households connected to an electricity service (on-grid or off-grid, with renewable or traditional source of energy). Comment: results can additionally be expressed in terms of communities.	1
	<i>Electricity consumption per capita (kWh/person*year)</i>	Definition: As defined by the country.	Responsible entities: Energy Commission (EC) Sources of information: Energy Outlook, PHC, GLSS, World Bank country data sheets.	Assumption: Ghana will continue to monitor this indicator. Baseline and targets will be identified or calculated for this indicator, by the Energy Commission.	Not included in PAF
1.1. SE4ALL Ghana Objective 1: Provide access to electricity in remote communities using decentralised renewable energy systems	<i>Number of households using RE as primary source of electricity per year (households/year)</i>	Definition: Households located in remote communities using any RE source (solar, wind, hydro, etc.) as main source of electricity for domestic use (lighting, ICT, phone charging, fans, refrigerator, etc.). Excludes commercial or productive use applications.	Responsible entity: Ministry of Power Sources of information: PHC and GLSS collect number of households using solar energy as main source for lighting but no reference to other RE sources is made or any other domestic applications other than lighting, Ministry of Power project reports.	Assumption: baseline will be identified or calculated for this indicator, by the Ministry of Power. Comment: the indicator can be disaggregated according to the end use and level of power needed.	3, 4, 5, 7

	<i>Number of communal facilities with access to electricity through a decentralised RE system (communal facilities/year)</i>	Definition: Any communal facility (hospital, clinic, school, or facility collectively used by the community and accessible to any member of the community) that uses a RE system as main source of electricity for their operation. This indicator excludes households.	Responsible entity: Ministry of Power. Sources of information: national off-grid electrification programmes information, Ministry of Power.	Assumption: Ghana will specifically focus on communal facilities located in remote communities. Baseline and targets will be identified or calculated for this indicator, by the Ministry of Power.	6
1.2. SE4ALL Ghana Objective 2. Improve access to modern energy for productive uses	<i>Number of businesses with access to energy, for productive uses applications (businesses/year)</i>	Definition: Businesses that use electricity or heat for productive uses, such as irrigation (water pumps), agricultural activities (e.g. solar dryers), in urban, rural and peri-urban areas. Business is defined as any commercial, industrial or artisanal venture with an identifiable income-generation goal. Electricity may be originated by any means (on-grid, off-grid, traditional or renewable sources).	Responsible entity: Energy Commission Sources of information: SE4ALL projects reports (resulting from Donor/GoG supported SE4ALL projects that will be coordinated by the EC or other government ministries and agencies)	Assumption: Baseline and targets will be identified or calculated for this indicator by the Energy Commission. Comment: this indicator can be disaggregated by type of businesses, by type of energy sources (renewable and traditional).	8, 9
2. Increase access to modern cooking solutions	<i>National access percentage to modern energy for cooking (%)</i>	Definition: Percentage of the population that is using a modern solution for cooking purposes. Modern cooking solutions, as per GTF, encompass manufactured non-BLEN cookstoves and BLEN cookstoves.	Responsible entities: GHACCO, Ministry of Power, Ministry of Petroleum, Energy Commission Sources of information: GHACCO, PHC, and GLSS. Energy Outlook informs the percentage of penetration of LPG, charcoal, firewood, kerosene and electricity at national, urban and rural level for household cooking, based on the PHCs, but does not break down the information by type of device.	Assumptions: Ghana will focus on the promotion of two cooking solutions: LPG and biomass (woodfuel) improved cookstoves, for which baseline and targets are to be defined. Comment: the indicator can be disaggregated in LPG usage, non-BLEN manufactured biomass cookstoves, and BLEN cookstoves, as deemed necessary within the local scenario.	2, 10, 15

1.3. SE4ALL Ghana Objective 3. Improve access to LPG as a clean cooking fuel	<i>Number of distributed LPG cylinders in rural areas per year (new LPG cylinders/year)</i>	Definition: Number of new LPG cylinders sold in rural areas. This indicator should focus on new cylinders added to the ones already in circulation.	Responsible entity: Ministry of Petroleum Sources of information: PHC, GLSS, Rural LPG Promotion Programme report and National Petroleum Authority (NPA)	Assumptions: a different indicator should focus on the energy consumed per capita that is derived for the new and recirculated (existing) cylinders, in rural areas. Target to be identified by Ministry of Petroleum.	11
	<i>Percentage of households using LPG as primary fuel for cooking (%)</i>	Definition: Access to LPG for cooking as percentage of total households.	Responsible entity: Ministry of Petroleum Sources of information: PHC, GLSS, Rural LPG Promotion Programme report and National Petroleum Authority	Assumption: same as above.	10
1.4. SE4ALL Ghana Objective 4. Improve access to energy efficient cookstoves by woodfuel users	<i>Number of public institutions, commercial cooking and agro-processing activities using improved cookstoves as primary cooking device (number of facilities/year)</i>	Definition: Number of public institutions, commercial cooking facilities and agro-processing activities using improved cookstoves as their main cooking device. This excludes households (domestic cooking).	Responsible entity: GHACCO, Ministry of Power, Energy Commission. Sources of information: PHC, GLSS, GHACCO, reports from SE4ALL development partners	Assumption: baseline and targets to be identified by Ministry of Power.	12
	<i>Number of households using improved cookstoves as primary cooking device (number of hh/year)</i>	Definition: Number of households which use an improved cookstove for cooking purposes, as main cooking device. This excludes commercial cooking or any cooking device used to run a business (i.e. non-domestic use).	Responsible entity: GHACCO, Ministry of Power, Energy Commission. Sources of information: PHC, GLSS, GHACCO, reports from SE4ALL development partners	Assumption: baseline and targets to be identified by Ministry of Power.	13, 14, 15

SE4ALL Global Goal 2: Double the share of renewable energy (RE) in the global energy mix by 2030					
3. Increase the share of RE in the national electricity mix	<i>Percentage of RE in the national electricity mix (%)</i>	Definition: Contribution of RE generation to the national electricity mix. Ghana currently monitors on-grid RE capacity separately from off-grid RE capacity.	Responsible entities: Energy Commission for on-grid RE capacity, Ministry of Power for off-grid RE capacity. Sources of information: Energy Outlook, national off-grid electrification programmes.	Assumption: Ghana will include the percentage of off-grid capacity in the calculation of the indicator to show the overall contribution of both on- and off-grid capacity to the national electricity mix.	16, 16a, 16b
3.1. SE4ALL Ghana Objective 1: Provide access to electricity in remote communities using decentralised renewable energy systems	<i>Installed capacity of RE mini grids in off-grid communities (MW/year)</i>	Definition: Capacity which is added using RE sources to feed a mini-grid installation for remote communities.	Responsible entity: Ministry of Power Source of information: National off-grid electrification programmes.	Assumption: baseline and target in MW to be identified by Ministry of Power. Comment: the information collected to estimate this indicator can be collected along with the activities applied to collect the number of solar lanterns distributed in off-grid communities currently being tracked by the country.	17
	<i>Total capacity of Solar Community Lighting Systems (Solar Street lights) installed in off-grid communities (MW/year)</i>	Definition: Installed capacity of all installed solar streets lights in remote communities.	Responsible entity: Ministry of Power Source of information: National off-grid electrification programmes.	Assumption: baseline and target in MW to be identified by Ministry of Power. Comment: the information collected to estimate this indicator can be collected along with the activities applied to collect the number of solar lanterns distributed in off-grid communities currently being tracked by the country.	18
	<i>Total capacity of solar lanterns distributed in off-grid communities (MW/year)</i>	Definition: Capacity of all distributed solar lanterns in remote communities.	Responsible entity: Ministry of Power Source of information: National off-grid electrification programmes.	Assumption: baseline and target in MW to be identified by Ministry of Power. Comment: the information collected to estimate this indicator can be collected along with the activities applied to collect the number	19

				of solar lanterns distributed in off-grid communities currently being tracked by the country.	
	<i>Total capacity of Solar Home Systems installed in off-grid communities (MW/year)</i>	Definition: Capacity of SHS installed in remote communities.	Responsible entity: Ministry of Power Source of information: National off-grid electrification programmes.	Assumption: baseline in MW and target to be identified by the Ministry of Power.	20
SE4ALL Global Goal 3: Double the global rate of improvement in energy efficiency by 2030					
	<i>Rate of improvement in energy intensity (%) (energy consumed per dollar of gross domestic product, GDP)</i>	Definition: Energy intensity is a ratio between energy supply and gross domestic product measured at purchasing power parity (MJ/\$2005 PPP). Energy intensity is an indication of how much energy is used to produce one unit of economic output. Lower ratio indicates that less energy is used to produce one unit of output. Energy intensity level is only an imperfect proxy to energy efficiency indicator and it can be affected by a number of factors not necessarily linked to pure efficiency such as climate.	Responsible entity: Energy Commission Source of information: WB data.	Assumptions: Ghana will not monitor this indicator in the first monitoring period, therefore no baseline and targets will be identified by Energy Commission. Comment: this indicator is relevant to monitor Ghana's contribution to the EE SE4ALL universal goal and it is suggested in the GTF.	Not included in PAF.
	<i>Average energy losses in the transmission and distribution grids (%)</i>	Definition: Quantity of energy that has been lost during transmission and distribution in the national grid, from generation to end-user, as percentage of total energy generated.	Responsible entity: Energy Commission Sources of information: Energy Outlook.	Assumptions: target to be set by Energy Commission/ GridCo.	Not included in PAF.
4. To increase energy efficiency in cooking with firewood and charcoal	<i>Annual average firewood consumption for cooking per household (kg/hh*year)</i>	Definition: Quantity of firewood being consumed in each household per year for cooking purposes, at national level. This excludes commercial, industrial or any business-related firewood consumption.	Responsible entity: Energy Commission Sources of information: PHC, GLSS	Assumptions: baseline and targets to be identified by Energy Commission.	21

	<i>Annual average charcoal consumption for cooking per household (kg/hh*year)</i>	Definition: Quantity of charcoal being consumed in each household per year for cooking purposes, at national level. This excludes commercial, industrial or any business-related charcoal consumption.	Responsible entity: Energy Commission Sources of information: PHC, GLSS	Assumptions: baseline and targets to be identified by Energy Commission.	22
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3 MONITORING PLAN

The monitoring plan provides a guide on how to monitor the indicators that will show how Ghana is progressing toward the achievement of its SE4ALL objectives. It is composed of monitoring protocols, one per indicator, which includes the following information:

- Description/definition of the indicator - i.e. what Ghana intends to measure with it;
- Method of calculation, if applicable;
- Source of information/data and responsible entity for providing it;
- Frequency of calculation or data acquisition;
- Baseline.

There are two levels of indicators: i) goal level indicators; and ii) objective level indicators. Goal level indicators intend to track the overall contribution to the initiative. They directly correspond to the three SE4ALL global goals: access to modern energy - electricity and modern energy for cooking; Renewable energy and energy efficiency. Those indicators have a broad definition to ease the comparison between all countries participating to the SE4ALL initiative at a global level.

The objective level indicators intend to track the performance of specific activities to be carried out in Ghana according to the country objectives as defined in the CAP and future AAs. Those indicators track in more detail the implementation of the CAP and future AAs.

The four following charts illustrate how indicators are related to each goal. A colour code is applied to highlight those indicators that will be monitored during the first monitoring period because they are linked to the strategic activities that Ghana pursues in the short-term as part of its CAP 2012. The highlighted indicators are detailed in chapter 3.1 and summarized in the Performance Assessment Framework in Section 6. This list of indicators will be completed at each update of the CAP into a new AA, in order to take into account any new activities included to Ghana SE4ALL initiative. The methodology of adding new indicators to the MER system is developed in Section 7 Recommendations for future updates of the MER System.

The numbers shown in each of the next figures are the ones corresponding to the indicators shown in the PAF from Section 6 and the Logframe in Table 1.

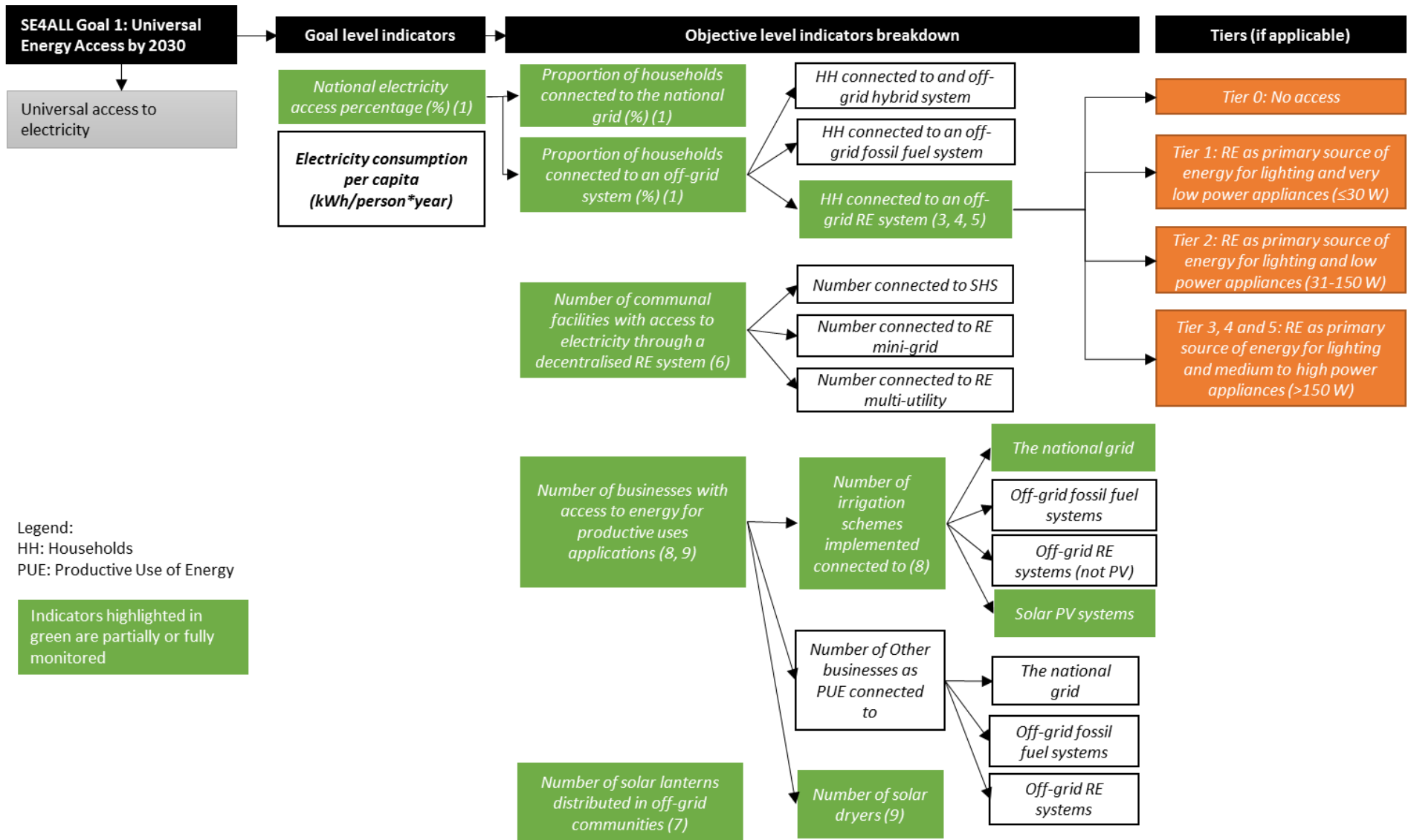


Figure 1: Electricity Access Indicators

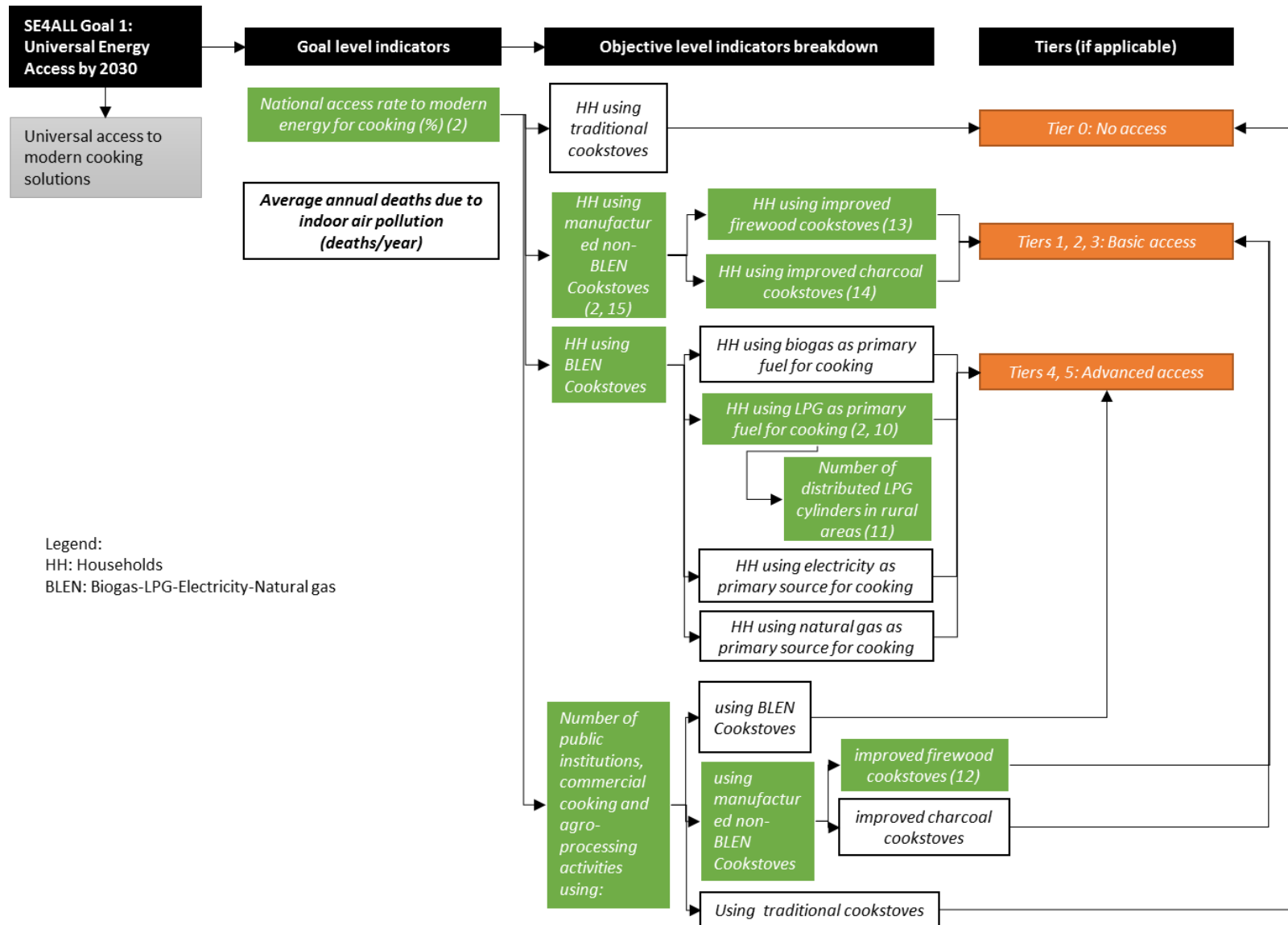


Figure 2: Access to Modern Energy for Cooking Indicators

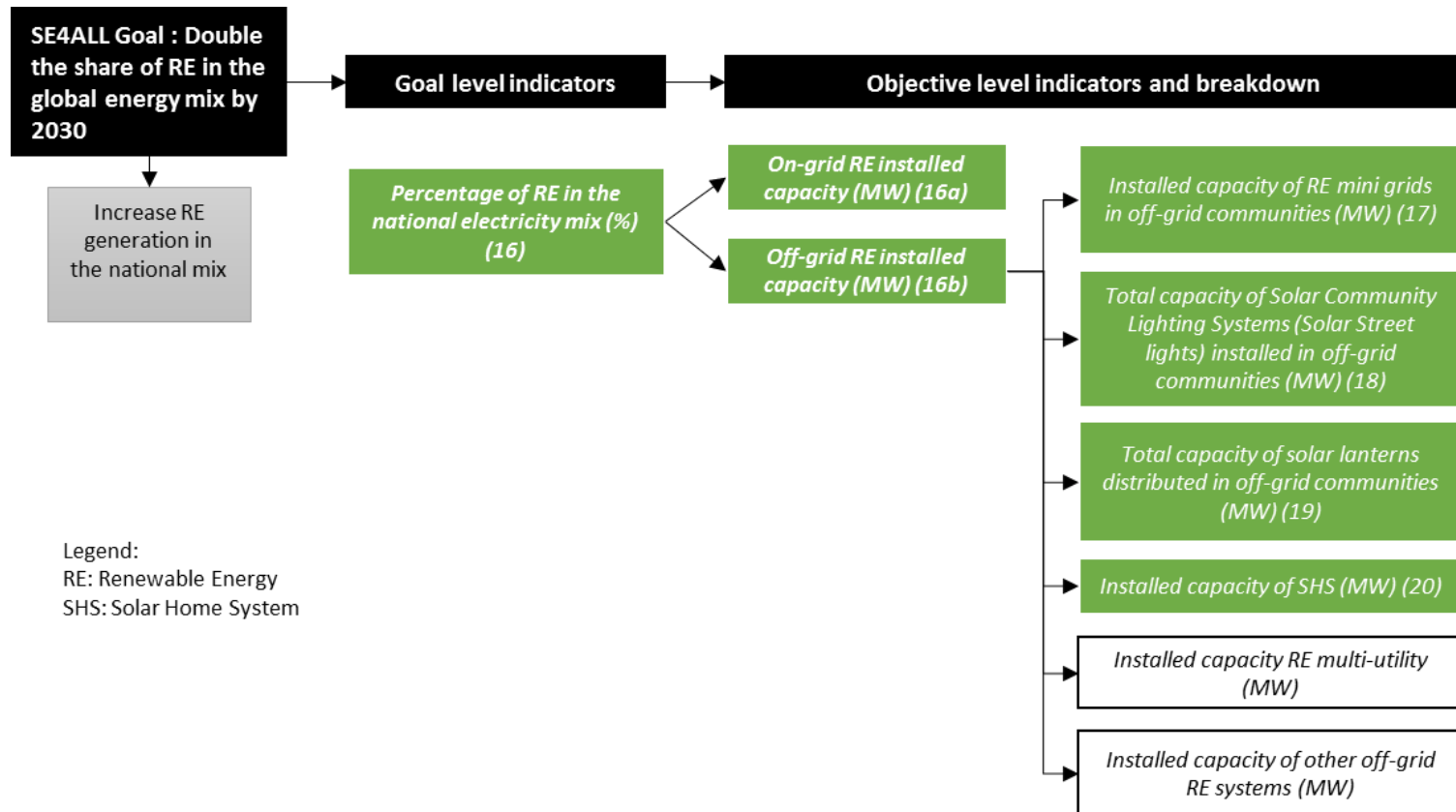


Figure 3: Renewable Energy Indicators

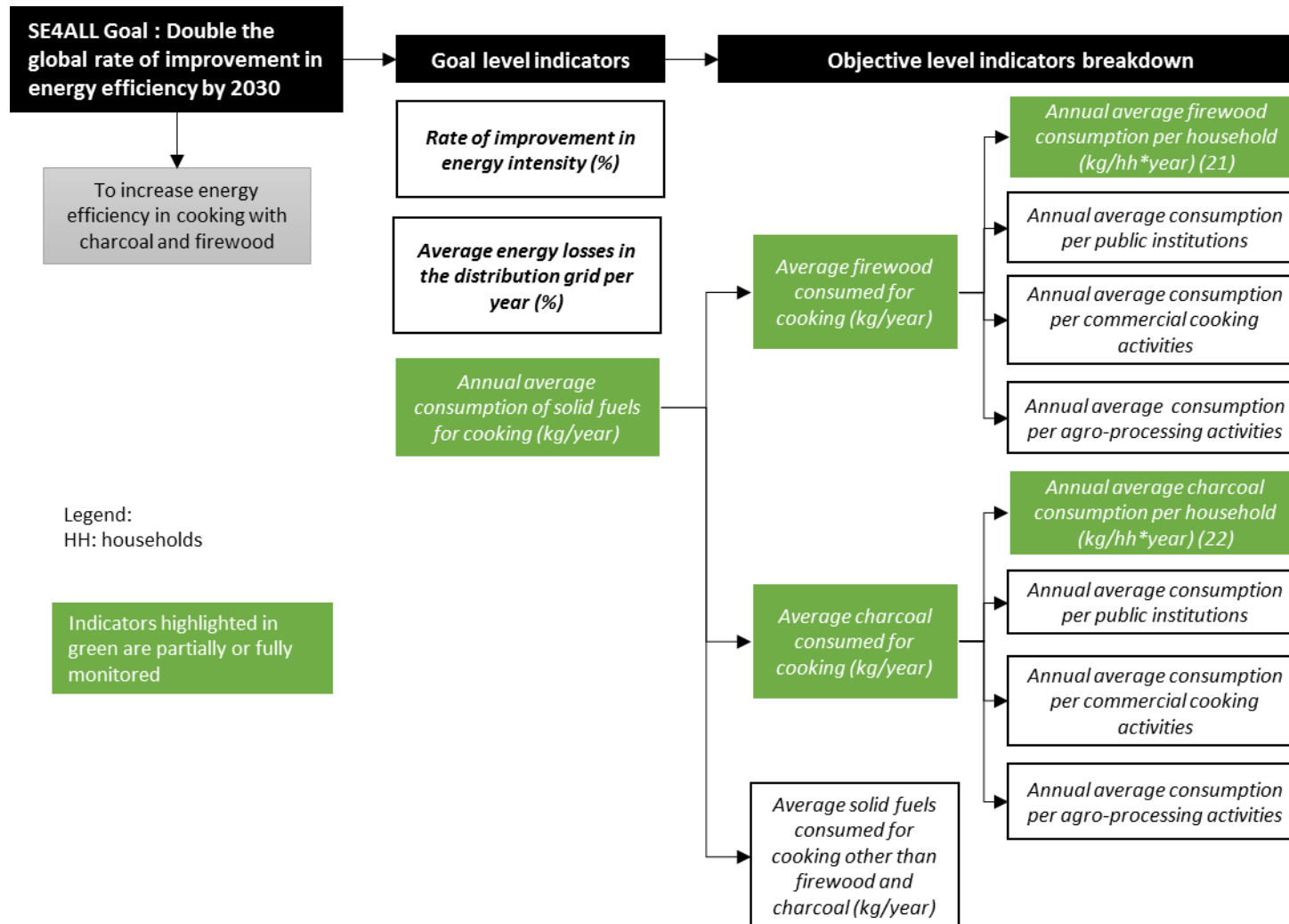


Figure 4: Energy Efficiency Indicators

Quality Assurance (QA):

Quality control procedures should be taken into consideration during indicators' monitoring activities. The purpose of having a QA plan is to identify and manage potential risks to the quality of collected data and information that will be used to calculate indicators, which will later be evaluated and reported. During data acquisition/collection, five criteria should be considered for data quality assessment: validity, reliability, integrity, precision, and timeliness.

Since several entities (e.g. Ministry of Power, GSS, GHACCO) are responsible for supplying data to the Energy Commission (EC), the EC should approach them in order to find out what QA procedures they apply, if any. If no QA procedure is applied, then provisions should be made to find the best applicable solution to assure the quality of data and information obtained.

3.1 Monitoring Protocols

The following sections present the different procedures for monitoring each indicator as selected in the previous flow-charts. They are organised by goal and then by objective level under each goal.

3.1.1 SE4ALL Global Goal 1: Universal Energy Access by 2030

Under this goal, Ghana aims at ensuring universal access to modern energy services by 2020, which includes ensuring universal access to electricity as well as to modern solutions for cooking.

Goal level indicators:

1	NATIONAL ELECTRICITY ACCESS PERCENTAGE (%)
Date created: May-2015	
Last update:	
<p><u>Definition/description:</u></p> <p>This indicator measures the degree of access that Ghana's population has to an electricity service. In Ghana, access to electricity is defined in two levels:</p> <ul style="list-style-type: none"> • At community level: number or percentage of communities with an electricity access point running through, and • At household level: number or percentage of households connected to the national grid or to an off-grid system (number of connections). <p>For the purpose of estimating the contribution of Ghana to the SE4ALL global goal, this indicator will be tracked as per the second definition (i.e. at household level - number of connections). The electricity services may be of any kind: traditional, renewable, on-grid, off-grid.</p> <p><u>Source of information/data:</u></p> <p>This indicator is currently calculated by GSS and reported every ten years in the National PHC as well as in the GLSS. It is also monitored by the Ministry of Power (MoP).</p> <p><u>Frequency of monitoring/data acquisition:</u></p> <p>This indicator will be monitored every year and data will be provided by the MoP to the EC.</p> <p><u>Baseline:</u></p> <p>The baseline figure for this indicator is the 2015 access percentage, which is estimated at 75.6% of households currently connected to the national grid. It does not currently include off-grid connections. Additional information on this figure is:</p> <ul style="list-style-type: none"> • ECG No. of residence connected: 2.53m; Customers (non-residents): 3.04m • NEDCO No. of residence connected: 2,136,009; Customers (non-residents): 1270 <p><u>Internal data quality assessment:</u></p> <p>The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.</p>	

Multi-tier approach for electricity access:

In accordance to the GTF, this type of indicator can be broken down in several Tiers, to have a richer analysis that contemplates not only the access/no access feature, but also other attributes of an electricity service. This type of approach will help Ghana understand the quality of the electricity service that is being provided to the population in order to make improvements in the future country strategies related to electricity access promotion/development.

The proposed multi-tier approach splits the level of access to electricity in five different Tiers, as follows in Table 2:

Table 2: Candidate framework for multi-tier measurement of household electricity access as per Figure 2.3 of Global Tracking Framework

ACCESS TO ELECTRICITY SUPPLY						
ATTRIBUTES	TIER 0	TIER 1	TIER 2	TIER 3	TIER 4	TIER 5
Peak available capacity (W)	-	>1	>500	>200	>2,000	>2,000
Duration (hours)	-	≥4	≥4	≥8	≥16	≥22
Evening supply (hrs)	-	≥2	≥2	≥2	≥4	≥4
Affordability	-	-	✓	✓	✓	✓
Legality	-	-	-	✓	✓	✓
Quality (voltage)	-	-	-	✓	✓	✓

▶ Five-tier framework.
 ▶ Based on six attributes of electricity supply.
 ▶ As electricity supply improves, an increasing number of electricity services become possible.

Index of access to electricity supply = $\sum(P_T \times T)$
 with P_T = Proportion of households at tier T
 T = tier number {0,1,2,3,4,5}

USE OF ELECTRICITY SERVICES					
TIER 0	TIER 1	TIER 2	TIER 3	TIER 4	TIER 5
-	Task lighting AND phone charging (OR radio)	General lighting AND television AND fan (if needed)	Tier 2 AND any low-power appliances	Tier 3 AND any medium- power appliances	Tier 4 AND any high-power appliances

▶ Five-tier framework.
 ▶ Based on of appliances.

Index of access to electricity supply = $\sum(P_T \times T)$
 with P_T = Proportion of households at tier T
 T = tier number {0,1,2,3,4,5}

Tiers to be tracked under the MER in the Ghanaian context:

- Tier 0 will be indirectly tracked when tracking the rest,
- Tier 1, 2, 3, 4, 5 are currently being tracked under a single figure with no specific breakdown in levels of access.

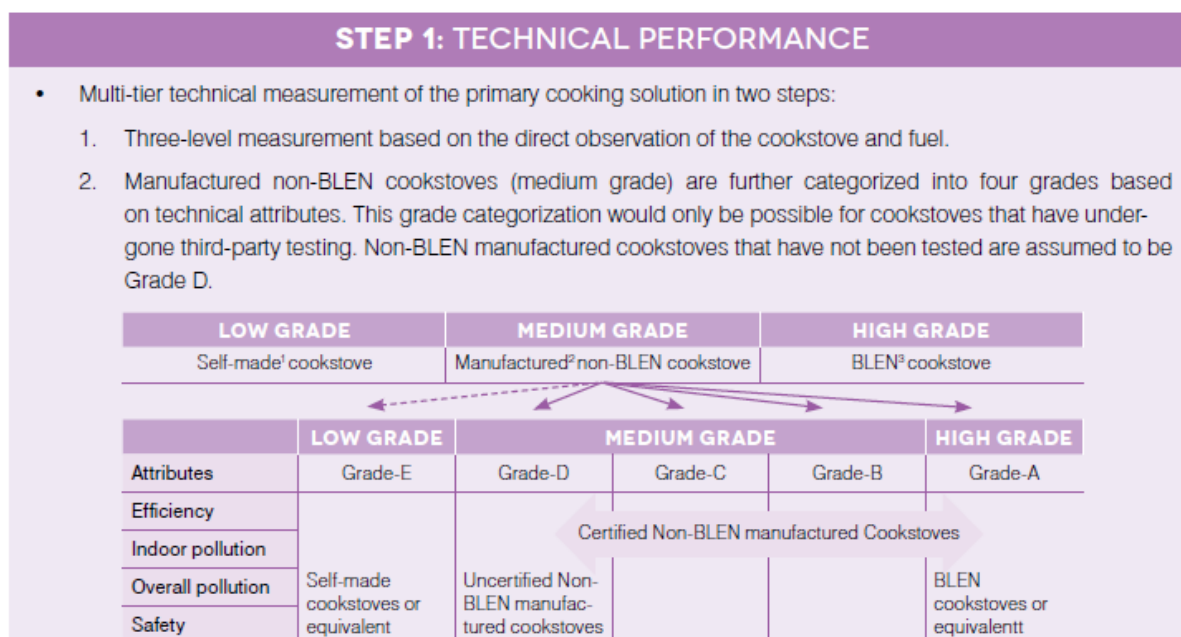
2	NATIONAL ACCESS PERCENTAGE TO MODERN ENERGY FOR COOKING (%)
Date created: May-2015	Last update:
<p><u>Definition/description:</u></p> <p>This indicator measures the level of access that the population has to a modern cooking solutions which are more energy efficient and less polluting than the traditional cooking solutions. This indicator tracks the percentage of the population (encompassing both domestic and commercial cooking) that is using a modern solution for cooking purposes. Modern cooking solutions, as per GTF, encompass manufactured non-BLEN cookstoves and BLEN cookstoves. In Ghana, this would include improved biomass cookstoves, i.e. manufactured non-BLEN cookstoves, and LPG usage.</p> <p><u>Source of information/data:</u></p> <p>Ghana will monitor this indicator by focusing on the use of two cooking solutions:</p> <ul style="list-style-type: none"> • Manufactured non-BLEN biomass (woodfuel) cookstoves, and • LPG use for cooking. <p>Part of the information needed to estimate this indicator will be taken from GHACCO reports, PHC, GLSS, MoPet, and Energy Outlook. The use of LPG for cooking is currently estimated by the Ghana Statistical Service and reported every ten years in the National Population and Housing Census.</p> <p><u>Frequency of monitoring/data acquisition:</u></p> <p>The EC will monitor this indicator once a year. GHACCO, MoPet, GSS will supply data to EC and EC will also use its own reports.</p> <p><u>Baseline:</u></p> <p>LPG use for cooking was 18.2% in 2010⁵. Baseline figure for non-BLEN manufactured cookstoves is to be defined by the EC with the first round of implementation of the MER system.</p> <p><u>Internal data quality assessment:</u></p> <p>The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.</p>	

Multi-tier approach for access to modern energy for cooking:

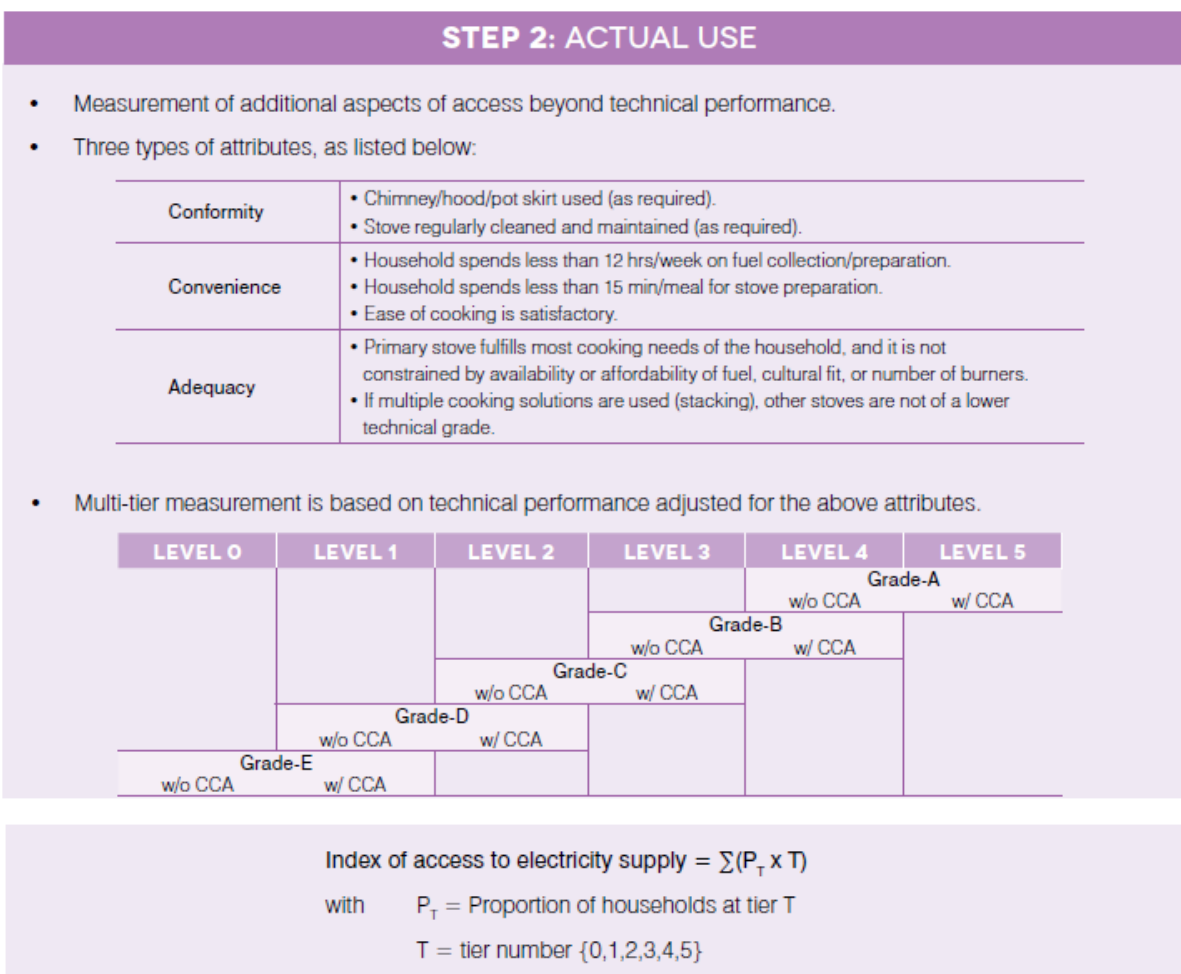
Similarly to the national electricity access and in line with the GTF recommendations, this indicator can be disaggregated into Tiers as follows in Table 3:

⁵ 2010 Population & Housing Census, Table 36, page 103 and Energy Outlook 2014, table 17.

Table 3: Candidate framework for multi-tier measurement of household cooking solutions as per Figure 2.4 of Global Tracking Framework



¹ A self-made cookstove refers to a three-stone fire or equivalent, typically made by an untrained person without the use of premanufactured parts.
² A manufactured cookstove refers to any cookstove available in the market (including cookstoves from artisans and small local producers trained under a cookstove program)
³ BLEN cookstove refers to stove-independent fuels (such as biogas, LPG, electricity, natural gas). BLEN equivalence of more fuels (such as ethanol) would be examined going forward. Non-BLEN cookstoves include most solid and liquid fuels for which performance is stove dependent.



- Tier 0 is no access
- Tiers 1, 2 and 3 include non-BLEN cookstoves
- Tiers 4 and 5 include BLEN-cookstoves

Ghana will track woodfuel (firewood and charcoal) improved cookstoves and LPG use for cooking, therefore contributing to tracking all the Tiers but with no specific breakdown applying an analysis of attributes to identify the different grades.

Objective level indicators:

1.1) SE4ALL Ghana Objective 1: Provide access to electricity in remote communities using decentralised renewable energy systems

Explanatory note: Indicators contribute to collecting information if the multi-tier approach for electricity access is applied but they only focus on those households that use RE as primary source of energy, leaving out those who receive energy from other sources (e.g. grid).

3	Number of households using RE as primary source of energy for lighting and very low power appliances (≤ 30 W) - contributes to Tier 1	
Date created: May-2015		Last update:
<p><u>Definition/description:</u></p> <p>This indicator measures the number of households which regularly use electricity produced by a renewable energy system (solar, wind, hydro, etc.) for lighting purposes and to power appliances of 30 W or less capacity. These appliances may include phone charging and radio. This indicator contributes to collecting part of the information needed to estimate Tier 1 under the goal level indicator Electricity Access Percentage (#1) described earlier.</p> <p><u>Source of information/data:</u></p> <p>Information will be collected through GLSS, PHC and MoP's reports. PHC and GLSS collect number of households using solar energy as main source for lighting but no reference to other RE sources is made or any other domestic applications other than lighting.</p> <p><u>Frequency of monitoring/data acquisition:</u></p> <p>This indicator will be monitored by the EC on a yearly basis. MoP will supply data to EC for this indicator.</p> <p><u>Baseline:</u></p> <p>No baseline figure is currently available for this indicator. It should be defined with the first round of implementation of the MER system.</p> <p><u>Internal data quality assessment:</u></p> <p>The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.</p>		

4	Number of households using RE as primary source of energy for lighting and low power appliances (31-150 W) - contributes to Tier 2
Date created: May-2015	Last update:
<p><u>Definition/description:</u></p> <p>This indicator measures the number of households which regularly use electricity produced by a renewable energy system (solar, wind, hydro, etc.) for lighting purposes and to power appliances of 31 to 150 W. It contributes to collecting part of the information needed to estimate Tier 2 under the goal level indicator Electricity Access Percentage (#1) described earlier.</p> <p><u>Source of information/data:</u></p> <p>Information will be collected through GLSS, PHC and MoP's reports. PHC and GLSS collect number of households using solar energy as main source for lighting but no reference to other RE sources is made or any other domestic applications other than lighting.</p> <p><u>Frequency of monitoring/data acquisition:</u></p> <p>This indicator will be monitored by the EC on a yearly basis. MoP will supply data to EC for this indicator.</p> <p><u>Baseline:</u></p> <p>No baseline figure is currently available for this indicator. It should be defined with the first round of implementation of the MER system.</p> <p><u>Internal data quality assessment:</u></p> <p>The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.</p>	

5	Number of households using RE as primary source of energy for lighting and medium to high power appliances (>150 W) - contributes to Tiers 3, 4 and 5
Date created: May-2015	Last update:
<p><u>Definition/description:</u></p> <p>This indicator measures the number of households which regularly use electricity produced by a renewable energy system (solar, wind, hydro, etc.) for lighting purposes and to power appliances of 150 kW and above. This indicator contributes to collecting part of the information needed to estimate Tiers 4 and 5 under the goal indicator Electricity Access Percentage (#1) described earlier.</p> <p><u>Source of information:</u></p> <p>Information will be collected through GLSS, PHC and MoP's reports. PHC and GLSS collect number of households using solar energy as main source for lighting but no reference to other RE sources is made or any other domestic applications other than lighting.</p> <p><u>Frequency of monitoring/data acquisition:</u></p> <p>This indicator will be monitored by the EC on a yearly basis. MoP will supply data to EC for this indicator.</p> <p><u>Baseline:</u></p> <p>No baseline figure is currently available for this indicator. It should be defined with the first round of implementation of the MER system.</p> <p><u>Internal data quality assessment:</u></p> <p>The data quality will be assured following the procedures currently applied by the Energy</p>	

Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.

6	Number of communal facilities with access to electricity through a decentralised RE system
Date created: May-2015	Last update:
<p><u>Definition/description:</u> This indicator covers any communal facility (hospital, clinic, school, or facility collectively used by the community and accessible to any member of the community) that uses a RE system as main source of electricity for their operation. This indicator excludes households.</p> <p><u>Source of information:</u> Information will be collected by the MoP through the implementation of National off-grid electrification programmes.</p> <p><u>Frequency of monitoring/data acquisition:</u> This indicator will be monitored by the EC on a yearly basis. Data will be supplied by MoP.</p> <p><u>Baseline:</u> Currently, there are several communal facilities receiving an electricity service through a decentralized RE system. The total number of facilities is 881, broken down as follows: 754 (Elecnor), 106 (GEDAP1) and 21 (JICA).</p> <p><u>Internal data quality assessment:</u> The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.</p>	

7	Number of solar lanterns distributed in off-grid communities
Date created: May-2015	Last update:
<p><u>Definition/description:</u> This indicator measures the number of solar lanterns sold or distributed to isolated (off-grid) communities.</p> <p><u>Source of information/data:</u> This indicator is currently monitored by the Ministry of Power, therefore information will be provided by it.</p> <p><u>Frequency of monitoring/data acquisition:</u> This indicator is monitored every year by MoP and thus EC will ask the MoP for the data on yearly basis.</p> <p><u>Baseline:</u> The baseline figure for this indicator is the number of solar lanterns provided/sold in off-grid communities in 2015, i.e. 32,616 units sold.</p> <p><u>Internal data quality assessment:</u> The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.</p>	

1.2) SE4ALL Ghana Objective 2. Improve access to modern energy for productive uses

8	Number of irrigation schemes implemented (grid-connected and decentralised systems/solar)
Date created: May-2015	Last update:
<p><u>Definition/description:</u> This indicator measures the number of irrigation schemes (water-pumps) used for irrigation purposes (as PUE) that are connected to the national grid or to a PV system (decentralised). This indicator excludes water pumps used for domestic applications.</p> <p><u>Source of information/data:</u> Information will be collected through GIDA (MoFA), GIZ and other development partners' programme reports.</p> <p><u>Frequency of monitoring/data acquisition:</u> This indicator will be monitored every year by the EC with inputs from the mentioned entities.</p> <p><u>Baseline:</u> Currently, the baseline figure for this indicator, as of 2015, is 32 for grid-connected water pumps and 5 for Solar PV connected water pumps, therefore adding up 37 irrigation schemes.</p> <p><u>Internal data quality assessment:</u> The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.</p>	

9	Number of businesses with access to energy through decentralised RE systems (focus on solar dryers)
Date created: May-2015	Last update:
<p><u>Definition/description:</u> This indicator covers those businesses that use energy (heat or power) for productive uses, such as agri-cultural activities nationwide (i.e. in rural, peri-urban and urban areas). Business is defined as any commercial, industrial or artisanal venture with an identifiable income-generation goal. For the moment, this indicator will measure the number of solar dryers (used as business) in use.</p> <p><u>Source of information/data:</u> Information will be collected through the SE4ALL Projects reports resulting from the Agricultural Engineering Services Directorate (AESD).</p> <p><u>Frequency of calculation:</u> This indicator will be monitored every year by the EC with information supplied by the AESD.</p> <p><u>Baseline:</u> Currently, the baseline figure for this indicator, as of 2015, is 21 solar dryers.</p> <p><u>Internal data quality assessment:</u> The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.</p>	

1.3) SE4ALL Ghana Objective 3. Improve access to LPG as a clean cooking fuel

10	Percentage of households using LPG as primary fuel for cooking (%)
Date created: May-2015	Last update:
<p><u>Definition/description:</u> This indicator measures the proportion of households that use LPG as primary fuel for cooking over the total number of households.</p> <p><u>Source of information/data:</u> This indicator is currently calculated by GSS and reported every ten years in the PHC as well as in the GLSS. Information will also be collected by the EC from the Rural LPG Promotion Programme report.</p> <p><u>Frequency of monitoring/data acquisition:</u> This indicator will be monitored once a year by the EC. Data will be supplied by MoPet and EC itself.</p> <p><u>Baseline:</u> Year 2015: 22.3% of Ghanaian households use LPG (at national level) as primary fuel for cooking.</p> <p><u>Internal data quality assessment:</u> The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.</p>	

11	Number of distributed LPG cylinders in rural areas
Date created: May-2015	Last update:
<p><u>Definition/description:</u> This indicator measures how many LPG cylinders are sold in rural areas. It should focus in new cylinders added to the ones already in circulation. It focuses on those use exclusively for cooking purposes.</p> <p><u>Source of information/data:</u> Information will mainly be collected through Rural LPG Promoting Programme, PHC and GLSS.</p> <p><u>Frequency of monitoring/data acquisition:</u> This indicator will be monitored every year by EC. Data will be supplied by MoPet.</p> <p><u>Baseline:</u> Currently, the number of cylinders for the year 2015 is estimated at 22,000.</p> <p><u>Internal data quality assessment:</u> The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.</p>	

1.4) SE4ALL Ghana Objective 4. Improve access to energy efficient and improved cookstoves by woodfuel users

12	Number of public institutions, commercial cooking and agro-processing activities using improved woodfuel cookstoves as primary device for cooking
Date created: May-2015	Last update:
<p><u>Definition/description:</u> This indicator tracks how many public institutions, commercial cooking facilities and agro-processing activities use improved cookstoves fed with woodfuel as their main cooking device. This excludes households (domestic cooking).</p> <p><u>Source of information/data:</u> Information will be collected through MoP, PHC, GLSS, as well as with the contribution of GHACCO and other SE4ALL development partners.</p> <p><u>Frequency of monitoring/data acquisition:</u> This indicator will be monitored on yearly basis by EC. Data will be supplied to EC directly by the entities involved in their collection (GSS, GHACCO, MoP, others).</p> <p><u>Baseline:</u> The identified baseline for this indicator is 332 for 2015.</p> <p><u>Internal data quality assessment:</u> The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.</p>	

13	Number of households using improved firewood cookstoves as primary cooking device
Date created: May-2015	Last update:
<p><u>Definition/description:</u> This indicator tracks how many households use an improved cookstove fed by firewood as primary cooking device. This excludes commercial cooking or any cooking device used to run a business (i.e. non-domestic use). Contributes to the calculation of the National access percentage to modern energy for cooking. Falls under Tiers 1, 2, 3 “Basic Access”.</p> <p><u>Source of information/data:</u> Information will be collected through MoP, PHC, GLSS, as well as with the contribution of GHACCO and other SE4ALL development partners.</p> <p><u>Frequency of monitoring/data acquisition:</u> This indicator will be monitored on yearly basis by EC. Data will be supplied to EC directly by the entities involved in their collection (GSS, GHACCO, MoP, others).</p> <p><u>Baseline:</u> No specific baseline has been identified for this indicator and it will be defined with the first round of implementation of the MER system.</p> <p><u>Internal data quality assessment:</u> The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.</p>	

14	Number of households using improved charcoal cookstoves as primary cooking device
Date created: May-2015	Last update:
<p><u>Definition/description:</u></p> <p>This indicator measures the number of households that use improved charcoal cookstoves as primary cooking device. This excludes commercial cooking or any cooking device used to run a business (i.e. non-domestic use). Contributes to the calculation of the National access percentage to modern energy for cooking. Falls under Tiers 1, 2, 3 “Basic Access”.</p> <p><u>Source of information/data:</u></p> <p>Information will be collected through MoP, PHC, GLSS, as well as with the contribution of GHACCO and other SE4ALL development partners.</p> <p><u>Frequency of monitoring/data acquisition:</u></p> <p>This indicator will be monitored on yearly basis by EC. Data will be supplied to EC directly by the entities involved in their collection (GSS, GHACCO, MoP, others).</p> <p><u>Baseline:</u></p> <p>No specific baseline has been identified for this indicator and it will be defined with the first round of implementation of the MER system.</p> <p><u>Internal data quality assessment:</u></p> <p>The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.</p>	

15	Percentage of hh using non-BLEN manufactured biomass cookstoves (%)
Date created: May-2015	Last update:
<p><u>Definition/description:</u></p> <p>This indicator measures the number of households that use improved biomass cookstoves as primary cooking device (non-BLEN manufactured cookstoves). This excludes commercial cooking or any cooking device used to run a business (i.e. non-domestic use). Contributes to the calculation of the National access percentage to modern energy for cooking. Falls under Tiers 1, 2, 3 “Basic Access”.</p> <p><u>Source of information/data:</u></p> <p>Information will be collected with the contribution of PHC, GLSS, MoP, GHACCO and other SE4ALL development partners.</p> <p><u>Frequency of monitoring/data acquisition:</u></p> <p>This indicator will be monitored on yearly basis by EC. Data will be supplied to EC by GHACCO.</p> <p><u>Baseline:</u></p> <p>No specific baseline has been identified for this indicator and it will be defined with the first round of implementation of the MER system.</p> <p><u>Internal data quality assessment:</u></p> <p>The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.</p>	

3.1.2 SE4ALL Global Goal 2: Double the share of renewable energy (RE) in the global energy mix by 2030

As per the National Energy Policy (2010), Ghana intends to achieve a 10% contribution of RE in its national energy mix by promoting the exploitation and productive use of biomass, mini hydro, solar, tidal, waste-to-energy and wind energy resources.

Goal level indicator:

16	PERCENTAGE OF RE IN THE NATIONAL ELECTRICITY MIX (%)
Date created: May-2015	Last update:
<p><u>Definition/description:</u></p> <p>This indicator measures the contribution of both grid-connected (16a) and off-grid RE systems (16b) in the national electricity mix. It is presented as a percentage of the total national installed capacity (MW) for electricity generation.</p> <p><u>Source of information/data:</u></p> <p>The data involved in the calculation of this indicator is the on-grid and off-grid capacity. For grid-connected capacity (16a) it accounts for the installed capacity (MW) available for grid supply of the different generation plants split by fuel type: hydropower plants, thermal power plants (fossil fuel based), renewable energy plants and embedded generation (LPG), from where the RE percentage is considered. This is calculated by the EC and reported in the annual Energy Outlook. The share of each source is informed as a percentage (%) of the total capacity installed.</p> <p>In the case of the off-grid capacity (16b), this includes RE systems installed in remote areas. In this first monitoring period, the off-grid installed capacity to be included covers RE mini-grids, Solar Community Lighting Systems (Solar Street lights), Solar Home Systems, and solar lanterns distributed in remote communities. Other future off-grid systems should be included in the calculation (e.g. wind energy, micro-hydro, etc.). The MoP is the entity responsible for monitoring off-grid capacity and therefore MoP reports on national electrification programmes will be used.</p> <p><u>Frequency of monitoring/data acquisition:</u></p> <p>This indicator will be monitored every year by the EC taking information from the Energy Outlook and receiving data on off-grid capacity by MoP.</p> <p><u>Baseline:</u></p> <p>The baseline figure for RE on-grid capacity is, as of 2015, 5.25 MW which represents 0.3% of total on-grid capacity. For off-grid capacity, the baseline figure is 236.9 kW (0.24 MW), broken down as follows: 60 kW (GEDAP 1), 4.9 kW (JICA) and 172 kW (Elecnor).</p> <p><u>Internal data quality assessment:</u></p> <p>The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.</p>	

Objective level indicators:

2.1) SE4ALL Ghana Objective 1: Provide access to electricity in remote communities using decentralised renewable energy systems

17	Installed capacity of RE mini grids in off-grid communities (MW)
Date created: May-2015	Last update:
<p><u>Definition/description:</u></p> <p>This indicator measures the total installed capacity from mini-grids supplied with RE, installed to power off-grid communities. This indicator adds to the total RE off-grid capacity that is part of the</p>	

RE national energy mix.

Source of information/data:

Information to estimate this indicator will be collected by MoP through the implementation of National off-grid electrification programmes.

Frequency of monitoring/data acquisition:

This indicator will be monitored once a year by the EC. Data to be supplied by MoP.

Baseline:

The baseline figure is 0 MW, as of 2015.

Internal data quality assessment:

The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.

18	Total capacity of Solar Community Lighting Systems (Solar Street lights) installed in isolated communities (MW)
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Date created: May-2015

Last update:

Definition/description:

This indicator measures the total installed capacity from Solar Community Lighting Systems installed in off-grid communities, in MW. This indicator adds to the total RE off-grid capacity that is part of the RE national energy mix.

Source of information/data:

Information to estimate this indicator will be collected by MoP through the implementation of National off-grid electrification programmes.

Frequency of monitoring/data acquisition:

This indicator will be monitored once a year by the EC. Data to be supplied by MoP.

Baseline:

The selected baseline for this indicator is 24.5 kW, 0.02 MW, broken down in 21 kW (Elecnor) and 3.5 kW (GEDAP 1).

Internal data quality assessment:

The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.

19	Total capacity of solar lanterns distributed in off-grid communities (MW)
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Date created: May-2015

Last update:

Definition/description:

This indicator measures the total capacity of the solar lanterns distributed in off-grid communities. This indicator adds to the total RE off-grid capacity that is part of the RE national energy mix.

Source of information/data:

Information to estimate this indicator will be collected by MoP through the implementation of National off-grid electrification programmes.

Frequency of monitoring/data acquisition:

This indicator will be monitored once a year by the EC. Data to be supplied by MoP.

Baseline:

Currently, the baseline capacity derived from solar lanterns, as of 2015, is 0.1 MW.

Internal data quality assessment:

The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.

20	Total capacity of solar home systems (SHS) installed in off-grid communities (MW)
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Date created: May-2015	Last update:
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Definition/description:

This indicator measures the total capacity of SHS installed in remote off-grid communities. It includes SHS installed in households as well as SHS installed for communal or public applications in schools, clinics or health centres.

Source of information/data:

Information to estimate this indicator will be collected by MoP Ministry of Power, through the implementation of National off-grid electrification programmes.

Frequency of monitoring/data acquisition:

This indicator will be monitored once a year by the EC. Data to be supplied by MoP

Baseline:

Currently, the baseline figure for this indicator, as of 2015, is 48 kW (Elecnor), equal to approximately 0.05 MW.

Internal data quality assessment:

The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.

3.1.3 SE4ALL Global Goal 3: Double the global rate of improvement in energy efficiency

Concerning energy efficiency, Ghana is currently mainly focusing at increasing the rate of improvement in the consumption of firewood and charcoal for cooking through the use of energy efficient (improved) end-use devices.

Objective level indicators:

21	Annual average firewood consumption for cooking per household (kg/hh*year)
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Date created: May-2015	Last update:
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Definition/description:

This indicator tracks how much firewood is being consumed in each household per year for cooking purposes, at national level. This excludes commercial, industrial or any business-related firewood consumption.

Source of information/data:

This information will be collected by GSS through PHC and GLSS.

Frequency of monitoring/data acquisition:

This indicator will be monitored once a year by EC. Data to be supplied by GSS.

Baseline:

No specific baseline has been identified for this indicator under CAP 2012 and will be defined with the first round of MER system implementation.

Internal data quality assessment:

The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.

22 Annual average charcoal consumption for cooking per household (kg/hh*year)

Date created: May-2015

Last update:

Definition/description:

This indicator tracks how much charcoal is being consumed in each hh per year for cooking purposes, at national level. This excludes commercial, industrial or any business-related charcoal consumption.

Source of information/data:

This information will be collected by GSS through PHC and GLSS.

Frequency of monitoring/data acquisition:

This indicator will be monitored once a year by EC. Data to be supplied by GSS.

Baseline:

No specific baseline has been identified for this indicator under CAP 2012 and will be defined with the first round of MER system implementation.

Internal data quality assessment:

The data quality will be assured following the procedures currently applied by the Energy Commission and/or by the entities supplying the data. If no procedure is in place then provisions should be made to assure quality of data/information used.

3.2 Monitoring Database

Depending on the frequency of the data collection, which may vary from one indicator to the other, the EC, in its role of hosting Ghana's SE4ALL Secretariat, will populate a database which will gather all the necessary information to estimate each indicator. The database will be populated every year or each time data are generated, and new information adding up to the information collected in the previous years.

The database will be in the form of computer folders containing different types of file as provided by the information sources. When information is not available in digital format, provisions should be made to scan the information in order to have it stored in digital format too.

There should be a Masterfile consolidating all tracked indicators and their results for each monitoring period. This Masterfile will be used to evaluate the obtained results in the evaluation phase and also report them accordingly.

3.2.1 Data collection form

In order to request information from the different sources to populate the monitoring database and to complete the indicators information sheets, the EC will contact the entities that will provide data and information, such as the MoP, GHACCO, etc.

The following table will be the tool to be used by the EC to request specific information from each source:

Table 4: Data Request Form (DRF)

ENERGY COMMISSION			
SE4ALL Monitoring, Evaluation and Reporting System			
DATA REQUEST FORM (DRF)			
To (entity)		Date (dd/mm/yyyy)	
DRF sent to:		DRF requested by:	
Name:		Name:	
E-mail:		E-mail:	
Tel:		Tel:	
DATA CORRESPONDING TO INDICATOR:			
Indicator name:		Indicator number:	
Description/definition of indicator:			
Specific data requested (<i>describe the data/information that you intend to collect with as much detail as possible</i>):			
Specific data supplied (<i>supply the data/information requested to you with as much detail as possible. Attach files if needed</i>):			

4 EVALUATION PLAN

4.1 Generalities

The evaluation process will consist of two steps: i) a mid-term short review, and ii) a complete annual review of the evolution made on activities conducted under the implementation of Ghana SE4ALL CAP or future AA, in order to understand and analyse the progress towards the targets set. The first review has as main objective to briefly analyse how the SE4ALL initiative is progressing, basically by means of verifying if the monitoring activities are being implemented, if the SE4ALL programmes and plans are up to schedule and if the necessary efforts are being made toward achieving the country goals. The goal is to preview any potential deviations or delays beforehand, prior to reaching the end of the year and prior to conducting the overall complete annual review where baselines, targets and monitored indicators' results will be evaluated.

Both reviews will be conducted by the EC in its role of Ghana SE4ALL Secretariat.

The complete annual evaluation will ensure a broad and representative perspective on the achievements and challenges in the implementation of Ghana SE4ALL CAP, and will allow the EC to assess the adequacy of the adopted strategy to meet the targets as planned, and take any corrective action if needed. In general terms, the purpose of the evaluation is twofold:

- (i) To contribute to improving Ghana's initiative effectiveness and targets' achievement planned for 2020. This will be done by means of feeding real time learning from Ghana's CAP implementation back into the country initiative, and modify strategic activities as needed for the following year;
- (ii) To contribute to the overall alignment of the strategic activities of Ghana's CAP and ensure that it remains relevant for addressing country level objectives and also aligned to the global SE4ALL initiative.
- (iii) To contribute to the identification of possible changes to be made to the monitoring plan.

4.2 Guidelines for carrying out the complete annual review

The evaluation will basically consist of analysing the estimate of each indicator and compare the result against the baseline, the interim targets (if any) and final targets as well as the respective expected trajectory in order to decide if modifications are needed on the targets or the strategies implemented for the next monitoring periods. Figure 5 schematically represents this process.

Every year, reference will also be made to the results of previous rounds of evaluation as well as to the mid-term review previously conducted, to show annual progress. When estimates are in line with the target, no action will need to be implemented. For those indicators where the estimations are showing delay toward the achievement of the target, corrective actions will need to be defined. It could be for example: to refine the target set, or to identify new activities to be included in the CAP to increase progress. These new actions will be identified by the EC in consultation with the implementing stakeholders if applicable.

The evaluation process will also be the opportunity to assess the data collection activities and the engagement of the partners involved in the monitoring activities. Note will be made on missing and inconsistent data and arrangements proposed to estimate the corresponding indicators.

This procedure should be applied for the result obtained for each indicator to be able to evaluate it independently.

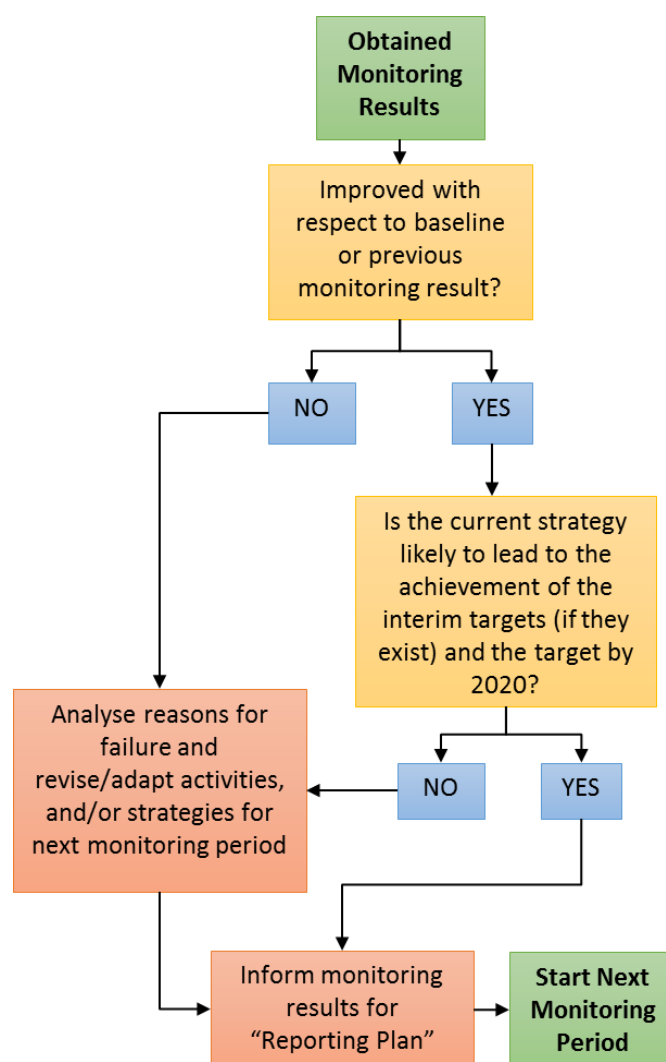


Figure 5: Evaluation process

5 REPORTING PLAN

Following the evaluation phase, the EC will report every year on the progress made under the implementation of Ghana SE4ALL CAP or future AA in a written performance assessment report. This report will provide an annual overview of the status of the country SE4ALL initiative, describing the main progress achieved, drifts if any and the corresponding corrective actions, lessons learned and actions for the future.

The annual performance assessment report would include the following sections:

- 1) Executive summary;
- 2) Overall progress made to date in achieving Ghana SE4ALL objectives;
- 3) Progress report: report of all indicators results to show the progress made under each goal and each specific objective against the baseline and targets set; comments on the trajectory; presentation of corrective or future actions to be implemented if any;
- 4) Data quality: identification and correction of missing and inconsistent data in the MER system;
- 5) Stakeholders engagement: report on the enrolment/participation of the different stakeholders in the MER system; report of any issues encountered and proposed corrective actions;
- 6) Lessons learned;
- 7) Expectations for the next years under the SE4ALL initiative.

Once completed, the report will be made available to all relevant stakeholders by the EC. Some results would also be communicated in the *Ghana SE4ALL Newsletter*.

The annual report would be prepared in time for the annual National SE4ALL Forums organised by the Ministry of Power. The progress made toward the targets set will be presented to all stakeholders at these occasions.

The results reported in the annual report could also be used by other optional means of communication, such as:

- Presented in any other forums that the country may consider attending or hosting to advertise on the status of the country SE4ALL initiative;
- Shown in newsletters currently being issued or new ones;
- Used for dissemination activities of SE4ALL initiative in Ghana;
- Shared in GoG's websites;
- Presented by other means of communication.

In all the cases, the use of information should be approved by the EC.

6 PERFORMANCE ASSESSMENT FRAMEWORK

The Performance Assessment Framework (Table 5), or PAF, is the key instrument for monitoring, analysing and reporting on the outcomes of Ghana SE4ALL CAP implementation. It captures key elements of expected results from the CAP implementation, by outlining indicators for each results level, as well as all the information associated to each of the indicators. The key performance indicators together with the baseline and target columns are what will be used to measure expected results. The targets and baseline are currently available only for a limited number of indicators. The gaps will be filled in with the implementation of the MER activities.

In Table 5, the column "Data collection to assess indicator" provides information on data required to estimate the indicator, the frequency of collection, the source of data and the responsible entities. The column "Indicator reporting" provides information on the reporting activities for each indicator (frequency and responsible entity). The means of verification briefly outline how the entity responsible for collecting information verifies it. Finally, the last column summarizes some assumptions related to specific actions that are assumed to be carried out and necessary to do the monitoring of the indicators and the difficulties operations might face when addressing these. The Performance Assessment Framework will be updated as necessary, every time changes are made in the country SE4ALL strategy, and especially after the publication of the AA and corresponding IPs. The update of the Performance Framework will follow the methodology described in Section 7.

Table 5: Performance Assessment Framework

Key performance indicators	Baseline (year & figure)	Targets (year & figure)		Data collection to assess indicator				Indicator Reporting (entity and format)	Means of Verification	Immediate Actions and Risks (if any)
				Frequency of collection	Data sources	Data source format	Responsible entity for providing data			
SE4ALL Global Goal 1: Universal Energy Access by 2030										
SE4ALL Ghana Goal 1: Ensure universal access to modern energy services by 2020										
1 National electricity access percentage (%) <i>- measure based on number of hh connected</i>	2015		2020	Once a year	Reports by MoP, PHC, GLSS	Report, excel spreadsheet	MoP	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with Ministry of Power.	IA: Communicate with MoP to inform data to be supplied to EC
	75.60%		100%							
2 National access percentage to modern energy for cooking (%) <i>- measure based on number of hh using LPG or non-BLEN manufactured biomass cookstoves as primary solution for cooking</i>	2015		2020	Once a year	Reports by MoP, MoPet, GHACCO, PHC/GLSS	Report, excel spreadsheet	MoP / GHACCO	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with GSS, MoP, MoPet, and GHACCO.	IA: Communicate with MoP/GHACCO to inform data to be supplied to EC
	see below indicator #10 for LPG and indicator #15 for cookstoves		50.00%							
1.1) SE4ALL Ghana Objective 1: Provide access to electricity in remote communities using decentralised renewable energy systems										
3 Number of households using RE as primary source of energy for lighting and very low power appliances (≤30 kW)	2015		2020	Once a year	MoP's reports on National off-grid electrification programmes.	Report, excel spreadsheet	MoP	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with MoP	IA: Communicate with MoP to inform data to be supplied to EC
	Not available		60,333.33 (362,000 population)							
4 Number of households using RE as primary source of energy for lighting and low power appliances (31 -150 kW)	2015		2020	Once a year	MoP's reports on National off-grid electrification programmes.	Report, excel spreadsheet	MoP	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with MoP	IA: Communicate with MoP to inform data to be supplied to EC
	Not available		Not available							

5	<i>Number of households using RE as primary source of energy for lighting and medium to high power appliances (>150 kW)</i>	2015		2020	Once a year	MoP's reports on National off-grid electrification programmes.	Report, excel spreadsheet	MoP	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with MoP	IA: Communicate with MoP to inform data to be supplied to EC
		Not available		Not available							
6	<i>Number of communal facilities with access to electricity through a decentralised RE system</i>	2015		2020	Once a year	MoP's reports on National off-grid electrification programmes.	Report, excel spreadsheet	MoP	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with MoP	IA: Communicate with MoP to inform data to be supplied to EC
		881		Not available							
7	<i>Number of solar lanterns distributed in off-grid communities</i>	2015		2020	Once a year	MoP's reports on National off-grid electrification programmes.	Report, excel spreadsheet	MoP	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with MoP	IA: Communicate with MoP to inform data to be supplied to EC
		32,616		2,000,000							
1.2) SE4ALL Ghana Objective 2. Improve access to modern energy for productive uses											
8	<i>Number of irrigation schemes implemented (grid-connected and decentralised systems/solar)</i>	2015		2020	Once a year	SE4ALL Project Reports, GIDA/MoFA, GIZ and other development partners programmes reports	Report, excel spreadsheet	GIDA (MoFA)/ GIZ/DPs	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with SE4ALL DPs/GIDA /MoFA	IA: Communicate with SE4ALL DPs/GIDA/ MoFA to inform data to be supplied to EC
		37		750							
9	<i>Number of businesses with access to energy through decentralised RE systems (focus on solar dryers)</i>	2015		2020	Once a year	SE4ALL Project Reports, AESD and other development partners programmes reports	Report, excel spreadsheet	Agric. Engineering Services Directorate	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with AESD	IA: Communicate with AESD to inform data to be supplied to EC
		21		250							

1.3) SEALL Ghana Objective 3. Improve access to LPG as a clean cooking fuel											
10	<i>Percentage of households using LPG as primary fuel for cooking (%)</i>	2015		2020	Once a year	PHC, GLSS, Rural LPG Promotion Programme report	Report, excel spreadsheet	MoPet	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with the Ministry of Petroleum (MoPet), NPA	IA: Communicate with MoPet to inform data to be supplied to EC
		22.30%		50%							
11	<i>Number of distributed LPG cylinders in rural areas</i>	2015		2020	Once a year	PHC, GLSS, Rural LPG Promotion Programme report	Report, excel spreadsheet	MoPet	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with the MoPet, NPA	IA: Communicate with MoPet to inform data to be supplied to EC
		22,000		Not available							
1.4) SE4ALL Ghana Objective 4. Improve access to energy efficient and improved cookstoves by woodfuel users											
12	<i>Number of public institutions, commercial cooking and agro-processing activities using improved woodfuel cookstoves as primary device for cooking</i>	2015		2020	Once a year	PHC, GLSS, GHACCO, reports from SE4ALL development partners	Report, excel spreadsheet	GHACCO	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with GSS, GHACCO, SE4ALL development partners	IA: Communicate with GSS, GHACCO and SE4ALL development partners to inform data to be supplied to EC
		332		1,000							
13	<i>Number of households using improved firewood cookstoves as primary cooking device</i>	2015		2020	Once a year	PHC, GLSS, GHACCO, reports from SE4ALL development partners	Report, excel spreadsheet	GHACCO	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with GSS, GHACCO, SE4ALL development partners	IA: Communicate with GSS, GHACCO and SE4ALL development partners to inform data to be supplied to EC
		Not available		Not available							
14	<i>Number of households using improved charcoal cookstoves as primary cooking device</i>	2015		2020	Once a year	PHC, GLSS, GHACCO, reports from SE4ALL development partners	Report, excel spreadsheet	GHACCO	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with GSS, GHACCO, SE4ALL development partners	IA: Communicate with GSS, GHACCO and SE4ALL development partners to inform data to be supplied to EC
		Not available		2,000,000							

15	<i>Percentage of hh using non-BLEN manufactured biomass cookstoves</i>	Not available		50%	Once a year	PHC, GLSS, GHACCO, reports from SE4ALL development partners	Report, excel spreadsheet	GHACCO	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with GSS, GHACCO, SE4ALL development partners.	IA: Communicate with GSS, GHACCO and SE4ALL development partners to inform data to be supplied to EC R: currently no breakdown of information by type of device used is available, only by fuel type (kerosene, woodfuel, LPG, etc.)
SE4ALL Global Goal 2: Double the share of renewable energy (RE) in the global energy mix by 2030											
SE4ALL Ghana Goal 2: Increase the proportion of RE in the total national electricity mix to 10% by 2020											
16	<i>Percentage of RE in the national electricity mix (%)</i>	2015		2020	Once a year	Energy Outlook, MoP reports on national electrification programmes	Report, excel spreadsheet	EC for on-grid RE capacity, MoP for off-grid RE capacity.	Energy Commission. Annual report on SE4ALL initiative progress.	EC Reports, MoP Reports	IA: Currently off-grid capacity is not included in the figure. Provisions should be made in order to include off-grid RE capacity in the calculation. Communicate with MoP to indicate data to be supplied to EC.
		0.30%		10.0%							
16a	<i>On-grid RE capacity (MW)</i>	5.25		50.00	Once a year	Energy Outlook	Report, excel spreadsheet	EC	Energy Commission. Annual report on SE4ALL initiative progress.	EC Reports	

16b	Off-grid RE capacity (MW)	0.24		Not available	Once a year	MoP reports on national electrification programmes	Report, excel spreadsheet	MoP	Energy Commission. Annual report on SE4ALL initiative progress.	MoP Reports	IA: Currently off-grid capacity is not included in the figure. Provisions should be made in order to include off-grid RE capacity in the calculation. Communicate with MoP to indicate data to be supplied to EC.
2.1) SE4ALL Ghana Objective 1: Provide access to electricity in remote communities using decentralised renewable energy systems											
17	Installed capacity of RE mini grids in off-grid communities (MW)	2015		2020	Once a year	National off-grid electrification programmes.	Report, excel spreadsheet	MoP	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with MoP	IA: Communicate with MoP to inform data to be supplied to EC
		0.00		5 (62 minigrids)							
18	Total capacity of Solar Community Lighting Systems (Solar Street lights) installed in off-grid communities (MW)	2015		2020	Once a year	National off-grid electrification programmes.	Report, excel spreadsheet	MoP	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with MoP	IA: Communicate with MoP to inform data to be supplied to EC
		0.02		Not available							
19	Total capacity of solar lanterns distributed in off-grid communities (MW)	2015		2020	Once a year	National off-grid electrification programmes.	Report, excel spreadsheet	MoP	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with MoP	IA: Communicate with MoP to inform data to be supplied to EC
		0.1		Not available							
20	Total capacity of Solar Home Systems installed in off-grid communities (MW)	2015		2020	Once a year	National off-grid electrification programmes.	Report, excel spreadsheet	MoP	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with MoP	IA: Communicate with MoP to inform data to be supplied to EC
		0.05		Not available							
SEALL Global Goal 3: Double the global rate of improvement in energy efficiency by 2030											
SE4ALL Ghana Goal 3: to ensure that all households using charcoal or firewood for cooking will use improved energy saving cookstoves by 2020.											
3.1) SE4ALL Ghana Objective: At least a 30% increase in the efficiency of woodfuel stoves in the country											
21	Annual average firewood	2015		2020	Once a year	GLSS, PHC	Report,	GSS	Energy	Communications	IA: Communicate with

	<i>consumption for cooking per household (kg/hh*year)</i>	Not available		Not available			excel spreadsheet		Commission. Annual report on SE4ALL initiative progress.	with GSS	GSS to inform data to be supplied to EC
22	<i>Annual average charcoal consumption for cooking per household (kg/hh*year)</i>	2015		2020	Once a year	GLSS, PHC	Report, excel spreadsheet	GSS	Energy Commission. Annual report on SE4ALL initiative progress.	Communications with GSS	IA: Communicate with GSS to inform data to be supplied to EC
		Not available		Not available							

7 GUIDELINES FOR UPDATING THE MONITORING, EVALUATION AND REPORTING SYSTEM

The MER system is not a static blueprint for implementation but a living document that can be adjusted as progress is made and lessons are learned, as activities are completed and new ones arise. It will evolve in accordance with Ghana's SE4ALL strategy, integrating any change made to it and reflected in the future AAs.

This section is meant as a tool for updating the MER system upon validation of the AA, and for the case that additional indicators are to be incorporated. Evolution in the MER system will mainly result in new sets of indicators being tracked: whenever a new objective or activity is included to the strategy, new indicators will need to be defined. These indicators will be chosen wisely to best represent the expected results. Others will be eliminated as activities are completed and targets achieved.

The EC, in its role of SE4ALL Secretariat, will be the only entity responsible for adding/deleting indicators to the MER system. However, feedback and need for new indicators from relevant stakeholders will be taken into account in the update process of the MER system.

7.1 Updating the Logical Framework

In case there is a need to review the complete structure of the MER system upon validation of the Action Agenda⁶, there will be a need to update the logical framework. In order to develop the new logical framework it will be necessary to identify the goals and objectives associated with the Action Agenda.

- *Goal*: What is the intended goal of the Action Agenda? This is the main goal that drives all of the activities and related sub-activities.
- *Objective*: What are the planned objectives designed to achieve the desired goal?

The logical framework will be constructed as follows:

Results	Indicators	Definition	Sources and Means of Verification	Assumptions
SE4ALL Global Goal 1, 2 or 3, namely: Universal Energy Access by 2030, Double the share of renewable energy in the global energy mix by 2030, Double the global rate of improvement in energy efficiency by 2030				
Country Goal	Goal indicator	Definition	Responsible entities for data collection	Assumptions
SE4ALL Ghana Objective	Objective indicator	Definition	Responsible entities for data collection	Assumption

Note: The logframe will include as many rows as identified goals' and objectives' indicators exist, without taking into account possible disaggregation.

7.2 Identification of new indicators

Whenever a new goal, objective or activity is included in the country SE4ALL strategy, questions should be raised on what indicators need to be measured in order to track progress toward the expected results. Indicators are how we measure progress towards a specific objective or goal. After the level of the activities is defined (goal or objective), the next step is to define the indicator(s) that will measure progress towards achieving objectives and goals.

The definition of new indicators will be oriented by the following criteria:

- Significant: the indicator closely tracks the result it is intended to measure;
- Practical: data can be collected on a timely basis and at reasonable cost;
- Measurable: the indicator can be quantified and measured by some scale (unit);

⁶ i.e. if the country goals and objectives are revised in such a way that the proposed indicators are not yet relevant to track the progress of the country SE4ALL initiative.

- Consistent: the measure is operationally precise and remains consistent over the time;
- Reliable: can be measured repeatedly with precision by different people;

The selection of new indicators will be made carefully to avoid overloading the MER system with too much information that might result in data pile-up and will not sustain the MER activities. In addition, two aspects related to indicators are essential to reduce the demand of resources associated to monitoring activities: diversity and number of indicators. It is necessary to assess those indicators that, although they are more difficult to monitor, capture the substance of the change that is occurring, in a better way. Moreover, having fewer indicators would reduce associated monitoring costs but it is important to analyse the relevance of each indicator and that there are enough ones to cover everything that needs to be tracked.

7.3 Definition of the indicators' information and monitoring requirements

For each new selected indicator, an "Indicator information sheet" should be completed. This sheet contains the indicator's information. Its purpose is to act as a comprehensive guideline for everything that is related to data: collection, quality, and use. This is also a communication tool so that stakeholders can understand some of the critical components of this sheet. Every indicator (information collected) should have some form of indicator information sheet. The following is a template of "Indicator information sheet" which should be used as guideline:

Table 6: Indicator information sheet

<i>(Add indicator number)</i>	<i>(ADD INDICATOR'S NAME AND UNIT OF MEASUREMENT BETWEEN BRACKETS)</i>	
	Date created: <i>DD-Month-YYYY</i>	Last update: <i>DD-Month-YYYY</i>
<p><u>Definition/description:</u> <i>Add the specific definition of the indicator describing what it intends to measure, spelling out what it is so all stakeholders have the same understanding of what this indicator is and what it intends to track.</i></p> <p><i>Indicate in what unit this indicator will be captured and, when/if necessary, any required disaggregation.</i></p> <p><u>Source of information/data:</u> <i>How data are collected, where data are coming from e.g. institution, survey, other source.</i> <i>Indicate if data are already being collected by any current activity, e.g. national census.</i></p> <p><u>Frequency of monitoring/data acquisition:</u> <i>How often and when data are collected, (who is responsible, what position within the Secretariat or which institution, for collecting the data).</i></p> <p><u>Baseline:</u> <i>Initial known value (year and corresponding figure) which is used for comparison with later data measure.</i></p> <p><u>Internal data quality assessment:</u> <i>How the data quality assessment is performed for this indicator, and when necessary and if applicable also describe the review process that this indicator may be subject to before dissemination to stakeholders.</i></p>		

Interim and final targets to be achieved in terms of year and figure will also be set for each new indicator in the Performance Assessment Framework. This will be done in consultation with the relevant implementing stakeholders if applicable.

7.4 Data Flow and Data Quality Assurance

7.4.1 Data Flow

The following figure maps the flow of data from collection to use and examines areas where data processes can be consolidated or uses can be enhanced. Differentiates between data elements and indicators (transformed data).

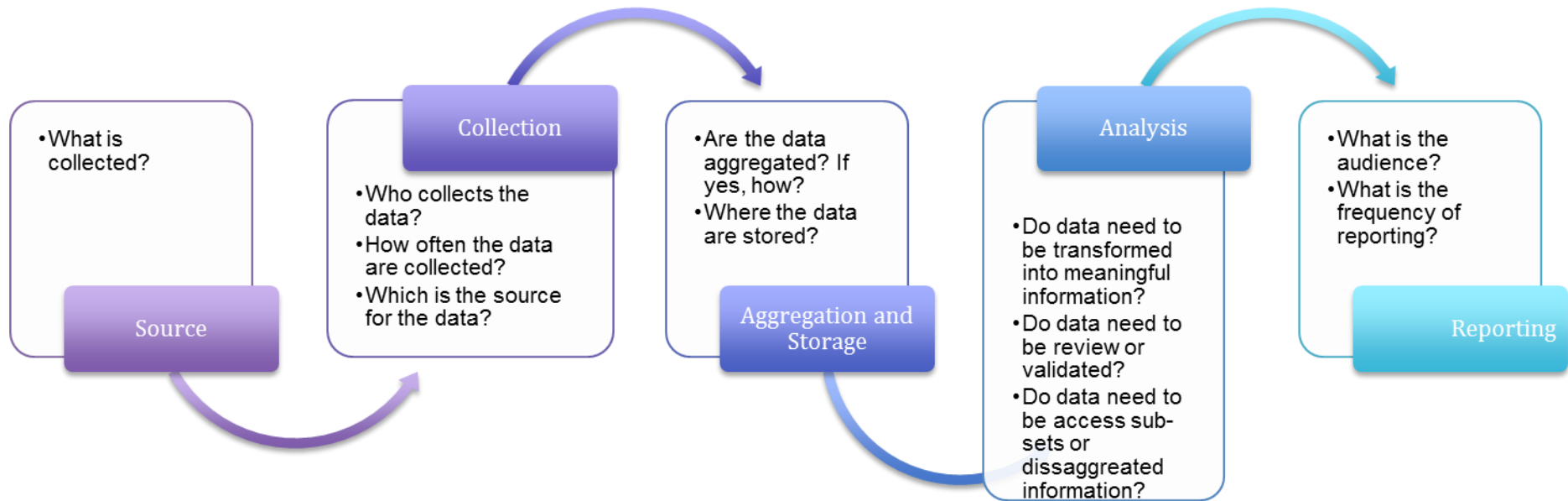


Figure 6: data flow from collection to reporting

7.4.2 Data Use

It will be necessary to summarize planned uses for the collected data. Think about how the collected information can be utilized to make informed programme decisions and what steps can help ensure that collected data gets to the right person, in the right time, and in the right format. The following set of questions helps identify the uses planned for the data collected:

- Uses: What are the multiple uses for the information generated from this indicator?
- Stakeholders: Who is the audience for this indicator?
- Mechanism: How will the information be disseminated?
- Format: How should this information be formatted to best reach the intended users?
- Next steps: What steps must be taken to ensure that this information is used? Any follow up needed? Feedback?

7.4.3 Data Quality Assurance

Data quality control procedures should also be taken into account when updating the MER system, particularly if new indicators require new data not previously collected or if new data quality control procedures are introduced by the entities involved in the monitoring, evaluation and reporting plans.

Always have in mind that the objective of assuring data quality shall consider five criteria: validity, reliability, integrity, precision, and timeliness; and remember that the purpose of having a QA plan is to identify and manage potential risks to the quality of collected data and information that will be used.

If not QA procedures are currently being applied by the EC or any other entity involved, then provisions should be made in order to include activities that contribute to controlling data quality and traceability.

7.5 Addition to the monitoring database and MER system

An evaluation will be carried out in order to assess the new indicators to be part of the MER system. These new indicators will be inserted in the monitoring database with their corresponding “Indicator Information sheet” and in the Performance Assessment Framework with their pertaining information (baseline, targets, data collection information, data reporting, etc.). They all should have their monitoring protocols also included as part of the MER system.

These new indicators will be monitored, evaluated and reported. If the nature of an indicator or set of indicators requires to have a different evaluation or reporting mechanism, the plans should describe how it will be evaluated, who will do the evaluation, what will be reported, to whom, and when.

In addition, it would be useful to indicate what information products based on data translated into strategic information (e.g., reports, bulletins, graphics, and newsletters) will be fed back to stakeholders who have reported data to the SE4ALL Secretariat.

7.6 Updating the Evaluation Plan

Updating the evaluation plan may entail:

- Changes coming from new AAs: for example need to compare with new targets (figures and years) that are set in future AAs
- Adding/deleting stages if new mandatory stages are needed (e.g. new quality assurance stage is to be applied as part of the evaluation process)
- Changing evaluation frequency

7.7 Updating the Reporting Plan

The reporting plan was conceived as a dynamic tool to avoid the need for updating it continuously. Changes to the reporting plan should only be made if a new mandatory report/means of communication is selected to be used throughout the duration of the SE4ALL initiative. Currently the proposal is to have a “Performance Assessment Report” to be issued once a year. If a new report will replace this one or if an additional report is necessary to be issued ever year (or with an alternative frequency), then the reporting plan should be updated to include it.

As mentioned in section 5, there are different means of communication that can be used to share information about the SE4ALL initiative results. Since these are dynamic then they are considered as optional, meaning that they are not mandatory, and that can be or not be used depending on the needs of the moment.
