Gold Standard Suppressed Demand Micro-scale Methodology for Electrification and Energization

The methodology allows the introduction of renewable energy based electrification/energization activities for communities that do not have access to the national or regional grid or for communities with low grid availability.

The applicability defines the following 6 situations: 1) New mini-grid, 2) Substitution of an existing fossil fuel based mini-grid with a renewable energy based mini-grid, 3) Substitution and expansion of an existing fossil fuel based mini-grid with a renewable energy based mini-grid 4) Bringing into operation installed renewable power generation systems that are not in operation 5) Facility-scale power supply with only one consumer and 6) Grid with less than 50% availability.

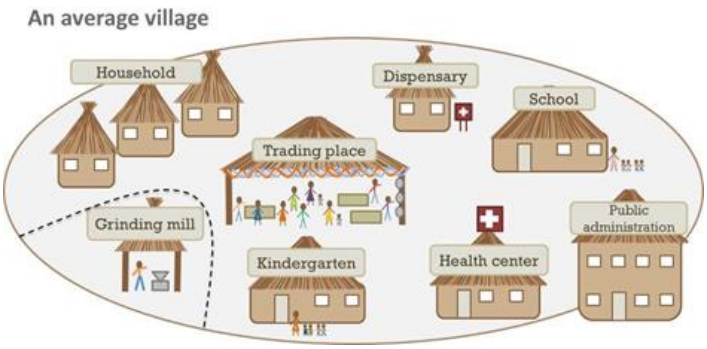
The renewable energy sources eligible for this methodology are limited to solar, hydro, wind, renewable biomass and biogas. Backup power generation from fossil fuel based power generation systems is accepted under this methodology.

As a suppressed demand methodology it will support the development of areas with limited electricity access, thus contributing to more sustainable development. The methodology is based on pre-defined service level (Minimum Service Level) for different consumer groups, as a maximum that can be credited.

The methodology is interesting to explore due to following reasons 1) transparent and simplified model for evaluating number of carbon credits, 2) pre-defined service level for different consumer groups, , 3) simplified monitoring – low cost operation and 4) restart of not-functioning systems.

Consumer group

The focus of this methodology is rural areas and the most common energy consumers in a rural village, which are illustrated in the diagram.



There is a distinction between eligible and non-eligible consumers. The eligible consumers have pre-defined service levels which can be transformed to CO_2 emission reductions. Eligible consumers include Household, Health Center, Dispensary, School, Kindergarten, Public Administration and Trading Place.

Non-eligible consumer groups are defined as those with no pre-defined service level and who cannot obtain CO_2 emission reductions, for instance a grinding mill. All potential and Non-eligible consumer groups and their respective pre-defined service

level could potentially be made part of the methodology with a proper justification based on approval by Gold Standard Foundation.

Dispensary			
Type of service	Number	Operation hours/day	Quality of service
Indoor light	2	12	1700 Lumen 30 Watt
Outdoor light	1	12	6000 Lumen 80 Watt
Radio	1	2	10 watt
Cell phone	1	24	30 Wh/day
Fan	2	12	65 Watt
Refrigerator	1	24	895 kWh/day
Pre-defined service level = 4.1 kWh/day			

Pre-defined service level (Minimum Service Level)

A consumer group can vary in size, and therefore the description will be generalised.

As an example, a dispensary is used to illustrate the pre-defined service level for a consumer group. A dispensary is defined as an office that dispenses medications and medical supplies and often has 2 rooms and at least 1 employee.

The pre-defined service level for dispensary is 4.1 kWh/day. It reflects the type of service, number of appliances, operation hours and the quality of the service, which has been the basis for the calculation. The above table illustrates for instance that a dispensary as a minimum is expected to have two indoor lights, which operate in 12 hours with a total lumen of 1700.

Pre-defined services level for consumer groups	
Consumer group	Pre-defined service level
Household	3 kWh/day
Health Center	8.6 kWh/day
Dispensary	4.1 kWh/day
School	10.0 kWh/day
Kindergarten	4.4 kWh/day
Public Administration	4.4 kWh/day
Trading Place	11.0 kWh/day

The table to the left gives an overview of the pre-defined service level for the 7 eligible consumer groups.

A default CO_2 emission factor for a diesel generation system of 1.3 kg CO_2/kWh has been accepted as a standard situation.

Calculating Emissions Reductions

The approach for measuring emission reductions is based on defining the pre-defined service level for each eligible consumer group. The pre-defined service level expresses the maximum level of electricity consumption (in kWh/day), which can be included in the baseline. The actual project service level can be higher than the pre-defined service level. However, CO_2 emission reductions for a renewable

energy system can only be claimed for the baseline emissions based on pre-defined service level adjusted with project and leakage emissions.

Monitoring
The monitoring is based on measuring the net renewable energy generation and the number of connected consumers for each consumer group. The monitoring of net energy generation shall be carried out on a continuous basis. Energy consumed by Non-eligible consumers is included as leakage. The actual consumption for each consumer, including the split between different types of services for one consumer will not be monitored.

In case two households are connected to the same renewable source they can together request only up to two times the pre-defined service level.

In order to allow an initial estimation of possible emission reductions for a specific project, a calculation tool has been developed along with the methodology, which is available from the Gold Standard Website.