










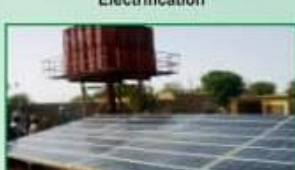













SOKOTO ENERGY RESEARCH CENTRE (SERC)

(ENERGY COMMISSION OF NIGERIA)

(FEDERAL MINISTRY OF INNOVATIONS SCIENCE AND TECHNOLOGY)

USMANU DANFODIYO UNIVERSITY SOKOTO

SOME SERC ACTIVITIES IN PICTURES

| BIOMASS SYSTEM | SOLAR THERMAL SYSTEM | | SOLAR PHOTOVOLTAIC PROJECTS |
|--|--|---|---|
|  Fixed dome Biogas plant |  Spiral Solar water heater |  Danjawa 250 litres Solar water Heating System |  7.2 Kw Danjawa Solar PV Electrification |
|  Portable Biogas digester |  Community based solar water heater |  Kilishi Solar Dryer at Kuchi |  Solar Water pumping at Birjingo community |
|  Double hole Saw-dust stove |  Parabolic Solar cooker |  Solar Dryer at Danjawa Village |  2 Kw Solar PV back - up UDUS Internet System |
|  Coal Stove |  Box Type Solar Cooker |  Solar Distiller |  4,5 Kw Solar PV Electrification at SERC |
|  Community based improved wood Stoves |  Concrete Solar Distiller | | |
|  Distribution of improved wood stoves to Danjawa Community | | | |
| WIND AND METROLOGY | | | |
| | |  5 Kw wind electricity generation |  Meteorological instrument installed at SERC |

CIRCULAR TOP BOX SOLAR COOKER WITH MULTIPLE ADJUSTABLE REFLECTING BOOSTERS

The novel features of this type of solar box cooker are the circular top absorber and additional reflecting boosters. The reflecting boosters are adjustable suitable for directing solar reflection from time to time as the same moves. The cooker can be used for boiling type of cooking such as rice, potatoes, yams, etc boiling. Depending on solar intensity it can boil 0.5kg (sufficient for about 6 adults) of rice in averagely 1Hr. The circular top minimizes the sides shadow effects of the common rectangular or square top type of box solar cooker.



Thermoelectric (Peltier Effect) powered Air blower Charcoal Stove.

SERC has developed a charcoal stove that utilizes thermoelectric (Peltier effect) to power an air blower for combustion of coal/charcoal for cooking. This device eliminates the problem of manual air supply to support combustion of charcoal during cooking. The operation of the stove is therefore more efficient.



Hybrid (Active and Passive) Large Scale Solar Dryer for Crops and Jerky Meat (“Kilish”) Drying Applications.

This Solar dryer consist of Perspex as glazing material and is provided with air blowers powered by solar photovoltaic modules. It can work on natural convection or forced convection depending on the type and moisture content of the product to be dried. The dryer can be expanded for large scale drying for agricultural and industrial applications.

This dryer has been patented.



Hybrid-(Active/Passive) Large Scale Solar Dryer



Solar Dryers: Combined mode; Direct and Indirect Types for Domestic Applications



Natural convection (Thermosyphon) Solar thermal water heating systems



Evacuated tubes forced convection solar water heating system for domestic and industrial applications

SOLAR THERMAL SYSTEM



Spiral Solar water heater



Danjawa 250 litres Solar water Heating System



Community based solar water heater



Killishi Solar Dryer at Kuchi



Parabolic Solar cooker



Solar Dryer at Danjawa Village



Box Type Solar Cooker



Solar Distiller



Concrete Solar Distiller

WIND AND RAIN

2- Solar Photovoltaic technologies



Solar PV mini-grid in a village in Sokoto, Sokoto State



Solar Water Pumping for Students in Sokoto, Sokoto State

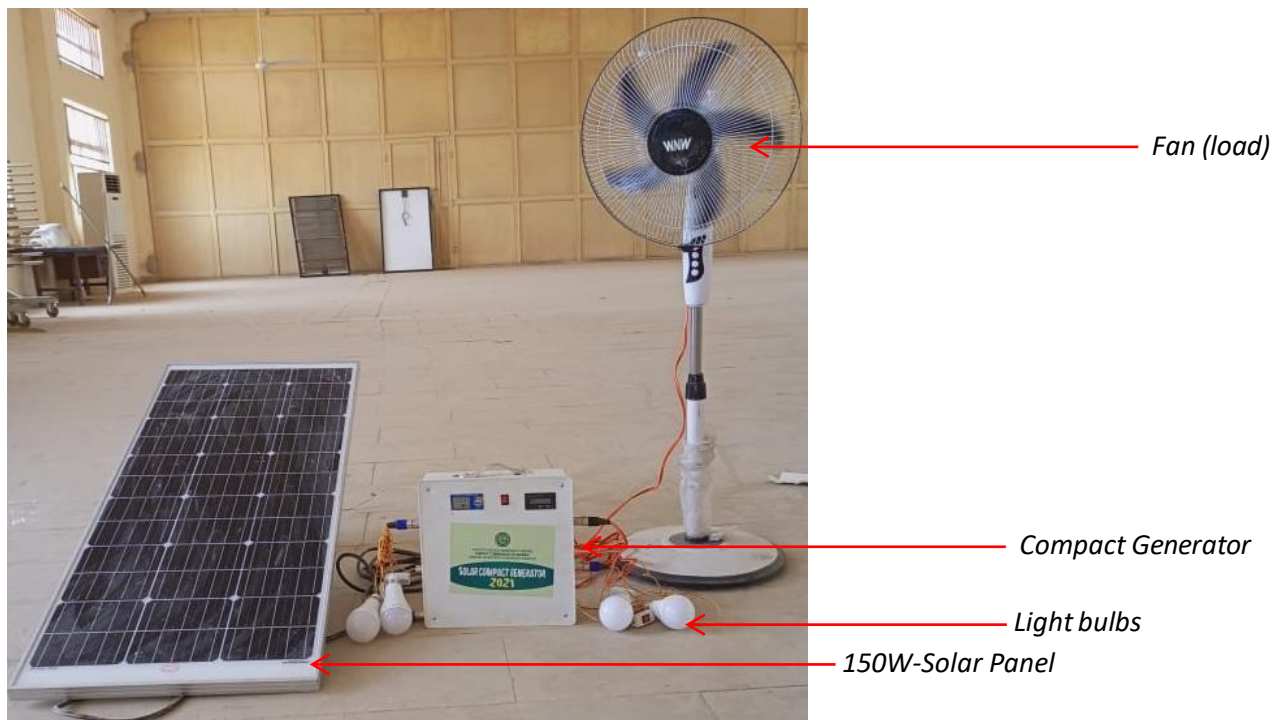


SERC Solar Compact DC Generator



SERC Solar Compact DC/AC Generator

Each of the compact generators can be used for powering of electrical appliances such as lightings, laptop, TV, decoder, fan, other small household appliances.



SERC - DC Solar Compact Generator with loads

3- Biomass energy conversion technologies



Fixed dome Biogas plant



Portable Biogas digester



Double hole Saw – dust stove



Coal Stove



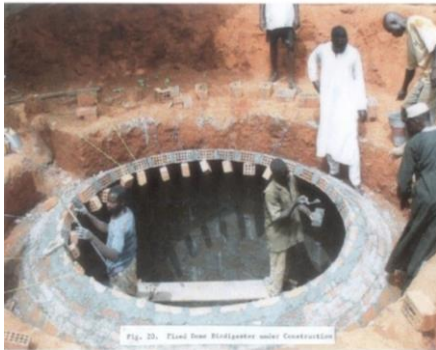
Community based improved wood Stoves



Distribution of improved wood stoves to Danjawa community



Different biogas plants and gas holders



Dome Type Biogas Pilot Plant at Danjawa

Wind Energy Conversion Systems

Construction of the blades



Plate 1a-Raw Pieces of wood



Plate 1b-Raw Pieces of wood being curved into wind turbine plates

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Constructed wind turbine tower



Pumped storage micro hydro power demonstration system and locally fabricated Turbine



SERC CONDUCTS YOUTHS (MALES & FEMALES) TRAININGS IN SOLAR PV SYSTEMS INSTALLATIONS AND CONSTRUCTION OF SOLAR COMPACT GENERATORS



Solar-Powered Evaporative Cooler (Desert Cooler)

Solar Powered Village Electrification (10kW -Standalone Minigrid Pilot Project at ‘Garu Village’



Installations of Solar Modules carried out by SERC Staff in Progress



**Power Distribution from the Solar PV Power House and installations of street lights
“Garu” Village Community**



**Garu Village Completed Array of Solar Modules
Installed by SERC**