



MULTIFUNCTIONAL SOLAR PLATFORM IN BASNÉRÉ

Design and installation

WOMEN'S COOPERATIVE SCOOP PENGWENDE OF BASNÉRÉ

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ABSTRACT

In 2018, the women cooperative in Basnéré benefited from a diesel run multifunctional platform. This project was financed by the African Development Bank (AfDB). After years of usage, the diesel engine stopped working and had completely broken down. The women faced a lot of issues and spent a lot of money on reparations and fuel costs.

They received a subsidy from the Austrian cooperation to hybridize the system with solar panels.

A completed study by FRES Yeelen Ba has estimated the whole investment of the project at **€12,461.84**. The Austrian cooperation has invested 69% of the whole budget, the women 6% and FRES Yeelen Ba was willing to subsidize the remaining 25% of the project. FRES Yeelen Ba also signed a maintenance contract with the women against a monthly fee of €91.60. Maintenance will be done every quarter and include the replacement of equipment like batteries, inverter, fuses, circuit breakers etc.

The system installed by FRES Yeelen Ba is composed of a 9.1 kWp capacity, 4 batteries of 12V 200Ah each, a 10kW hybrid inverter, a speed variator, two three-phase engines for the machines, 8 lampposts, DC and AC protection, etc. The system is replicable and can be upgraded.

The system is designed to run one machine at the time. The woman can work with the machines from 9am to 4pm. In this case, the system can harvest the maximum energy from the sun and charge the battery. Both the lighting and freezer are available 24/7. The freezer is not allowed to run at the same time as the engine. Besides the mentioned appliances, the women now have access to sufficient energy, that can be used for other business opportunities which require electricity.

CONTEXT

The SCOOP Pengwende of Basnéré is a women's cooperative whose objective is the processing of agricultural products. The cooperative, which brings together 78 women, was officially recognized on January 23, 2020. The organization was created in 2016 in the form of a women's village group with the aim of improving the living conditions of women in the village of Basnéré.

The SCOOP has benefited from a new configuration of their multifunctional platform since 2018 which runs on diesel.

INTRODUCTION

While processing maize, sorghum and peanut butter with a diesel run multifunctional platform, the women's cooperative of Basnéré have encountered many difficulties. As a result, due to the breakdown of their diesel engine, the cooperative had been forced to shut down their activities at the beginning of July 2022. Thanks to funding made available by the Austrian Cooperation, the women regained hope and saw an opportunity to resume their economic activities. Using the funds to transform their agro-processing platform to solar would enable the cooperative to remove the many expenses incurred due to the diesel run platform.

This document presents in the first part, an inventory of the multifunctional platform after a first visit on the site. Based on the identified difficulties, FRES Yeelen Ba designed and proposed a solar multifunctional platform. The second part of the document shows, the design phase followed by the installation phase, realized by FRES Yeelen Ba for the hybridization of the multifunctional platform with a solar photovoltaic system.

1 INVENTORY

1.1 Observations

The platform is composed of a 22 HP diesel engine initially sized to power two machines at a time through transmission shafts (Figure 1).



Alternator + Diesel Engine



Drive shaft

Figure 1 : Alternator + Diesel Engine + Drive Shaft

The group of women have 4 types of machines :

- A grinder (mill with 300 mm stone wheels for oilseeds – shea and peanuts);
- A hammer crusher for shea;
- An “Engelber” type huller to remove corn bran and;
- A mill to produce corn flour.



Figure 2 : A Crusher (mill with 300 mm stone wheels for oilseeds – shea and peanut) and a hammer crusher for shea.



Figure 3 : An "Engelber" type huller to remove corn bran and a mill to produce corn flour.

The platform has additional elements such as shea butter kneading machine and a freezer (Figure 4 et Figure 5).



Figure 4 : A shea butter kneading machine



Figure 5 : A freezer



Figure 6 : A shea roaster (run with wood)

A manual pump available on their site provides water for their activities.



Figure 7 : Manual village pump

1.2 Difficulties

- The diesel engine is not capable of running two machines at the same time. It is undersized. Because of this, the women can only work with one machine at a time.
- At the same time, the numerous breakdowns of the diesel engine were increasing. The last operation of the platform has been evaluated at the beginning of July 2022, after which the platform has been completely shut down.
- During the period of operation of the platform, the lighting was not working, and the women were forced to use torches during night work on the platform.
- The freezer has never been used since it was supplied because of the lack of energy.
- The group encountered difficulties when using the manual pump. The villagers would come to take water from this pump for their domestic work. Due to it being the only pump in the village, too many people were making use of this, which unabled the women cooperative to properly make use of the pump. The cooperative had to use the water from this pump to irrigate their crops, which were 5 m away. This has made carrying the buckets of water to irrigate their crops very heavy and painful.

1.3 Results after analysis

After visiting and analyzing system in Basnéré, we noticed an advanced deterioration of the diesel engine. The repair of this engine would cost more than €763.36. However, it would also require constant monitoring by a technician in order to ensure its good functioning. This solution will be very expensive for the group because it includes the costs of the technician's travel which is at least once a week. The cost of motor oil, fuel and accessories would have eventually exhausted their fund received from the Austrian Embassy within a year.

The alternative solution, which would be solarizing their system is of significant importance as it allows them to reduce expenses but increase their income.

Knowing that the machines are working properly, we decided to replace only the energy production system with solar photovoltaics. We added one electric motor in each of the two rooms. The system will also power the freezer, interior and exterior lights, and a set of sockets for charging phones.

2 SIZING AND PROPOSAL

2.1 Sizing

The system size is based on the following assumptions:

- One motor out of two operates for 5 hours;
- Internal lamps are needed for 4 hours (2 hours at night);
- External lamps are needed for all night;
- The freezer is needed for 11 hours (during the day).

The evaluation of the energy requirements is summarized in the table below.

Table 1 : Assessment of energy needs

Hours	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	1	2	3	4	Total	
1 engine of 5500W							5500	5500	5500	5500	5500														27500	
2 Lamps inside												36	36	36	36											144
2 lamps outside	36	36												36	36	36	36	36	36	36	36	36	36	36	36	468
1 Freezer					215	215	215	215	215	215	215	215	215	215	215											2365
Phone charging					14	14	14	14	14	14	14	14	14													126
Energy Consumed	36	36	0	0	229	229	5729	5729	5729	5729	5729	265	265	287	287	36	36	36	36	36	36	36	36	36	36	30603

With these energy requirements, the capacity of the system is estimated to be 9.75kWp.

The energy production throughout the day is greater than the energy consumed.

Table 2 : Energy distribution

Hours	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	1	2	3	4	Total
Energy consumed	36	36	0	0	229	229	5729	5729	5729	5729	5729	265	265	287	287	36	36	36	36	36	36	36	36	36	30603
Energy produced	0	975	1462	1950	3413	5363	6338	6825	7312,5	6825	6337,5	5363	2925	975											56063
Batteries	800	0	0	0	0	0	0	0	0	0	0	0	0	800	800	800	800	800	800	800	800	800	800	800	9 600

The diagram below shows an energy production of the forecast field higher than the energy demand.

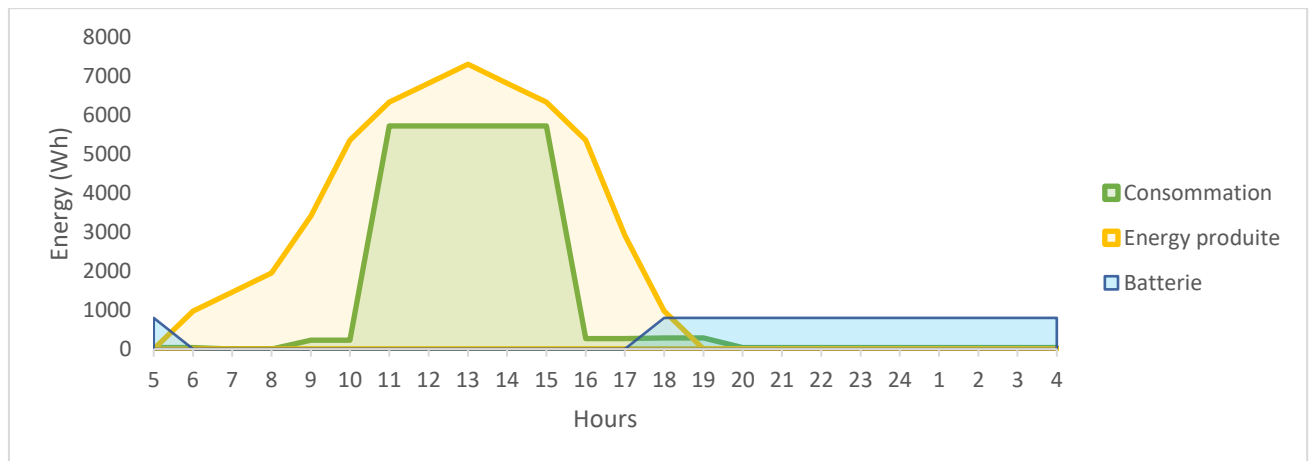


Figure 8 : Energy distribution.

2.2 Proposal

We offer an autonomous system with a hybrid inverter and a 48V battery bank. The illustration of the system is shown in the diagram below.



Figure 9 : Schematic of the system

The diagram below shows the integration of the electric motors in the two rooms to operate the different machines (corn flour, bran remover, shea grinder and shea crusher).

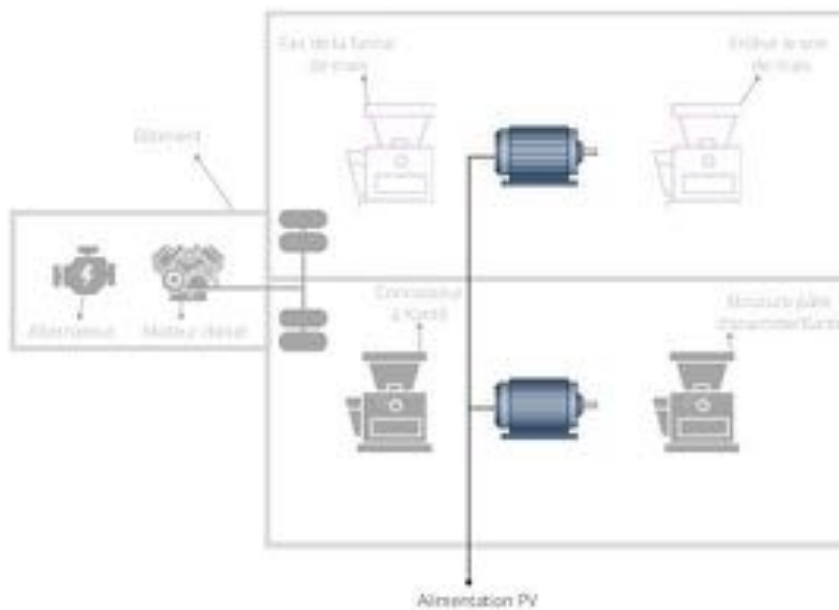


Figure 10 : Integration of electric motor into the existing platform

Advantages of the system:

- The inverter has a solar network or generator input allowing the system to be hybridized.
- The system produces enough energy during the day to carry out other income-generating activities. These are small consumables such as a fan or others. However, the excess energy is not enough to run another electric motor.
- Thanks to the telephone charging bank, women can earn income by charging the villagers for telephone charging. Any other chargeable devices like radios or torches are income opportunities for them.
- The freezer will be able to operate for a minimum of 11 hours or even up to 24 hours with the surplus energy in the batteries. They can sell cold water or ice at any time of the day. Which is another additional income stream.
- Maintenance costs are reduced.
- Follow-up after installation by FRES Yeelen Ba to ensure the proper functioning of the installation and to intervene in time in the event of a problem.

3 QUOTE

The quote of the system is as follows:

Items	Unit	Qty	Unit price	Total price (FCFA)
Mono 325Wp panels	u	28	77000	2156000
MPP Solar 10kVA 3ph hybrid inverter	u	1	2200000	2200000
12V 200Ah battery	u	4	175000	700000
Panel support + civil engineering	ens	28	20000	560000
Battery holder	ens	1	50000	50000
5.5kW asynchronous motor	u	2	140000	280000
Three-phase variable speed drive 11kW 400V 50Hz IP 20	u	1	500000	500000
Panel connection box with fuse and lightning arrester	ens	1	50000	50000
Battery connection box with fuse	ens	1	50000	50000
Three-phase AC box at the output of the inverter with 4P circuit breaker	ens	1	100000	100000
Panel cables - connection box 80m of 2x6mm ²	ens	1	120000	120000
Battery-battery connection box cables 2x35mm ² (10m red and 10m black)	ens	1	80000	80000
AC cables 4x25mm ² inverter output to connection box 25m	ens	20	9500	190000
2x2.5mm ² AC cables from freezer + telephone socket 10m	ens	10	1000	10000
AC cables 2x1.5 lighting outlet 45m	ens	45	700	31500

Items	Unit	Qty	Unit price	Total price (FCFA)
Circuit breaker, Switch with three outputs: Off On 1 and On 2 (1 0 2) other accessories	ens	1	100000	100000
Grounding system, Yellow green cables, copper cable 25mm ² , earth well and coal and cow dung	ens	1	125000	125000
Trunking, clips, screws, spikes	ens	1	60000	60000
Labor (installation + training)	ens	1	800000	600000
Total				8 162 500

Arrested this quote for the sum of : **eight million one hundred sixty-two thousand five hundred (8,162,500) CFA Francs.**

8,162,500 FCFA= 12,461.84 Euros

4 25% CO-FINANCING BY FRES YEELLEN BA

The total budget estimated by FRES Yeelen Ba to solarize the multifunctional platform of SCOOP Pengwendé of Basnére is estimated at **12,461.84 Euros**.

The Austrian cooperation is subsidizing 69% of this budget and the women cooperative is giving 6%, FRES Yeelen Ba is willing to subsidize the remaining 25%.

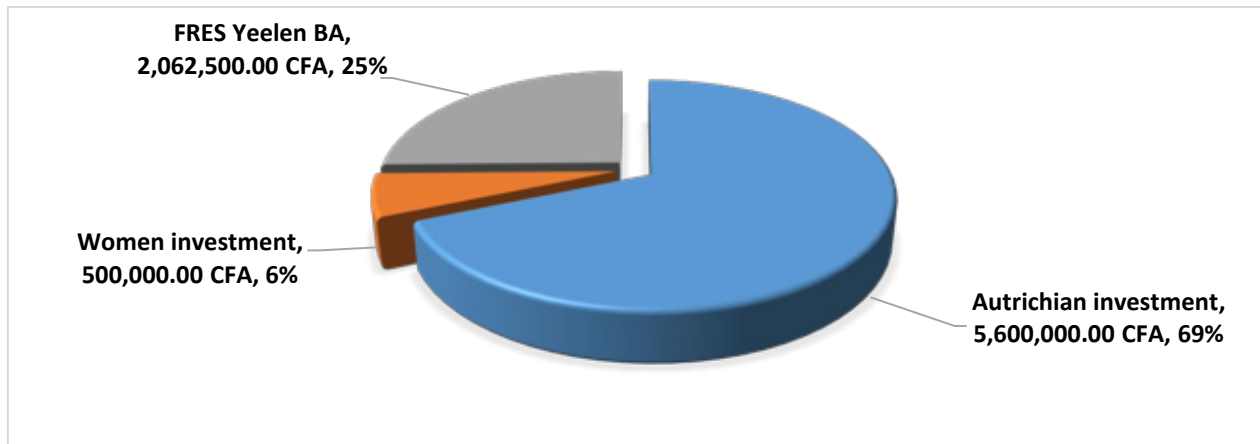


Figure 11: Investment breakdown

The subsidy from FRES Yeelen Ba will allow to buy the remaining equipment consisting of:

- Four 12V 200Ah batteries;
- Panel supports + civil engineering;
- The battery holders;
- Two 5.5kW asynchronous motors;
- A three-phase 11kW 400V 50Hz IP 20 variable speed drive.

5 MAINTENANCE CONTRACT

To make sure the solar system will be working for more than 20 years, FRES Yeelen Ba proposed a maintenance contract to the women cooperative. This enables the women to avoid a repetition of the previous situation, where they were confronted with a diesel engine that was breaking down and where no maintenance was offered by the supplier.

This service offered by FRES Yeelen Ba is charged to the women against a monthly fee of €91.60.

Maintenance, as previously indicated, will consist of:

- Battery charge control;
- Inverter operation check;
- Cleaning and dusting of inverter fans;
- Cleaning of panels;
- Verification of the presence of shade on the panels;
- Control of the quantities of energy produced;
- Verification of the operation of the lighting;
- Control of the operation of the electric motors, the freezer and the load bank of the laptops;
- Checking the continuity of the wiring;
- Test of level of understanding of the mode of operation by women.

Maintenance also includes carrying out minor repairs and/or replacements, namely:

- Replacement of lamps in the event of breakdowns;
- Repair of the inverter or variable speed drive in the event of breakdowns;
- Change of fuses or circuit breaker in case of non-operation;
- The batteries are replaced by other batteries from FRES Yeelen Ba in the event of a major loss of capacity in compliance with the operating periods.

In the final contract proposed and signed by both parties on the 21st of September 2022, FRES Yeelen Ba is committed to:

- Carry out preventive and curative maintenance every three months;
- Intervene on the solar system in the event of a breakdown before the quarterly changeover;
- Replace all the solar equipment in case of failure. This includes:
 - the batteries every 5 years;
 - the inverter every 8 years;
 - and others solar equipment.

For more details on the contract, please read [Appendix 6](#).

6 PLANNING OF ACTIVITIES

The planning of the different activities is presented in the table below.

Table 3 : Planning of the activities

	Week 1					Week 2				
	M	T	W	T	F	M	T	W	T	F
Commissioning										
Solar panels/batteries/inverter										
Cables/AC and DC box/ Panels support										
Speed variator/engines etc.										
Installation phase										
Site preparation and equipment deployment										
Civil works/installation of engines										
Installation of solar panels installation										
Inverter/batteries/AC and DC boxes etc.										
Grounding, wiring										
Test and training										
Giving the installation to the women										

7 COMMISSIONING

The solar panels were purchased from **Felicity Solar**, a local provider of solar equipment based in Ouagadougou, Burkina Faso.

Loading the vehicle (see image below).



Figure 12 : 28 Solar panels + 4 x 12 200Ah batteries + inverter



Figure 13 : Solar panels structures + cables + accessories

8 INSTALLATION PHASE

8.1 Installation of the photovoltaic solar field

The photovoltaic solar system is about 9.1kWp. This capacity can occupy a surface of 54.3 m² on the ground. The initial plan was to put the solar panels on the roof of the building, but with spacing the surface of the roof turned out to be quite small. We have considered a variety of configurations but in all cases the result was the same, the panels could not fit on the roof. That is why we decided to switch to a ground structure system. A ground structure is even better as it enables the women to easily clean the solar panels. Another constraint was that the roof was not strong enough in certain areas, which may cause more damage in the future. By using a ground structure this is also prevented.

The ground system structure is made of a heavy iron (IPN80) and square tube of 25 mm². The iron is cut, painted, soldered together and then fixed in the ground. Each structure is done in a certain way so that the panels face the south with a tilt angle equal to 12°C (Figure 14).



Figure 14 : Soldering the solar panels structures.

Each crosspiece has a total length of about 5.3 m. They are soldered together (Figure 15) to have a minimum length of 14 m which is the total length of panels put together in a row. The crosspieces are also drilled to receive the screws and bolts for fixing the panels.



Figure 15 : Drilling the iron tube (crosspieces)

The crosspieces are soldered on the base frame and the solar panels are put on top (Figure 16).



Figure 16 : Soldering the crosspieces

The solar panels are then connected into series. We have two rows of 14 panels in series. This connection is possible thanks to MC4. The male MC4 (+) is connected to the female MC4 (-) of the next solar panels. Connection is done at the back of the panels and the cables are regrouped and attached with a **Colson necklace**.

Connecting panels in series



Colson Necklace



MC4 male and female



8.2 Installation of the main part of the system

8.2.1 Inverter

The solar inverter is a 10kW hybrid system. This inverter takes DC energy from the solar panels and converts into AC useful energy to power the different equipment.



The inverter receives as input solar panels and AC grid entry input (see picture below). As there is no grid in Basnéré there is no possibility for hybridization. In case the grid comes to Basnéré, the system can be hybridized by simply connecting the **AC Grid** port to the grid. We harvest AC energy at the output which passes through 6mm² cables and 32A circuit breakers to power the lighting in the building, the freezer and the engines.



Figure 17 : Bottom view of the inverter

8.2.2 Batteries

A total of 4 batteries of 12 V 200Ah were installed. This is a 9.6 kWh battery bank with 4.8 kWh usable capacity. The battery bank is protected by a circuit breaker of 200Amps.



Figure 18 : Batteries + protection

8.2.3 Protections

The different AC powered equipments are protected with AC circuit breakers of 32A and 25A. Fuses are installed to protect the panels (DC circuit). Two DC power surge protectors were installed to protect the system against lightning.



Figure 19 : System protection equipment

8.3 Installation of the speed variator

The speed variator is an equipment installed to peak shave the engine demanded. It helps start the engine at slow speed, thus small current, and protects the inverter.

This is a 11kW speed variator capable to power up to 11kW motor. The speed variator is setup to a specific frequency, voltage, and rotation per minute for it to command the different engines.



Figure 20 : Speed variator 11 kW 400V 50Hz IP 20

8.4 Installation of the engines

A total of two engines were installed to drive the different machines of the cooperative.

In the picture below a 5.5 kW engine was installed to power the peanut butter machine at the left side. This engine can reach 1440 rotation per minute (1440 rpm). With a voucher the different shafts of the engine and the machine are connected. The manual inverter works as a switch and can either power or stop the engine.



Figure 21 : First engine at the right-side powering peanut butter machine

The picture below shows us two different machines and a 5.5 kW engine in the middle. The machine at the right side is the maize de-husker. Its job is to remove corn bran. When the bran has been removed, the maize is carried to the second machine at the right side so that it can be grinded into powder. Yes, it is the milling machine.

This engine can also reach 1440 rotations per minute. It is also either powered or switched of with the manual inverter.



Figure 22 : The second engine in the middle powering either the dehusker of maize at its right or the maize milling machine at its left

8.5 Grounding

A system of grounding was put into place to protect the whole installation. The grounding protects the solar panels, the inverter, lighting, freezer, and other equipments from lightning.

The grounding is done by digging a 2.5m depth hole with 1 meter as diameter. A ground rod is inserted at the bottom of the hole and is connected to a copper wire which is connected outside to the earthing bar. The hole is then filled with cow dung, sawdust, charcoal, and sand.



Figure 23 : Grounding steps

8.6 Lightings

A total of 8 LED lamps were installed, 3 outside and 5 inside.



Figure 24 : Lighting

8.7 Fence

The fence was installed to help protect the panels from kids and animals climbing on top of it. It is about 48m in length and 1.5m in height. There is a door at the front which allows the women to access the panels, when it is time to clean them.



Figure 25 : Fencing

9 TESTING

Some tests were done to make sure that the installation works and if everything is safe.

Verifications	State
First step, verify if there is no short-circuit in the cabling, from solar panel cables to the output of the inverter.	OK
Verify the energy production from the solar panels.	OK
Verify if the batteries are charging	OK
Verify if the lamps are working	OK
Verify if the freezer is working	OK
Verify if the different sockets are working	OK
Verify if the speed variator is powered	OK
Verify if the two engines are working	OK
Verify the different peaks	OK
Grind some maize, groundnuts and see if it is working	OK

9.1 Lights are working



Figure 26 : Inside lighting

9.2 Freezer is working

After plugging it into the socket, it starts working.



Figure 27 : Powering the freezer

9.3 Engines

We initially tested the peanut butter machines



Figure 28 : Engine running the peanut butter machines



Figure 29 : Introducing groundnut into the machine



Peanut butter with a big smile



Milling maize



Figure 30 : Peanut butter and milling maize

10 TRAINING

A special training was given to the women on how to start and stop the engines and working periods of the equipment.

The working period of the different equipments are presented in the table below.

From 9am to 4pm, the women are allowed to work with the machines. This is 7 hours available for the women to use it to grain their maize or groundnuts. At this period, we have the maximum of sunlight. The system is designed to work in the daytime. Also, the two engines are not allowed to work at the same time. Only one engine at the time. That means that if they are de-husking or milling maize, they cannot make peanut butter and vice versa, only one at the time. Also, the freezer is not allowed to work while the engines are working. Lighting is available 24/7.

Table 4 : Working period of the different equipment

Hours	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	1	2	3	4	
Milling/dehusk maize																									
Peanut butter																									
Freezer																									
Lighting																									

The pictures below show the women listening to the instructions in the training. All questions were answered and detailed explanations were given.



Figure 31 : Some pictures while giving training

In the training, we also ask a local miller from another village to teach women on how to use the machines.

In the pictures below, you can see the miller showing the women how grinding and milling is done.



Grinding



Milling

Figure 32 : Miller showing women how to easily grind peanut and mill corn

CONCLUSION

Thanks to the Austrian cooperation and FRES Yeelen Ba, the project was made possible. FRES Yeelen Ba installed a system that is replicable, that can be upgraded and which is easy to maintain.

With this new solar multifunctional platform, women can grind peanuts, shea nuts, condiment and mill some cereals. This without spending any dollars on fuel and repair costs. From now on, they can focus on their core activities which are agro-processing and producing soubala, shea butter, juice, soap etc.

APPENDIX

Appendix 1 : All in one hybrid inverter 10 kW : datasheet..... II

Appendix 2 : Three phase motor.....III

Appendix 3 : Solar panels..... IV

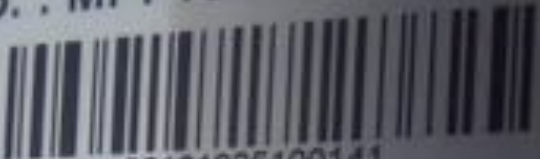
Appendix 4 : Family pictures..... V

Appendix 5 : Cables + lamps + accessories VI

Appendix 6 : Maintenance contract VII







Appendix 1 : All in one hybrid inverter 10 kW : datasheet

Model No. : MPI 10K

Serial No. : 
96161905100141

PV INPUT	Nominal operating voltage 720Vdc
	Vmax PV 900Vdc
	PV input voltage range 300-900Vdc
	Isc PV 2*18.6A
	MPPT voltage range 400 ~ 800Vdc
GRID/AC OUTPUT	Nominal operating voltage 3/N/PE, 230/400 Vac
	Nominal output current 14.5A per phase
	Nominal operating frequency 50Hz
	Maximum power 10000W
	Power factor range 0.9 lead-0.9lag
AC INPUT	Nominal operating voltage 3/N/PE, 230/400 Vac
	Maximum input current 40A per phase
	Nominal operating frequency 50Hz
BATTERY	Battery voltage range 42~56Vdc
	Maximum battery current 275A

Ambient temperature -10~+55°C
Enclosure IP 20
Safety class I

CE

RoHS Compliant

Appendix 2 : Three phase motor



Appendix 3 : Solar panels



Appendix 4 : Family pictures



Appendix 5 : Cables + lamps + accessories



Appendix 6 : Maintenance contract

**CONTRAT DE FOURNITURE, D'INSTALLATION ET DE MAINTENANCE
D'UNE PLATEFORME MULTIFONCTIONNELLE (PTFM) SOLAIRE POUR
LE SCOOP PENGWENDE DE BASNERE**

N° CONTRAT	CONTRAT N° SSD/FRES-YB/22/010
OBJET	HYBRIDATION DE LA PLATEFORME MULTIFONCTIONNELLE DE LA SCOOP-PA PENGWENDE DE BASNERE DANS LA COMMUNE DE BAKATA/ZIRO.
MONTANT DU CONTRAT	Huit millions cent soixante-deux mille cinq cents (8 162 500 FCFA) Francs CFA soit € 12 462
DEMANDEUR	SCOOP-PA PENGWENDE DE BASNERE scop@basnere.org Tel. (+226) 57499215
FOURNISSEUR	SSD-FRES-YELENBA S.A Orodara - BP- 57 TEL. (+226) 20 99 57 55 / (+226) 75 74 06 65
FINANCEMENT	COOPERATION AUTRICHIENNE, FRES-NL, FRES-YELENBA et le SCOOP-PA PENGWENDE DE BASNERE
DELAI D'EXUCUTION	4 semaines

Société des Services Décentralisés « SSD-FRES-YELENBA S. A » sise à Orodara dans la province du Kénédougou ; Burkina Faso BP 57
TEL : (+226) 20 99 57 55
CEL : (+226) 75 74 06 65 / 71 72 78 94

Représentée par Monsieur **KEITA Bourama**, lequel agissant en qualité de son **Directeur Général**

Ci-après dénommée « Le Fournisseur »

D'une part

Et

SCOOP-PA PENGWENDE DE BASNERE.

Représentée par **SAKANDE Azeta** agissant en qualité de **Présidente**

Ci-après dénommée « Le Client »

D'autre part

Pour les fins du présent contrat, le Fournisseur et le Client seront désignés collectivement comme « les parties » et individuellement « la partie »

Il a été convenu et arrêté ce qui suit :

Partie 1 : Exécution des travaux

Article 1 : Objet du contrat

Le présent contrat a pour objet, l'hybridation de la plateforme multifonctionnelle de la SCOOP PA-PENGWENDE de BASNERE dans la commune de BAKATA/DIRO

Article 2 : Composition de la commande

Le présent contrat porte sur :

2.1 : Le matériel décomposé comme suit :

- **Financement coopération autrichienne et apport SCOOP PA-PENGWENDE DE BASNERE**
 - Panneaux de 325Wc mono ;
 - Onduleur hybride MPP Solar 10kVA 3ph ;
 - Coffret de branchement panneau avec fusible et parafoudre
 - Coffret de branchement batterie avec fusible ;
 - Coffret AC triphasé à la sortie de l'onduleur avec disjoncteur 4P ;
 - Câbles panneaux - coffret de branchement 80m de 2x6mm² ;
 - Câbles coffret branchement batterie- batteries 2x35mm² 10m rouge et 10m noir) ;
 - Câbles AC 4x25mm² sortie onduleur au coffret de branchement 25m ;
 - Câbles AC 2x2,5mm² départ congélateur + prise téléphones 10m ;
 - Câbles AC 2x1,5mm² départ éclairage 45m ;
 - Disjoncteur, Commutateur à trois sorties : Arrêt Marche 1 et Marche 2 (1 0 2) autres accessoires ;
 - Système de mise à la terre, Câbles jaune vert, câble nu 25mm², Cuivre nu, puit de terre et charbon et bouse de vache ;
 - Goulottes, attaches, vis, pointes ;
- **Don de FRES/YEELNBA**
 - Batterie 12V 200Ah ;

- Support panneaux +Génie civil ;
- Support batteries ;
- Moteur asynchrone de 5.5kW ;
- Variateur de vitesse triphasé 11kW 400V 50Hz IP 20.

Article 3 : Réglementation et pièces contractuelles

3.1. La réglementation applicable au présent contrat est celle en vigueur au Burkina Faso, en matière de vente et de prestation de service.

3.2. Les pièces contractuelles sont dans l'ordre des priorités d'application :

1. Le Présent contrat
2. Le Devis détaillé

Article 4 : Délai d'exécution

Le délai d'exécution du présent contrat est de (04) semaines à compter du paiement de l'avance de démarrage.

Article 5 : Montant et Conditions de paiement

5.1. La présente convention a été consentie et acceptée moyennant la somme de : **Huit millions cent soixante-deux mille cinq cents (8 162 500 FCFA) Francs CFA.**

5.2. Ce coût représente la fourniture et l'installation du système solaire photovoltaïque de 9,1 kWc.

5.3. Le paiement au titre des prestations sera effectué en FCFA selon les modalités suivantes :

5.3.1. Soixante-quinze (75%) pour cent à la signature du présent contrat et fonds de démarrage,

5.3.2 Vingt-cinq (25%) pour cent est accordé comme subvention par la FRES NL (actionnaire principale de la FRES BURKINA FASO). Cette subvention est conditionnée au paiement mensuel et régulier des frais de maintenance pendant une durée de 3ans minimum.

Article 6 : Mode de paiement

Le paiement sera effectué par chèque émis ou virement bancaire à l'ordre de SSD-FRES-YELENBA S. A

Article 7 : Conditions de réception et délai de garantie

La réception définitive sera effectuée par les représentants de SCOOP-PA PENGDWENDE de BASNERE et de SSD FRES YELEN BA.

Les éléments de vérification de cette commission ci-dessus citée seront qualitatifs et quantitatifs conformément aux spécifications.

Article 8 : Obligation du fournisseur et du client

Le fournisseur s'engage à :

- Livrer le matériel de très bonne qualité selon les spécifications de la facture proforma ;
- Respecter les clauses du présent contrat
- Observer la discrétion sur l'opération, objet du présent contrat ;
- Remettre au client, l'ouvrage utilisable dans les délais prévus à la convention
- Procéder à la pose et la mise en services des équipements en professionnel avisé

Le client s'engage à :

- Payer le prix et modalités convenues,
- Faciliter l'accès des lieux au fournisseur ou toute personne ou groupe de personnes désigné par lui,

Article 9 : Règlement des litiges et droit applicable

Le présent contrat est régi par la législation en vigueur au Burkina Faso.

Tout litige, susceptible de s'élever entre les parties, à propos de la formation, de l'exécution ou de l'interprétation du présent contrat, qui n'aura pas été réglé à l'amiable dans un délai d'un (01) mois, sera tranché définitivement par voie d'arbitrage suivant le règlement d'arbitrage du centre d'arbitrage, de médiation et de conciliation de Ouagadougou (CAMC-C) par trois (03) arbitres nommés conformément à ce règlement.

L'arbitrage aura lieu à Ouagadougou. La langue de l'arbitrage sera le français

Article 10 : Modification du contrat

Les termes du présent contrat ne peuvent être modifiés que d'accord-parties par voie d'avenant dûment signé.

Article 11 : Election de domicile

Les parties font élections de domicile :

- Pour SCOOP-PA PENGDWENDE de BASSERI, l'adresse de son siège dans la commune de BAKATA/ZIRO ;
- Pour SSD-FRES-YELENBA S.A à l'adresse du lieu de son siège social.

Partie 2 : suivi et partenariat

Le présent contrat a pour objet d'appuyer la plateforme multifonctionnelle du groupement SC'COOP PA-Pengwende de Bostere afin de faciliter l'exécution de sa mission.

Article 12 : Remplacement et Maintenance

Le fournisseur s'engage à :

- Réaliser une maintenance préventive et curative tous les 3 mois ;
- Intervenir en cas de panne avant le passage trimestriel ;
- Remplacer tous les composants solaires dont
 - o les batteries tous les cinq ans ;
 - o l'onduleur chaque 8 ans ;
 - o et tout autre composants solaires.

Article 13 : Frais de maintenance

Les frais de maintenance s'élèvent à 60 000 FCTA payable 1 fois par mois à compter du 1er janvier 2023.

Procédure de paiement Orange money : *144*4*7*9187762#

Article 14 : Durée du contrat

Ce contrat est valable pour une durée de 3 ans par tacite et reconduction.

Article 15 : Entrée en vigueur et expiration

Le présent contrat entre en vigueur dès la date de sa signature par les deux parties et expire aux termes de la période spécifiée à l'Article 15.

Article 16 : Rupture du contrat

Le présent contrat sera résilié en cas de non-paiement des frais mensuels relatif aux remplacements et à maintenance du système solaire pendant la durée du contrat mentionné à l'Article 15.

Fait à Ouagadougou, le ... 21/09/2022

Deux (02) exemplaires originaux

Pour SCOOP-PA PENGDWENDE de BASNERE

(Signature précédée de la mention
manuscrite « lu et approuvé »)



SAKANDE Azeta

Pour SSD-FRES-YELENBA S.A

(Signature précédée de la mention
manuscrite « lu et approuvé »)



M. KEITA Bourama



ANNEXES

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Description	Unité	Qté	Prix unitaire	Prix Total
Panneaux de 325Wc mono	u	28	77000	2156000
Onduleur hybrid MPP Solar 10kVA 3ph	u	1	2200000	2200000
Batterie 12V 200Ah	u	4	175000	700000
Support panneaux +Génie civil	ens	28	20000	560000
Support batteries	ens	1	50000	50000
Moteur asynchrone de 5,5kW	u	2	140000	280000
Variateur de vitesse triphasé 11kW 400V 50Hz IP 20	u	1	500000	500000
Coffret de branchement panneau avec fusible et parafoudre	ens	1	50000	50000
Coffret de branchement batterie avec fusible	ens	1	50000	50000
Coffret AC triphasé à la sortie de l'onduleur avec disjoncteur 4P	ens	1	100000	100000
Câbles panneaux - coffret de branchement 80m de 2x6mm ²	ens	1	120000	120000
Câbles coffret branchement batterie- batteries 2x35mm ² 10m rouge et 10m noir	ens	1	80000	80000
Câbles AC 4x25mm ² sortie onduleur au coffret de branchement 25m	ens	20	9500	190000
Câbles AC 2x2,5mm ² départ congélateur + prise téléphones 10m	ens	10	1000	10000
Câbles AC 2x1,5 départ éclairage 45m	ens	45	700	31500
Disjoncteur, Commutateur à trois sorties : Arrêt Marche 1 et Marche 2 (1 0 2) autres accessoires	ens	1	100000	100000
Système de mise à la terre, Câbles Jaune vert câble nu 25mm ² , Cuivre nu, puit de terre et charbon et bouse de vache	ens	1	125000	125000
Goulottes, attaches, vis, pointes	ens	1	60000	60000
Main d'œuvre (installation + formation)	ens	1	800000	600000
Total				8 162 500

