



Netherlands Enterprise Agency



# Feasibility of local sales of CNSL for fuel to boost competitiveness of cashew processors



21/07/2022



# Actual CNSL market

- High petrol price : 100 USD/barel
- Prix CNSL à l'export : 400 to 450 USD/MT FOB Abidjan → + 100 USD/MT in 2 years  
~200 FCFA/kg

→ Interesting to develop a local market  
intéressant de développer un marché local qui sera plus stable et plus rentable pour les transformateurs de CNSL

A titre de comparaison en IVC :  
Stable

- Gasoil 615 FCFA/l
- DDO 562 FCFA/l
- HFO 459 FCFA/l

# T-CNSL Lab analyses

- Humidity (%) <1%
- Density (g/cm<sup>3</sup>) 0,95 à 0,97
- Ash rate (%) <1%
- Acidity (KOH mg per g of CNSL)
- Viscosity (cSt) < 525 cSt

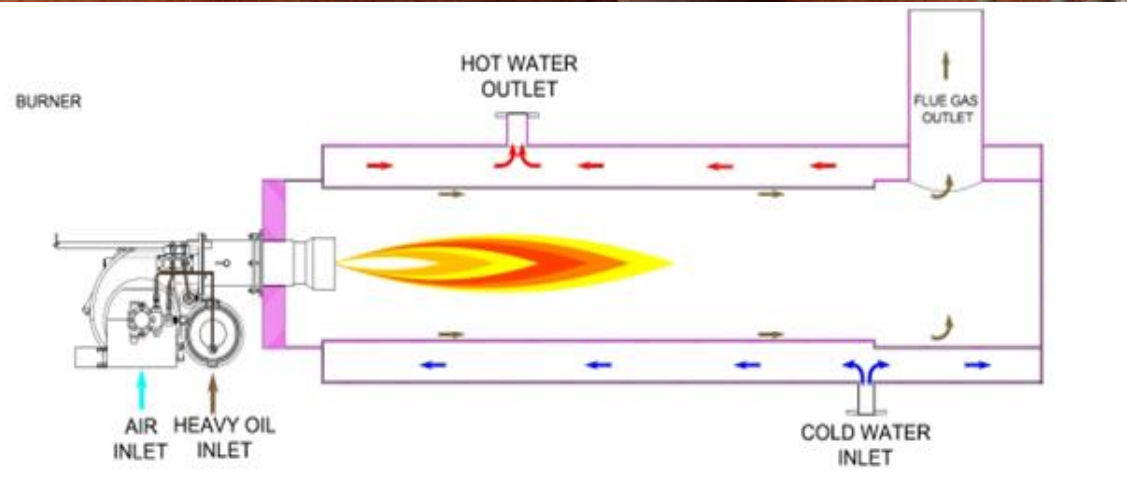
Adapted protocols to ease local analysis



# Test platform



- Tank
- Oven
- Chimney
- Smoke analysing equipment



# Burner ECOSTAR EC020SC1



Price : 600€ EXW  
4x more with spares, transport and custom

## Including :

- Parametring screen
- Preheater
- High pressure pump
- Blower
- Security systems
- Automatic start





# Local burners



Kabore burner (IVC)



Nakou burner (BF)



# Combustion tests



**Target values smoke analysis :**

CO = mini

CO<sub>2</sub> = 8 – 12%

O<sub>2</sub> = 9% max

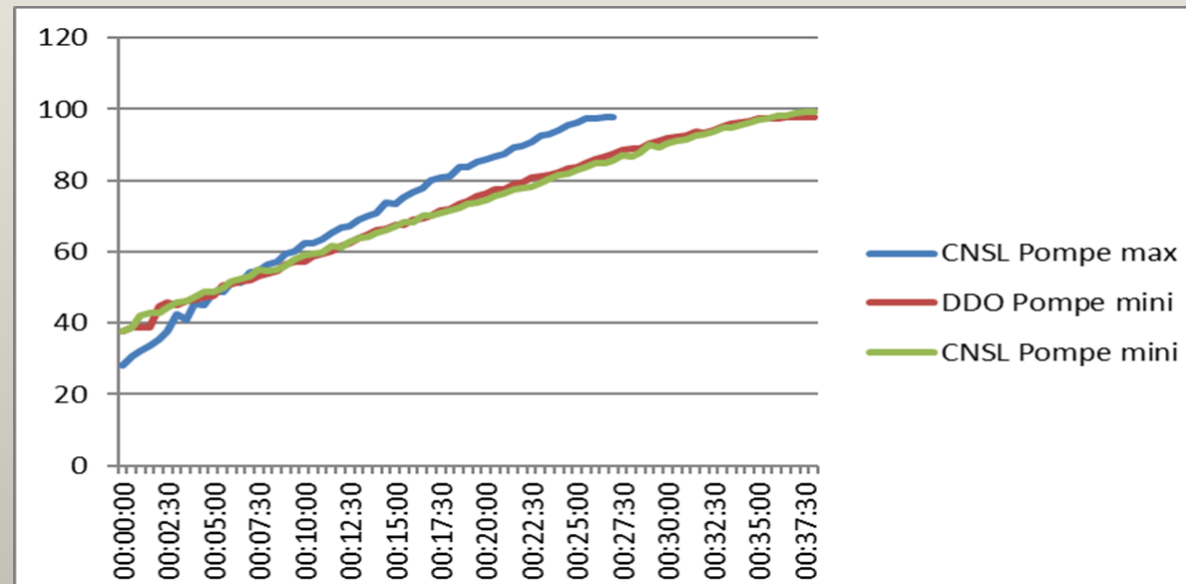
X<sub>air</sub> = 20 – 50%

Eff = > 60%



# Combustion tests

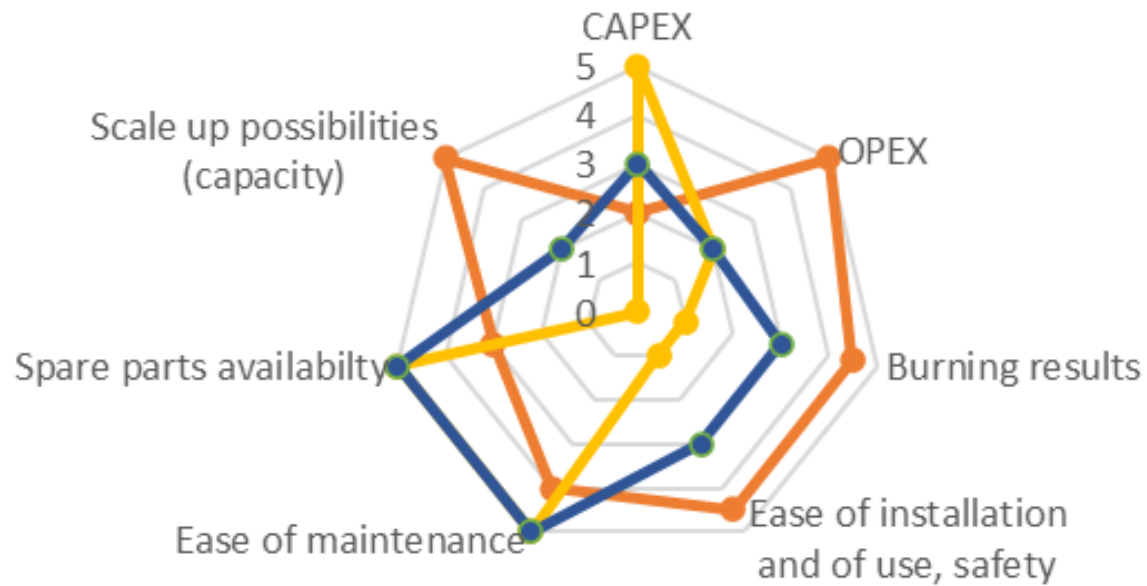
Puissance	Rapport air primaire / air secondaire	Ventilation	CO (ppm)	%CO2	%O2	%Xair	%Eff
Max	Min	3,5	8 940	14,5	1,9	10	71
		4	3 395	10,2	7	50	58,6
	Max	4	1 714	8,4	9,6	84	49,7
		3,5	8 870	5,9	12,8	158	32,4
	Intermédiaire	4	1 301	5,8	13,1	167	25,7
		5	156	4,8	14,1	207	14,3
Mini	Min	2,5	3 053	3,7	15,9	317	16,8
		3	751	1,5	18,8	895	-105
	Max	0,5	8 706	10,8	5,5	35	75,2
		1,5	8 503	12,7	4	23	74,8
		2	3 892	12,2	4,7	29	71,9
	Intermédiaire	2	8 429	11,2	5,8	38	72,5
		2,5	5 957	8,6	9,5	83	65,6
		3	4 532	7,7	10,5	100	61,4



# Results on the burners

Notes of each burner

—●— Ecostar ECO2OSC1    
 —●— Nakou local burner    
 —●— Kabore local burner



Smallest model of the serie → 360  
 litres/day (~700 kg of shells)  
 Available up to 7 times more powerfull

# On-site test of ECOSTAR burner

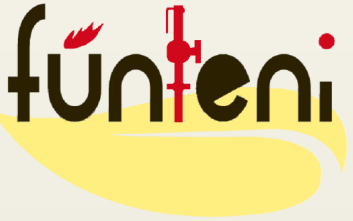


Cashew  
factory  
boiler



Bakery oven



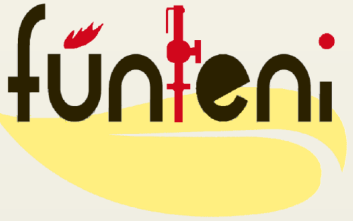


Next phase planification



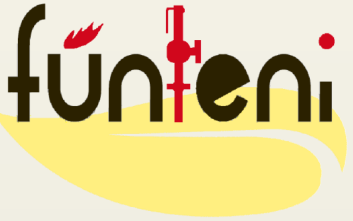
## Next phase

- 1. Installation, training and follow-up of a new burner at Pharmivoire (or other) to use only CNSL**
- 2. Installation of our burner at a bakery or small factory for a short time to show and prove it is working.**
- 3. Advise and help to Novarea on how to deliver CNSL to clients**
- 4. Advise and help Novarea on how to improve their process**
- 5. Advise and help Novarea on how to find clients for their cashew shell cake**
- 6. Train Novarea on CNSL laboratory analysis**
- 7. More research at factories/bakeries and writing the business case for the interesting ones with technical and financial proposal.**



# Pharmivoire case

Prix gasoil (FCFA/l)		615		Prix du gasoil (FCFA/kg)		724		450							
Cout d'achat du bruleur et de la modification de l'installation				Caractéristiques du bruleur					Surcoûts électriques		Economies combustible				
Prix bruleur EXW (FCFA)	Prix bruleur livré + pièces de rechange (FCFA)	Prix modification installation (FCFA)	Prix installation total (FCFA)	Capacité min (kW)	Capacité max (kW)	Consommation fioul min (l/h)	Consommation fioul max (l/h)	Puissance électrique (kW)	Difference consommation électrique (kWh/j)	Diff elec consu (FCFA/j)	Consommation journalière Gasoil (l/j)	Consommation journalière CNSL (+25%) (l/j)	Economies combustible par jour (FCFA/j)	Marge de 20%	Retour sur investissement (jours de travail)
1 487 710	5 950 842	2 000 000	7 950 842	449	2 469	40	220	15	94	9 360	1 500	1 875	241 544	193 235	43



# Contacts



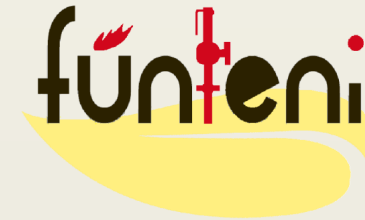
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