

ECOWAS Solar Thermal Energy  
Capacity Building and  
Demonstration Programme  
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Verde



# Experiences, challenges and barriers on solar thermal energy in ZiE and Burkina Faso

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# Solar thermal energy situation in Burkina Faso



Cooling (2iE)  
Vaccine/Food conservation  
(2 research institutes + 1 hospital)



Hot water

DHW (bath, dishes cleaning)  
Health infrastructures/ Maternities  
Hotels (not common)  
Indigeneous industries (e.g. shea butter production)

Sorption refrigeration

Water pasteurization



Solar drying

Fruits drying (mango, banana, ananas, etc.)  
Crops/roots drying

Solar cooking

Domestic use  
4 solar-powered kiosks



# Solar thermal equipment in Burkina Faso: an idea of prices and economics

Systems	F CFA	€
Hot water system, 100 litres, 50 – 70 °C, Actualité Énergie	200 000	300
Hot water system, 200 litres, CEAS, HX in the tank, life expectancy = 7 years	600 000	900
Hot water system, 200 litres, 50 – 70 °C, Actualité Énergie	360 000	550
Cooker, classical parabola, life expectancy = 5 years	65 000	100
Dryer, eq. mango 7 kg·day <sup>-1</sup> , Actualité Énergie	35 000	55
Water pasteurizator, 22 l·hour <sup>-1</sup> , Actualité Énergie	20 0000	30

Rough evaluating of paying back time	
Volume	200 l
Initial temperature	30 °C
Final temperature	65 °C
Cost of the solar system	600 000 F CFA (900 €)
Cost of the electrical heater	80 000 F CFA (122 €)
Cost of electricity	100 F CFA·kWh <sup>-1</sup> (0,15 €·kWh <sup>-1</sup> )
Utilisation factor	0,6
Annual electricity bill	237 331 F CFA (362 €)
Paying back time *	2,9 years

- *This is a rough estimating and gives only an idea.*
- *The positive impact on the environment has been ignored.*



# Solar thermal equipments in Burkina Faso: stakeholders

- **Local production :**

Actualité Énergie: hot water, cookers, dryers, distillators, solar kiosks

ISOMET : cookers, installing flat collectors, etc.

Groupement NAM: cookers

- **Imports:** large part of solar collectors from China, Dubai, etc.

Trends: evacuated tubes without local possibility of maintenance

- **Training in solar thermal:** CEAS (Centre Écologique Albert Schweizer), 2iE

- **Research and Development**

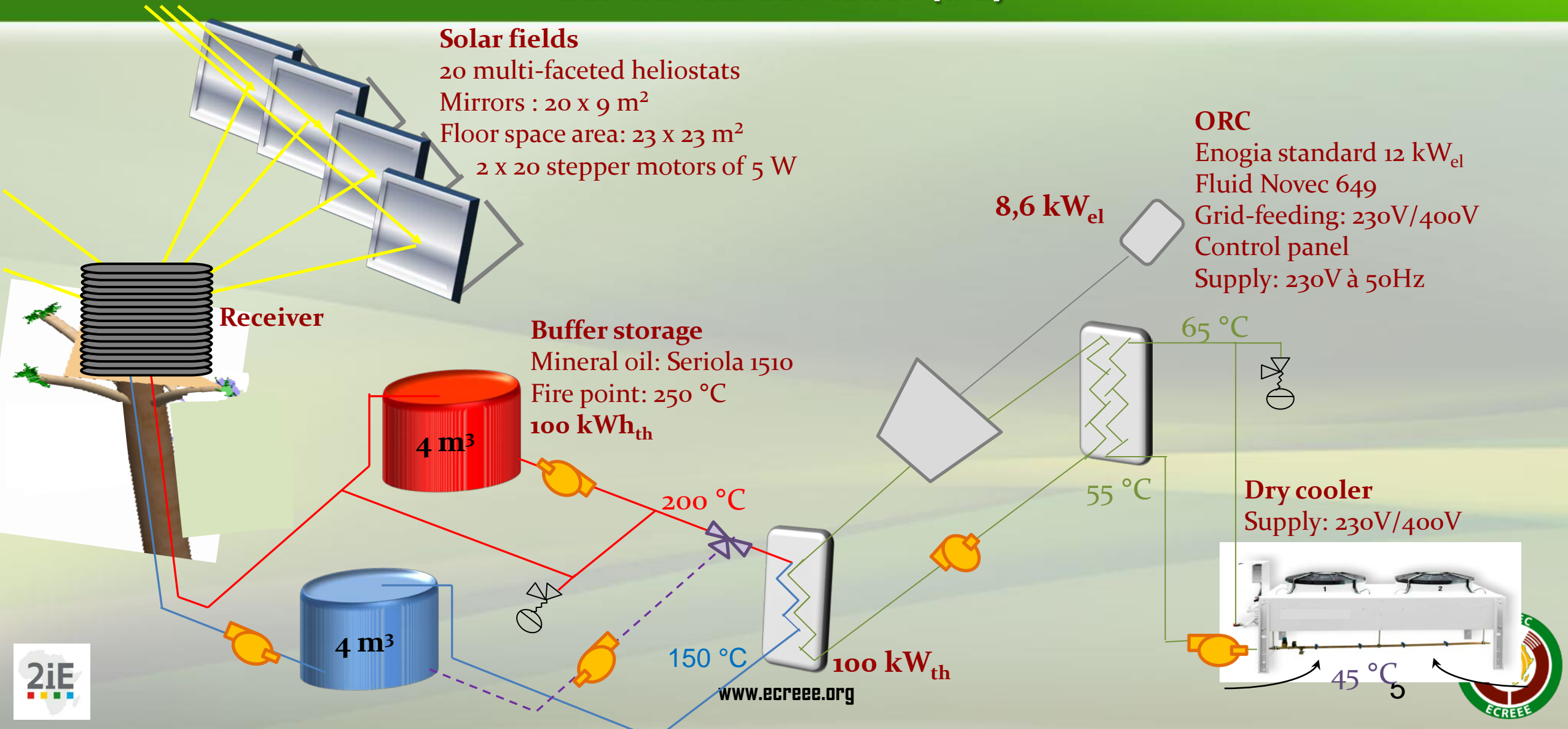


- **Government:** Art. 29 of the Finance Act n° 051-2012/AN: duties free imports and VAT exemption for solar equipment



# Experiences of 2iE concerning solar thermal energy

## CSP4Africa: CSP tower (1/2)



# Experiences of 2iE concerning solar thermal energy

## CSP4Africa: CSP tower (2/2)



### Heliostat built at 2iE

- Human scale heliostats: easier to be manufactured and handled (mirrors:  $9 \times 1 \text{ m}^2$ )
- Common mirrors: low-cost and locally available and acceptable reflectivity



### Locally manufactured solar receiver

[www.ecreee.org](http://www.ecreee.org)

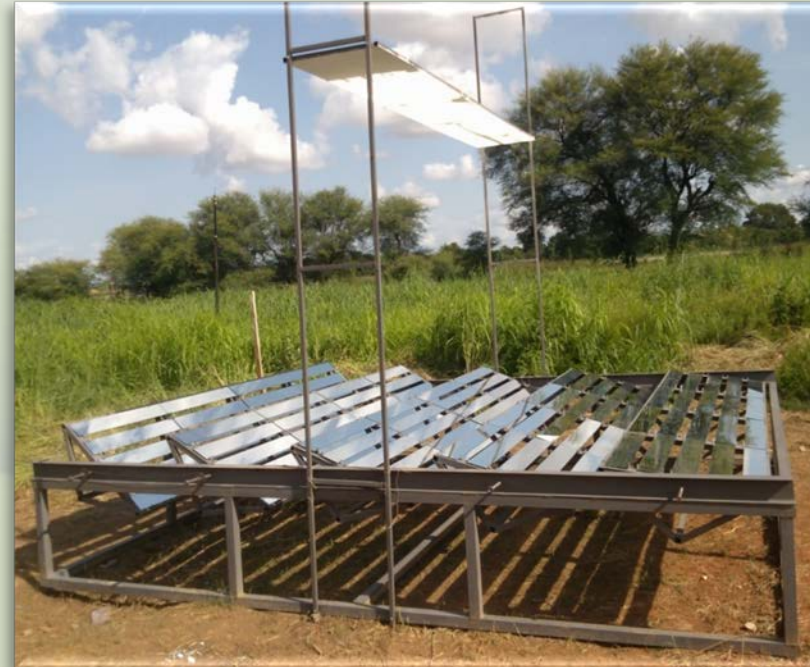


### CSP tests platform at 2iE



# Experiences of ZiE concerning solar thermal energy

## CoLiFre: linear Fresnel concentrator



**Solar irradiation data  
assessment (DNI, GHI, DHI):  
4 weather stations in BF**

**Linear Fresnel concentrators for various applications:**

**Electricity generation**

**Solar sorption cooling**

# Experiences of ZiE concerning solar thermal energy

## CLIMSOL: solar adsorption cooling



**Flat-plate solar collector s: 15 kW**

**Hot water tank: 2 x 1000 l**

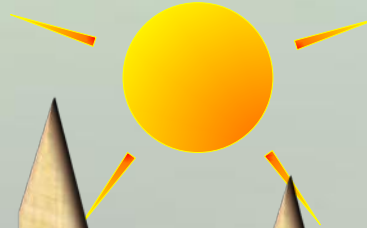
**Cooling power : 8 kW  
(Sortech ACS 8)**



**Common leakage problems**



# Existing key barriers for solar thermal energy



# Needs and expectations concerning a training and demonstration project



Practical training of 2 or 3 people from LESEE in solar collectors design and construction HT plumbing.

Solar thermal platform at ziE for students practical works and year-round monitoring

**THANK YOU**

Training for professional offered by Institutes. How could we integrate solar collector construction in the curricula for students?

MoE: Statistics/data on the solar thermal needs (market) in Burkina Faso

Mass media communication on economical analysis of STE. A Solar Day can be imagined in each WAC where experts can discuss in public media solar related issues.

Quality materials identification from the market & Standards definition

