

Work Package16

LEOPARD

Lead Partner:
University of Picardie Jules Verne
Amiens - France

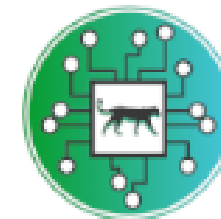
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<https://www.leap-re.eu/leopard/>



LEAP-RE

Long-Term Joint EU-AU Research
and Innovation Partnership on Renewable Energy



LEOPARD



The LEAP-RE project has received funding from the European Union's Horizon 2020 Research and Innovation Program under Grant Agreement 963530.

LEOPARD at a glance

1 530 000 €
2021 - 2024

 50% de cofinancement européen

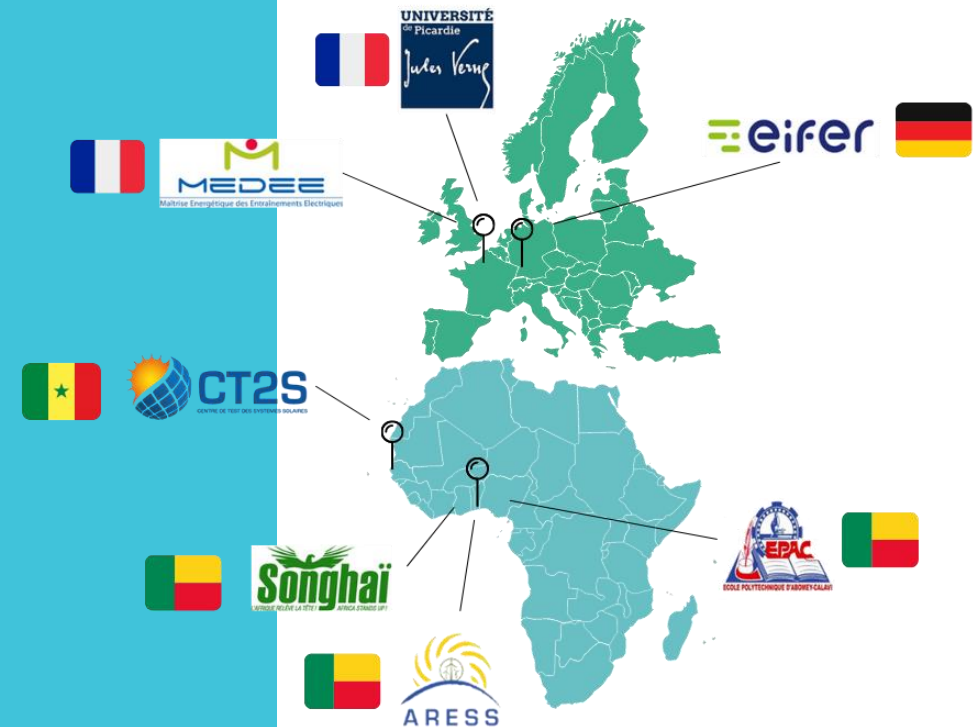
7 Partners involved

UPJV (FR), EIFER(DE), MEDEE(FR),
ARESS(BJ), CT2S(SN), SONGHAI(BJ),
UAC-EPAC(BJ).



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France (2), Germany (1), Benin (3), Senegal (1)



LEOPARD – Objectives and tasks



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The LEOPARD project aims to disseminate micro-grid technology by designing, testing and evaluating a containerized solution for renewable energy production in rural and peri-urban areas in Benin :

- Determine the local conditions of access to energy in rural areas
- Analyze the conditions of interconnection of the containerized solution to a larger network
- Optimize the technical and economic benefits of the solution
- Define the conditions for replicability in Benin and Senegal

■ Task 16.1 STATE OF THE ART, NEEDS ANALYSIS, DEVELOPMENT & PROTOTYPING

*Lead partner: **ARESS**; Other partners: UPJV, EIFER, Centre SONGHAI, CT2S, UAC-EPAC* [M7 – M21]

■ Task 16.2 INSTALLATION, OPERATION & ASSESSMENT

*Lead partner: **Centre SONGHAI**; Other partners: ARESS, CT2S, UAC-EPAC, UPJV* [M15 – M42]

■ Task 16.3 COMMUNICATION, DISSEMINATION & REPLICATION

*Lead partner: **MEDEE**; Other partners: UPJV, UAC-EPAC, CT2S, EIFER* [M7 – M43]

■ Task 16.4 COORDINATION & MANAGEMENT

*Lead partner: **UPJV**; Other partners: Centre SONGHAI, Pole MEDEE, CT2S* [M7 – M43]

Structure of LEOPARD



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TECHNOLOGY

- Solar Photovoltaic,
- On-grid and Off-grid systems,
- Energy storage

ANALYSIS & DESIGN TOOLS

- Open-source and commercial tools : Data Analysis and Assessment, LENI, MemoGrid,

METHODOLOGY

- Data collection, Design, Simulation and Detailed specification of containerized solution.
- Building and testing the prototype, Quality control.
- Study of Replicability in **Benin** & in **Senegal**
- Communication and Dissemination.

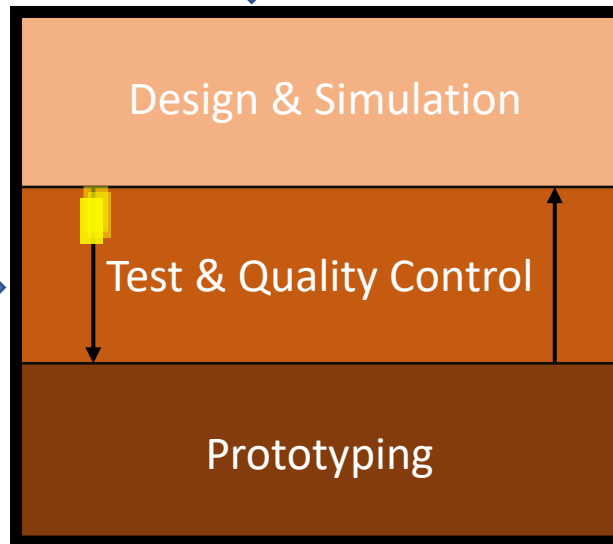
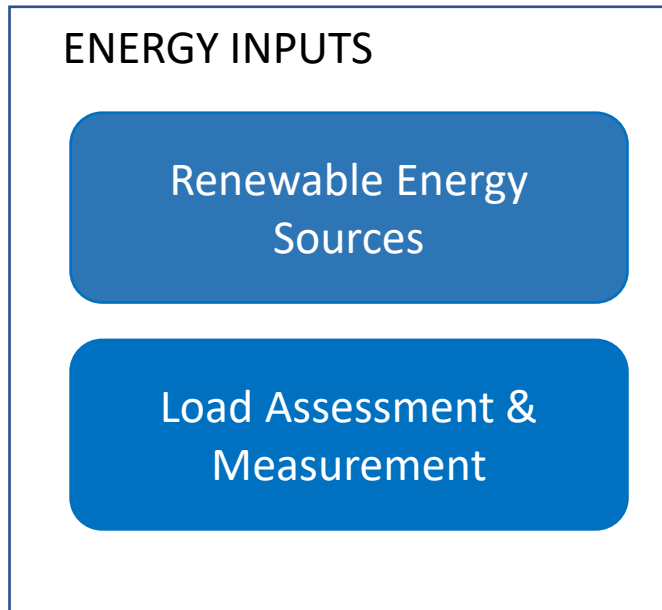
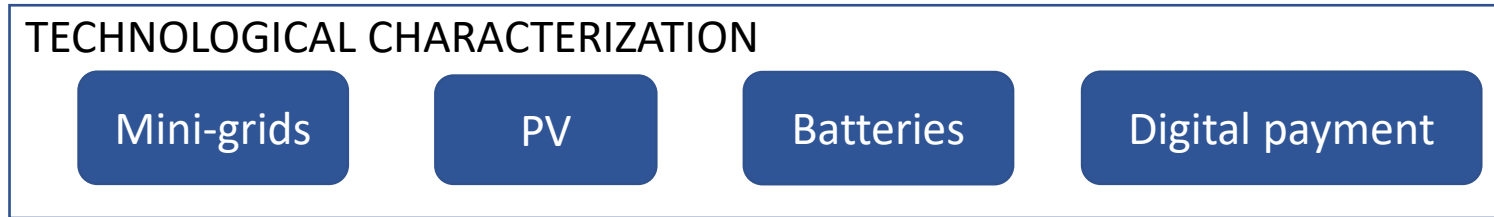
CAPACITY BUILDING

- Knowledge transfer to Operators & Technicians, MSc and PhD thesis students' involvement.
- Common CB activities in synergy with WP9-15

LEOPARD - Methodology



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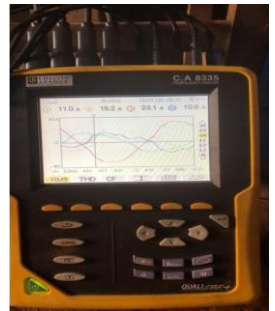


LEOPARD – Analysis & Design Tools



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Model	Scope
Data Analysis and Assessment	Analysis of the data collected by the sensors in the containers and the dwellings
MemoGrid: Multi-Energy MOdelling for microGrid	Design and optimize the LEOPARD solution (i.e. PV panels, storage and associated power electronics) in relation with load curves. The use through a secure web platform (AnyLogic Cloud) is developed and will allow partners access to the simulation.
LENI: LEAST COST ELECTRIFICATION TOOL	development of a quantitative methodology using multiple data sources that can evaluate an entire country to perform a pre-screening of candidate microgrid installation sites. The replicability study will be done on Benin and Senegal and is based on LENI.
Solar container	development of a prototype which can be duplicated in different regions and countries in Africa including payment aspects...



Involvement of Master and PhD students in the project



- 01 PhD
- 02 MSc
- 01 MSc (to be confirmed)

Organization of Workshops

- *Actions agreed within Pillar II to be organized in synergy and coordination with the other WPs*

Knowledge transfer to Operators & Technicians for Replicability & Maintenance purposes

- *CT2S (Senegal), EPAC/UAC (Benin), ARESS (Benin), UPJV (France), ...*

Kick-Off meeting in SONGHAI Centre, Porto Novo, Benin



Main achievements



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Pilot at Songhai Centre – Porto Novo, BENIN



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MemoGrid : Multi-Energy MOdelling for microGrid



Technical characteristics of containerized solution	
Electrical power	30 kW
Maximum Photovoltaic power	45 kWc
Trackers number	6
Weight without Batteries	550 Kg
Dimensions [cm]	210 x 80 x 120
Additional sources allowed	Generator group / grid
TGBT capacity in number of households to be supplied	Up to 200 households with consumption monitoring to facilitate billing
Built-in protection device	Surge arrester / Circuit breakers
Environmental operating ranges	Up to 95% Humidity non-condensing. Temperature range -10 to +55 degree Celsius
Supervision system	Online provided for remote monitoring (3 / 4G local connection by router)
Smart energy manager	Load management PLCs
Suggested Photovoltaic Power	Between 30 and 45 kWc
Photovoltaic technology	Monocrystalline silicon
Power Module	410/415/420 450
Open circuit voltage	50,4 V
Short Circuit Current	10,6 A
Module Efficiency	20,38 %