

RURAL ENERGY ASSESSMENT

A tool for analysing energy needs and building appropriate local solutions

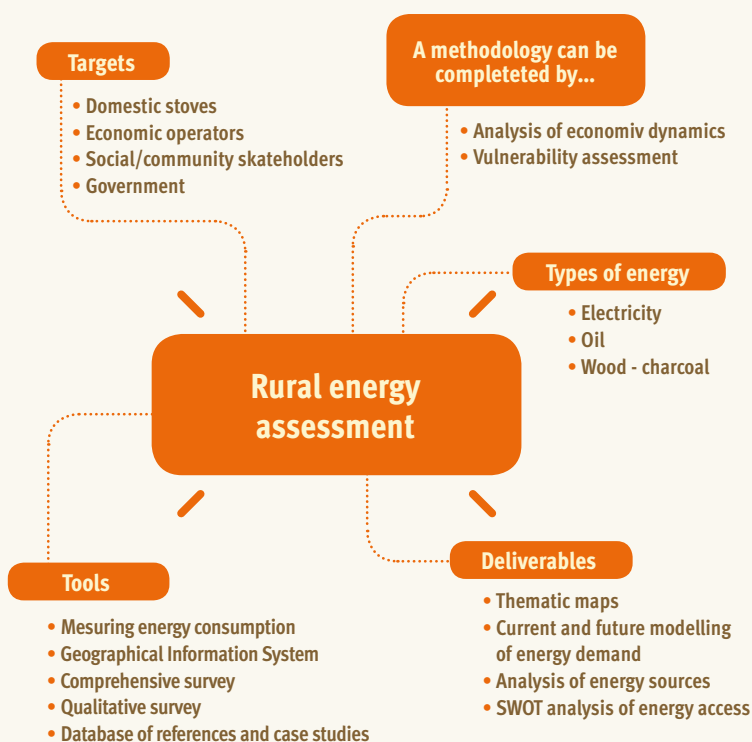
■ WHY CARRY OUT A RURAL ENERGY ASSESSMENT?

Energy is both a lever essential to our **economic development** and **home comforts** and the main source of **greenhouse gases** which impact the environment. This is just as true in rural areas of West Africa. Energy is needed for **domestic uses** (wood or charcoal for cooking, electricity for lighting or leisure), **economic activities** (food processing, crafts and services), public services (schools, health care and water supply) and government **administration** (computers). And energy production impacts both the local (pressure on forests) and global (CO² emissions) environment.

To find energy solutions that can reconcile economic development, sustainability, environmental protection and resilience in the face of future climate changes, a careful local analysis of current and future energy needs, as well as **potential production sources**, is vital. This is the *raison d'être* of **energy assessment**.

Energy assessment is designed to provide a **comprehensive picture** at the level of a rural **municipality or district**, aiming to highlight the position of energy consumers, the value chain to which they belong and the barriers they face in moving towards sustainable, clean solutions. A snapshot of the energy territory, which will not only establish a baseline situation but also highlight the kinds of support that could be provided in a dynamic local process. An **evaluation** and **decision-making tool** for councillors, institutions or project developers.

■ ENERGY ASSESSMENT IN A DIAGRAM:



■ A METHODOLOGY TO BE ADAPTED TO THE LOCALITY AND ITS SPECIFIC FEATURES

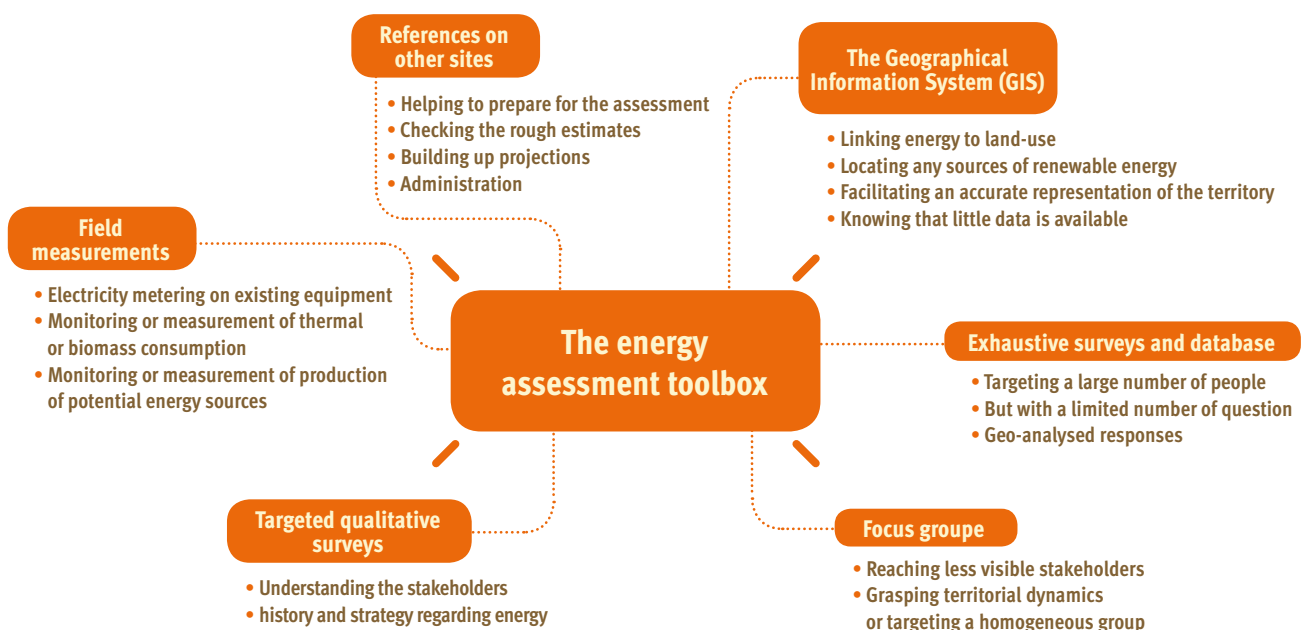
An energy assessment is based on the principle of combining **comprehensive mapping** with an understanding of the target stakeholders, by means of **energy metering** and **qualitative interviews**. The team has a **toolbox** including measuring equipment with comparative benchmarks and surveys with model questionnaires or interview frameworks. Only the most appropriate tools will be kept for each assessment. Having benchmarks measured in other localities is a prerequisite for a successful assessment.

The assessment has many components: a review of the productive use of fossil fuels, an estimate of a locality's domestic and productive electricity needs, etc. Finally, as energy is a lever for developing a territory, the findings complement an overall analysis of development options.

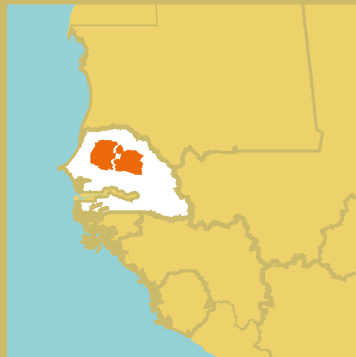
■ THE STAGES IN AN ENERGY ASSESSMENT:

	Stages	Sub-stages	Resources
1	Understanding of the expected deliverables and delimitation of the territory	<ol style="list-style-type: none"> 1. Delimitation of the territory 2. Clarification of the objectives 	In-depth exchanges with sponsors
2	Preview of the territory and existing data	<ol style="list-style-type: none"> 1. Creating a geo-database 2. Obtaining geographical data 3. Obtaining demographic statistics 4. Making maps of the area 	GIS software (ArcGis type) Local development plan Shared shapefiles Google Earth
3	Adaptation of the methodology and preparation of appropriate tools	<ol style="list-style-type: none"> 1. Determine assumptions concerning stakeholders 2. Adapting tools and data collection/surveys 3. Informing and discussing with the manager/councillor 4. Testing tools and amending them where necessary 	Existing toolbox First immersion in the territory
4	Taking measurements, carrying out surveys and interviews in the field	<ol style="list-style-type: none"> 1. Training the interviewers and technicians 2. Monitoring the comprehensive surveys, taking measurements 3. Carrying out qualitative surveys 4. Holding focus group 	Power analyser, measuring instruments, GPS Experienced interviewers
5	Analysis of data and description of the territory	<ol style="list-style-type: none"> 1. Description of the demographic and economic situation. Cartographic description. 2. Classification and modelling of stakeholders 3. Description of current situation 	Maps Excel modelling
6	Preparing scenarios on change and modelling of energy demand	<ol style="list-style-type: none"> 1. Defining the change scenario 2. Modelling the resulting energy consumption 3. Modelling renewable energy sources 	Consolidation spreadsheet (Excel)
7	Comparing with other territories and making recommendations	<ol style="list-style-type: none"> 1. Validation of forecasts (rough estimate) 2. Proposed focus of analysis and recommendations 	Assessment or case studies already made Discussions with sponsors

■ THE MAIN ENERGY ASSESSMENT TOOLS:



■ GERES EXPERIENCE: 4 EXAMPLES TO HELP EXPLAIN ENERGY ASSESSMENT:



Energy assessment in Linguère and Ranérou departments, Senegal

Objectives and principles:

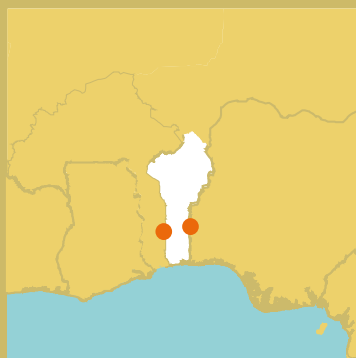
- The aim of the assessment is to get a better understanding of the effects of energy in two departments in the zone known as the Ferlo in Senegal, a vulnerable region where crop and livestock farming are the main sources of livelihood.
- The assessment focuses on the energy needs of both households and economic operators, looking at biomass energy as well as electricity.

Action undertaken:

The work combined a series of surveys and measurements in 12 rural municipalities (out of a total of 18) and the four urban municipalities in the two departments. A total of 6000 households or VSEs (Very Small Enterprises) were surveyed and specific measurements were taken for some of them.

Example of lessons learned:

Many economic activities cluster around boreholes, benefiting not only from access to water but above all from the economic dynamism generated by such access. It is therefore useful to take account of these clusters of income-generating activities when looking at access to productive energy and ways to share out energy investment costs between a borehole (up to 300kWh per day) and Very Small Enterprises or groups (totalling between 50 and 100 kWh per day) on the other.



Energy assessment of the logistical centres of Tchetti and Oké-Owo in the collines (Benin)

Objectives and principles:

- The administrative centres of Tchetti-Léma and Oké-Owo are two urban areas in Benin on the borders of Togo and Nigeria. Their location and features led the Collines Intermunicipal Grouping (Groupement Intercommunal des Collines – GIC) to consider developing them as logistical centres as part of its Collines 2040 strategy for the whole area.
- The assessment was designed to bring an understanding of the energy issue to bear on current thinking and debate.

Some elements of the action undertaken:

- Description of all uses in both areas and their respective dynamics
- Estimation of current energy consumption, for both domestic and productive uses (biomass and electricity)
- Consideration of the electricity needs of Tchetti-Léma between now and 2040

Example of a possible way forward post-assessment:

In neither centre is the electricity available, whether through the interconnected grid (Tchetti-Léma) or a solar power station installed in 2014 (Oké-Owo), enough to supply all economic operators. In view of the current dynamism of the two areas and their expected role in the next few years, supplying energy in business parks at these locations would appear to be a relevant solution.



Estimating electricity needs for non-electrified areas (Benin, Myanmar)

Objectives :

Designing an appropriate electricity solution, especially on a decentralized basis, means estimating the likely load curve at different points in time (year 1, year 5, year 20). What makes the exercise difficult is that, in areas that are not yet electrified, such future consumption is hard to predict. When solutions are primarily based on renewable energies, it is nevertheless important right from the pre-project phase to estimate these needs so that the funding plan can be put together and available energy sources investigated.



Principles and deliverables:

The assessment relies heavily on measured comparisons with other areas and the inclusion of development scenarios.

The deliverables include a precise description of what exists (especially the presence of economic operators) and estimates of load curves (changes in power demand (in kW) in the area over 24 hours) depending on scenarios. The latter serve to take account of factors such as economic development policy or the roll-out of more energy-efficient equipment.



Analysis of productive uses of electricity in three rural municipalities, south-east Mali

Objectives and deliverables:

The rural electrification company SSD Yeelen Kura has electrified several rural towns in Mali since 2008. The study should help to observe and analyse the connection of productive stakeholders (artisans, traders and micro-businesses) and their impacts on the electricity grid.

Action undertaken:

The work combined a series of surveys and measurements in three places (Bla, Koury and Yorosso), focusing in particular on workshops, bakeries, ICT, tailors, petrol stations, shops, radio, water supply and health centres.

Example of lessons learned:

Most (but not all) economic operators prioritize the quality of the electricity supply over its cost. In the absence of efficient service, they prefer to have their own sources of power, even if this costs more.

At isolated sites, geographical concentration of operators requiring greater power output (a few additional kW) or specific time slots is key to better management of both their impact on the grid and their expectations in terms of power and quality.

