TRAINING PROGRAMME

OUR VISION

A SCALABLE OFFERING

• Our courses are regularly updated based on participants' feedback and observations

CUSTOMIZED TEACHING METHODS

• Our training programme is adapted to the trainees' level.

A NETWORK OF EXPERIENCED INSTRUCTORS

• Our instructors are experts in their respective areas and have excellent technical and teaching skills. They have extensive expertise in the practices and realities of the participants' native countries.

TRAINING CERTIFICATE

• Participants receive a course certificate as evidence of their actual participation in a training session.

COURSES

ELECTRICITY SECTOR AND RENEWABLE ENERGIES

As a historical partner to institutions and funders involved in the energy sector for over 25 years, IED has developed unique expertise and know-how in areas linked to rural electrification and renewable energy development.

Hence, IED offers training and skill reinforcement courses, either integrated in projects or independently organized, targeting the various sector players: Ministries in charge of energy, rural electrification agencies, national utility companies, research departments, engineering schools, independent consultants, electrical system operators

With a design based on stakeholders' concrete experiences, the courses offered by IED are comprehensive and progressive and provide participants with full autonomy in the targeted themes.

Courses are offered at the IED Lyon / Francheville office or at our subsidiaries (Cameroon, Burkina Faso, Cambodia) as well as at your facility.

IED digital solutions training programs

WWW.IED-SA.COM

Flexible and customized training sessions that meet the

Training, a needed initiative ?

OUR PEDAGOGY

We highly value experience sharing and practical exercises (simulation exercises

OUR COMMITMENT

- A **partner approach** based on the will to build long-term productive collaboration .
- A **customer-oriented approach** that translates into an effort to address true challenges and real issues.
- An **ethical attitude** placing each participant as player at the heart of the session.
- A **sustainable dimension** revealing clear objectives and a result-oriented culture in the acquisition of knowledge.

OUR STRENGHTS

Our teams of instructors are composed of consultants/engineers from the professional world, who focus on the operational transfer of skills acquired in the classroom as well as in the field.

We are driven by a culture of customization and focus our attention on your issues as a priority.

Our courses are supported by internally developed software (Geosim©, Giselec©, Demand Analyst©) and reference tools recognized in the area of energy (Homer, Retscreen) and intensively used as part of IED's engineering/ consulting activities.

CUSTOMIZED SOLUTIONS

Any training course can be customized to meet the participants' express needs.

TRAINING MATERIAL

The training material we use is provided to participants in electronic format at the end of the training session (excluding licensed software).

ADDED VALUE

A unique experience with organizations and institutions active in the energy sector, with field practice, and in particular, a close look at the world of electrification in numerous situations and countries.

TRAINING sessions :

Code	Training	Duration
SIG01	Geographic Information System (GIS) and village level mapping	5 days
SIG02	Use of mobile tools for data collection	5 days
DEM01	Rural Electricity load forecasting	3 days
DEM02	Electricity demand analysis and planning and Demand Side Management	4 days
GEN01	Geospatial electrification planning	10 days
GEN02	Analysis and planning of territorial energy generation	5 days
RES01	Distribution network electrical and mechanical studies	10 days
RES02	Transmission Network Analysis and Planning	5 days
ENR01	Sizing Hybrid PV/Diesel power plants	4 days
ENR02	Mini-hydro power plant pre-feasibility studies (MHPP)	3 days
ENR03	Pre-feasibility studies of energy production projects based on biomass resources	3 days
ECO01	Economic and financial analysis of decentralized rural electrification projects	3 days

REGISTRATION STEPS

1. Please contact IED and describe your needs
2. We will send you a proposal
3. We will send you a registration confirmation upon payment of the appropriate amount
4. We can help with the choice of accommodations
5. You should finalize your visa procedures and inform us of your flight schedule

Group training

CUSTOMIZABLE TRAINING MODULES MATCHING SPECIFIC NEEDS

This is the most economically sound approach if you wish to enter a team into a common skill development program; group training also has many extra advantages :

- It makes it possible to integrate the specificities of the participants' professional environment
- A training programme customizable to the needs of your structure
- Fosters the implementation of shared methods and reinforces a collaborative attitude
- Allows for great flexibility in the choices of duration, dates, and training locations
- Facilitates exchanges between institutions and countries

OBJECTIVES

Highlight and development of knowledge and know-how, assistance in project steering, application of acquired skills: such are the values that drive us throughout our training courses.

GEOGRAPHIC INFORMATION SYSTEM (GIS) AND VILLAGE LEVEL MAPPING

SIG01 ■ Tools/Methodology/Professions

DURATION

5 days

TARGET AUDIENCE

Ministries in charge of infrastructures planning (health, education, water, transportation, energy, …)

Rural electrification agencies

National utilities

Engineering firms

Engineering schools

Power systems' operators

Independent consultants

A FEW REFERENCES…

CI-ENERGIES (Ivory Coast)

REA (Tanzania)

MIME (Cambodia)

SBEE (Benin)

EDG (Guinea)

USED TOOLS

Manifold©, Mapsource©, Google Earth©

OBJECTIVES

The usefulness of GIS as a support to decision making for infrastructure development is now widely recognized, particularly for multicriteria analysis applied to electricity, energy, transport, water, education or health sectors. The functionalities of GIS offer a wide range of possible spatial and numerical analyses, which can then be illustrated on the produced maps, with combinations of color schemes, graphs and boxes with popup options. The present training course covers the whole range of tools and skills required to produce maps: use of GIS and their functionalities, working from online data sources such as Google Earth, using GPS instruments and topographical maps.

TRAINING PROGRAMME

1. Geographic Information Systems (GIS)

- Introduction to GIS
- Fundamentals : Projection systems, graphic semiology, cartography
- Structuring GIS and databases
- Examples of applications : rural electrification

2. Introduction to a GIS software: MANIFOLD©

- Presentation of Manifold and its interfaces
- Basic functions
- Accessing and visualizing geo-referenced information

3. Practical session: using information organized in database

- Importing data (GIS, Excel, Google Earth etc.),
- Integration of GPS information
- Creating / updating databases
- Use of not geo-referenced data and maps :satellite imagery, base maps, ...
- Producing thematic maps
- Exporting data and maps for presentation purposes
- Spatial and alphanumerical analysis : queries introduction

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USE OF MOBILE TOOLS FOR DATA COLLECTION

SIG02 ■ Tools/Methodology/Professions

DURATION

5 days

TARGET AUDIENCE

Ministries in charge of energy

Rural electrification agencies

National utilities

Engineering firms

FEW REFERENCES

DOE (Philippines)

USED TOOLS

ODK, ONA, IED Survey

GPS, Smartphone

OBJECTIVES

This training is aimed at technical services, field agents and design offices whose work requires field surveys, georeferencing of infrastructures, addressing of households, etc. With the development of open source technologies from mobile devices such as smartphones, large data collection campaigns can be organised and optimised at low cost.

The use of mobile GPS equipment can thus satisfy a number of tasks with consolidated data in real time and at a distance:

- Socio-economic surveys,
- Technical auditing (with geo-referencing and photography)
- Addressing
- Creation of cartography
- Digitalisation of infrastructures...

TRAINING PROGRAMME

1/ Organise a field survey campaign

- Choose a technology and material,
- Anticipate risks,
- Plan operations,
- Recruiting & training interviewers
- Managing the conduct of investigations.

2/ Using GPS in a survey campaign

- Choosing the right device for your needs
- Good practice in GPS scoring

3/ Designing a questionnaire (for completion by smartphone)

- Design a questionnaire (free format, compatible with many applications),
- Know how to use an online data aggregation platform (e.g. ONA...)
- Design a questionnaire on an Android application with GPS point capture

4/ Processing the data

- Consolidate survey results
- Good practices in terms of data cleaning / storage / management

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RURAL ELECTRICITY LOAD FORECASTING

DEM01 ■ Tools/Methodology/Professions

DURATION

3 days

TARGET AUDIENCE

Ministries in charge of infrastructures planning (health, education, water, transportation, energy, …)

Rural electrification agencies

National utilities

Engineering firms

Engineering school

Electric systems operators

Independent consultants

QUELQUES REFERENCES

CI-ENERGIES (Ivory Coast)

REA (Tanzania)

MIME (Cambodia)

SBEE (Benin)

AER (Cameroon)

USED TOOLS

Demand Analyst© , Survey Analyst

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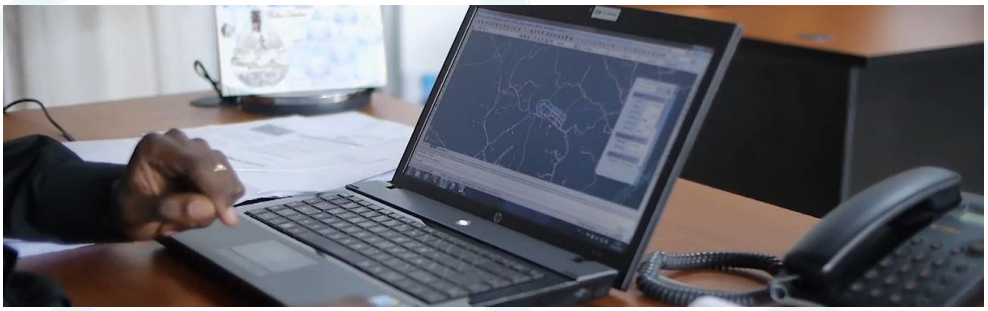
OBJECTIVES

This course examines all functionalities of the Load Forecasting software Demand Analyst© and provides keys to the creation of a forecasting model adapted to the context of each study. Demand Analyst© is characterized by a "bottom up" approach disaggregated by consumer type, thus allowing for a fine analysis of load curves, essential for accurate sizing of systems, and ensuring profitability of the power plants. The course begins with the task of organizing a household level survey to determine assumptions that will be used by Demand Analyst© software, for rural electrification situations.



TRAINING PROGRAMME

1. Field level energy survey for load forecasting

- Sampling and methodology
- Templates and use of the survey-processing tool : Survey Analyst
- Statistical analysis of survey results

Practical session : cleaning, analysing and using a survey file

2. Load Forecasting

- Advantage of using an adequate load forecasting approach
- Presentation of Demand Analyst©
- Comparative scenarios

Practical session 1 : Using a set of data from surveys

Practical session 2 : Analysis of demand at the scale of a group of village

3. Advanced - Sensitivity analysis

- Synchronisation factor
- Integrating industrial activities into the model
- Sensitivity analysis and assumptions
- Result interpretation and use

ELECTRICITY DEMAND ANALYSIS, FORECASTING AND MANAGEMENT (DAP)

DEM02 ■ Tools/Methodology/Professions

DURATION

4 days

TARGET AUDIENCE

Ministries in charge of energy

Rural electrification agencies

National utilities

Engineering firms

FEW REFERENCES

SBEE (Benin)

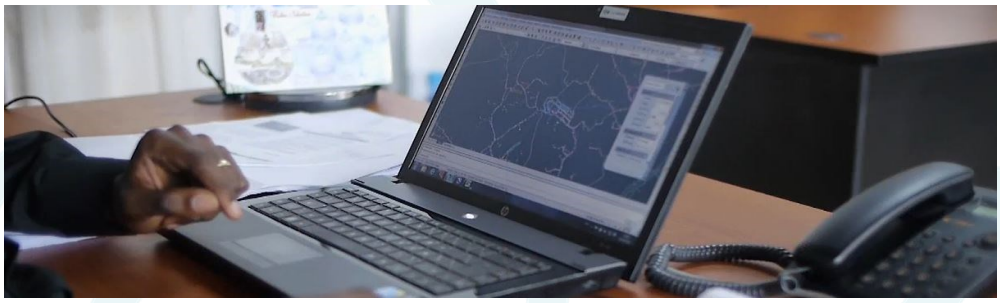
MEH, JIRAMA (Madagascar)

USED TOOLS

DAP©

OBJECTIVES

This training course focuses on issues related to the demand for electricity at the scale of a zone or a country. The training, based on the use of the DAP software, will allow the forecasting of demand and peak load, but also the preparation of actions of Electricity Demand Management (EDM), themes addressed in the master plan of the energy transmission and production network. The training allows to answer all the questions related to an energy demand forecasting study.



TRAINING PROGRAMME

1. DAP general presentation :

- Load definition and forecasting methods
- Representation of a load
- The 4 forecasting methods in DAP
- Steps in a load forecasting study

2. DAP functionalities practical exercises

- Data preparation
- Simple / historical forecasting
- Statistical and sectoral forecasting
- Consumer forecasting
- DSM forecasting
- Analysis of results

3. DAP modular procedures

Imports, exports, profile calculations, normalisation, visualisations, ...
Theoretical presentation
Demonstration and exercises
Functions :

- Import of historical data
- Normalization to temperature
- Calendar
- Calculation of annual, weekly and daily profiles
- Simple and aggregated determinants
- Analysis of results, scenarios

4. General review of the subject

Study case and Questions and answers

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GEOSPATIAL ELECTRIFICATION PLANNING

GEN01 ■ Tools/Methodology/Professions

DURATION

10 days

TARGET AUDIENCE

Ministries in charge of energy

Rural electrification agencies

National utilities

Engineering firms

Engineering school and training institutes

Independent consultants

PREREQUISITES

Mastering GIS software

A FEW REFERENCES

CI-ENERGIES (Ivory Coast)

REA (Tanzania)

MIME (Cambodia)

SBEE (Benin)

ADER (Madagascar)

USED TOOLS

Manifold©, Geosim©

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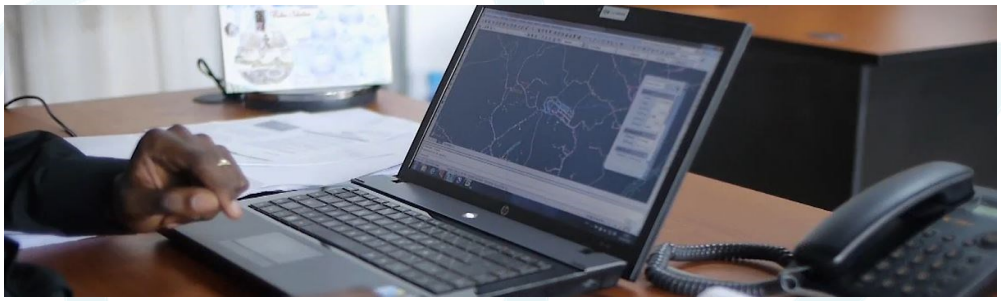
OBJECTIVES

This course aims to answer all questions related to rural electrification planning, whatever the size of the study area : Which settlements should be electrified in priority in order to maximize the impact on population ? What is the current and future demand for electricity services ? What are the most appropriate energy supply options ? Where can we support the use of renewable energy ? Which solutions can we offer to the most remote communities ?

This course is based on Geosim©, a tool to support planning decisions. Geosim© is an interactive software base on GIS technology, designed to create rural electrification planning scenarios.



TRAINING PROGRAMME

1. Introduction to rural electrification — GEOSIM©

- Principles and concepts of rural electrification
- General presentation of the tool and its modular approach
- Setting and preparation of the GIS database

2. Spatial analysis of a geographical area

- Theoretical concepts

Practical session : Spatial analysis on a limited geographical area

3. Load forecasting

- Presentation and demonstration of the module

Practical session : Load analysis of a limited geographical area

4. Supply options

- Presentation of the module, comparative analysis of supply options

Practical session 1: Network extension and voltage drop validation,
Practical session 2: Decentralized projects and renewable energy (hydro, isolated diesel, biomass, PV and wind hybridization…)

- Pre-electrification solutions and assessment of investments
- Sensitivity analysis

5. Preparation of electrification scenarios

- Production of project reports ad maps
- Economic and social indicators of projects (beneficiaries, electrification rate..)
- Investment sequencing and project portfolio

ANALYSIS AND PLANNING OF ENERGY GENERATION

GEN02 ■ Tools/Methodology/Professions

DURATION

5 days

TARGET AUDIENCE

Ministries in charge of energy

Rural electrification agencies

National utilities

Engineering firms

FEW REFERENCES

AER (Cameroun)

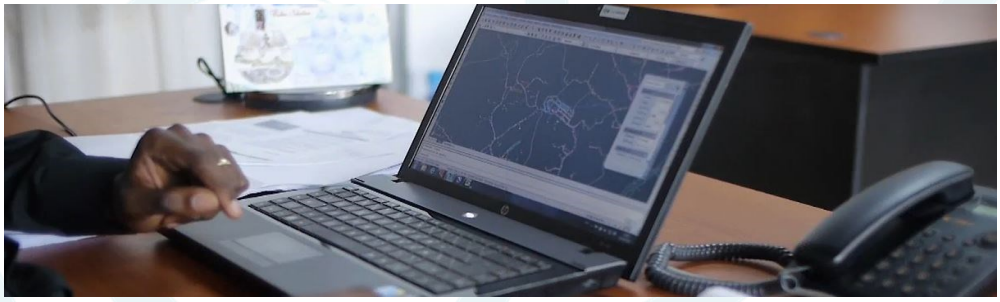
USED TOOLS

GAP©

OBJECTIVES

With the increasing complexity of interconnected transmission networks, the diversification of supply sources and the introduction of **intermittent renewable energies** (wind and solar), it has become essential to better analyse and control energy production in order to guarantee an acceptable level of **stability and quality of service**. The training based on the GAP© software studies the modelling of a generation park, calculating the technical and economic results of different scenarios of expansion of the thermal, hydro-electric, wind and solar park. In addition, GAP© also allows the representation and optimisation of a storage system, the simulation of interconnections and the evaluation of the firm power to be exported or imported. Finally, GAP© can be used to optimise the maintenance programmes of production units.

The objective of the training is to facilitate the **integration of renewable energies**, to contribute to the security of supply, to analyse the impact and cost of failures by diagnosing the electrical system and to evaluate the cost of environmental impacts (CO2 emissions, energy mix, etc.).



TRAINING PROGRAMME

1. Concepts of the Demand and generation adjustment

2. Input data for generation analysis and planning

- General presentation
- Resource and load forecast scenarios
- Generation powerplants

3. Detailed presentation of the GAP functionalities

Preparation of a study database

- Production system planning
- Comparison of alternative investment plans
- System reliability analysis
- Interconnection project assessment

(comparison of isolated systems and the interconnected system)

- Pricing study (total and marginal generation costs)

5. Results and study case

Importing a model

Evaluation of results and performance indicators

Cost, exportable power, fuel consumption/CO2 emissions, impact of DSM

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DISTRIBUTION NETWORK ELECTRICAL STUDIES

RES01 ■ Tools/Methodology/Professions

DURATION

5 days

TARGET AUDIENCE

Ministries in charge of energy

Rural electrification agencies

National utilities

Engineering firms

Engineering school and training institutes

PREREQUISITES

Mastering GIS software

A FEW REFERENCES

CI-ENERGIES (Ivory Coast)

SBEE (Benin)

EDG (Guinea)

USED TOOLS

Manifold©, Giselec©

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OBJECTIVES

In rural areas and, more broadly, for LV and MV distribution networks, few electrification projects include detailed and systematic sizing studies.

As a result, electricity distribution equipment is often improperly sized, which leads to excessive investments or poor service quality. The economic consequences of this are not or insufficiently addressed, even though distribution often represents more than half the electrification costs.
This course, centred on mastering the GISELEC© software, targets the acquisition of skills necessary for **the electrical optimization of MV and LV network** at the stage of preliminary studies: optimal transformer coverage, network layout and conductor sizing.

TRAINING PROGRAMME

1. Basic theoretical concepts

- MV/LV network architecture an technologies
- Electrical calculation : Max intensity, voltage drops, network losses

2. Study area modelling

- Using the associated GIS software
- Creation of background maps
- Concept of load points and load forecast model

3. Coverage of the study area by MV/LV transformers

- Assessing demand within the study area
- Distribution of the transformers' impact zones
- Optimal transformer sizing and positioning in order to reduce network losses

4. Layout and electrical modelling of MV and LV networks

- Layout of LV networks and validation of user coverage zones
- LV network sizing (technical-economical optimization)
- Layout and sizing of MV networks

5. Presentation of electrical study results

- Publishing network maps
- Power study results

6. To go further

- Handling real cases using GISELEC©

DISTRIBUTION NETWORK MECHANICAL STUDIES

RES01 ■ Tools/Methodology/Professions

DURATION

5 days

TARGET AUDIENCE

Ministries in charge of energy

Rural electrification agencies

National utilities

Engineering firms

Engineering school and training institutes

PREREQUISITES

Mastering GIS software

Mastering GISELEC© electrical studies

A FEW REFERENCES

CI-ENERGIES (Ivory Coast)

SBEE (Benin)

EDG (Guinea)

USED TOOLS

Manifold©, Giselec©

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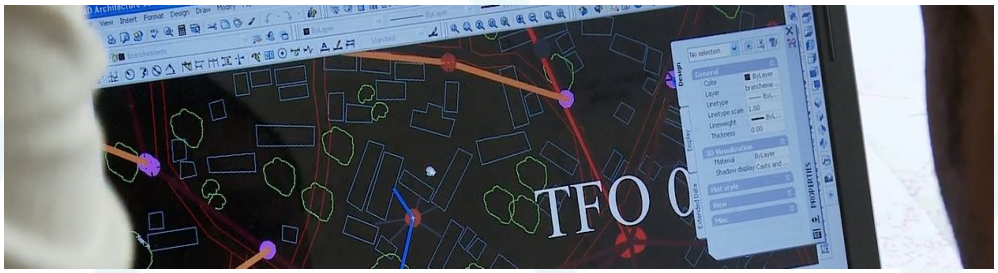
OBJECTIVES

In rural areas and, more broadly, regarding LV and MV distribution networks, few electrification projects include detailed and systematic sizing studies.
As a result, electricity distribution equipment is often improperly sized, which leads to excessive investments or sustainability issues.
This course, centred on mastering the GISELEC© software, targets the acquisition of skills necessary to the **mechanical optimization of MV and LV networks** in preliminary studies: pole sizing optimization, mechanical studies and pole heights, pole selection, result presentation, etc.



TRAINING PROGRAMME

1. Basic theoretical concepts for mechanical calculation

- Characterizing elements to be sized: columns, conductor configuration, conductors, ,…
- The principle of mechanical calculation: applied mechanical force and material modelling, status change equation, calculation of deflection and clearance compliance,…
- Standard and calculation assumptions (Application of NFC 11-201 standard)

2. Definition of networks to be sized

- Import and adaptation of network layout from electrical studies
- Configuration of the software

3. Pole placement and characterization

- Automatic positioning of columns according to principles (max angles, medium and max spans, MV block lengths,…)
- Validation and maximisation of the proposed layout
- Final characterization of poles : positioning additional elements (IACM, MV/LV transformers,…) et defining clearances

4. Mechanical calculations and pole sizing

- Calculation of forces in the various climate condition
- Calculation of pole heights
- Optimal pole selection

5. Presentation of mechanical study

- Detailed network maps
- Staking
- Detailed list of materials

6. To go further

- Handling real cases using GISELEC©

MV AND HV NETWORK ANALYSIS AND PLANNING (NAP)

RES02 ■ Tools/Methodology/Professions

DURATION

5 days

TARGET AUDIENCE

Ministries in charge of energy

Rural electrification agencies

National utilities

Engineering firms

Engineering school and training institutes

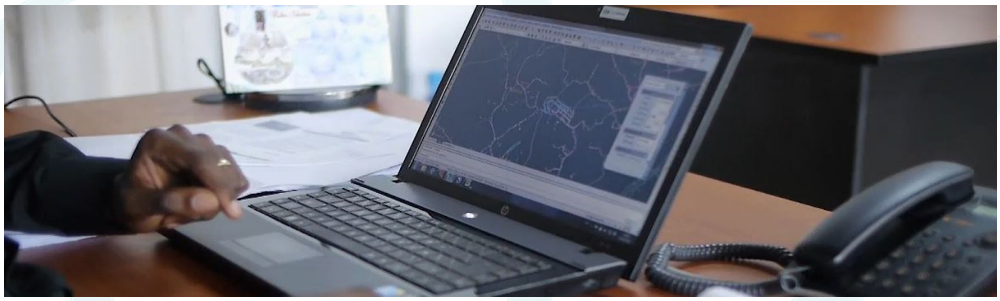
Electric systems operators

USED TOOLS

NAP©

OBJECTIVES

Because the development of energy transmission infrastructures requires, upstream, an in-depth study and modelling of load flows, the training main objective is to present the specialised NAP© software and provides basic skills to use it. The aim is to (i) study and compare different network scenarios while optimising load flows and taking into account constraints, (ii) simulate incidents and ensure network stability, and (iii) identify generation redispatches to meet network constraints.
The results are typically used to develop investment plans for both transmission and distribution.



TRAINING PROGRAMME

1. NAP general presentation

2. Load sharing calculations and optimisation

- Mandatory data
- Load Flow : types of nodes and calculation principle
- Constraint Power Flow : inequality constraint resolution
- Optimal Power Flow : optimisation of the production plan
- Visualisation of data and interpretation of results
- Case study exercises: transmission and distribution

3. Advanced network calculations

- Short circuit calculation: principle and case study
- Incident analysis (N-1): principle and case study
- Sensitivity analysis: principle and case study

4. Network mapping and GIS

- Integration of network GIS data
- Use of the Modelling Space
- Study case

5. Strengthening and reducing losses

- Transmittable power

6. Planning approach

- Network structures
- Development strategy
- Investment plan
- Economic analysis

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SIZING HYBRID PV/DIESEL POWER PLANTS

ENR01 ■ Tools/Methodology/Professions

DURATION

4 days

TARGET AUDIENCE

Ministries in charge of energy

Rural electrification agencies

National utilities

Engineering firms

Engineering school and training institutes

Electric systems operators

A FEW REFERENCES

MAMWE (Comores)

CLUB-ER

DNE (Guinea)

AER (Cameroon)

USED TOOLS

Homer

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OBJECTIVES

Thanks to significantly lower prices of solar panels, hybrid PV/diesel power plants make it possible to reduce costs compared to solutions using a diesel generator only. However, costs of storage remain high and issues linked to electronics remain complex.
Therefore, the sizing of hybrid plants, as well as their technical-economical optimization are significantly more complex than in the case of conventional diesel or PV power plants. This course will enable participants not only to acquire fundamental skills in the area of hybrid systems, but also to master technical-economical optimization.

TRAINING PROGRAMME

1. Introduction to hybrid systems

- Advantages and limitation of hybrid systems for rural electrification
- Specific technical and economical aspects
- Basic comparative analysis of investments and production costs

2. Designing sustainable hybrid systems

- Assessing solar resources
- Adapting the production system to the characteristics of the load curve
- Factors increasing system sustainability
- Principles of technical-economical maximisation

3. Practical session – using the HOMER software

- Principles of the HOMER software
- Project creation : data entry/import
- System behaviour simulation
- Technical optimization
- Economical optimization

4. Technical specification of components

- Range of existing products
- Recommendations for technical requirements

PRE-FEASIBILITY OF PROJECTS FOR MICRO HYDRO POWERP PLANTS (MHPP)

ENR02 ■ Tools/Methodology/Professions

DURATION

3 days

TARGET AUDIENCE

Ministries in charge of energy

Rural electrification agencies

National utilities

Engineering firms

Engineering school and training institutes

Electric systems operators

A FEW REFERENCES

NEA (Philippines)

BNETD (Ivory Coast)

CNR (France)

AER, ENEO (Cameroon)

DNE (Guinea)

USED TOOLS

RETScreen

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OBJECTIVES

The course on preliminary studies for MHPP aims at providing engineers/ technicians with a basic understanding of MHPP projects with a power output between 20 kW and 5 MW and how to prepare consistent pre-feasibility studies.

TRAINING PROGRAMME

1. General introduction

- Inventory of hydroelectric resources and load forecasting at national and regional levels
- National regulations and procedures regarding the development of hydroelectricity
- General methodology – Organisation chart and preliminary survey – Roles of the various partners in a project
- Reminder of principal definitions,
- Preliminary study.

2. MHPP pre-feasibility study

- Collection of climate, rainfall and hydrometric data—Assessment of the local geological environment,
- Cartography study based on 1 / 200 000 and 1 / 50 000 maps and site design options; hydrology study, taking topography and geologic restrictions into account,
- Organisation of field missions and site visits
- Integrating of site missions and site visits—Detailed study datasheets
- Plant capacity and generation for various design options
- Production site characterisation

3. Applying RETScreen software to a MHPP preliminary study

- What is RETScreen ?
- Case study 1 : Technical data entry and analysis
- Case study 2 : Economic study

PRE-FEASIBILITY STUDIES FOR BIOMASS PRODUCTION PROJECTS

ENR03 ■ Tools/Methodology/Professions

DURATION

3 days

TARGET AUDIENCE

Ministries in charge of energy

Rural electrification agencies

Development partners

Independent consultants

Project developers

A FEW REFERENCES

ADER (Madagascar)

MIME (Cambodia)

REA (Tanzania)

AER (Cameroon)

USED TOOLS

Demand Analyst©

OBJECTIVES

Biomass is an energy source readily available for decentralized electricity production; it is often available in large quantities in areas presenting a potential for the development of economic activities. This course offers a cross-sectional analysis of all aspects of an electricity production project:

⇒ Sustainable organization of biomass collection (plantations, waste, etc.)
⇒ Output assessment
⇒ Technological option
⇒ Technical and economical analysis of projects

The objective of this course is to give participants a clear vision of the biomass potential and of the steps to take in order to achieve viable electricity production.

TRAINING PROGRAMME

1. Biomass resources

- Context and use of biomass
- Biomass energy resources from sources other than forest
- Resource characterisation in quantity, seasonality, and energy production potential

2. Energy production : Technological options

- Production of steam from biomass (steam/electricity cogeneration)

Examples of cogeneration : self-consumption and surplus sale

- Production of biogas, operating a bio-digester

Examples of electricity production units from biogas

- Gasification, which type of biomass ? Which operating type ?

Examples of electricity production from gasification

3. Technical and economic analysis

- Supply, availability, transport, handling and storage
- Analysis of energy needs (domestic and non-domestic demand)
- Energy production: selecting technology and sizing
- Costs and operational and maintenance constraints
- Investment and economic analysis

4. Practical case studies

- Pre-sizing a project
- Utilisation of results and sensitivity study

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ECONOMIC AND FINANCIAL ANALYSIS OF DECENTRALIZED RURAL ELECTRIFICATION PROJECTS

ECO01 ■ Tools/Methodology/Professions

DURATION

3 days

TARGET AUDIENCE

Ministries in charge of energy

Rural electrification agencies

National utilities

Engineering firms

Engineering school and training institutes

Electric systems operators

A FEW REFERENCES

CLUB-ER

AER (Cameroon)

USED TOOLS

RETScreen

OBJECTIVES

This course enables participants to master economic and financial analysis as a tool to facilitate decision-making at the various stages of a decentralized rural electrification (DRE) project: Planning/Pre-feasibility study (summary draft) / Feasibility study (detailed draft). Using appropriate tools and methods, participants will learn to address the following issues: How to choose between several DRE projects? What will be the production cost per kWh? From an economic standpoint, what is the benefit of investing in renewable energy production projects? What is the profitability for the developer of a DRE project? How to ensure optimal sizing ?

TRAINING PROGRAMME

1. Principles and key steps in economic and financial analysis

Presentation of the decision-making aid tool at the various stages of progress

- ♦ Planning
- ♦ Pre-feasibility study (summary draft)
- ♦ Feasibility (detailed draft)

Review of key concepts : update, depreciation…

2. Methods and tools for economic and financial analysis

Configuring a model and enunciating assumptions
Assessment criteria for investment projects: indicator and ratio reading and analysis

- ♦ Net Present Value (NPV), Internal Rate of Return (IRR) and payback time
- ♦ Economic profitability vs investor profitability

3. Sensitivity analysis / risk assessment

Assessing sensitive parameters and assumptions in the development of decentralized systems

- ♦ Types of load curves
- ♦ Demand trends
- ♦ Characterization of technologies (hydro, biomass, diesel, etc.)
- ♦ Profitability and risk for the investor

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PARTICIPATION FORM (1)

Training label : _____

_____

Name :			
Position :			
Institution :			
Address :			
Tel. :			
Email :			
Passeport #:			
Birthdate :			
Nationality :			
Do you have any experience or knowlegde in the field of the targeted training ?	❑ Fair	❑ Average	❑ Poor
If yes, please detail :			

Expected date (2) : _____

Do you need any particular support to get a visa (Invitation letter) ? _____

Participant's signature :	**Administration stamp and date**

FOR TRAINING, PLEASE BRING A FONCTIONAL LAPTOP, FREE OF VIRUS, INCLUDING AN ADMINISTRATOR WINDOWS PROFILE

(1) To send to the following emails addresses : contact@ied-sa.com, ied@ied-sa.com

(2) Please note that the training date may change if the quota of 3 participants attending the training is not reached.

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TARIFFS

TRAINING SESSIONS

Training tariffs are valid for 2024

Training	Duration days	Cost/ person € (excl. VAT)
Geographic Information System (GIS) and village level mapping (*)	5	2 800
Use of mobile tools for data collection	5	2 800
Load forecasting study in rural areas	3	1 680
Territory Electricity Forecasting and Demand Side Management	4	2 240
Geospatial electrification planning*	10	5 600
Analysis and planning of territorial energy production and energy mix	5	2 800
Distribution network electrical and mechanical studies*	10	5 600
Transmission Network Analysis and Planning	5	2 800
Sizing Hybrid PV / Diesel power plants	4	2 240
Mini-hydro power plants pre-feasibility studies	3	1 680
Pre-feasibility studies for biomass production projects	3	1 680
Economic and financial analysis of decentralized projects	3	1 680

**Tariff include the installation of a GIS licence "Manifold System 8.0 Personal Edition" on the attendant computer*

Gradual discounts are applicable upon the registration of two participants in the same training.

Tariffs include coffee breaks, lunch given at the training place. Accommodation, transportation cost and any further meal cost are not covered. On participant demand, IED can suggest hotels and can arrange transportation from the hotel up to the training place. All costs remain at the attendant responsibility.

Regarding **in-site or online training**, please don't hesitate to contact IED for a customized proposal.

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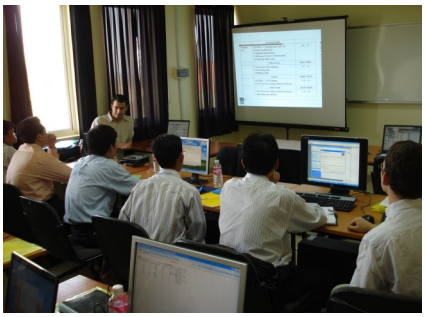
These training sessions can take place either at IED's head office in France, or using our subsidiaries' logistics in Africa and Asia, or directly on site. Please contact us for more information regarding our training program or to schedule personalized sessions.



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