

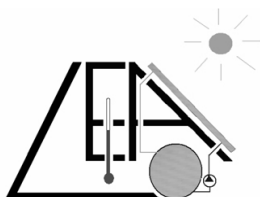
LABORATOIRE D'ENERGETIQUE APPLIQUEE (LABORATORY OF APPLIED ENERGETICS)

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O. SOW (Author)

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University Cheih Anta Diop (UCAD)



*Laboratoire d'Energétique
Appliquée (LEA)*



*Ecole Supérieure Polytechnique
(ESP) de Dakar*

Brief presentation

The Laboratory of Applied Energetics was created in 1984 by Professors Souleymane SECK, First Vice-chancellor of University SENGHOR of Alexandria and Bernard CHAPPEY, President of the University of Evry until September 2002 which at that time was respectively Directeur of the University "Ecole Nationale Supérieure Universitaire de Technologie" (ENSUT) and Director of the IUT of Créteil (France). It was directed until September 1991 by Mr. André GIRARDEY, who was detached from the University Paris XII.

The Laboratory of Applied Energetics is invested in the fields of thermodynamics and applied thermics, with for objective the study and the realization of energy systems entering within the framework of the political development of Senegal in particular, and in the sahelian zone in general. Are concerned, the Rational Use of Energy, Thermal Comfort, Saving Renewable Energy and the Energy utilization and other Systems Energy.

PERSONNEL

Direction

- Head: Mamadou Adj
- Head Adjoint: Dorothé Azilinson

Framing

1. Mamadou Adj
2. Dorothé Azilinson
3. Djibril Diaw
4. Mactar Faye
5. Salif Gaye
6. Youssouf Mandiang
7. Vincent Sambou
8. El-Hadji Malick Soumare
9. Ousmane Sow

Researchers in thesis of doctorate 3-rd cycle – 4
Researchers in single thesis of doctorate – 17

General description preface of the head of the laboratory



Name: ADJ

First name: Mamadou

Address: LEA, ESP, UCAD BP 5085 Dakar-Fan – Tel.: 33.825 34 26

E-mail: madj@ucad.sn, mhmadj@yahoo.fr,

- Director of studies of ESP.
- Director of the Laboratory of Energy Applied, ESP, UCAD.
- Responsible of the Thermal option, Systems Energy and Environment of Master 2 of Research “Engineering” of the Polytechnic University.

Formation

- July 1974: A level C
- June 1975: Preparatory year with the Lomonosov Academician of Kiev.
- June 1980: Diploma for the occupation of Electromechanical Engineer of the Polytechnic Institute of Odessa.
- June 1981: BEPA Centers English Improvement of Jules Ferry of Dakar.
- Nov. 1983: Diploma of Thorough Studies Energy, Paris XII.
- Nov. 1987: Doctor-engineer of the ENSUT of Dakar.
- Jan. 1989: Doctor of the University Paris Val de Marne.

Professional activities

Direction of energy ministry for industrial development and the craft industry

- January 1981 – May 1982: Head of the Division of the Great projects.
- May 1982 – March 1983: Responsible for the valorization of renewable energy.
- April 1983 – January 1984: Head of the Division of the Secretariat of the National Commission of Energy.

Ecole supérieure polytechnique (Ex-ENSUT) Université Cheikh Anta Diop de Dakar

Teaching activities

- October 1987 – September 1990: Person in charge of the Laboratory of Electrical engineering.
- October 1990 – September 1991: Person in charge of the Formation HAD of Dpt Electronic engineering.
- October 1991 – September 1996: Chief of the Department Electronic engineering.
- October 1996 – July 2003: Person in charge of the Continuing education of Dpt Electronic engineering.
- Since April 2003: Director of studies of the Polytechnic University.

Research activities – Laboratory of applied energy

- Researcher at the Laboratory of Applied Energy (LEA) since its creation in Nov. 1984.
- September 1989 – July 1991: Assistant person in charge of the LEA.
- Since October 1991: Director of the Laboratory of Applied Energy.

Coordination of projects

- August 1996 – December 2000: Coordinator for ESP of Project PNUD/FEM RAF/93/G32: Reduction of the gas emissions to greenhouse effect thanks to the improvement of energy efficiency of the buildings in West Africa (Ivory Coast and Senegal) - Senegalese Codes of Energy efficiency and Thermal Comfort of the Building industries.
- October 2000 – December 2004: Person in charge of the Technical Group and Coordinator of the Institutions Sénégalaises (LEA/ESP – ISE (Institute of Sciences of the Environment) and ENEA (National School of Economy Applied)) project PSACD (Sénégal-German Project of Domestic Fuels), Direction of Energy, GTZ (German Co-operation): Energy planning – Modeling of Under Sector of domestic fuels.

Research orientations of the laboratory

Rational use of energy (Dorothe Azilinson, Djibril Diaw)

- energy planning;
- modeling of energy consumption.

Thermal comfort in the habitat and energy saving (Vincent Sambou, El-Hadji M. Soumare)

- numerical modelling of the habitat;
- recovery of solar energy.

Solar production of cold (Mamadou Adj, Youssouf Mandiang)

- photovoltaic systems;
- thermoelectric systems;
- thermodynamic systems.

Solar production of warm water (Dorothe Azilinson, Salif Gaye)

- solar-fired heater.

Materials (Youssouf Mandiang)

- thermophysical and hydro-thermophysical characteristics of local materials.

Desalination (Mamadou Adj, Ousmane Sow)

- sea water;
- brackish water.

Mechanics of the continuous mediums (Ousmane Sow)

- Dynamics of the Structures.
- Mechanics of the continuous media.

Activities

Research tasks

*Diplome d'études approfondies
(diploma of advanced studies) (DEA)*

DEA Energy and Dynamics of the Complex systems – University Paris Val de Marne in collaboration with the ENSUT, University Cheik Anta of Dakar.

DEA Sciences Physics for the Engineer – Control and Industrial Process control – University Paris Val de Marne in collaboration with the ENSUT, University Cheik Anta of Dakar.

DEA Engineering sciences – Option Heat transfers & Energy Systems of the Polytechnic University, University Cheik Anta of Dakar.

MASTER Engineerings – Option Heat transfers & Energy Systems of the Polytechnic University, University Cheik Anta of Dakar.

Projects of research and development

Regional project PNUD/FEM/RAF/93/G32

From August 1996 in December 2000 the Laboratory of Applied Energy was implied in the development of the Codes of Energy efficiency and the Thermal Comfort of the Building industries of Senegal within the framework of very important regional project PNUD/FEM/RAF/93/G32 on Reduction of the gas emissions to greenhouse effect thanks to the improvement of energy efficiency of the buildings in West Africa Ivory Coast - Senegal). The activities which were developed by the team installation made it possible to produce the principal reports/ratios:

- Total methodological Notes.
- Methodological Notes sectoral (Envelope, Lighting, Electricity, Ventilation & Air-conditioning, Medical Warm water.
- Follow-up of the climatic data.
- Typology of the buildings.
- Complementary Data.
- Development of the input files of the buildings of reference.
- Energy Optimization of the buildings of the Zone of Dakar.
- Energy Optimization of the buildings of the Zones of Kaolack, Tambacounda, Ziguinchor.
- Guides of application for the drafting of the draft standards of the Codes.

Standards Senegalese applicable to the photovoltaic batteries of solar systems

Organizer of the GT3 (Technical Group) Electrochemical Storage of the CT13 (Technical Committee) of Solar energy, the LEA took part in the preparation of standards Senegalese applicable to the photovoltaic solar systems and their components.

The CT13 was created on the initiative of the Project Senegal-German Solar energy. The GT3 worked in the following parts:

- Stationary Batteries with lead: general regulations and testing methods.
- Accumulator Batteries to lead intended for the storage of the photovoltaic electrical energy of origin.
- Auxiliary Electrolyte: physical characteristics, degrees of essential purity, terminals and connections.
- Stationary Batteries with lead intended for the storage of the photovoltaic electrical energy of origin: dimensioning methods, regulations of installation and exploitation.

Work could be done starting from the publications:

- CEI (International Electrotechnical Commission) No. 27, 50, 51, 51, 359, 485, 617, 896-1, 896-2, 1056-1, 1056-2 and 1056-3.
- DIN 43.530 Part 2, 43.530 Part 4.

PSACD (Senegal-German Project of Domestic Fuels)

Since 2000 the Laboratory of Applied Energy is implied in the modeling of the Under-Sector of Domestic Fuels within the framework of the PSACD (Senegal-German Project of Domestic Fuels) in relation to the IER of the University of Stuttgart, the Institute of Sciences of the Environment of and the Techniques Faculty of Science of the UCAD and the Department Town and country planning, Environment and Urban Management of the National school of Economy Applied of the University Sheik Anta Diop.

The objective consists in implementing a model of management and energy valorization of the various types of fuels and technologies used today, in order to allow a provisioning of the Senegalese households of domestic fuels according to their specificity and of the requirements of “sustainable development” in the direction desired by the international community (Brundtland report/ratio, Conference of Rio...).

An Energy System of Reference (S.E.R.) for the production and the consumption of fuels to Senegal was proposed. This SER includes/understands all fuels and technologies used today in Senegal; as well as the socio-economic variables which are associated for them.

Demographic data-gathering and on:

- them agricultural and agro-industrial vegetable residues;
- them municipal waste;
- them technologies of carbonization;
- them equipment of cooking;
- near the structures concerned allowed to have a base and to carry out simulations to see the evolution of the current location (case of reference) and the impact of the adoption of certain strategies and scenarios (case studies).

