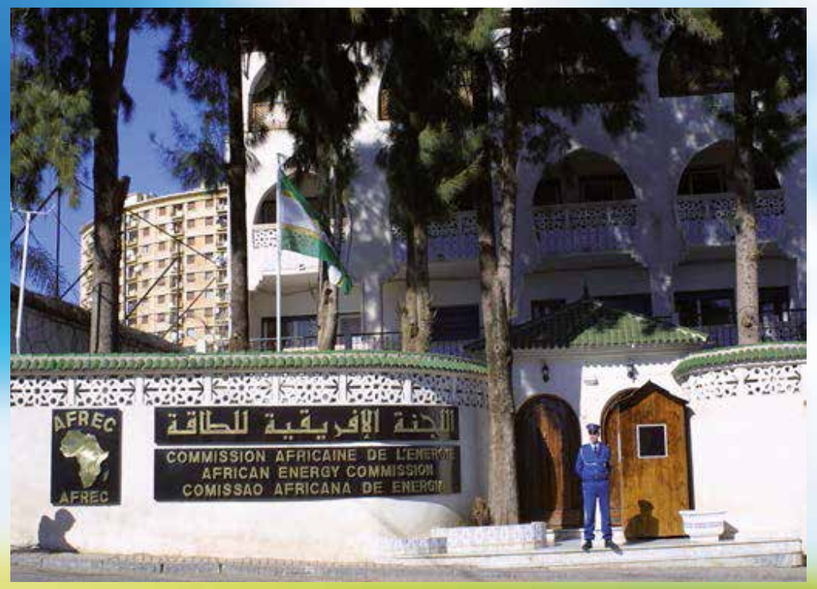
2016

Happy New Year

AFREC Places Renewable Energies at the heart of its Programms in this New Year 2016 and beyond



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AFRICAN UNION

Commission de l'Union Africaine
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مفوضية الإتحاد الإفريقي

Newsletter AFREC 2015

AFREC ENERGY

Commission Africaine de l'Energie
The African Energy Commission
اللجنة الأفريقية للطاقة

03 - 06 November 2015
Nairobi (KENYA)

the 4th Seminar of the African Energy Information System and Database

14 - 17 December 2015
Accra (GHANA).

Seminar on Clean Energy Policies and Climate Change in Africa

21 - 23 DECEMBER 2015
CAIRO – EGYPT

TRAINING WORKSHOP ON THE DEVELOPMENT OF RENEWABLE ENERGY FOR POWER GENERATION IN AFRICA, GRID-CONNECTED WIND FARMS, PV AND CONCENTRATED SOLAR POWER (CSP)

AFREC is For Developing the African Continent Energy Sector

www.afrec-energy.org

Summary of the Seminar

Summary Report of the 4th Seminar of the African Energy Information System and Database

03 - 06 November 2015, Nairobi - KENYA.

The African Energy Commission (AFREC) held from November 3 to 6, 2015 at the Hilton Nairobi (Kenya), the fourth AFREC seminar on the African Energy Information System and Data Base (AEIS) under the theme 'Creation of the African Data Base on Energy Efficiency (ADEE).

The main objective of this 4th seminar was to consider and launch the work of creating the African Data Base on energy efficiency indicators. Besides, the seminar had the following objectives:
The main objective of this 4th seminar was to consider and launch the work of creating the African Data Base on energy efficiency indicators. Besides, the seminar had the following objectives:

- Review the progress made in the implementation and operation of the AFREC's database of energy statistics launched in 2012;
- Provide training for Focal Points on the techniques of energy statistical data collection and energy efficiency indicators in the residential sector;
- Draw upon the experiences of international and regional organizations operating in the fields of energy statistics and energy efficiency indicators and certain countries;
- Develop and adopt a roadmap for the development of energy efficiency indicators for Africa;
- Establish a regional training calendar for national Focal Points in 2016 and 2017, in terms of energy statistics and energy efficiency indicators in Africa.

More than 50 participants (see list of participants) from Member States, AFREC, international institutions attended the seminar. Other invited participants have not made the trip to Nairobi due to difficulties in obtaining visas or lack of flights.

Apart from the opening and closing ceremonies, 16 sessions organized according to the themes have taken place. The presentations in the various sessions were followed by discussions in a climate of serenity (Presentations available on the website: **www.afrec-energy.org**).

1- Opening Ceremony

Three statements were delivered at the opening: the Executive Director of AFREC expressed the pleasure of welcoming all the participants in the seminar and thanked the Government of Kenya who accepted to host the seminar. He later apologized for the African Union Commissioner for Infrastructure and Energy who could not make the trip to Nairobi, but wished success to the 4th seminar of AFREC. He thanked the staff of the IEA, the International Consultant (Jean-Yves Garnier), participants from international organizations and national Focal Points. He then presented AFREC history through the three previous seminars (Algiers 2003; Algiers 2005 and Cairo 2011), as well as AFREC's achievements. He stressed the importance of energy statistics and energy efficiency indicators. He concluded by wishing fruitful deliberations and a pleasant stay to all participants.

The representative of IEA thanked the host authorities and AFREC. He continued emphasizing the availability of IEA to help AFREC in data collection and the creation of databases.

The representative of the Kenyan Minister of Energy and Petroleum welcomed all the participants and highlighted the challenges Africa is facing in the implementation of databases. He opened the seminar wishing full success to the seminar and a pleasant stay to all participants.

group photo followed the opening ceremony.

2- Sessions

The seminar continued through 13 sessions grouped by themes, under the supervision of the staff of AFREC.

2.1- AFREC Strategy to Develop Energy Efficiency Indicators in Africa

In his presentation, the Executive Director of AFREC reported on AFREC activities by stressing the recommendations and strategies adopted in the three previous seminars (Algiers 2003 and 2005; and Cairo 2011). The third seminar in Cairo led to the adoption of the Action Plan 2012- 2014. AFREC was able to achieve the objectives contained in its roadmap for the period 2012- 2014.

He recalled the achievements of AFREC since 2012, namely: creation of databases, annual publications (2012, 2013, 2014 and 2015), creation of Focal Points (54), Capacity Building Workshops (10 Workshops including 271 people trained), country visits, and capacity building of AFREC staff.

The fourth seminar in Nairobi aims to adopt the new 2015-2017 action plan and the training of national focal points on energy efficiency indicators. The cycle of the proposed action plan 2015-2017 includes the following:
- Strengthening the achievements of the first Action Plan 2012- 2014,
- Organization of 4 regional seminars on statistics in 2016
- Organization of 4 regional seminars on energy efficiency indicators in 2016
- Organization of 4 regional seminars in 2016
- Organization of the 5th AFREC Seminar in 2017.

Data collection on energy efficiency indicators will start with 15 countries selected in the residential sector initially.

Mr Yves GARNIER/AFREC Consultant

Dr Hussein ELHAG/The Executive Director of AFREC

2.2- Importance of Energy Statistics for any Energy Policy, Country or Organization.

Mr. Jean-Yves Garnier who was delighted to be present at the seminar for three reasons (6 years stationed in Djibouti and Côte d'Ivoire, present at the launch of AFREC and 20 years working in energy statistics) stressed the importance of energy statistics for households, businesses and governments. A country for example must know the imported quantities of energy; quantify the level of GHG emissions (greenhouse gases). Energy remains a key component for countries and for the global economy. However, data collection must follow a number of rules (cost, schedule, dissemination mechanism ...)

Mr. Duncan MILLARD presented the case of the United Kingdom through the evolution of the energy production, sources of imports of energy, energy balance, and analysis of energy consumption by region. He showed that having good energy data helps make good decisions.

Mrs. Afef CHACHI dwelt on the case of Tunisia, which has an energy system through the development of energy balances, energy efficiency indicators and surveys. Tunisia has crafted annual energy balances since 1980 through the ONE (National Energy Observatory). Energy efficiency indicators are made by ANME (National Agency for Energy Management). As for INS, (National Statistics Institute) it conducts household surveys every 15 .years

Mr. Duncan MILLARD made a second presentation based on the situation of IEA. The IEA, founded in 1974 after the first oil shock, collects data from member and non-member .countries

The Executive Director of AFREC showed that the Commission is following in the footsteps of IEA, but data collection requires substantial resources and skilled personnel. AFREC ensures the collection of data through the AFREC questionnaire developed by IEA, but some Focal Points have not yet well understood the questionnaire, hence the importance of training. In this respect, AFREC operates in 4 stages: collection, validation, dissemination and capacity building. The sources of data collected by AFREC are of two types, primary (Member States and African specialized institutions) and secondary (international institutions).

2.3- How Does IEA Collect Data?

Mr. Duncan MILLARD indicated that IEA collects data from members and non-members. Data collection from member countries of year n-1 is done through 5 questionnaires. IEA has also a monthly questionnaire and a questionnaire on prices.

2.4- AFREC Data Collection System

Mr. Jean-Yves Garnier recalled the process of developing the AFREC questionnaire, which started in 2000, but the 2002 Johannesburg meeting was decisive. Ten meetings were held to develop the AFREC questionnaire. The questionnaire has a home page, a page on instructions and Excel spreadsheets that contain the basic structure and products. The AFREC questionnaire is used to generate energy balances. A manual of procedures is missing from this questionnaire.

Mr. Abdoulay OUEDDO highlighted the strengths and weaknesses of the current situation of data collection in AFREC. The strengths are the existence of the questionnaire, the creation of Focal Points and capacity building. The weaknesses lie in the non-compliance with AFREC format in data transmission, inefficiency of some Focal Points and the fact that Focal Points quit after being trained.

2.5- Energy Efficiency (EE)

Mr. Jean-Yves Garnier presented during this session the limits of statistics for energy efficiency policy. He showed the importance of EE in reducing GHG (greenhouse gas). EE contributes in creating jobs, reducing poverty, but there is often a lack of data and this is how the energy balance data are used initially. For example, one can calculate the following indicators:
Production/TPES, electricity transmission loss rates, added to economic indicators as TPES/GDP, per capita electricity consumption, CO2 emissions per capita. In sub-Saharan Africa, energy consumption in the residential sector is dominated by biomass. EE indicators are pyramidal. The top is represented by aggregate indicators and detailed indicators are represented in the middle of the pyramid. The AFREC questionnaire on statistical data collection enables the development of aggregated indicators, but for detailed indicators it is necessary to develop an AFREC questionnaire on EE.

Mrs. Roberta Quadrelli presented IEA's energy efficiency indicators during this session. EE indicators are developed because there is energy saving potential and EE offers multiple benefits. EE is defined in a simple manner: **use less energy for the same service.**It is calculated as follows: **Energy consumption/activity.**

Activity data to be collected are: GDP, population, physical production (example: number of tonnes of cement produced), passenger-km, tonne-km, number of households, number of devices (TVs, refrigerators ....). She touched upon the pyramidal structure of EE indicators, and then presented two handbooks on EE indicators produced by IEA and available online.
Mr. Jean-Yves Garnier subsequently presented the specificities of residential sector in Africa in terms of energy consumption, compared to the OECD. In OECD countries, the industrial sector represents 1/3 of energy consumption, the transport sector ¼ and residential 1/5, whereas in Africa, the residential sector represents 56.1% of energy consumption, which makes it a priority. In this sector, biomass represents 80% of total energy consumption, but there are huge disparities between North Africa and sub-Saharan Africa and among countries.

2.6- Energy Efficiency Data Collection Methodology for the Residential Sector

Mr. Duncan MILLARD focused his presentation on data collection in the household sector. In this sector, data are collected through household surveys, on-site measurements and estimates from models, but household surveys are expensive.

2.7- Country Experiences: How do they collect data and measure EE indicators?

Eleven countries made presentations at this session. The following can be highlighted:
- Two countries, Ghana and Nigeria have adopted EE policies;
- Energy-saving measures have been adopted in some countries through the distribution of energy-saving lamps

2.8- IEA Training on Energy Efficiency Indicators, Data Collection in the Residential Sector

Mr. Duncan MILLARD rather made a presentation on the establishment of effective data collection and institutional arrangements. He recalled the 10 principles of official statistics. He then presented the examples of the UK, which adopted a law on statistics from 2007, the United States that has a code of conduct on statistics, Italy where data collection is mandatory, and France, which has a law on data publication since 1951.

He concluded his presentation on the importance of monitoring and evaluation.

2.9- Experience of Institutions: How do they collect data and measure EE indicators?

Four institutions made presentations during this session.
Ms. ZHU Xianli from C2E2- Denmark, presented her institution, the programs developed by this institution, which covers three African countries (Uganda, Tanzania and Zambia), and the University of Cape Town in South Africa. She then presented the Danish and Chinese experiences in the field of EE. Denmark collects several household data; China adopted a law on statistics in 1993, which was amended in 1996 and 2009. The CNBS collects the statistics in China. China's EE policy aims to reduce energy intensity by 3% by 2020.
Mr. Didier Bossebouef from ADEME- France presented the work ADEME in the field of EE and dwelt on the MEDENER MED-IEE project. MEDENER is a club of EE agencies of the Mediterranean countries. Three North African countries (Algeria, Morocco and Tunisia) are covered by the MED-IEE project. He presented the activities conducted and the results obtained.

Ms. Amel BIDA from RCREEE- Egypt first presented this regional center on EE, which was established in 2008 and currently comprises 15 members. ECREEE aims to develop renewable energy in the MENA region. She emphasized the project undertaken on EE indicators. She presented the approach and results.

Mr. Yézouma Coulibaly from 2IE-Burkina Faso, presented 2IE, a school founded in 1974 by 14 French-speaking countries, but which accounts currently 32 member states. He presented the work of this training institution.

2.10- Energy Price Data Collection: Sources and Methodologies

This special session on energy prices was driven by whether AFREC could create a database on energy prices.
The Executive Director of AFREC presented the state of energy prices in Africa. Three to four countries practice adjustments in prices of petroleum products in Africa in the light of developments in crude oil prices. Electricity rates are high in Africa.

Several countries subsidize energy, which has impacts on economies. He ended his presentation with questions:
- The link between energy prices and EE;
- Price indicators and EE
- How and where to find energy prices
- How can AFREC collect data on prices and can it create a database on prices.

Mrs. Roberta Quadrelli presented the experience of IEA on energy taxes and prices.

2.11-Country Presentations: Energy Statistical Data Collection

23 countries made presentations on the status of energy data collection. The following difficulties have been flagged:

- Reluctance of some data providers;
- Weakness or lack of a legal framework;
- Lack of financial means;
- Lack of staff ;
- Staff turnover;
- Data privacy
- Reliability of some data collected;
- Non-compliance with data collection deadlines
- Difficulty of collecting data on biomass

2.12- Action Plan for the Creation of AEIS

The Executive Director of AFREC introduced the second Action Plan 2015-2017 to enable AFREC to continue to its activities. The Action Plan includes the following points: objectives, projects, focal points, workshops, technical support, infrastructure, national and regional statistics, expected results, impact and challenges.

After fruitful discussions, the Second Action Plan 2015- 2017 presented by the Executive Director was adopted with amendment.

The amendments mainly concern the following points:

- Focus on the cooperation between African Ministers in charge of Energy and AFREC;
- Link the action plan to the policies of the African Union Commission;
- Country visits by the staff of AFREC;
- provide support to countries that are lagging behind;
- Government commitment is another challenge to be considered.

2.13- Roundtable

The round table was organized around a series of questions or concerns raised by the focal points. All delegations expressed themselves to this effect. The following issues have been raised:

- Continue the training of Focal Points;
- Assist countries in the creation of the national EISs (Energy Information System);
- Develop a manual of statistics;
- Sensitize African Ministers in charge of energy on the importance of energy statistics and energy efficiency indicators;
- Include a minimum amount in national budgets to support data collection;
- Create synergy between the Focal Points;
- Think of an emulation mechanism among focal points;
- Send invitations to focal points on time;
- Choose the best routes when traveling.

The following countries have sought the support of AFREC: Togo, Gabon, Sierra Leone, The Gambia, Guinea and South Sudan.
Some Focal Points must send the contact of their Ministers or other authorities to AFREC for better monitoring of relations between AFREC and countries.

3- Recommendations and Adoptions

The participants to the 4th Seminar have made the following recommendations:

1- Involvement of Ministers in charge of Energy and Petroleum

To ensure better collection of energy statistics and energy efficiency indicators in Africa, participants seek greater involvement by Ministers in charge of Energy and Petroleum in institutional arrangements, funding and creation of national Energy Information Systems (EIS).

2- Securing the Achievements of Focal Points

AFREC Focal Points should remain at their posts to avoid a constant renewal of the training received. Focal Points must in turn train others at the national level.

3- Data Transmission Deadline

Data collection requires the adoption of a schedule including a collection, validation and publication period. The deadline for submission of the data collected in year n-1 should be not later than September 30th, of the year n

4- Household Surveys

Participants encourage states to carry out household surveys periodically, especially in the area of biomass, although household surveys are costly.

5- Submission of Studies on EE to AFREC

States send to AFREC studies already carried out on EE in order to supply its library, as well as other available studies.

6- Cooperation among database providers

AFREC should continue its cooperation with IEA and create partnerships with other institutions (C2ER, ADEME, RCREEE, 2EI) and others to be identified.

Participants to the 4th Seminar have adopted the following documents:

1- Second AFREC Action Plan 2015-2017

To enable AFREC to continue its activities started in 2015, and following the end of the First Action Plan 2012-2014, the participants adopt the Second Action Plan 2015- 2017. AFREC has a new roadmap to continue discharging its missions.

Communiqué to the 3rd Conference of African Ministers in charge of Energy (CEMA)

To advocate and bring the concerns of participants to the attention of African Energy Ministers, AFREC will send the draft communiqués adopted to CEMA.

4- Closing Ceremony

Certificates of participation were given to each participant, and the Executive Director of AFREC concluded the seminar by thanking all the participants, the speakers, the host country, the interpreters and the technicians of the Nairobi Hilton Hotel.

Summary of the Seminar

Seminar on Clean Energy Policies and Climate Change in Africa

14 - 17 December 2015, Accra - GHANA.

1- Introduction

The African Energy Commission (AFREC) organized from December 14 to 17, 2015 at Accra Crystal Palm Hotel (GHANA) a seminar on the theme: **Clean Energy Policies and Climate Change in Africa.**

The seminar took place in a particular context, two days after the Cop21 held in Paris (France) from 30 November to 12 December 2015.

Dr Hussein ELHAG, Directeur Exécutif de l'AFREC

2- Objectives

The main objective of the seminar was to assist African governments, policymakers and regulators as well as the energy industry and the business community to design, plan and regulate the strategies and projects aimed to understand the dimensions of clean energy mechanisms and mitigate the impacts of climate change. Besides, the seminar had the following objectives:

- Raise awareness on the definition, dimensions and mechanisms of clean energy;
- Study the basic requirements of crafting a document relating to the clean energy program;
- Understand the carbon credit concept and learn the calculation methods to assess the eligibility of projects to such mechanisms;

- Define the mechanisms that contribute to clean energy strategies and understand how climate change is affecting African countries and threatening their socio-economic development, agricultural production and food security;
- Learn to take advantage of carbon trading and plan alternative energy investments;
- Study the best practices in mitigating climate change effects, promoting renewable energy and reducing greenhouse gas emissions;
- Develop action plans to implement a climate change mitigation strategy and reduce the countries'' vulnerability;
- Craft investment policies and strategies to mitigate impacts;
- Learn the basics of adaptation skills.

3- Attendance

Twenty-nine (29) participants (see list of participants) from Member States, AFREC, international institutions and universities took part to the Seminar.

Other invited participants have not made the trip to Accra following difficulties in obtaining visas or lack of flights.

4- Opening Ceremony

Two statements were delivered at the opening; the Executive Director of AFREC who thanked all the participants, and the Government of Ghana for hosting the seminar. He then apologized for the Delegation of the African Union Commission that could not travel to the Accra. He touched on the binding agreement signed in Paris on December 12, 2015 by 195 countries. Africa emits less than 4% of global GHG emissions (greenhouse gases), but it must reduce emissions and adapt to climate change. The cost of clean energy has been set at $100 billion per year at the Cop21. The Paris agreement will enter into force in 2020. He insisted that Africa is highly vulnerable to climate change.

The representative of the Government of Ghana welcomed all participants and thanked AFREC for the choice of Accra to hold the seminar. He spoke to the issue of climate change effects in Africa and stressed the need for Africa to develop strategies to address climate change. Africa has growing energy needs but it must also reduce emissions. He opened the seminar while wishing full success and a pleasant stay to all participants.

A group photo followed the opening ceremony.

The seminar continued through sessions grouped by themes, under the supervision of AFREC staff.

La photo de groupe a suivi la Cérémonie de clôture.

5- Sessions

Apart from the opening and closing ceremonies, 12 sessions were held according to different themes. Presentations in the various sessions were followed by discussions in a climate of serenity (presentations available on the website: www.afrec-energy.org. The topics addressed include 4 components:

- Climate Change and Energy;
- Responses to climate change - mitigation and adaptation strategies;
- Responses to climate change - Developing carbon credit projects;
- Carbon as a financial asset for companies.

5.1- Elements of Clean Energy and Climate change interconnections

In his presentation, the Executive Director of AFREC reviewed the different concepts pertaining to clean energy and climate change. He defined and explained clean energy, clean energy mechanisms, climate change and adaptation to climate change. He continued highlighting the effects of climate change especially in Africa. He concluded his presentation by a beautiful metaphor: the Earth is in our hands and we are letting it burn; if it burns our hands will burn as well.

5.2- Climate change Impact in Africa

Mr. Albert NIKIEMA of FAO-Ghana presented the climate change impacts in Africa. He dwelt on the aspects of mitigation and adaptation in agriculture, livestock and forestry. He presented the FAO strategic objectives, addressed climate change impacts in Africa, as well as mitigation and adaptation policies. In the field of bioenergy, the FAO has developed a tool to support countries - the DEFS (Development of bioenergy, the fight against hunger and food security).

5.3- Role of renewables in Combating Global Warming and Climate Change in Africa

The two presenters scheduled in this session being absent, the Executive Director of AFREC made a presentation on the Agreement of the COP 21 and Africa. He recalled the objectives of the COP 21, the negotiation phases and results.

5.4- Role of Regulations in Combating Global Warming and Climate Change & Role of Education and Research against Global Warming

Mr. Joachim TEBA from Togo presented the case of his country. Article 41 of the Togolese Constitution is devoted to environmental protection. Togo ratified the UNFCCC (United Nations Framework on Climate Change) in 1994 and the Kyoto Protocol in 2008. Togo has an action plan to fight against climate change. He recalled that Togo's GHG emissions were negligible but coastal erosion is a real problem in the country.

Mr. Gabriel TAHYI presented the activities undertaken by the Energy Centre of the Kwame Nkrumah University (TEC-KNUST) in the field of research. He dwelt on the REEP project funded by the European Union.

5.5- AFREC Program on Climate change & Climate Change Policy in Africa : Case of Benin

The Executive Director of AFREC presented the African Union strategy on Climate Change. Climate change issues at the African Union Commission are currently managed by the Department of Rural Economy and Agriculture. Since 2009, the AU Commission has been preparing the African common position before each COP. Then he presented AFREC's mandate to address climate change issues (Article 3 of the Convention), and the databases created and under creation by AFREC. AFREC's activities on climate change are meant to support the strategy of the African Union Commission.

Mr. N'TCHA NATTA from Benin introduced the national and international context of climate change, the national legislative framework and the actions against climate change conducted in Benin. He recalled that Benin has ratified the three United Nations Conventions. The 1990 Constitution provides for the protection of the environment and the country has a framework law on the environment and laws on flora and fauna, as well as a UNFCCC implementation strategy. Climate change impacts are visible in Benin particularly in terms of coastal erosion and in the field of agriculture.

5.6- Potential Impact of climate change on the Continent, Climate Change Economic Cost and Sources of Financing

Mr. Benjamin AFOTEY made a presentation on climate change impacts in Africa. Africa is highly vulnerable to climate change, and according to climate experts, temperatures could rise by 1.5 to 3°C, by 2050. Africa has 320 coastal cities that could be impacted by the rising level of ocean waters. Several sectors are threatened by climate change. Africa gives off less GHG, but must start to reduce emissions.

Mr. Narcisse ABOYA dealt with the economic costs of climate change, the funding agencies and eligibility mechanisms. There are various assessments of climate change costs made by various bodies, which include: the GEF (Global Environment Fund), the Adaptation Fund (created in 2001 at COP 7) and funds provided for in the COP 21 (100 billion/year).

5.7- Climate change Program components in Sahelian Countries; what is Climate Change and How Does it Affect Africa?

Mr. Bokoye SOULEYMANE presented the general context of the situation in Niger, the impacts of climate change in the country, the key elements of its INDC (Intended Nationally Determined Contribution) and good practices. He dwelt on the strategy of sustainable land rehabilitation.

Mr. Jean INZAMBA ENDIKANO ELIA focused his presentation on the situation in the DRC (Democratic Republic of Congo) and other states of Central Africa in terms of climate change impacts, solutions (mitigation and adaptation) and the position of the DRC at the COP 21.

5.8- Adaptation to climate change in Africa & Climate Change Policies in African Islands: Case of Seychelle

Mr. Sheku Kamara presented the impacts of climate change in Africa identified by various agencies. He defined the concepts of vulnerability, resilience and adaptation. He then presented the 27 most vulnerable points in Africa and other impacts.

Mr. Theodore MARGUERITE focused his presentation on the case of Seychelles, made up of a group of islands with a population of 91 000 inhabitants. Climate change impacts are visible through coastal erosion, loss of biodiversity (flora and fauna) and water salinity.

5.9- African Alignment Strategy to Global Demand; Agreements and Mechanisms for Mitigation and Adaptation to Climate Change

Mr. Dauda ZALLE presented the case of Burkina through the legal and institutional framework, the organizational framework, the main sectoral programs and policies and the way forward. Burkina has adopted an Energy Policy (POSEN 2014- 2025) and a National White Paper on energy.
Mr. Cheik KANTE focused his presentation on Mali's INDC (Intended Nationally Determined Contribution) presented at the COP 21. He dwelt on the objectives of INDC, Mali's GHG emissions and adaptation guidelines.

5.10- Country Presentations

Eleven countries (11) presented the strategies pursued in promoting clean energy policies as a means to mitigate negative impacts of climate change. The presentations include the following:

- Adoption of renewable energy development strategies, plans and programs;
- Adoption of institutional frameworks dedicated to renewable energies;
- Lack or poor funding for renewable energy;
- Adoption of a law on the promotion of the Inga site (DRC);
- Adoption of INDC (Intended Nationally Determined Contribution) as a mitigation measure;
- Availability of clean energy sources;
- Adoption of energy efficiency measures (distribution of energy-saving lamps, dissemination of improved stoves program);
- Low penetration of non-hydropower renewable energy;

5.11- Roundtable and Discussions

A roundtable was organized on a series of questions on financing, beneficiation of renewable energy, support of the international community, the role of women, the actors involved in the fight against climate change. All delegations expressed themselves in this respect and came up with the following:

6- Recommendations

The participants made the following recommendations:

1- Recommendation on Renewable energy Financing
Africa's emissions of GHG (greenhouse gas) are low (3-4% of global emissions) but it must reduce them and adapt to climate change effects. In the field of energy, renewable energy is a means to mitigate GHG emissions. Africa's huge renewable energy resources are an asset for the continent. Financing renewable energy is a major challenge for Africa, and African governments as well as the international community should mobilize funds to this end.

2- Recommendation on Support to Research & Development on Renewable Energy
New and renewable energy will spread over Africa if technologies are duplicated and controlled by Africans. Africa needs to boost its research and development on renewable energy, it must not go on passively consuming others' technologies.

3- Awareness Raising
Africa remains the most vulnerable continent to climate change. Climate change issues must involve all segments of the population, especially the youth. Awareness raising programs on climate change must be introduced in the curricula of primary schools.

4- Adoption of Programs to Combat Climate Change
Climate change impacts affect all African countries and all segments of their populations. Each country must adopt national, regional and continental programs to address climate change in a participatory way.

7- Closing Ceremony

Certificates of attendance were distributed to each participant, and the Executive Director of AFREC concluded the seminar by thanking all the participants, presenters, the host, interpreters and technicians of the Accra Crystal Palm Hotel.

Done in Accra, on December 16, 2015
The Seminar

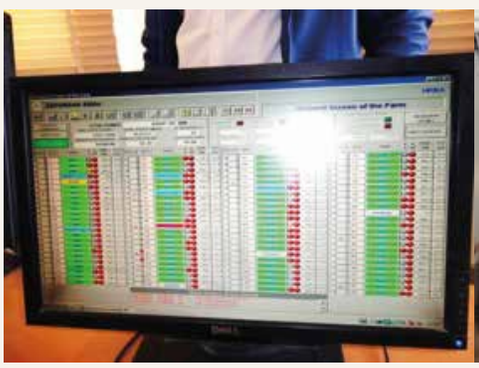
Summary of the Seminar

TRAINING WORKSHOP ON THE DEVELOPMENT OF RENEWABLE ENERGY FOR POWER GENERATION IN AFRICA, GRID-CONNECTED WIND FARMS, PV AND CONCENTRATED SOLAR POWER (CSP)

21 - 23 DECEMBER 2015, CAIRO – EGYPT

1- Introduction

The African Energy Commission (AFREC), in association with the Egyptian Electricity Holding Company (EEHC) of the Egyptian Ministry of Electricity and Renewable Energy, organized from 21 to 23 December at the Novotel Airport Hotel in Cairo (Egypt), a seminar on the theme: **Training Courses on the Development of Renewable Energy for Power Generation in Africa.**



The course covered: grid connected of wind farms, PV and Concentrated Solar Power (CSP)

This seminar was held after the one organized in 2010 on energy technologies in Cairo, and in 2011 on solar energy in Algiers.

2- Objectives

The main objective of the seminar was to improve the technical capacity, knowledge transfer and upgrading of the skills of technical experts in the use of renewable energy in Africa. Besides this main objective, the seminar aimed at the following:

- Strengthen the technical capacity of the participants to support their work in developing the renewable energy sector in their country of origin;
- Enable participants to acquire new technical and planning skills in the field of renewable energy technologies through presentations and guidance on the field provided by engineers and leading professionals specialized in wind and solar energy;
- Provide a valuable platform for the exchange of professional and cultural experiences among the participants;
- Achieve the overall objectives of the African Union in the support of Africa's socio-economic development.



3- Attendance

More than fifteen (15) participants (see list of participants) from Member States, AFREC and academia took part in the seminar. Other invited participants have not made the trip from Cairo following difficulties in obtaining visas or lack of flights.

4- Opening Ceremony

Two statements were delivered at the opening; the General Manager of Marketing and Training Department in the Egyptian Electricity Company (EEHC), who welcomed all participants, and the Executive Director of AFREC who opened the seminar and expressed his satisfaction of the good cooperation between AFREC and the Ministry of Electricity and Renewable Energy of the Arab Republic of Egypt. He stated his pleasure to be in Cairo and wished that all of Africa benefited from the experience of Egypt in the field of renewable energy. He also welcomed all the participants.

The seminar continued through sessions grouped under specific themes, and site visits under the supervision of staff from the Egyptian Ministry of Electricity and Renewable Energy.

5- Sessions

Apart from the opening and closing ceremonies and site visits, 6 sessions held under specific themes were held. Presentations in the various sessions were followed by discussions in a climate of serenity (presentations distributed to all participants).





5.1- PV Technology
Mr Mohamed Hamed presented the basics of photovoltaic technology through the following: energy requirements, site location and climate data. He reviewed the basic components of the different photovoltaic systems.

5.2- Solar Technology
Monsieur Essam El said a axé sa présentation sur la mesure de la radiation, la technologie d'énergie solaire
Mr Issam El Said focused his presentation on the measurement of radiation, solar technology and thermal energy. Solar radiation can be direct or diffuse; overall radiation is the sum of both. PV exists in several sizes. With regard to thermal energy, there can be temperatures of 80 ° C, 300 ° C and 1000 ° C. Films were also screened to better illustrate his presentation.

5.3- Power Storing System
Mr Issam El Said dwelled on the storage and retrieval of energy in the context of SCP. Energy can be stored in liquid or solid form.

5.4- CSP Site Selection
Mr Issam El Said focused his presentation on the measures of the radiation measuring equipment and site topology. For CSP, a DNI (radiation) higher than 1900 KWh/m2 is needed. Data on radiation of at least 10 are required. Radiation is measured with the use of a pyrheliometer or satellites (SWERA, PVGIS and Metoonorm).

5.5- Wind Projects in Egypt
Mrs Noran Afifi presented the completed and on-going projects in Egypt. She dwelt on the regulatory and institutional framework, site location, wind data, environmental impact studies and financing mechanisms.

5.6- PV System

Mr Hany Ahmed made a presentation on two PV systems: connected and not connected to the grid. The grid-connected requires PV modules, an inverter, transformer and grid, whereas the non-connected one requires PV modules, an inverter and a battery.

6- Site Visit

Three sites were visited as part of the seminar to enable the participants to have a sense of the realities on the ground.



6.1- NREA Laboratory

A visit to the laboratory of the Renewable Energy Regulation Authority (NREA) was an opportunity for the participants to see the activities carried out. The following units have been visited:

- CSP Unit;
- The photovoltaic (PV) Unit
- Biomass Unit;
- Household appliances Unit.



6.2- Ministry of Electricity and Renewable Energy

The participants visited the solar PV system installed on the roof of the Ministry of Electricity and Renewable Energy. This system consists of a series of solar panels on the roof and a 6 KW converter in the 13th floor of the building. During this visit, the highest authorities of this Ministry expressed their satisfaction with the cooperation with AFREC. The Executive Director of AFREC insisted on pursuing such cooperation.





During the visit, each participant received a certificate of attendance.






6.3- Zafarana Wind Farm

The Zafarana site is a wind farm with a capacity of 550 MW, located 190 km away from Cairo. The visit covered three places under the supervision of Mr Ahmed Azmy: in theatre, the control room and the wind farm.

The Zafarana site was chosen after the publication of Egypt's Wind Atlas because of its proximity to Cairo, wind speed (9.0 m / s), soil topography (flat ground), low turbulence and high capacity factor. A number of companies from the following countries are involved in this site: Spain, Japan, Germany and Denmark. Currently, Zafarana farm has 700 turbines, and its installed capacity increased from 63 MW in 2001 to 545 MW. It produced 1287, 6 GWh in 2013. Egypt's objective is to increase the share of wind power in electricity generation from 12% to 20% in 2020.



7- Recommendations

The participants made the following recommendations:

1- Recommendation on Solar and Wind Technology in Africa
Africa has significant solar and wind resources whose beneficiation requires the development of an industry of solar and wind technology to create a value added on the continent.

2- Recommendation on Adoption of National and Regional Strategies for the Development of Renewables.
Renewable resources and spaces exist in Africa. Some renewable resources can only be developed in a regional context. It is more than necessary to map out in each country and sub-region, a strategy and policies to develop renewable energy, including solar and wind resources.

8- Closing Ceremony

The Executive Director of AFREC closed the seminar by thanking all the participants, stakeholders, the host, interpreters and technicians of the Cairo Novotel Airport (Egypt). He wished the best to all for 2016.

Done in Cairo, on December 23rd, 2015
The Seminar