



ECREEE

ECOWAS Regional Centre for Renewable Energy and Energy Efficiency



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ECREEE at COP 17, Durban, South Africa

– ECREEE Side Event, 7 December 2011

ECREEE was accepted by the United Nations Framework Convention on Climate Change (UNFCCC) as an observer organization to the United Nations Climate Change Conference, COP-17 in Durban, South Africa. At the margins of the COP, ECREEE organized the side event, 'Promoting Renewable Energy and Energy Efficiency Investments for Sustainable Development in West Africa' on 7 December at the Inkosi Albert Luthuli International Convention Centre (ICC). The side event brought together high level speakers from the Economic Community of West African States (ECOWAS), United Nations Industrial Development Organization (UNIDO), Strategic Global Environment Facility (GEF), Austria and Spain.

The main objective of the side event was to identify ways to overcome the key constraints for green energy investments in the ECOWAS region. This is against a background of the severe energy crisis in the ECOWAS region and the reality that, despite the region's significant renewable energy and energy efficiency potential, it still presents its markets largely underdeveloped. In 2010, for instance, West Africa attracted only a minimal fraction of the overall glo-



L-R Mr. Christopher Addy-Nayo, Consultant for the ACP Business Climate Facility, Mrs. Irene Giner-Reichl, Director General for Development Cooperation, Austrian Federal Ministry for European and International Affairs; Mr. Mahama Kappiah, Executive Director of ECREEE; Dr. Dmitry Piskunov, Managing Director, UNIDO; Dr. Johnson Boanuh, Director of Environment of the ECOWAS Commission; Dr. Robert Dixon - Climate Change Team Leader at the Global Environmental Facility (GEF)

bal renewable energy investments estimated at US\$200bn.

The distinguished panelists, among others, examined the role of international development assistance, climate finance and the concept of Nationally Appropriate Mitigation Actions (NAMAs), the added value of regional approaches to address national investment barriers and the role of ECREEE. The side event

also provided inputs for the ongoing study of the improvement of investment and business frameworks for green energy in the ECOWAS region being undertaken by ECREEE with the assistance of the Business Climate Facility (BizClim). The study will also demonstrate how NAMAs can be used to raise additional finance for renewable energy and energy efficiency investments.

IEA - ADEME Energy Efficiency Day at COP-17

– Wednesday, 7 December 2011

The International Energy Agency (IEA), in collaboration with the Republic of South Africa's Energy Department and the French Environment and Energy Management Agency (ADEME) organized a series of side events on energy issues at the margins of COP-17, held in Durban. This included the Energy Efficiency Day, which took place on 7 December at the Climate Change Response Expo. The day was marked by various sessions featuring high level policy dialogues on energy efficiency trends and policies. Mahama Kappiah, Executive Director (ED) of ECREEE, gave a presentation in the session on how to overcome barriers to energy efficiency. This focused on the ongoing regional project 'Supporting Energy Efficiency for Access in West Africa (SEEA-WA)' funded by the Africa Caribbean Pacific-European



Ms Dominique Campana, (second from right) officially presenting ADEME's support to the SEEA-WA project. Others are from left, Ms Hélène Sabathié-Akonor, Head of Sub-Sahara Africa International Affairs, ADEME; Mahama Kappiah, Executive Director, ECREEE; and Mr. François Moisan, Executive Director for Research, Strategy and International Affairs, ADEME

Union (ACP-EU) Energy Facility, ADEME and the United Nations Development Program (UNDP). The project is implemented in partnership with the Austrian Energy

Agency (AEA), the French consultancy company, Alternatives pour l'énergie, les énergies renouvelables et l'environnement (AERE), the European Copper Institute and ENERGIA.

The project is being undertaken against the background of interrelated challenges that the ECOWAS region is currently experiencing – energy poverty, energy security and climate change mitigation. The ED noted that, with access to modern energy services in the region at only about 20%, and given the unsustainable nature of current energy practices, it would be important that energy efficiency remained a high priority. Its specific objective is to overcome the technical, financial, legal, institutional and capacity related barriers that hinder the implementation of cost-effective energy efficiency measures in the region.



Mahama Kappiah making a presentation at the Paris-Nairobi Side Event

COP-17 Side Event: The Paris–Nairobi Climate Initiative

– 8 December 2011

Under the auspices of the Paris–Nairobi Climate Initiative, the French and Kenyan Governments organized a ministerial COP-17 side event as well as one on 'Structuring Energy Projects and the NAMAs'. In his presentation at the event, Mr Mahama Kappiah, ECREEE Executive Director, gave an overview of the energy situation in West Africa, the establishment of ECREEE, and the centre's interventions and priority programmes for the next 5 years covering the areas of policy development, capacity development, and knowledge management, as well as investment promotion.

Also, at the margins of the Paris–Nairobi side event, Ms. Dominique Campana, the International Affairs Director of ADEME presented a cheque for the amount of €42,000 to the ECREEE Executive Director. This amount represents the first installment of ADEME's contribution to the SEEA-WA project which is currently being implemented by ECREEE. ADEME is contributing a total of €140,000 to the project which is sponsored by the EU-ACP Energy facility of the European Union to the tune of €1,500,000. Other co-donors of the SEEA-WA project include the UNDP and the ECOWAS Commission.

NREL SIDE EVENT AT COP17, 29 NOV. 2011

ECREEE also participated in the US National Renewable Energy Laboratory (NREL) side event which was held at the US Centre. NREL and other international partners including ECREEE, the Chilean Renewable Energy Center (CER), and the US Department of Energy (DoE) supported Open Energy Information (OpenEI) (web portal <http://openei.org>). OpenEI is an open platform to share and link data, information, tools, training materials and other resources to support clean energy development globally. The side event therefore sought to promote the gateway, which aims to provide relevant information, enrich content, reduce duplication of effort, and provide a more universal structure for data management. The OpenEI is akin to the ECOWAS Observatory for Renewable Energy and Energy Efficiency (EORE). The web-based EORE will be launched by ECREEE at the end of 2012 and will inform interested investors on renewable energy potential, stakeholders and business opportunities in the ECOWAS region.

Book Presentation – 'Africa and Climate Change: The Heat is On'

– 6 December 2011

ECREEE also participated in the book presentation, 'Africa and Climate Change: The Heat is On', which was held at the EU Pavilion of the Climate Change Response Expo at COP-17. Edited by Ambassador Georg Lennkh, special envoy and Austria's foremost expert in African politics, and Irene Giner-Reichl, Director-General for Development Cooperation at the Austrian Foreign Ministry, the volume presents important African voices, from government, international organizations and academia, on one of the 'hottest' global issues as it affects a continent. Cognizant of the fact that Africa may have to bear the brunt of the effects of climate change, the book examines the various ways African stakeholders have been analysing the threat and assessing their options, particularly



L – R: Chris Addy-Nayo, Consultant for the ACP Business Climate Facility; Mrs. Irene Giner-Reichl, Director General for Development Cooperation, Austrian Federal Ministry for European and International Affairs and Hyacinth Elayo, Energy Policy Analyst at ECREEE at the Book Presentation

leading up to COP-17. Mahama Kappiah, ECREEE ED, and Martin Lugmayr, Renewable Energy Expert at ECREEE, contributed a chapter – 'Towards a Sustainable Energy Scenario in West Africa:

The ECOWAS Regional Centre for Renewable Energy and Energy Efficiency at a Glance'. The chapter highlights the pioneering approach of ECOWAS in developing the region's renewable energy and energy efficiency sectors, which subsequently led to the establishment of the first regional renewable energy and energy efficiency (RE&EE) promotion agency in sub-Saharan Africa. The centre's activities aim to mitigate the effects of the existing barriers to the creation of RE&EE markets in West Africa. They also contribute to the achievement of the UN Millennium Development Goals (MDGs), the UN goal on universal access to clean, affordable energy by 2030 and the international agreements to reduce greenhouse gas (GHG) emissions to keep the global average temperature rise below 2°C.



Cape Verde Attains 25% Renewable Energy Penetration

The Island country of Cape Verde has completed the installation of a 25.5 MW wind park, thus increasing the total installed capacity of renewable energy installation in the country to 33MW. With this project, the country has already attained half of its target of 50% renewable energy penetration by 2015 – adopted in its 2010 renewable energy policy.

Following the adoption of the policy, the government embarked on a comprehensive RE resource assessment, developed RE resources maps for all its ten islands, and developed the Cape Verde Renewable Energy Investment Plan (CV-REIP), which identified potential locations for installing RE generation plants in the country. In accordance with the Plan, the Government, with a concessional credit from Portugal, constructed two Solar PV parks in 2010 on the islands of Santiago (5 MW) and



H.E. Dr. José Maria Neves, Prime Minister of Cape Verde at the inauguration of the Wind Park in São Vicente

the Island of Sal (2.5 MW). The construction of the 25.5 MW bundled wind park on four islands in 2011 therefore brings to a total of 33MW, the installed RE capacity in Cape Verde.

The total cost of the project is €61 M funded by credit sources from the European Investment Bank (EIB) €30 M, the African Development Bank (AfDB) - €15 M, and equity sources from the Africa Finance Corporation (AFC), Finnfund, Infraco, Electra and the Government of Cape Verde. The project is expected to produce 80 to 110GWh/year and cut down CO2 emissions from 12.000 to 20.000 ton/year.

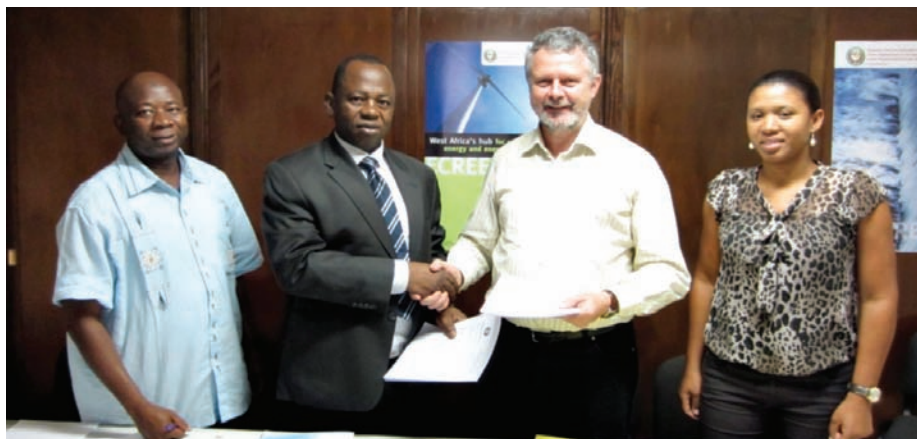
Island	Type of Turbine	Number of Turbines	Capacity(MW)
Santiago	Vestas □ V□52	11	9.35
Sao Vincent	Vestas □ V□52	7	5.95
Sal	Vestas □ V□52	9	7.65
Boavista	Vestas □ V□52	3	2.55
Total			25.5

The ECREEE BizClim Project – ‘Promoting Renewable Energy and Energy Efficiency Investments in West Africa in the Context of the NAMAs’

ECREEE is undertaking a strategic study: ‘Promoting Renewable Energy and Energy Efficiency Investments in West Africa in the context of the NAMAs’. Supported by the ACP (BizClim), the project will review and analyse targeted ECOWAS countries’ environmental and investment policy legislation/regulations/procedures. This is against a background where in West Africa, with rapidly growing economies, energy consumption will more than triple by 2030. This will require more than €10b in investment in energy and environmental projects. These investments will be crucial in determining whether the ECOWAS region contributes to minimizing GHG emissions. Countries can invest in clean technologies to fight climate change and to stimulate other small-scale

private investments in clean energy production, efficient energy consumption and other environmental projects. However, so far, West Africa is not attracting substantial investment in the renewable energy and energy sectors. Moreover, West African countries are hardly benefiting from the established clean development mechanisms and other carbon funds. This requires that governments support an enabling business environment to encourage financial institutions, private banks and private investors to come into the market to invest in green technologies. More so in the case of NAMAs, it requires that there be a legislative, regulatory and institutional framework to attract funding from the industrialized countries for RE&EE investment projects. These

projects will also generate a host of sustainable development benefits to local communities leading to job creation, and improved energy supply and sanitation. ECREEE has the potential to become an important link between international climate, energy and development cooperation policy, and a key entry point for international funding for energy related climate change mitigation in West Africa in forthcoming years. This study therefore aims to strengthen or create the enabling environment for investments and innovative finance in NAMAs regarding RE&EE environmental projects in West Africa by catalysing the introduction of the necessary legal and regulatory reforms, including through NAMAs Policies and Measures (PAMs).



L-R: Bah Saho, Renewable Energy Expert, ECREEE; Mahama Kappiah, ECREEE Executive Director; Henk Joos, Chief Executive Officer of QUINVITA; and Edna Sanches, Financial and Administrative Manager of QUINVITA at the signing of the bio-energy assessment agreement between ECREEE and Quinvita.

Launch of the ECOWAS Sustainable Bioenergy Crops Assessment

ECREEE, UNIDO, the International Industrial Biotechnology Network (IIBN) and QUINVITA, a global industrial crop technology and knowledge provider for Jatropha, have launched a major strategic study on the potential for sustainable production of novel bioenergy crops in the ECOWAS region. A cooperation agreement was signed by Mr Mahama Kappiah, ED of ECREEE and Mr Henk Joos, Chief Executive Officer (CEO) of QUINVITA, at the margins of the OECD West Africa Club Forum 'West Africa and Brazil: Addressing Renewable Energy Challenges', held in Praia, Cape Verde, from 5–6 December 2011. The strategic study will:

- assess the potential for increased food production and utilization of non-food/feed residue/waste for bioenergy production from selected food crops;
- identify 'go' and 'no-go' regions for between five and eight novel bioenergy crops within the 15 ECOWAS countries, taking into account available land for agriculture, forestry and other environmental impacts;
- identify three potential pilot projects for specific regions in ECOWAS countries, with a potential for sustainable production of 10,000–15,000 hectares of a specific bioenergy crop;
- provide a sustainability assessment of potential projects, taking into consideration social, economic and environmental aspects of bioenergy crops and their integration with food production, social and environmental factors.

All assessments will provide geographic information systems (GIS)-based data on the whole ECOWAS region and will identify

the best sites for renewable energy (RE) projects. All data will be published through the ECOWAS Observatory for Renewable Energy and Energy Efficiency (EORE).

ECREEE AND CENER ASSESS THE CSP POTENTIAL AND INVESTMENT SITES IN WEST AFRICA

Concentrated solar power (CSP) plants are one of several renewable energy technologies with significant potential to meet part of future energy demand. It is the only solar-based technology capable of providing utility scale electricity. West Africa has several regions, such as the Sahel, with a promising solar resource potential for CSP plants. The National Renewable Energy Centre (CENER) is a public technology centre specializing in applied research and the development and promotion of renewable energies. It is highly rated and receives national and international prestige. CENER has a cutting-edge technological infrastructure, with the most modern laboratories and facilities in Europe. In May 2011, ECREEE visited the CENER facilities and signed a memorandum of understanding (MoU). As a follow-up, CENER submitted a co-funded project proposal to conduct an analysis of CSP potential and feasibility in the ECOWAS region. The assessment includes an overview of the current CSP technologies and trends, an evaluation of the solar potential for CSP in the region, as well as a pre-feasibility study of a CSP power plant to be constructed in the ECOWAS region. The project started last December and is expected to be completed by the end of 2012.

The ECREEE Business Plan 2011–2016

The ECREEE Business Plan for the period 2011–16 has been developed by ECREEE in cooperation with the technical assistance of Nexant Inc. and with the support of the United States Agency for International Development (USAID), Spain, Austria and UNIDO. The business plan provides a powerful strategic long-term implementation framework allowing continued monitoring of the achievements of the centre. By mapping out a clear vision, the plan serves to guide the centre towards a position of relevance and sustainability in the coming years. The strategy includes the definition of objectives and milestones, performance indicators, annual action plans, and human and financial resources requirements. It also highlights the peculiarities and specific challenges facing the region with respect to energy, while presenting the opportunities for and barriers to renewable energy and energy efficiency deployment, as well as a country-by-country review of the needs, opportunities and key issues within the sector. At the end of the 6-year period, an independent external evaluation will be carried out to assess the achievements of the centre based on the performance indicators set out in the business plan. These include the number of additional people/institutions with access to modern energy services through RE&EE; the number of jobs created directly or indirectly during construction and operation of RE&EE projects; the volume of income and savings generated by RE&EE projects; the volume of GHG tons reduced throughout the lifetime of installed RE&EE projects; the volume of reduction of fuel wood used for cooking through RE&EE projects; the rate of electricity access rates in rural areas in ECOWAS; and the MW capacity installed in the region. The budgetary requirement for the period is projected at €35m. The business plan is being reviewed by ECREEE's partners, its National Focal Institutions (NFIs), other relevant stakeholders and the ECREEE Technical Committee, and will be formally presented and approved at the next ECREEE Board Meeting in April 2012.



Bridging the Gender Gap for Development Effectiveness in the Energy Sector: A Policy and Practitioners Meet

The ENERGIA International Network on Gender and Sustainable Energy, a partner to the ECREEE project on SEEA-WA, in collaboration with Swedish International Development Cooperation Agency (SIDA) organized a practitioners and policy meeting on 'Bridging the Gender Gap for Development Effectiveness in the Energy Sector'.

This meeting brought together key players in the energy sector, financial institutions, NGOs and development organizations such as the World Bank, and, of course, ECREEE.

The purpose of the meeting was to inform policymakers and development partners on strategies to integrate gender concerns into energy policies and programmes in a more systematic and cost-effective manner. The meeting encouraged an exchange of knowledge and experiences regarding the formulation, implementation and monitoring of gender-sensitive energy policies and programmes, and also demonstrated how mainstreaming gender in energy poverty eradication programmes raises the success bar of such developmental efforts.

The meeting, which was organized into five thematic modules, covered issues on: engendering energy projects and programmes; gender in energy sector policies and institutions; maximizing development effectiveness through synergizing efforts; financing and women's entrepreneurship; and networking and capacity building.

Clearly, improving energy access for development necessitates that gender differences, and associated social roles, can be considered within programme designs to ensure that equal opportunities can be provided for eliminating energy poverty. These lessons are particularly important to the SEEA-WA project, which aims to overcome, among other things, gender-related barriers hindering the acceptance/adoption of energy-saving measures among the rural and urban poor. ECREEE, a partner to Energia in the SEEA-WA project participated in this workshop.



Adnan Z. Amin, Director - General of IRENA; Louis Seck, Minister of Renewable Energy of Senegal; Mahama Kappiah, ECREEE Executive Director at the signing of the MoU between IRENA and ECREEE.

ECREEE and IRENA sign MoU and Commence the implementation of Joint Projects and Activities

From its creation, the International Renewable Energy Agency (IRENA) and ECREEE have been in permanent dialogue to define a partnership that will result in enhanced action by IRENA in West Africa, as well as international support for ECREEE activities for the deployment of renewable energy in the region. At the margins of the opening of the IRENA Innovation and Technology Centre in October 2011 in Bonn, both institutions signed an MoU. It was agreed to cooperate particularly in the areas of exchange of knowledge and in-

formation, capacity building, the IRENA renewable energy readiness assessment, the IRENA renewable energy atlas, and other joint activities. ECREEE is part of the end-users community and future data provider for the IRENA Renewable Energy Atlas. The Renewable Energy Readiness Assessment (RRA) will be scaled up to cover the entire ECOWAS region; there will be joint action concerning capacity building activities; an assessment on RE costs and scenarios for West Africa will also be provided.

On-line Course on Renewable Energy Technologies and Management

Between October and December 2011, the Economic and Technological Development Distance Learning Centre (CEDDET) Foundation, with the support of ECREEE, executed the second edition of the on-line course 'Management of Renewable Energy Technologies: Trends and Prospects'. The on-line course was organized for civil servants and decision makers from African Ministries of Energy and Environment. The instructors for the course were provided by the Center for Energy-related, Environmental and Tech-

nological Research (CIEMAT), a public research agency for excellence in energy and the environment. The course was taught in French and 18 institutions from different ECOWAS countries participated. In 2012, organization of a new edition is expected and ECREEE will review the contents as well as disseminate the launching of the course. The CEDDET Foundation is a non-profit entity fostering cooperation, created in 2001 as a joint initiative between the Spanish Ministry of Economy and Finance and the World Bank.





■ ECREEE HEADQUARTERS GOES GREEN:

Installation of a 9.9 kW Roof-top PV System

The first private grid-connected renewable energy household system has been commissioned under the new renewable energy law of Cape Verde. The PV system, which has been operational since November 2011, is a demonstration project for the region and a showcase for a grid-connected PV system at the household or office level. Thanks to the new renewable energy (RE) law approved in Cape Verde in January 2011, small producers and consumers are now allowed to install RE electricity systems for auto-consumption and may also feed any electricity surplus into the national electricity grid, thus discounting the final electricity bill. This RE incentive mechanism for households, commonly referred to as net metering, is already being implemented in some developed countries.

Net metering laws encourage the installation and use of RE technologies,



Installation of the Solar PV system at ECREEE Headquarters

reduce reliance on fossil fuels, add to the diversification of current energy portfolio, and help lessen the environmental footprint associated with electricity generation and consumption.

The ECREEE PV system therefore demonstrates the social, economic and environmental benefits of green energy:

- The project will generate considerable

energy savings over its expected lifetime of 25 years. ECREEE will buy less electricity from the grid and sell the excess electricity to the grid.

- The project investment is attractive and viable given the high electricity tariffs in Cape Verde (exceeding 25 EUR/cents per kWh) and the country's significant solar potentials.

- Henceforth, ECREEE will not only save money, but will also become energy self-sufficient.

The system also includes a battery bank back-up to ensure energy security for the office during power shortages, and for periods when the energy produced by the PV system is inadequate.

- Moreover, the system reduces greenhouse gas (GHG) emissions and local pollution through the substitution of diesel/heavy fuel based electricity generation with a cleaner source.

ECOWAS Delegation on a Renewable Energy Study Tour to Spain

ECREEE and the UNDP-Regional Environment Project organized a study tour on renewable energy in Spain from 14-18 November 2011. The activity was hosted there by the Spanish Agency of International Cooperation for Development (AECID), CIEMAT and the Technological Institute of Canary Islands (ITC). The study tour invited representatives from the following seven West African countries: Mauritania, Cape Verde, Sierra Leone, Benin, Sao Tome, Mali and the Ivory Coast. The delegation also comprised a series of resource persons from USAID, the World Future Council and the West African Power Pool. This activity started in September with a previous visit to Spain made by a Gambian delegation to visit wind energy technologies and to learn about the role of the public sector in the deployment of renewable energy.

The visit provided a full understanding of Spain's national policy to deploy renewable energy across all its territories and in particular the ingredients for an optimal policy package on legal, fiscal and techni-



Participants at the Study Tour

cal frameworks at both national and local level. The participants learnt how various forms of renewable energy resources are assessed, harvested and managed. The complementary role of public institutions and the private sector was explained with all necessary details. In particular, the whole delegation discovered how intermit-

(in particular solar and wind power) is managed within the national grid. A two-day field visit to renewable installations on the Island of Gran Canaria was a highlight of the week-long study tour.

UNDP and ECREEE will pursue the collaboration and propose a coherent programmatic framework project to coordinate activities among countries.





SWAC/OECD–ECREEE Forum Explore Renewable Energy Cooperation between West Africa and Brazil



The Sahel and West Africa Club (SWAC/OECD), in collaboration with ECREEE and the governments of Cape Verde and Brazil, organized the Forum 'West Africa and Brazil: Addressing Renewable Energy Challenges' from 5–6 December 2011 in Praia, Cape Verde.

The forum brought together SWAC members and all stakeholders – public and private sectors, civil society representatives, development partners and

the media – to discuss the renewable energy challenges within the context of South–South co-operation, in particular with Brazil. The 2011 Forum also followed up on the July 2010 ECOWAS–Brazil Summit, where renewable energy and ECOWAS–Brazil partnerships were central topics of the discussions. The forum focused on the relationship between ECOWAS and emerging partners, particularly with Brazil and its experience in the biofuels area. Other

issues analysing the linkages between bioenergy and food security were also discussed.

Back to back to the forum, ECREEE held a meeting with the Brazilian delegation to further discuss the partnership between ECOWAS and Brazil in the field of biofuels. The outcome of the meeting was an agreed MoU to be signed by both parties in order to commence specific activities that will boost the deployment of biofuels in West Africa.

GIS Training on Mapping Quality Infrastructure in the ECOWAS Region

Towards the realization of the ECOWAS Observatory for Renewable Energy and Energy Efficiency (EORE), ECREEE and the International Centre for Science and High Technology (ICS-UNIDO) jointly organized GIS training for mapping quality infrastructure in the ECOWAS region, from 28 November to 2 December 2011, at the School of Tourism in Praia, Cape Verde. The training, which was attended by various professionals from ECOWAS member states, aimed at contributing to their technical background in

the various applications of the GIS tool for mapping quality infrastructure and services at country level, particularly focusing on renewable energy.

As part of the collaboration, members of ECREEE staff also participated in the fellowship programme organized by ICS-UNIDO in Trieste, Italy. In this programme, ICS supported the building up of capacity for mapping out renewable energy, and also the development of the observatory framework.

ECREEE is currently defining its end-user requirements and technical specification for implementation of the observatory. As a step on the path of its implementation, ECREEE is also conducting a comprehensive renewable energy resource assessment for the ECOWAS region, which includes bioenergy, wind and solar potential. ECREEE is also building up cooperation among other local and international data providers to gain best experience and technical know-how on the implementation of the observatory.

ECREEE Regional Workshop Adopts Road Map for a Regional Renewable Energy and Energy Efficiency Access Program

The Regional Workshop on 'Accelerating Universal Energy Access through the Use of Renewable Energy and Energy Efficiency' held from 24–26 October 2011, in Accra, Ghana. The workshop was jointly organized by the ECOWAS Regional Centre for Renewable Energy and Energy Efficiency (ECREEE), UNDP and the Government of Ghana.

Over 130 energy experts and public officials from the ECOWAS region discussed and adopted a road map for a pro-active regional renewable energy and energy efficiency access programme. The programme will boost universal access by 2030 to modern, reliable and affordable energy services in rural and peri-urban areas in ECOWAS. The initiative contributes to the objectives of the ECOWAS White Paper on Energy Access in Peri-urban and Rural Areas and the UN Goals for Universal Energy Access by 2030.

The opening session of the workshop was presided by Alhaji. Inusah Fuseini, Honourable Deputy Minister for Energy of Ghana. Others who delivered keynote addresses include Dr Johnson Boanuh, representing the President of the ECOWAS Commission, Mr Mahama Kappiah, Executive Director of ECREEE, Mr Akmel Prosper Akpa, representing the Director-General of UNIDO, and Mr Aboubacar Oualy, Coordinator, representing the Regional Energy Programme of UNDP. In their various speeches, the speakers expressed their appreciation to the Government of Ghana for hosting such an important workshop and also registered their profound gratitude to the partners, notably UNIDO, UNDP, Austria, Spain, the European Commission and USAID for supporting the integration activities of ECOWAS and ECREEE. They stressed that the workshop will afford another unique opportunity to reflect on ways of finding lasting solutions to the energy challenges currently plaguing the ECOWAS region.

Mr Mahama Kappiah, ECREEE Executive Director, called for urgent action to provide access to electricity and modern cooking fuels in the rural areas of the ECOWAS. He highlighted the crucial role of decentralized clean energy solutions and mini-grids for rural income genera-



L – R: Dr Johnson Boanuh, ECOWAS Director for Environment; Mr Mahama Kappiah, ECREEE Executive Director; Alhaji Inusah Fuseini, Honourable Deputy Minister for Energy of Ghana; Mr. Akmel Prosper Akpa, Senior Adviser to the UNIDO Director-General; and Mr Aboubacar Oualy, Coordinator, representative of the Regional Energy Programme of UNDP.

tion, education, health care, agricultural activities, job creation and household energy. He also emphasized the market opportunities for the private sector in rural areas where only 8% of the population has access to modern energy services.

Mr Aboubacar Oualy, Coordinator of the Regional Energy Programme of UNDP for Poverty Reduction, highlighted the progress achieved so far in the implementation of the ECOWAS White Paper on Energy Access in Peri-urban and Rural Areas. He highlighted the solid partnership with ECOWAS and the leading role of UNDP in the implementation of the White Paper. He also reaffirmed UNDP's commitment to contributing to the global agenda on access to energy services and the 2012 Year on Sustainable Energy for All.

Mr Akmel Prosper Akpa, Senior Adviser to the Director-General of UNIDO, expressed his sincere gratitude to ECOWAS for showing leadership in promoting renewable energy and energy efficiency. He explained that with the creation of ECREEE the first regional renewable energy promotion agency of sub-Saharan Africa is fully operational. He assured the continued support of UNIDO to ECREEE and announced support for the establishment of similar centres in East and Southern Africa.

Alhaji. Inusah Fuseini, Honourable Deputy Minister for Energy of Ghana,

in his key note address, noted that the Government of Ghana was committed to the objective that energy is a fundamental right of all its citizens. This objective has led to a continuous review of government policies and strategies, including the Renewable Energy Bill, with a view to securing access to reliable and cheaper sources of energy. He therefore called for the active collaboration of governments, development partners, local communities, private sector, utilities, agencies and consumers in the task of financing access to modern energy to the poor. He therefore expressed confidence that the workshop will examine the prospects and challenges of similar initiatives so as to draw best practices aimed at ensuring the international goals of universal access to energy.

The workshop also featured the launch of three flagship ECREEE projects:

- the 'Supporting Energy Efficiency Project for Access in West Africa (SEEA-WA)' supported by the European Commission;
- the ECOWAS Regional Policy on Renewable Energy supported by the Africa-EU Renewable Energy Cooperation Programme;
- the ECOWAS Regional Wind and Solar Assessment supported by USAID.



Official Launch of “Supporting Energy Efficiency for Access in West Africa (SEEA-WA)” Project



L-R: Dr. Johnson Boanuh, of the ECOWAS Commission; Mr. Herve Delsol, European Delegation of Ghana; Mr. Mahama Kappiah, Executive Director, ECREEE; Ms. Hélène SABATHIÉ-AKONOR, ADEME; Mr. Mann Philip, EU-Partnership Dialogue Facility; Mr. Mareva BERNARD-HERVE, AFD; and Mr. Charles Murphy of USAID

Technical and commercial losses in the West African power sector (e.g. theft, illegal operators) range from 20% to 35% in comparison to 7% to 10% in North America and Western Europe. It is estimated that around 30% of the total electricity supply in West Africa is consumed by the house-hold sector. The importation of low-quality appliances and unsustainable building practices are a major cause for peak loads, power cuts and load shedding in urban centres. As the saying goes, the cheapest energy is the one not consumed. Saving energy means saving additional investments that could be re-directed to satisfy the energy service needs of peri-urban and rural areas. It is for this reason that ECREEE in collaboration with its partners, AEA, AERE and ENERGIA, submitted a proposal to the second call of the ACP-EU Energy Facility in 2010.

The contract for the €2.3m project ‘Supporting Energy Efficiency for Access in West Africa (SEEA-WA)’ was signed by the European Commission and the ECOWAS Commission in August 2011. The project is co-financed by the ECOWAS Commission, ADEME and the UNDP. It was officially launched at the margins of the ECREEE Workshop on ‘Accelerating Universal Energy Access through the Use of Renewable Energy and Energy Efficiency’ held from 24–26 October 2011 in Accra, Ghana.

The SEEA-WA project aims to create an enabling environment for energy efficiency technologies and solutions by mitigating various existing barriers such as policy, technical, financial, legal, institutional and capacity related. The project foresees the establishment of a regional energy effi-

ciency network of centres of excellence in all ECOWAS member states. All member states have been requested to nominate appropriate institutions. In addition, the project will develop an ECOWAS Energy Efficiency Policy Paper which will include ‘minimum performance standards’ and energy efficiency labels, particularly for appliances (e.g. compact fluorescent lamps (CFLs), cooling/refrigeration equipment, cooking stoves) and buildings. The project will facilitate several training activities and a regional awareness campaign on the social, economic and environmental benefits of energy efficiency solutions and practices. It is envisaged that the ECOWAS Energy Efficiency Policy will be adopted by ECOWAS energy ministers in the ECOWAS - Global Forum for Sustainable Energy (GFSE) High Level Forum which will take place from 8–11 October in Accra, Ghana.

TOWARDS A REGIONAL POLICY FRAMEWORK FOR RENEWABLE ENERGY IN WEST AFRICA

The Regional Renewable Energy Policy for West Africa (RREP-WA) project was launched in October 2011 under the auspices of the Renewable Energy Cooperation Program (RECP) of the Africa–EU Energy Partnership. Supported by the Partnership Dialogue Facility of the EU Energy Initiative (EUEI-PDF), the project aims at developing a coherent and achievable renewable energy policy framework for the ECOWAS region.

The experience of the EU has shown that regional integration can be a useful tool to

facilitate the adoption and implementation of RE&EE policies and related legal and regulatory frameworks on national levels (e.g. EU Directive with binding renewable energy targets). It is acknowledged that supportive governmental policies play a key role for mobilizing resources and encouraging both local and foreign private sector investment in the renewable energy sector.

The ECOWAS policy will set attainable minimum renewable energy targets at regional level harmonized with national targets and will propose a portfolio of policy measures, laws, regulations and incentives to be implemented on national and regional ECOWAS levels with both short-term and long-term views. So far only a few ECOWAS countries such as Cape Verde, Ghana and Senegal have adopted a national policy for renewable energy.

The draft policy document is expected to be validated by the ECOWAS member states prior to its formal adoption by the ECOWAS Energy Ministers in the third quarter of 2012. The French consultancy company IED – Innovation Energie Développement – was contracted by EUEI-PDF to assist ECREEE in the development of the policy.

LAUNCH OF THE ECOWAS WIND AND SOLAR RESOURCES ASSESSMENT

ECREEE has commenced a comprehensive renewable energy resource assessment for the ECOWAS region covering solar, wind and bioenergy crops. This is predicated on the need to ensure that relevant renewable energy resources are adequately documented and accessible to a wide array of stakeholders and investors. In furtherance of this objective, ECREEE secured United States Agency for International Development (USAID) support for a wind and solar resource assessment of the region to be executed by Nexant Inc. in a two-phase approach. The first phase of the resource assessment, which is ongoing, consists of mapping the wind and solar resources, development of a database of the findings and development of tools to analyse the data. It includes the development of a database of promising grid-connected investment locations for further analysis. The second phase will focus on project support aimed at bringing selected projects to closure.

ECREEE Train-the-Trainers Workshop on GIS energy planning and RETScreen in Accra, Ghana



Participants at the training

The ECOWAS Regional Centre, ECREEE, and the Technology Energy Centre (TEC) of Kwame Nkrumah University of Science and Technology (KNUST) in cooperation with UNIDO organized a regional training workshop on energy access planning and financial analysis of renewable energy and energy efficiency projects. The workshop was held from 22–26 August 2011 in Kumasi, Ghana and was attended by around 50 professionals from energy ministries and universities of all 15 ECOWAS countries. The workshop was also supported by the EU-Partnership Dialogue Facility (EU-PDF).

In his welcome address, Prof. Abeeku Brew-Hammond, Director of TEC-KNUST,

welcomed participants to the city of Kumasi and expressed his sincere gratitude to ECREEE and all supporters for making the workshop a reality. He re-emphasized TEC-KNUST's commitment to serving as a centre of excellence for sustainable energy issues in the West African region. In his opening speech, Mr Ibrahim Soumaila, energy efficiency expert at the ECREEE Secretariat, stressed the importance of energy planning tools to boost rural electrification and the dissemination of renewable energy and energy efficiency technologies. He announced that ECREEE would take the lead in the establishment of a regional train-the-trainers network for green energy planning tools. He reminded participants from uni-

versities that the workshop will lead to concrete follow-up activities in their respective countries in 2012.

The workshop opened with a two-day training on an energy access planning toolkit developed by TEC-KNUST in cooperation with Columbia University. The toolkit was successfully applied in Ghana and provided a comprehensive planning database on the status of electrification in the country. An integrated network planner proposed least-cost electrification options for unserved settlements in peri-urban and rural areas. Depending on proximity to the central grid the planner proposes grid extension or off-grid electrification options. All data generated by the toolkit are GIS based and can be accessed through interactive maps. The toolkit is of high relevance for energy planners in other ECOWAS countries with low electricity access rates.



The other three days of the workshop focused on the technical and financial structuring of renewable energy and energy efficiency projects. The lack of knowledge of local banks, investors, developers, planners and policymakers on how to assess the technical and financial feasibility of such projects is a major barrier to green investment in the ECOWAS region. The participants were introduced to the RETScreen Clean Energy Project Analysis Software. The software gives energy experts the opportunity to design and analyse green projects technically and financially. The West African participants were introduced to the different modules of the program which supports all major renewable energy and energy efficiency solutions and provides access to important climate data such as solar radiation, wind speeds, etc. The participants made their own calculations and gave estimations for the energy production savings and financial viability of case studies on their home countries. The training concluded with an exam on the last day of the workshop. In 2012 the participants will organize national follow-up trainings on RETScreen. The training sessions will be conducted by trainers certified in the regional training. The ECREEE RETScreen training schedule is available at web portal <http://retscreen.ecreee.org>.

ECREEE launches Renewable Energy and Energy Efficiency Project Map for West Africa

ECREEE and the association repowermap (web portal <http://www.repowermap.org>), based in Switzerland, agreed on cooperation regarding the GIS mapping of renewable energy and energy efficiency programmes and projects in West Africa. The GIS map is available on the ECREEE website (web portal <http://www.ecreee.org>). In the

forthcoming months the partners will integrate relevant GIS data into existing RE&EE programmes and projects in the ECOWAS region. This also includes the ECOWAS Renewable Energy Facility (EREF) projects and the energy component of GEF West Africa Program (SPWA). Moreover, the map will provide an overview of RE&EE key stakeholders in the ECOWAS region (universities, companies, ministries, including contact data). The map is seen as a first step in the process of establishing the ECOWAS Observatory, EORE.



ECREEE at the Vienna Energy Forum

– 21-23 June 2011, Vienna Austria



ECREEE organized an information booth at the Vienna Energy Forum 2011, which was held from 21–23 June 2011 at the Hofburg Palace in Vienna, Austria. The forum, which focused on the theme ‘Energy for All – Time for Action’, facilitated an international dialogue on providing universal energy access and on the multiple co-benefits of increasing energy efficiency. Organized jointly by UNIDO, the Austrian Federal Ministry for European and International Affairs, and the International Institute of Applied Systems Analysis (IIASA), the forum will be a regular event held every two years. Core themes that were addressed at the conference included:

- agreement on a common understanding of energy access;
- agreement on a strategy to ensure universal access to modern energy services and to increase energy efficiency by reducing energy intensity by 40% until 2030;
- identifying indicative targets and policies in support of these objectives;



Arnold Schwarzenegger, former Governor of California; and Dr. Kandeh Yumkella, UNIDO DG speaking at the Forum.

- prioritizing key national and regional actions on energy access and energy efficiency;
- presentation of results from the Global Energy Assessment coordinated by IIASA.

The forum attracted over 1000 participants from around the world including heads of state and their ex-counterparts, ministers, policymakers, experts, and representatives of civil society and the private sector, to discuss how to overcome energy poverty and how to move from declarations of intention to tangible action on the ground. Speaking at the event, the ex-Governor of California Arnold Schwarzenegger said it was time for

‘Energy Freedom’, adding that universal energy access was not ‘just about lighting a dark room, or cooking on a better stove. It’s about the freedom that energy – and especially renewable energy – gives us’.

The Director General of UNIDO, Kandeh K. Yumkella, Chair of UN-Energy, emphasised that access to modern energy services is at the core of our economic development challenges, adding that ‘without access to modern forms of energy it is highly unlikely that any of the objectives of the Millennium Development Goals will be achieved’. The conference report and documentary are available at web portal <http://www.unido.org/index.php?id=1001185>.

Second Coordination Meeting with the ECREEE NFIs, in Kumasi, Ghana



ECREEE staff and NFIs

The second ECREEE coordination meeting with the National Focal Institutions (NFIs) took place in Kumasi, Ghana, on 27 August 2011. During the meeting the 2012 work plan, the 2011 status report, the ECREEE Business Plan, the ECOWAS Renewable Energy Facility (EREF), the ECOWAS Renewable Energy Observatory (EREO) and the SEEA-WA project were discussed.

Third Executive Board Meeting

The Third Meeting of the Executive Board of ECREEE was convened on Wednesday 6 July 2011 in Accra, Ghana to among other matters, review the implementation of the ECREEE 2011 Work Plan; discuss and adopt the audited financial report of ECREEE for the year 2010; and also assess the performance of the Executive Director.

Ms Sherry Ayithey, the Honourable Minister of the Environment, Science and Technology of Ghana, in her welcome address, thanked the ECOWAS Commission for nominating her to serve on the ECREEE Board. She noted that this would enable her to bring on board the views of the African Environment Ministers. She enjoined ECREEE to support member states to develop renewable energy projects and access appropriate technology. The Minister also expressed appreciation for the choice of Accra as the host city for the meeting



ECREEE Executive Board Members

and wished all the participants a pleasant and fruitful stay in Ghana.

H.E. James Gbeho, the President of the ECOWAS Commission, in his opening address, noted that the meeting was symbolic, given that it is the first year anniversary of the Centre, and expressed the ECOWAS Commission's pride in the achievements the Centre had recorded

within the relatively short period of its existence. While thanking the partners for their support for the Centre, he urged the Board to provide useful and constructive recommendations for it.

The meeting was attended by all members of the ECREEE Board, including Mr Celestin Talaki, ECOWAS Commissioner for Infrastructure and Chairman of the Board; Dr Ada Okwuosa, ECOWAS Commissioner for Administration and Finance; Hon. Sherry Ayithey, Minister for Environment, Science and Technology of Ghana;

Amadou Diallo, Secretary General of the West Africa Power Pool (WAPP); Roger Laloupo, ECOWAS Director for Legal Affairs; representative of the Minister for Power of Nigeria; representatives of AECID; representative of the Austrian Development Agency (ADA); representative of UNIDO; and Mahama Kappiah, ECREEE Executive Director.

Fourth Executive Board and Second Technical Committee Meeting of ECREEE

– 20–21 October 2011, Benin

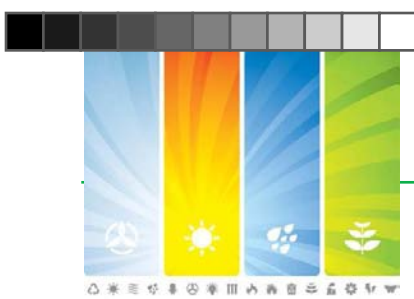


ECREEE Executive Board and Technical Committee Members

The Fourth Meeting of the Board of the ECOWAS Regional Centre for Renewable Energy and Energy Efficiency (ECREEE) convened on Friday 21 October 2011 at the Secretariat of the West African Power Pool (WAPP) Secretariat, in Cotonou, Benin to, amongst others, approve the ECREEE 2012 Work Plan, as well as the ECREEE Business Plan 2011 – 2016. The meeting was preceded by the Second Meeting of the ECREEE Technical Committee on the 20th of October 2011.

The Board and the Technical Committee commended ECREEE on the implementation of the 2011 Work Plan, including the launch of new programmes and projects. They also reviewed and approved the ECREEE 2012 Work Plan and budget. In the 2012 work plan, ECREEE intends to implement 86 activities which will contribute to the achievement of the impact performance indicators of the six result areas in the ECREEE log frame. These activities are implemented throughout the six result areas of ECREEE:

- RESULT AREA 1: Effective regional RE&EE promotion agency created and efficiently managed;
- RESULT AREA 2: Funds for RE&EE programmes and projects mobilized and implemented;
- RESULT AREA 3: Tailored policy, legal and regulatory frameworks created and implemented;
- RESULT AREA 4: Capacities are strengthened and applied;
- RESULT AREA 5: Knowledge base, awareness raising and advocacy strengthened;
- RESULT AREA 6: Business and investment promotion.



ECREEE becomes an implementing agency for two UNIDO-GEF projects worth 9,3 million USD



ECREEE was accepted as an implementing agency for two GEF projects to be executed under the SPWA. Both approved projects are coordinated by UNIDO and have an overall volume of more than US\$9.3m. The project 'Promoting Coordination, Coherence and Knowledge Management under the Energy Component of the GEF Strategic Program for West Africa (SPWA)' has an overall volume of US\$1.6m and will be implemented by UNIDO and ECREEE between 2011 and 2014. The approved GEF grant amounts to US\$0.7m. The aim of the project is to create synergies and spillover effects between the various energy projects implemented under the SPWA in all 15 ECOWAS countries and additionally in Burundi, Chad and Mauritania. The project foresees the establishment of a high level SPWA Steering Committee.

To boost knowledge management, networking, advocacy and the strengthening of capacities on RE&EE in the ECOWAS region, the GEF project foresees the establishment of a web-based energy community portal and observatory for RE&EE. Both tools will be managed and regularly updated by expert ECREEE staff. The establishment of the observatory is also supported by the Austrian Development Cooperation (ADC) and AECID. The tools will provide and disseminate updated RE&EE market information/data on resources, GIS maps, national policies, projects, financial and tender possibilities, as well as key stakeholders in the ECOWAS region. The results and deliverables of all projects implemented under the GEF-SPWA will be disseminated through the observatory. It is envisaged that the Observatory will be launched in the ECOWAS-GFSE-GEF High Level Forum from 8-11 October in Accra, Ghana.

The second approved GEF project 'Promoting Market-based Development of Small to Medium Scale Renewable Energy Systems in Cape Verde' has an



overall volume of US\$7.7m and will be implemented by UNIDO, ECREEE and the Government of Cape Verde between 2012 and 2015. The total GEF grant amounts to around US\$1.8m. The project aims to promote viable, market-based small- to medium-scale renewable energy systems in the country. It refers to the ambitious Cape Verdean Government's plan to reduce the country's dependence on imported fossil fuels and reduce GHG emissions, through increased energy production from renewable resources. Through private-sector investment and government-supported projects, Cape Verde achieved its target of generating at least 25% of its electricity from renewable sources by the year 2011 and aims to achieve 50% by the year 2020. Moreover, it is the intention to produce 100% of the electricity on the island of Brava from renewable sources. The specific objective of the GEF project is to develop a market environment that will promote investments in small- to medium-scale renewable energy systems. In this regard the project will focus on activities under the following components: (1) implementation of demonstration projects on different islands in the areas of PV, solar thermal energy and wind power; (2) development of a policy and regulatory frameworks for small-scale solutions; (3) capacity building and awareness raising. A project manager will be appointed and work from the ECREEE office.

First Call of Renewable I

The first call for proposals of the ECOWAS Renewable Energy Facility (EREF) for peri-urban and rural areas was opened from 31 May to 31 July 2011. ECREEE received 166 concept notes with a grant request of around 8 million EUR. Including the indicated co-funding in the proposals the total volume of the projects amounts to around 16 million EUR. The large attendance reflects the high demand for sustainable rural energy solutions in the ECOWAS region.

The most active countries were Nigeria, Senegal, Ghana and Cape Verde. Over 70% of the proposals were submitted by applicants from the private sector (e.g. companies and NGOs). 82% of the proposal were submitted under the financing window investment promotion and 18% under the window of business development. Over 50% of the projects focused on solar (PV, CSP and solar thermal) as well as bioenergy solutions (particularly biogas and improved stoves). Small scale hydro power and wind power got only a minor attention.

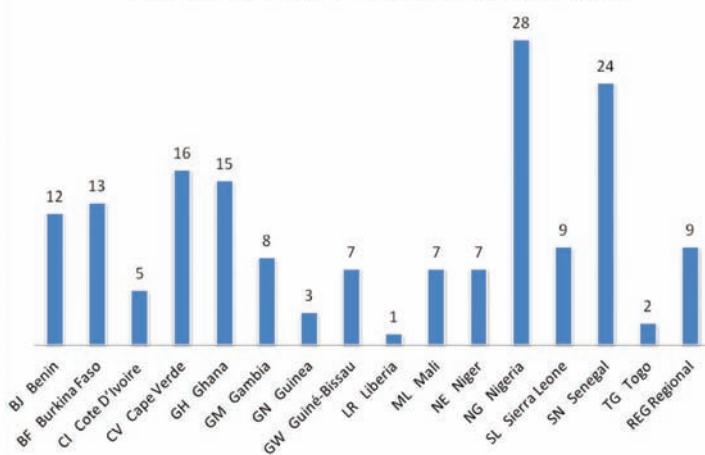
ECREEE selected 55 concept notes (around 40% of eligible concept notes) and invited the successful applicants to present a full project proposal at latest by 29 February 2012. The technical appraisal of the concept notes was done according to the established evaluation criteria: relevance, impact, effectiveness, feasibility and efficiency, as well as sustainability. Each project was appraised by ECREEE and an external evaluation consultant. In each ECOWAS country the projects with the highest evaluation scores were selected. ECREEE tried to keep a balance between the size and needs of the countries and different RE&EE technology solutions.

The EREF was highly welcomed on international levels and the ECOWAS region. The EREF will be also presented by ECOWAS at the forthcoming UN Conferences related to the 2012 Year of Sustainable Energy for All. A detailed report on the first call for proposals as well as the trilingual EREF guidelines are available at: <http://eref.ecreee.org>.

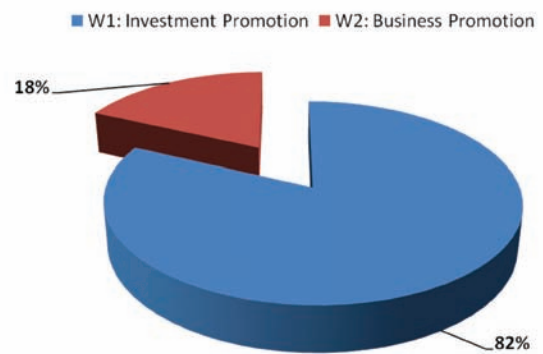
of the ECOWAS Energy Facility (EREF)



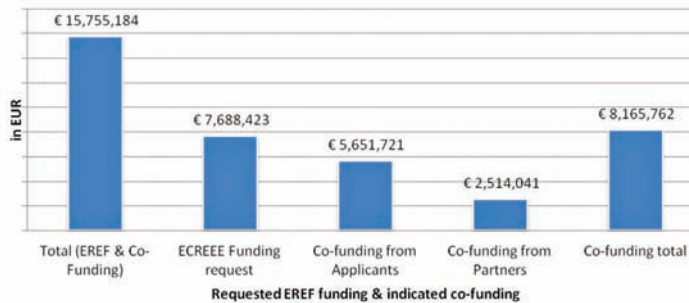
A total of 166 EREF concept notes received



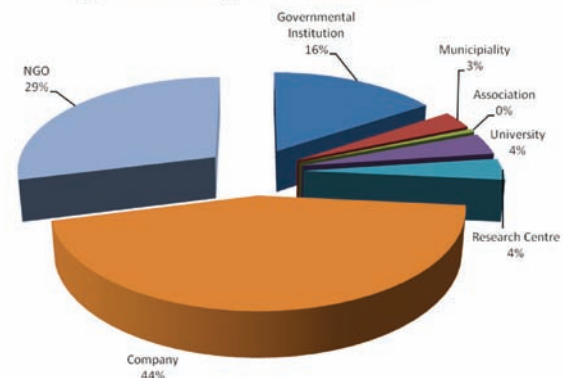
Proposals by EREF Financing Windows



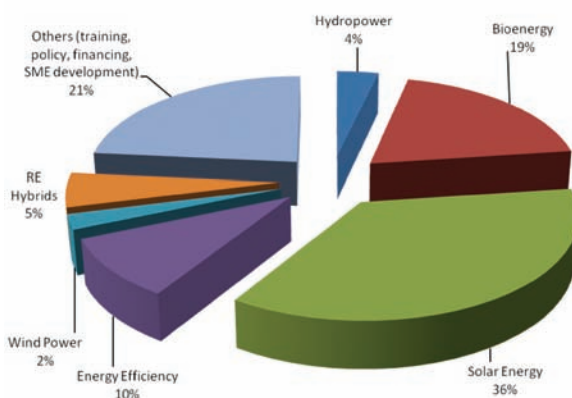
Received EREF funding requests & indicated co-funding



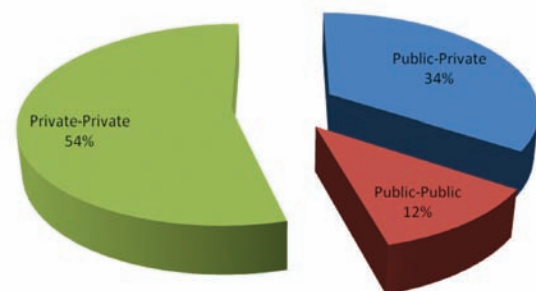
Types of EREF applicants in % of total

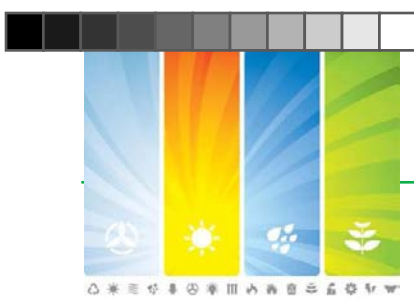


RE&EE Focus of EREF Concept Notes



Partnerships of EREF applications





Regional Seminar for West African Policymakers, — 15–17 June 2011, Canary Islands, Spain

ECREEE, in collaboration with ITC and with the support of AECID, organized a Regional Seminar on the Integration of Renewable Energy into the Energy Systems of the ECOWAS Region. The workshop took place from 15–17 June in the Canary Islands. The seminar brought together key decision makers and chief executives of the utilities of ECOWAS member states and experts from different Spanish institutions. The objective of the seminar was to discuss the experience of the Canary Islands in electrical grid planning and the challenge posed by high penetration of renewable energies in the electricity system. The seminar also critically assessed the readiness of ECOWAS countries for the integration of renewable energies into national electricity grids. The workshop concluded with site visits to renewable energy installations and control centres.

ECREEE–AREA Conference on Renewable Energy and Gender

AREA held its third international conference on Renewable Energy & Gender in cooperation with ECREEE from 27 June to 1 July 2011, at the NICON Hilton Hotel, in Abuja, Nigeria. The energy–gender nexus is considered an important working field of ECREEE. Due to their local availability renewable energies play an important role in satisfying household energy requirements. The conference brought together policymakers and representatives from business and civil society, to facilitate a pan-African information exchange. The participants exchanged ideas on policies, technologies and financial mechanisms for the deployment of renewable energies in Africa, in consideration of the fact that gender is a main determinant that defines access, ways of utilization, opportunities and control over all energy resources. As renewable energy could be a tool for gender equality and the empowerment of women, gender perspectives are a critical component of policymaking at all levels. Presentations from the conference can be downloaded from the ECREEE website, web portal <http://www.ecreee.org>.

Upcoming ECREEE events in 2012

19 to 22 March 2012, Bamako, Mali
ECOWAS Regional Bioenergy Forum

9 to 12 April 2012, Praia, Cape Verde
ECREEE Training for National Renewable Energy Policy and Incentives Schemes and Global Energy Transformation Pathways and Policy Tools

16 to 20 April 2012, Monrovia, Liberia
Regional Workshop on Small Scale Hydro

08 to 10 Oct 2012, Accra, Ghana
ECOWAS-GFSE-GEF High Level Forum

11 to 12 Oct 2012, Accra, Ghana
First International Off-grid Renewable Energy Conference, IRENA-ARE-ECREEE

Procurement and Recruitments

Deadline for submission of bids: 27 April 2012
 Design, development and testing of the web based community portal and Observatory for Renewable Energy and Energy Efficiency of the ECOWAS Regional Centre for Renewable Energy and Energy Efficiency (ECREEE)

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