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Submissions from entities in the United Nations system and elsewhere on their efforts in 2016 to implement the outcome of the WSIS

Submission by

United Nations Industrial Development Organization

This submission was prepared as an input to the report of the UN Secretary-General on "Progress made in the implementation of and follow-up to the outcomes of the World Summit on the Information Society at the regional and international levels" (to the 20th session of the CSTD), in response to the request by the Economic and Social Council, in its resolution 2006/46, to the UN Secretary-General to inform the Commission on Science and Technology for Development on the implementation of the outcomes of the WSIS as part of his annual reporting to the Commission.

WSIS report 2016 from UNIDO

Executive summary

Firstly, this year's report from UNIDO focuses on a recent ICT application initiative, namely the ECOWAS Observatory for Renewable Energy and energy Efficiency (ECOWREX), which has been developed by the organization's Department of Energy. Although the initiative was reported on last year, this year's reporting is more comprehensive because of the initiative's further development into ECOWREX2 in the course of 2016. It was developed in response to a need to increase the flow of accurate information on existing and planned resources. Reliable and updated energy information is vital for strategic planning and development and is a pre-requisite to an enabling environment for investors and project developers in the energy sector.

Secondly, the same Department has collaborated with the International Center on Small Hydro Power (ICSHP) to develop a small hydropower knowledge platform and produce the *World Small Hydropower Development Report (WSHPDR*). The small hydropower knowledge platform is aimed at improving existing knowledge and mitigating information barriers towards the development of small hydropower worldwide.

Thirdly, UNIDO reports on a set of initiatives from its Department of Environment, which contributes to several of the WSIS action lines, for example, the access to information and knowledge, the capacity building, the development of ICT applications for e-learning and e-environment and the promotion of international and regional cooperation. The main objective of these interventions is to spread and scale up a culture of knowledge sharing, by connecting public and private entities of all domains: research, manufacturing, servicing, etc. From this set, this year's report extracts two initiatives in particular: the global UNIDO-UNEP Resource Efficient and Cleaner Production (RECP) programme and the so-called *ECACool* (http://www.ecacool.com/en/), a website established by the regional network of Refrigeration and Air-conditioning (RAC) Associations of Europe and Central Asia (ECA) and whose main partners are UNIDO and UNEP.

Action lines

C7: ICT applications

1) ECOWAS Observatory for Renewable Energy and energy Efficiency (ECOWREX)

http://www.ecowrex.org/

Accurate information on the existing and planned resources is vital for strategic planning and development and reliable and updated energy information are pre-requisites to an enabling environment for investors and project developers in the energy sector.

The ECOWAS region has been facing similar challenges in the collection and distribution of usable data. The existing country data is in most cases not easily accessible and not updated. Different systems, resource maps, exist with various models and data sources. For investors and companies, it is difficult to identify cooperation partners due to the absence of specialized platforms for exchange of information and experiences. Information on good practices or successful (or unsuccessful) projects is not readily available for decision makers and experts. Given this situation, significant opportunities are lost for sustainable energy development in the region.

The ECOWAS Observatory for Renewable Energy and Energy Efficiency (ECOWREX) therefore aims to improve existing knowledge and mitigate information barriers towards the development of the energy sector in the ECOWAS region. More specifically, the main objectives of ECOWREX are to:

- Provide targeted, timely and statistical information on the energy resources (especially in the field of renewable energy (RE) and energy efficiency (EE)) including RE resources, policies, projects, power plants and other relevant information about the ECOWAS Region, to support in decision making.
- Build up a network of energy experts and cooperation among key local and international players to share knowledge and experience on best practices and technical knowhow from around the world
- Support decision makers, project developers, investors and other stakeholders with tailored information and planning strategies. It will boost knowledge management, networking, advocacy and strengthening of capacities on renewable energy and energy efficiency.

ECOWREX is a web-based platform that presents data through three main forms.
First is through the "map viewer", which provides over 40 different layers related to energy resources and other infrastructure relevant for planning, in the energy sector. Users can query and search by well-structured attributes,

overlay and analyze these resources together. Also, it is possible to view information on the interaction among key energy stakeholders and locations of power plants and other energy related projects. In addition, a metadata catalog is available, which links each layer on the map viewer to its corresponding metadata record. It stores data documentation and makes it searchable. Through the metadata catalog other projects and initiatives will be able to directly harvest the ECOWREX metadata and push them into a global visibility. A second feature is the "country profile", which displays country level data on various aspects of RE and EE. Third is through the "analysis and trends" section, where users are provided with a tool to observe, analyze and predict the pattern of development of all the energy indicators available on the observatory. Here users can analyze and compile customized reports in different formats based on the particular indicator selected in varying formats, compare data of the 15 ECOWAS countries with indicators on the observatory, and follow changes and trend as the energy sector continues to emerge.

In partnership with the University of Geneva, Noveltis S.A.S, the Energy Centre of the Kwame Nkrumah University of Science and Technology (KNUST) and the Directorate of Energy, Cape Verde, ECREEE is currently executing a project titled "ECOWREX 2" with the theme "*Promoting Sustainable Energy Access through the use of geospatial technologies in West Africa*". The project is funded by the European Union. Specifically, ECOWREX 2 seeks to improve the ECOWREX GIS, by building a complete Spatial Data Infrastructure (SDI) and adding new resource maps of energy access, green power potential/power consumption, all focused on increasing investment in West Africa. The output will be fully compliant with the Open Geospatial Consortium (OGC) standards, thereby aiding data interoperability, effective data processing, sharing and knowledge transfer.

The major outputs of the project include:

1. An improved web-based map framework with improved functionalities to enable easy and reliable sharing and transfer of data.
2. Enhanced solar and wind maps with improved temporal and spatial resolutions necessary for planning.
3. A map of ratio between power consumption and green power production potential.
4. Energy access map based on the "GEAR GIS toolkit" model developed by the KNUST Energy Centre, for Ghana.
5. Increased knowledge and awareness on the use of geospatial technology, including data and metadata collection standards in West Africa.

2) The World Small Hydropower Knowledge Platform

www.smallhydroworld.org

Small hydropower (SHP) is a renewable energy (RE) solution to meet the needs of productive uses and to electrify rural areas. It is a mature technology, which can be easily designed, operated and maintained locally. It has the lowest electricity generation prices of all off-grid technologies, and the flexibility to be adapted to various geographical and infrastructural circumstances. Despite these benefits, the potential of small hydropower in developing countries remains untapped. It is therefore paramount for UNIDO to foster uptake of small hydropower through awareness building, information dissemination and experience sharing on the use of RE, such as small hydropower, in industries and in small enterprises, in particular. Such accurate information on the existing SHP resources and reliable updated information are vital for strategic planning and development and are pre-requisites to an enabling environment for all stakeholders in the energy sector.

Towards this objective, UNIDO's Department of Energy collaborated with the International Center on Small Hydro Power (ICSHP) in 2013 to develop a small hydropower knowledge platform and produce the *World Small Hydropower Development Report (WSHPDR*). This flagship initiative of UNIDO is the first compilation of valuable information on global small hydropower.

The small hydropower knowledge platform is aimed at improving existing knowledge and mitigating information barriers towards the development of small hydropower worldwide. More specifically, the main objectives of the knowledge platform are:

- Provide accurate, relevant and reliable SHP data on the current status and development potential of SHP by region and country in a user-friendly format to facilitate SHP knowledge exchange.
- Inform SHP stakeholders in formulating policy and encouraging investment that will accelerate growth of SHP worldwide.

- Build a network of SHP experts who will provide relevant data in regular intervals to keep the information updated and to leverage knowledge exchange while ensuring local ownership of the regular contributions to the country and regional reports, thus enhancing awareness for SHP locally.
- Document the successes and replicable implications of SHP implementation for productive uses.
- To ensure the quality of data and analysis, and that they are presented in a format that can achieve maximum impact

The knowledge platform is web-based and presents accurate, relevant and reliable SHP data on the current status and development potential of SHP by region and country in a user-friendly format. The platform covers 20 regions and 160 countries, making it the most comprehensive global SHP platform available to date. Through the "map viewer" users can easily search for relevant information either by region or country. When selecting a region, users are provided with the SHP potential (in MW) of the region and the installed capacity. Furthermore, when accessing a region on the web-based platform a download link is provided to the relevant chapter of the *WSHPDR* covering both the specific regions and countries within the selected region. Going down to the country level, the knowledge platform firstly provides the user with information of the country's SHP potential (in MW) and the installed capacity in the country. In the region view users are provided with a download link to the country specific subchapter of the *WSHPDR*, which gives the user in-depth SHP information for the selected country. Additionally, while a country is selected, users can access the detailed view for the country where additional country-specific information is provided, such as general information (population, area, climate, topography, etc.), small hydropower capacity, overview of the electricity sector, small hydropower sector overview, RE policy, legislation on small hydropower, and barriers to small hydropower development.

In 2016, UNIDO and ICSHP, along with partners, launched the updated version of the Report and Platform, continuing UNIDO's mission to inform world leaders on the status and potential of small hydropower development, and encourage stakeholders in the sector to share and disseminate this knowledge. The updated knowledge platform is expected to be fully operational and available to the public in March 2017. Immediate beneficiaries of the updated knowledge platform are expected to be policymakers and business communities responsible for formulating SHP relevant renewable energy policies and investment decisions. Based on data and analysis provided by the Report, they will be aware of the SHP status and potentials by region and country, as well as the most appropriate technology options, thereby making informed decisions. Also, various development agencies will be able to use the data from the Report as a basis of their assessments in identifying viable sites for project implementation. South-South knowledge exchange will be facilitated through the knowledge platform

Press release of the launching: http://www.unido.org/news/press/new-report-highlight-1.html

3) Resource Efficient and Cleaner Production - RECP*net*

The global UNIDO-UNEP Resource Efficient and Cleaner Production (RECP) programme provides a comprehensive, strategic and coherent framework to scale up and mainstream RECP activities and results nationally, regionally and globally. RECP entails continuous application of preventive environmental strategies to processes, products and services over their entire life cycle in order to reduce resource consumption, as well as risks to humans and the environment, while increasing efficiency of production and service processes.

RECP is scaled up in developing and transition economies via the Global Network on RECP (RECP*net*), run by UNIDO and UNEP. RECP*net* enables the effective and efficient development, transfer, application, adaptation and replication of RECP policies, practices and technologies, and facilitates effective North-South and South-South collaboration.

Established in 2010, RECP*net* (http://www.recpnet.org/) currently has 74 members from around the world. Members of RECP*net* are organizations or initiatives that deliver, as a core activity, RECP services for public good and private interest in developing and/or transition economies. Members are committed to cooperate beyond an exclusive profit motive in the spirit of international collaboration, knowledge management and professional excellence.

Knowledge Management System (KMS) is a key toolbox in this regard. Its objective is to prepare a global system for knowledge sharing between member institutions, mainly addressing their managers and technical experts. About 600 institutions are currently using its toolkits, training documents, manuals, guidelines, case studies,

factsheets, success stories, indicators and benchmarks, research papers, and training courses. Most of this information is reserved only for members. However, tools developed by UNIDO and UNEP are publically available.

RECP*net* has three operational goals:

1. Foster professional and institutional excellence of member organizations to provide effective and efficient RECP services with measurable impacts. In this respect, the current activities undertaken are as follows:
    a. Constant improvements to KMS undertaken to increase usage and usefulness.
    b. Global and regional KMS coordinator contracted for increased south-south cooperation and best support for members.
    c. Upload of RECP-relevant technical documents to the KMS.
    d. Guidance provided to thematic experts working groups for regional and global cooperation of experts in specific areas of RECP.
    e. Overview on trainings and tools developed for use in the KMS.
    f. Regular KMS coordination conference.
2. Create business opportunities for the members, through:
    a. Creation of an RECP*net* experts market place, with profiles of members and personal experts (reserved for RECP*net* members)
    b. Advertisement to members through social media of business opportunities.
    c. Advertising member's performance through social media.
3. Strengthen and promote the RECPnet brand and advocate RECP to the wider stakeholder community, through:
    a. Launch of new RECPnet website and social media presence:
        i. www.recpnet.org
        ii. https://www.facebook.com/RECPnet
        iii. https://www.linkedin.com/company/recpnet
        iv. https://twitter.com/recpnet
    b. Connect with RECP-related platforms, e.g., Green Growth Knowledge Platform, SCP clearinghouse, and/or integrate other websites e.g., Indian Environmental Information system, e-literature sources on different websites.

What is the actual status of RECPnet KMS?

- A new and modern looking website which is prepared for use on mobile devices, including a small content management system to handle quick changing information for public availability (success stories, events, news).
- The links to social media has been integrated in the website.
- A google-like search has also been integrated in the website, as a first step.
- KMS: over 1,100 users registered for the KMS, as editor, contributor or reader.
- KMS: approximately 1,300 documents uploaded (RECP success stories, fact sheets, case studies, presentations, tools and toolkits, training documents, Manuals and Guidelines, Research studies, ….).
- KMS: system functionalities have been improved.
- To overcome the low activities of communication in the network, thematic working groups were started, focused on specific issues (benchmark, waste management, energy efficiency, etc). This is the beginning of a process of organizational team development.

Main barriers to fully develop the existing KMS as system

- The original approach to KMS was to build regional hubs. However, experience is showing that this is raising barriers among these regions hubs rather than building cooperation paths. Consequently, region hubs might not be provided in future and, in its place, thematic areas should be promoted in order to foster cooperation between members and experts not only regionally but also globally.
- As the common language is not only English, the installed system is not able to overcome this in an acceptable way of using and managing. Many of the experts are not English speakers and hesitate to upload information in English; this is a big loss of knowledge for the network.
- The tree structure for topics should represent the fields of knowledge which the members are familiar with. Topics are mainly showing the project programme outcomes and are not accepted by user. The design of a multilingual reference structure (semantic concept map) seems to be the best way to handle worldwide efficient knowledge sharing.

- There are elements of quality control included, such as categories of documents, structure tree for industrial sectors and topics, but these elements are not common knowledge. The way of using them is difficult to understand; in consequence it is nearly impossible to influence the quality of new contents.
- The search for contents brings you a lot of results, but is not intuitive; not using the categories and structure to focus on specific results may confuse more than it helps to find the right resulting information.
- To manage a complex system, it is necessary to include reporting and monitoring of system actions, as it is offered by google statistics. There is no analysis or report functionality provided in the existing system.
- The trainings were held in a time where the system was not completed; the current users have never been trained, and so far are not familiar with the benefits of using the KMS.
- There is no source coding or similar documentation of the KMS programming, therefore the replacement of the system by a customized and professional ready-to-market-product for knowledge sharing including a long-term service contract is recommended in order to reduce the necessary budget.
- There was no clear systematic method how to develop and introduce a knowledge sharing system neither unilingual nor multicultural and multilingual. In consequence the existing system is not replacing this missing communication and a lack of ownership is visible.
- Knowledge management should focus first on the basics of experience learning and knowledge representing methods, to find the sensible action points which are different in different societies, also remarkable in the different logic of languages.
- There is no budget available for the maintenance and continuous improvement of the system, which is strongly needed in this dynamic changing IT-environment. There is no practical evidence that knowledge sharing or knowledge management has a self-running behavior even in modern, open and dynamic organizations.
- There is neither ICT technical nor methodological support in UNIDO, which make it much more difficult to establish and sustain knowledge management – as a culture and as a system.
- UNIDO itself seems not to be organized to take use of one KMS for more than one project, even in a programme there are different KMS-systems established. KMS should play a more central role in UNIDO, with a strategy on how to re-use experiences among projects, building a source of innovation and efficiency raising concept for the next projects.

4) Other ICT initiatives

Another example of ICT applications managed by the Department of Environment, and particularly by the Montreal Protocol Division, is the so-called *ECACool* (http://www.ecacool.com/en/), a website established by the regional network of Refrigeration and Air-conditioning (RAC) Associations of Europe and Central Asia (ECA) and whose main partners are UNIDO and UNEP. The website was firstly designed to establish closer cooperation and information exchange among regional RAC Associations of ECA and associated countries with economies in transition, as well as international organizations on new non-HCFC technologies having low global warming potential. Comprehensive information on modern refrigeration equipment and technologies, refrigerants, best servicing practices, science and engineering news is hosted on the website. In 2016 UNIDO redesigned the whole website and reorganized its informational structure. In the case of *ECACool*, UNIDO is contributing to WSIS action lines like the access to information and knowledge or the implementation of e-learning applications.

Finally, the projects implemented under the Stockholm Convention and the Minamata Convention related divisions have this year developed information and communication technologies for the cooperation and information exchange, although in these cases the initiatives are not part of regional or international programmes, but punctual actions for the correct implementation of the projects. However, plans are currently on the table to develop global ICT applications for the optimal management of knowledge and information under these frameworks.