Background on The Global Renewable Energy Atlas

Doubling of the share of renewable energy globally and ensuring universal energy access requires identifying the most appropriate technologies and available resources for each national, regional, and local circumstance. This identification requires an assessment of local resources and conditions. The rapid deployment of investments in energy infrastructure and access projects will require accurate information, transparent decision-making, and detailed planning. Each of these steps requires a detailed assessment of the potential for each renewable energy resource throughout the world.

A large technical and knowledge gap exists between nations having access to the necessary funding, technologies, and expertise to evaluate their national potentials and those that do not currently possess those abilities. The Global Renewable Energy Atlas initiative, operated by IRENA, aims at gathering the best institutes, datasets and methods to develop a single open-source internet-based platform, designed from the recommendations of the end-users, and developed by a large international partnership.

The initiative started with the development of the Global Solar and Wind Atlas, developed in 2011 and 2012, in partnership with the multilateral Solar and Wind working group of the Clean Energy Ministerial. The partnership was expanded during the third Clean Energy Ministerial (London, 2012), the CoP18 (Doha, 2012), and the third IRENA Assembly (Abu Dhabi, 2013). At the time of writing, thirty-nine countries are directly involved in the initiative, and are committing man-power and datasets to the programme, by involving their national institutes.

The mandate of IRENA should address all renewable energy resources, and the initiative would expand into a Global Renewable Energy Atlas by including bioenergy, geothermal energy, and hydropower in 2013 and 2014, and marine energies in 2015.

The partnership strategy does not duplicate the work or efforts of existing stakeholder networks and initiatives, including the work of relevant members. The strategy involves building on existing partnerships. Similarly to the Solar and Wind component, which is operated in partnership with the Clean Energy Ministerial, the technical groups should be jointly operated with existing networks or organizations.

For bioenergy, it is proposed to create an activity group within the GBEP Working Group on Capacity Building (WGCB), co-led and operated by IRENA and the GBEP Secretariat and in cooperation with GBEP Partners and Observers and any other relevant partners.

Outcomes

The outcome of this programme is a single joint platform providing free and open access to the most advanced datasets and tools, to help countries willing to initiate the assessment of their renewable potentials.
The Internet-based platform is designed to raise awareness of technology opportunities, to limit the financial risk for countries willing to investigate their technical potentials further, and for companies willing to invest in a new market. To this end, it provides high quality resource maps from leading technical institutes worldwide, and simplified models for evaluating the technical information. The dataset is enriched by more detailed national atlases that are validated against measurement campaigns.

The ambition for this platform is to become a repository for high quality renewable energy resource data and a catalyst to trigger planning, policy development and attract investors in emerging and new renewable energy markets.

**Focus of the Activity Group**

The assessment of the bioenergy potentials is a complex process, requiring large amounts of information, critical expertise, and ground-based analysis. The complexity and depth of the analysis, as well as the amount of data required to provide an accurate estimate of the bioenergy potential makes it unlikely to carry a detailed analysis at global scale with an online tool in a near future.

The ambition level of the Atlas shall be commensurate with the quality of the input information, and should be carefully determined by the activity group. The limits of the outputs provided by the Atlas should be clearly specified. A disclaimer will be needed, spelling out the need for a ground validation process before making any concrete investment or licensing decisions.

**Data collection**

The ambition level of the initiative will depend strongly on the datasets made available to the Atlas. The Activity Group would first identify the existing datasets and databases that would be relevant for integration to the Atlas. The architecture of the Atlas enables to make this information accessible to the end-users, and to be shared widely with other initiatives. Accessing this information through an interactive online portal is an extremely relevant support to countries willing to initiate their own national assessment.

Similar initiatives exist, and the same technology is for example already in use by FAO through its online geo-catalogue, which is directly compatible with the Global Atlas data catalogue (http://www.fao.org/geonetwork/srv/en/main.home). By linking the two geo-catalogues, the Atlas is directly able to load information of compatible formats from the FAO database, visualize and query this information through the online GIS. Additional data layers and remotely hosted datasets from institutes and governments can be listed into the catalogue, and made accessible to the application.

It is expected that this initial effort will make available high-quality and validated existing bioenergy resource assessments performed using different methodologies at different scales, as well as base data layers (e.g. landcover, land use, type of soil, forest resources). In this process of data collection, it is expected that significant data gaps will be found on various territories. Solutions for filling these data gaps would be discussed, solutions might be found through other partnerships of the Atlas, such as the Global Earth Observation (GEO) initiative.

A difficult point will be to document the uncertainty of the different datasets made available to the Atlas. The reflexion is starting within the Solar and Wind group to define a set of basic...
assessment criterion giving an indication on the data quality, and a similar reflection will be needed within the Activity Group.

Data analysis
The Atlas architecture could enable to integrate existing analysis tools. For example, the renewable energy resource explorer developed under the UNEP/SWERA programme is already included in the Global Atlas.

For bioenergy, it is technically possible to make available some reference models enabling to estimate the bioenergy potentials, and to activate those models on selected data layers for user-defined geographic entities. The number of tools that can be accessed through the Atlas is not limited technically, nor is their level of complexity, as the tools are hosted remotely as web-processing services. It is as well entirely possible to adapt an existing tool to function as a web-processing service. However, this aspect should be carefully investigated. Any tool to be referenced by the Atlas should be able to provide quality information. It should be based on quality-controlled datasets, be relevant for the selected geographic entity, and take into account the technical limits of geospatial analysis for advising policy-makers. The Activity Group would help identifying and defining the possible tools which could be integrated in the Atlas.

Direct resource assessment
The detailed assessment of the bioenergy potentials requires ground data collection and validation. The need to carry detailed assessment campaigns will emerge rapidly, for example from the IRENA initiatives on islands or on the east African corridor. In addition, several IRENA members approached the organization to support the mapping of their renewable resources. Several questions emerge in this regard: are there methodologies that can be recommended to carry those assessments, and on which ground? Are there adequate approaches for each geographic extent (small islands, regions, countries, group of countries)? Is there a possibility to assess the uncertainty of those methodologies? Is there a need to define a consensual methodology to assess the bioenergy potentials, and is it an achievable goal in the medium-term? UNEP has taken the lead on the latter, and this experience would be extremely valuable to the group discussions.

The budget for performing detailed assessments would have to be leveraged from contributions additional to the annual budget of IRENA.

The Activity Group would contribute to overall objectives of the Working Group on Capacity Building for Sustainable Bioenergy, by providing a platform primarily for identifying and disseminating information about existing tools and resources available from both the public and private sources and facilitating appropriate linkages between them.

The Atlas is by essence a platform to share information. The Activity Group would in addition identify opportunities for the Global Renewable Energy Atlas to share information, stimulate discussion, and identify opportunities for cooperation on sustainable bioenergy development and deployment.
Governance

The Activity Group will report to the GBEP Working Group on Capacity Building for Sustainable Bioenergy (WGCB). It would also act as the bioenergy technical group of the Global Renewable Energy Atlas. The activities and the outcomes of the Activity Group would also be reported to the Steering Committee of the Global Renewable Energy Atlas by its leader, IRENA.

GBEP and the Steering Committee of the Global Renewable Energy Atlas have an overlapping membership, which would enable efficient interactions between both initiatives. In addition, the GBEP Secretariat would be invited as observer to the Steering Committee of the Global Renewable Energy Atlas.

The GBEP Steering Committee and the Steering Committee of the Global Renewable Energy Atlas are the main governance bodies of the initiative. The latter is comprised of countries and organizations committed to contributing to the process in terms of providing data and/or supplying expertise. The Steering Committee meets on a regular basis, during the main IRENA events. The Steering Committee reviews the development of the initiative, and advises on its implementation. In addition, the Steering Committee brings added-value to the process, and adds content to the initiative by monitoring and/or enabling the coordination of the national initiatives, enriched by regular exchanges of information.

Implementation Strategy - 2013

The Activity Group will be a pluri-annual activity. In 2013, the Activity would be organized as follows:

1. Presentation of the proposal for the Activity Group, January 2013.
3. Mobilization of GBEP Partners and Observers and constitution of the Activity Group, Q1 – Q2 2013.
4. First working session of the Activity Group, definition of the work programme, Q2 2013
5. First work programme for the Activity Group, Q3 2013.
6. Implementation phase starting, Q4 2013/ Q1 2014.

Participants

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<th>Leader</th>
<th>IRENA</th>
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<td>Proposed partners</td>
<td>GBEP Partners and Observers, Brazil (Getúlio Vargas Foundation), Sweden (Chalmers University), the Netherlands (RIVM-IMAGE, Utrecht University, <a href="http://www.b-i-o.nl">www.b-i-o.nl</a>), the United States (DOE, USDA, NREL, USGS-IGBP), Vietnam. Organizations: EEA (CORINE), FAO (FAOSTAT), IDB, IICA, IEA, IIASA (GGI, GAEZ), UNEP (Integrated Biodiversity Assessment Tool, country mapping studies), World Bank.</td>
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Estimated Budget - 2013

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<th>Administrative Cost – IRENA contribution¹</th>
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<tr>
<td>1. Planning Activities</td>
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<td>2. Travel</td>
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<tr>
<th>Project Activity Cost</th>
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<tr>
<td>1. Workshops</td>
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<td>2. Partners costs</td>
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In cooperation and with the support of:

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¹ Preliminary figures upon acceptance of the IRENA work programme and budget by the IRENA Assembly for 2013.