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Africa Clean Energy Corridor / West Africa Clean Energy Corridor

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1. Background/Context

The Africa Clean Energy Corridor (ACEC) is a regional initiative that seeks to secure the accelerated development of renewable energy potential and cross-border trade of renewable power within the Eastern Africa Power Pool (EAPP) and Southern African Power Pool (SAPP). The initiative builds upon the strong political commitment of African leaders to strengthen regional institutions and transmission infrastructure, forming large competitive markets and lowering costs across production sectors. By creating a larger regional electricity market, the ACEC could attract investments to meet 40-50% of power needs in the EAPP and SAPP regions by 2030. Combined efforts will also diversify resource availability, improve energy security and foster investment opportunities and job growth. Scaling up renewable energy also offers a comprehensive opportunity to avoid lock-ins with carbon-intensive infrastructure and leapfrog towards a low-carbon future. Such region-wide renewable energy deployment could cut the annual CO2 emission level in 2030 by 310 Mega tonnes (Mt), translating into 2,500 Mt savings of cumulative CO2 emissions between 2010 and 2030 while increasing electricity supply by 2.5 times.

Development of the ACEC is guided by a Communiqué endorsed by Ministers and heads of delegations from the EAPP and SAPP countries in January 2014. Since then, support for the initiative has expanded exponentially, with the additional engagement of more than 30 governments, regional organizations, development partners and financial institutions.

The Communiqué called for an Action Agenda with five main pillars of (i) Zoning and Resource Assessment to identify sites for renewable power generation in areas with high resource potential and suitable transmission routes; (ii) National and Regional Planning to fully consider cost-effective renewable power options; (iii) Enabling Frameworks for Investment to open markets and reduce financing costs; (iv) Capacity Building to plan, operate, maintain and govern power grids and markets with higher shares of renewable electricity generation; and (v) Public Information and Awareness Raising on how the corridor can provide secure, sustainable and affordable energy.

In response to the high interest from other African sub-regions and benefitting from the experiences gained during the initiation and development of ACEC, IRENA initiated the process in 2015 to expand the initiative to West Africa through the West Africa Clean Energy Corridor (WACEC). WACEC aims to support the region's ongoing efforts to address the key energy challenges, including, increasing power demand-supply

imbalance, high cost of power generation, and poor access to energy in coordination and collaboration with all relevant stakeholders.

2. Findings/Progress/Implementation

Concrete results achieved under each pillar of the initiative are:
Resource Assessment: to power plans in high resource areas

Africa Clean Energy Corridor:

- Development of the zoning methodology for the identification of high resource potential and cost-effective power generation zones, which has been validated by stakeholders from utilities, government, regulatory bodies, power pools and academia within the region.
- Collection of extensive data from EAPP and SAPP countries on their renewable energy resource potential, existing and planned grid transmission infrastructure and road networks, protected areas, national electricity load profiles and infrastructure expansion costs, for use in the zoning analysis.
- Identification of renewable energy zones in the EAPP and SAPP member countries and presenting these to stakeholders, highlighting developable areas for wind and solar (both utility-scale photovoltaic and concentrated solar power) technologies.
- A regional workshop organised in Namibia in April 2017 enabled data gathering on the sites earmarked for development.

- This output provided a basis for financial viability analyses, which aims to inform power procurement procedures in the relevant countries as well as the regional planning processes. In that regard, the financial viability and suitability of 25 project sites have been assessed within the ACEC zones to guide renewable investments.
- The results of this assessment are being considered by some of the countries in designing their tendering processes as well as guiding their interactions with potential solar and wind project developers.

West Africa Clean Energy Corridor:

- Completion of a suitability analysis work for solar and wind which helped to identify the area of high potential in the region and will be used as basis for the future zoning work under WACEC
- Conduct of scoping study for the solar component of the WACEC aiming to install 2 GW of Solar by 2030 in West Africa (funded under the ongoing European Union Energy Initiative's Technical Assistance Facility).

- Initiation of financial viability analyses for sites earmarked for Solar and Wind project development. In that regard, 14 sites have been assessed in Mali and Togo and other countries such as Nigeria and Senegal have expressed their interest in the service.

National and Regional Planning: to fully consider cost-effective renewable power options

Africa Clean Energy Corridor:

- Development of least-cost System Planning Test models to support planning for long-term power generation expansion plans (over the next 20 – 40 years) in continental Eastern and Southern African countries. These models also allow policy makers to assess least-cost investment options in light of a specific policy goal, such as a renewable energy penetration target, import independence, affordability or CO2 targets, in order to assess investments in international transmission lines for renewable energy deployment. The tools have been made available and regional training seminars were held, with the attendance of more than 50 energy planners in total.
- Ongoing work has also been initiated to incorporate the zoning results into regional planning in Eastern and Southern Africa power pools.
- Support was provided to Swaziland through a 10-month capacity building programme for the development of and Energy Master plan for enhancing energy security, affordability and environmental sustainability based on the results of the zoning exercise
- The Energy Master plan will be adopted by the cabinet by the end of the first half of 2018 and will be followed by energy planning capacity building programme to strengthen the country's implementation capacity.

West Africa Clean Energy Corridor:

- Development of the "Planning and Prospects for Renewable Energy in West Africa" report taking into account the new model input data and national renewable deployment scenarios using SPLAT-W country models coming out of a six-month capacity-development programme in 2015/16 organised by IRENA and the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE), in collaboration with the International Atomic Energy Agency (IAEA) and the United Nations Framework Convention on Climate Change (UNFCCC).

- Initiation of a capacity building programme to establish a national energy planning unit for energy statistics and long-term energy planning taking into account cost-effective renewable energy options in Sierra Leone.
- Contribution to the update of the West Africa Power master plan, for which the kick-off meeting was held in Cotonou in January 2018, by providing input to support the collection of reliable data on renewable energy resource potential, costing as well as capacity building on planning and project facilitation.

Enabling Frameworks: to attract Investments

- Guidance provided, through Renewables Readiness Assessments, to Djibouti, Gambia, Ghana, Mali, Mozambique, Niger, Senegal, Swaziland, Tanzania, Zambia and Zimbabwe on the development of enabling policy, legislative and institutional frameworks.
- Launch of the Sustainable Energy Marketplace (SEM) for project initiation, development and financing. SEM brings together renewable energy project owners, governments, financiers, and service/technology providers to enhance the understanding of the market and the capabilities of project owners in a transparent and structured way.
- Concerning the regulatory work, IRENA supported the Regional Electricity Regulators Association for Southern Africa (RERA) to develop a knowledge base on regulatory actions supporting renewable energy development in the region.
- IRENA has cooperated with national regulators and RERA, ministries, utilities and academia to enhance investment frameworks for wind and solar PV. This engagement has developed an assessment, in two pilot ACEC countries (Namibia and Zimbabwe) as well as the entire SAPP region, on how existing planning processes can be amended, including the empowerment of the regulatory roles to provide greater investment certainty and ensure timely project delivery; deepened the understanding of auction practices and impacts in sub-Saharan Africa (South Africa, Uganda, Zambia); principles for designing bankable power purchase agreements for renewable energy in Southern Africa and further details related to efficient project development and approval.

Capacity Building: to plan, operate, maintain and govern power grids and markets with higher shares of renewable electricity generation.

Africa Clean Energy Corridor:

- Holding capacity-building workshops related to the renewable power zoning process in the EAPP and SAPP regions. The workshops, attended by ministries, utilities, regulatory bodies, and academics, presented preliminary study results and provided a platform for explaining the zoning process and methodology.
- Organization of training seminars on energy planning and the use of planning tools for the ACEC countries, which were attended by energy planning officers, utility planners and academics.
- Holding the first IRENA Renewable Energy Training Week on regulation. The continuing training week series inform decision makers in governance bodies and industry about the possible paths for the development and integration of renewable resources into today's power systems.
- Organization of the Southern Africa Renewable Energy Statistics Workshop for building capacities in the collection, processing and dissemination of renewable energy data as well as the construction of national renewable energy balances. Other topics covered at this training workshop included: renewable energy costs; resource assessment; energy production from bagasse (field trip); and estimation of renewable energy production from international trade statistics about imports of equipment (solar panels and solar water heaters).
- Series of trainings on strategic long-term energy planning through the use of IRENA's System Planning Model (SPLAT-SW) for Swaziland.

West Africa Clean Energy Corridor:

- IRENA, in partnership with the relevant regional institutions, initiated a capacity building programme with the end-goal of facilitating regional market integration. This capacity building programme put the focus on the development of renewable energy PPAs as well as the planning and operation of grids with higher shares of variable renewable power.
    - The component on the planning and operation of grids with higher shares of variable renewable power was kicked-off in Dakar in December 2017 and will be completed by end of June 2018
    - The component on the development of RE PPA was kicked-off in January 2018 and will be completed by end of August 2018.

  These two activities will be followed by a three-year capacity building programme aiming to address all the issues identified by the gap analysis.

Public Information and Awareness Raising: on how the Corridor can provide secure, sustainable and affordable energy

Featuring of ACEC at all major fora in Africa and at global level which led to the additional engagement by more than 30 governments, regional organizations, development partners and financial institutions, and growing interest from new partners to join.

As for the WACEC, the concrete results achieved so far include:

- Validation and technical adoption of the WACEC concept by Directors of Energy and Environment of 15 ECOWAS countries in Dakar (April 2016)
- Inclusion of the WACEC in the work program of the West African Energy Leaders Group (W-AELG).
- Initiation of discussions with WAPP for considering least cost RE options in the revision of their master plan.
- The West Africa Clean Energy Corridor (WACEC) action plan was approved by the ECOWAS Energy Ministers in December 2016. Regulation on the WACEC was adopted by the ECOWAS Council of Ministers as an annex to the ECOWAS Treaty and it was reported to the Summit of ECOWAS Heads of States in June 2017 in Liberia.

3. Challenges

- Difficulties in collection of reliable and updated data and information on ongoing and planned renewable energy-related activities within all the various sectors
- Difficulties in reaching consensus among national stakeholders on a country-level counterpart
- Difficulties to get long-term commitment and dedication from the counterparts at country level
- Limited technical skills at country-level to take forward the various pillars of CECs
- Difficulty of ensuring transfer of information and skills within different departments

4. Issues to be discussed by STC experts

- How to ensure coordination with ongoing initiatives and programmes on the continent for a smooth implementation of the corridors?
- How to embed the CECs in countries' national renewable energy and climate change agendas?
- How can the corridors support the regions in their efforts to create a sustainable low-carbon power market?

5. Recommendations/Way Forward

Outcomes by end-2018

- 2 trainings on the planning and operation of grids with higher shares of variable renewable power in WACEC Region
- 1 study tour for grid operators from the WACEC Region in a country with substantial experience in the operation of grids with high shares of variable renewable power
- 4 trainings on the development of renewable energy power purchase agreements in WACEC Region
- Formulation of 2 mid-term capacity-building programmes on planning & operation of grid and the development of PPAs
- Regional training on statistical data collection, processing and dissemination in West Africa
- Regional stakeholder consultation in ACEC Region
- Financial viability analyses for sites earmarked for development of Solar and Wind in ACEC and WACEC countries

Longer-term goals

- A steady flow of bankable renewable energy generation and transmission projects to be presented by countries to investors to attract long-term stable investments.
- Revision of regional power plans to incorporate renewable energy generation projects and accompanying transmission projects.
- Enabling frameworks to be comprehensively established at regional and national levels to attract investments into renewables and facilitate cross border renewable power trade within EAPP, SAPP and WAPP regions
- Capacities and skills to be enhanced to plan, build, operate, maintain and govern power systems within the ACEC and WACEC with higher shares of renewable electricity generation.